



Activity report
2010



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Message from the Board

“ Given this tension between energy supply and demand, regulation is required to protect the collective interest and avoid speculation. ”

This report in its new form, by the Commission de régulation de l'énergie (CRE, French energy regulator) is clearer for all those who are interested in the energy sector.

Energy is at the centre of the development of life in society. This is why it is essential to give people the means of understanding what is at stake.

The year 2010 was marked first of all, by the passing of the law on the new organisation of the electricity market (NOME Law), which gives CRE new missions and changes its governance by introducing a Board of five full-time members.

The year 2010 and the past few months have also been marked by significant events in the energy sector: increase in the price of supply, development of renewable energy, the Fukushima disaster and the subsequent questions on nuclear safety.



➤
From left to right:
*Frédéric Gonand,
Philippe de Ladoucette
(Chairman),
Olivier Challan Belval,
Jean-Christophe Le Duigou
and Michel Thiollière.*
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The world's energy demand is rapidly increasing. This means that all forms of energy must be used and that the energy mix must be diversified to meet the needs of our economies. The development of new energy (wind, photovoltaic, biomass, etc.) is therefore desirable although it has encountered several difficulties, in particular with regard to funding.

The security of supply is still a major issue for France and Europe. Those who participated in the 2010 World Energy Congress in Montreal in September, reiterated the need to meet energy demands while guaranteeing our citizens maximum safety, environmental protection and cost-effectiveness.

Given this tension between energy supply and demand, regulation is required to protect the collective interest and avoid speculation. Regulation should always promote an economically rational approach: a price must correspond to a physical reality. CRE and the Autorité des Marchés Financiers (AMF) (the French securities regulator) have therefore implemented a unique cooperation agreement in Europe to monitor the emissions trading market, in which electricity and gas producers are major players.

France is actively taking part in the implementation of the European energy market by supporting a rational approach. Within the framework of the Council of European Energy Regulators (CEER) and the brand new Agency for the Cooperation of Energy Regulators (ACER), CRE is endeavouring

to promote harmony rather than uniformity in terms of market organisation and network structure. The preparation of network codes, which harmonise the operating rules for the electricity and gas markets, illustrates this approach.

The opening of markets must benefit final customers. In that aim, CRE has undertaken major projects, such as the implementation of smart meters in the gas and electricity sectors, in order to significantly improve customer information, giving customers full freedom to better manage their consumption and choose their provider. CRE also aims to promote greater electricity service quality across the French territory. ●

“ CRE is endeavouring to promote harmony rather than uniformity in terms of market organisation and network structure. ”

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How CRE works and the activity of CoRDIS

1. CRE'S POWERS AND ORGANISATION

1.1. Introduction to CRE

The Commission de régulation de l'énergie (CRE) is an independent administrative authority that regulates the energy sector in France. It was created in 2000, the year in which the energy markets were opened to competition.

CRE's overall mission is to *"contribute to the proper operation of the electricity and natural gas markets, to the benefit of final customers."* It has a statute guaranteeing the independence of its missions.

It has taken part in the implementation of the new organisation of the energy market (Nome Law) by performing important missions to increase market competition, promote the integration of renewable energy in the networks and encourage the control of energy demands by introducing smart grids. In supporting these developments, CRE is a key player in the energy world and has consolidated its legitimacy as the regulator of the energy sector.

CRE is governed by the laws of 10 February 2000, 3 January 2003, 9 August 2004 and 7 December 2006, which transposed the European Directives of 1996, 1998 and 2003 concerning the internal electricity and natural gas markets.

Members of the Board of CRE define the major policy lines and adopt recommendations and decisions. Since the adoption of the Nome Law on 7 December 2010, the CRE Board has been composed of five full-time members, appointed based on their expertise in the legal, economic and technical fields. Their mandate is irrevocable and cannot be renewed.

CRE's financial resources are covered by the State budget. The same budget as for the year 2009 was allocated to CRE in 2010, i.e. €20 million, including €11.9 million for staff appropriations and €8.1 million for operations. This budget is identical to the 2011 budget.

186
deliberations
 in 2010.

1.2. CRE's missions

CRE informs all customers

CRE seeks to win consumers' trust with regard to the operation of markets by consulting with their representatives and developing retail market surveillance tools such as the market observatory. It designs and improves information tools with the national energy ombudsman (le médiateur national de l'énergie), such as the Energie-Info website (www.energie-info.fr) and the supply comparator proposed by suppliers.

CRE ensures the proper operation of retail markets

CRE organises the work of consultation platforms bringing together all stakeholders (representatives of customers, suppliers, system operators, licensing authorities and public authorities) and supervises experiments on smart metering systems.

CRE also issues opinions on the regulated tariffs for the sale of electricity and gas, in particular, on sale tariffs for persons in situations of financial uncertainty.

277
Commission sessions
 in 2010.

Since the adoption of the NOME Law, CRE has been responsible for setting the tariff for regulated access to incumbent nuclear electricity (ARENH) of operators supplying final customers.

CRE supervises transactions made in organised or non-organised wholesale electricity and natural gas markets, as well as cross-border trading

CRE's action aims to detect, through the analysis of prices and players' decisions, any abnormal behaviour. Therefore, in terms of CO₂ markets, CRE supervises in cooperation with the Autorité des marchés financiers (AMF), transactions made by gas and electricity market players. By reassuring stakeholders, CRE promotes the development of transactions and enhances the market's ability to give relevant price signals.

CRE participates in the implementation of mechanisms to support electricity production and the supply of electricity and gas

CRE implements the tendering procedures launched by the Ministry for Energy within the framework of the pluriannual investment plan (PPI) for electricity production. It issues opinions on the tariffs for the purchase of electricity produced by cogeneration or from renewable energy sources and manages the compensation mechanism for suppliers that pay public service charges.

CRE ensures the proper operation and the development of gas and electricity networks and guarantees the right to access to public electricity grids and natural gas networks and facilities

Until present, CRE proposed to the minister for the economy and the Minister for Energy, tariffs for the use of gas and electricity transmission and distribution networks and LNG terminals. With the transposition of the third energy package, CRE will define the method used to establish these tariffs and deliberate on their development. It will have full power in that regard.

Through the Standing Committee for Dispute Settlement and Sanctions (CoRDIS), CRE settles disputes concerning access to and use of public electricity and gas networks and natural gas facilities (*see page 10*). It may level sanctions on failure to fulfil the obligations incumbent upon the operators or users of an electricity or gas infrastructure.

CRE supervises and monitors the independence of system operators. It approves the investment programmes of electricity and natural gas transmission system operators, and the principles of legal and accounting unbundling between transmission, supply and distribution activities, by ensuring obedience to compliance programmes and the independence of these operators.

CRE supervises the organisation of the balancing mechanism on electricity grids as well as the operation of the balancing system for natural gas transmission networks, and approves methods for calculating

8
public consultations
in 2010.

and allocating capacity at inter-connections in close collaboration with regulators of all Member States.

CRE also makes regulatory decisions regarding the technical and financial conditions of connection to public electricity and natural gas grids, in particular by approving the procedures for processing requests for connection to the public electricity transmission network, user installations and public distribution networks.

CRE contributes to the construction of the European electricity and gas market through the improvement and harmonisation of network access rules

As a member of the European Regulators' Group for Electricity and Gas (EREG) and since 3 March 2011, of the Agency for the Cooperation of Energy Regulators (ACER), CRE participates actively in European work on the integration of energy markets. This work will be stepped up with the development of network codes, provided for by the third energy package, which will govern cross-border matters and market integration.

CRE is also involved in regional electricity and gas initiatives aimed at better management of cross-border exchanges and the emergence of regional markets.

CRE maintains permanent dialogue with energy players. It ensures transparency by systematically publishing its decisions and sets out, whenever possible, to provide visibility to operators, in particular in terms of pricing.

102
hearings
in 2010.

1.3. Human resources

Staff

CRE's maximum staff has been 131 full-time employee equivalents (FTEE) since 2008. This has proven to be quite insufficient given the new missions attributed to CRE in the Nome Law and the implementation of the third energy package reforming the internal energy market.

Recruitment

Gender parity is fully respected in CRE's divisions.

Today, CRE is recognised in the French institutional landscape for the quality of its expertise which hinges on the recruitment of high-level specialists. For several years now, more diverse profiles have been sought: in addition to engineers (30%), academics (34%), graduates from business schools (21%) and schools of political studies (5%) are also recruited. CRE also hires young graduates and professionals. Moreover, six of the twelve trainees received by CRE in 2010 were hired at the end of their internship.

CRE also strives to propose individual career paths to its staff within its divisions by promoting internal mobility and promotion.

In addition, management techniques are taught to staff members and dialogue is maintained with former staff networks.

35.6
years
Average age
(Board and CoRDIS
members not included).

In 11 years, CRE's missions have continued to increase. The adoption of the Nome Law has broadened its scope of action and confirmed its expertise.

Training

In terms of continuous education, CRE implements a proactive policy to ensure that its staff members adapt to the changes in their jobs and to the development of their career when they resign so that they may take up management positions.

A budget of €101,260 was allocated to training in 2010. Seventy-six officers followed one or more courses, which represents a total of 142 training actions conducted.

Remuneration

In accordance with the budget available (€11.9 million for staff appropriations), CRE strives to offer levels of remuneration that are consistent with those of the energy sector.

Officers are given a fixed salary that takes into account initial training, professional experience and the requirements of the post, and a variable portion granted according to performance, as is practised by companies in the energy sector.

2. THE STANDING COMMITTEE FOR DISPUTE SETTLEMENT AND SANCTIONS (CoRDIS)

Created in 2007, the Standing Committee for Dispute Settlement and Sanctions (CoRDIS) exercises CRE's powers in terms of the settlement of disputes concerning access to and use of public electricity and natural gas networks and in terms of sanctions. It is separate to the CRE college.

CoRDIS has the power to settle the technical and financial aspects of disputes *“between the operators and users of public electricity transmission and distribution grids, between the operators and users of natural gas transmission and distribution infrastructure, between the operators and users of natural gas storage installations and between the operators and users of liquefied natural gas installations, and*

between operators and users of carbon dioxide transmission and geological storage installations related to access to those grids, infrastructure and installations or to their use [...]”

With regard to sanctions, CoRDIS exercises CRE's powers. It may intervene of its own accord or be required to do so by the Ministry for Energy or the Ministry of the Environment, a professional organisation, an accredited user association or any other person concerned. It may also issue a decision following an administrative enquiry conducted by CRE officers.

CoRDIS was created by Article 5 of the French law of 7 December 2006 concerning the energy sector, the provisions of which are currently contained in Articles 38 and 40 of the consolidated law of 10 February 2000.



From left to right:

Roland Peylet,
Sylvie Mandel,
Pierre-François Racine
(Chairman of CoRDIS)
and Dominique Guirimand.

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CoRDiS is composed of two State counsellors appointed by the Deputy Chairman of the Conseil d'État (Pierre-François Racine and Roland Peylet) and two counsellors from the Cour de Cassation (Dominique Guirimand and Sylvie Mandel) appointed by the Chief Justice of the Cour de Cassation. Pierre-François Racine was appointed Chairman of CoRDiS by decree.

In the year 2010, CoRDiS rendered eleven decisions. Three of these in particular should be highlighted.

2.1. Suppliers shall no longer bear the transportation portion of customers' unpaid electricity bills

In a decision dated 22 October 2010, a request to modify the DSO-S (Distribution System Operator – Supplier) contract was brought before CoRDiS by Direct Énergie so that it would no longer bear the transportation portion of customers' unpaid electricity bills.

In order to propose a single contract to its clients, such as a regulated tariff contract, covering the supply of electricity and access to the electricity distribution network, a supplier must have previously signed with the system operator a contract known as a “DSO-S contract”, a sort of framework contract that determines the reciprocal obligations of the supplier and the system operator, but also of clients, in terms of access to the network. In the single contract system, the supplier bills the client for the supply portion which it keeps and the transportation portion that it must pay to the distributor.

However, the clauses of the DSO-S contract currently in effect and signed by each of the suppliers with ERDF obligate suppliers to bear the entire unpaid sum, including the transportation portion that goes to ERDF.

Seeing a considerable increase in sums unpaid by its customers, one of the electricity suppliers, Direct Énergie, contested before CoRDiS, ERDF's right to

“ CoRDiS, independent from the college of commissioners, enables CRE to accomplish one of its fundamental missions: to guarantee transparent and non-discriminatory access to energy networks, which is essential for opening the market to competition. ”

make it bear the unpaid sums corresponding to transportation. Direct Énergie also contested other clauses of the DSO-S contract.

Based on a previous decision (decision of 7 April 2008, Direct Énergie, Gaz de France, Electrabel France and Poweo against ERDF), CoRDiS considered that once suppliers fulfil tasks or bear costs for the system operator within the framework of the single contract mechanism, they must be placed in a situation similar to that of the system operator when the latter is directly tied to the customer by a contract for access to the distribution network.

Given this principle, CoRDiS, not accepting all of Direct Énergie's requests, decided that there was no provision in current legislation that authorised ERDF to make suppliers bear the risk of unpaid sums corresponding to the portion that is paid to the distributor.

CoRDiS therefore concluded that, to pay the sums due for the use of the network to the system operator, the supplier must have previously collected them from final customers, unless it has not acted in due form to collect the outstanding sums. It invited ERDF to make this amendment to the DSO-S contract. CoRDiS gave ERDF a deadline of two months to transmit to Direct Énergie a new DSO-S contract in compliance with its decision.

2.2. The purchase of electricity generated within the framework of the legal purchase obligation system is not subordinated to the direct connection of production facilities to the public transmission grid

On 12 July 2010, CoRDiS rendered an important decision in a dispute opposing wind energy producers to the RTE company regarding the connection of their production facility to the public electricity transmission grid.

This project, developed by the SEPE Le Nouvion company, covered five production sites. The wind farms of the Saint-Riquier 1 and Saint-Riquier 2 companies were installed on these sites. Their unit power was less than 12 MW so that purchase contracts could be signed. RTE refused the indirect connection of these companies, in particular on the grounds that the connection agreement signed by SEPE Le Nouvion could not be executed, because it had not kept the status of producer, which it had transferred to Saint-Riquier 1 and Saint-Riquier 2.

First of all, CoRDiS decided that it was not necessary to be a producer in order to be connected to the transmission network. It then affirmed that a company running a private grid, whose purpose was to inject its electricity production into the public transmission grid, should be considered as a user of the public grid within the meaning of the directive of 26 June 2003 and the decree of 27 June 2003.

Therefore, it considered that RTE could not refuse access to its grid without lawful cause.

During this dispute, CoRDiS reaffirmed the principle according to which the connection of producers is one of the missions of transmission system operators, and that no provision of law N°. 2000-108 of 10 February 2000 “*imposed an obligation for production facilities to be directly connected to the*

11
decisions
made in 2010.

public transmission grid, and that neither this law, nor any text implementing it, subordinated the purchase of electricity generated in the context of the legal purchase obligation system to a direct connection to a public distribution grid.”

CoRDiS then considered that the public electricity service must be ensured by system operators under the best price conditions, to enable producers to exercise their right to a purchase obligation contract.

CoRDiS concluded by instructing RTE to transmit an operation agreement and a contract for access to the public transmission network in order to connect the private network comprising SEPE Le Nouvion, Saint-Riquier 1 and Saint-Riquier 2.

“**Only matters concerning access to and use of networks and their use may be brought before CoRDiS. CoRDiS is not competent to settle all disputes between network users and system operators.**”

2.3. The public distribution system operator must assume the consequences of inconsistent application of processing procedures for connection requests

The JUWI company wished to develop a ground-mounted photovoltaic plant in the Saint-François municipality in Guadeloupe. In 2008, this company had therefore sent to the Island Energy Systems Division (SEI) of the EDF company, operator of the local distribution grid, requests for detailed studies with a view to connecting six ground-mounted photovoltaic systems to the public electricity distribution grid, as well a receipt for the filing of a notification prior to the start of work or redevelopment not subject to a building permit.

EDF recorded this request at the end of December 2008, but did not include the project in the connection queue on the grounds that a copy of the request for operating authorisation was not enclosed. Lastly, after the technical and financial proposal was signed by the JUWI company in 2009, in January 2010 EDF requested JUWI to supply the urban development document for the production facilities related to the six photovoltaic projects. It was only then that the project was placed in the connection queue.

JUWI therefore brought the matter before CoRDIS, with the aim in particular, of establishing that by requiring an operating permit and not an urban development permit in order for its connection project to be queued, EDF's procedure for processing its connection request was not consistent.

First of all, CoRDIS decided that a delivery station is an integral part of the production facility and is not a connection infrastructure within the meaning of Article 2 of the decree of 28 August 2007 based

on Article 23-1 of the law of 10 February 2000, and that in this case, an urban development permit was indeed required.

CoRDIS considered that under Article 4.9 of the procedure for processing requests for connection of electricity production facilities to ERDF's public distribution grids, applied by EDF, JUWI's photovoltaic production project could be placed in the connection queue once a copy of the prior declaration of work or the notification of instructions was produced, in compliance with Article R 421-9 of the French Urban Development Code as it is worded in the decree of 5 January 2007.

The Committee drew the following conclusion: the queuing of the JUWI project was delayed because of an unfounded request by EDF for a copy of the operating authorisation receipt. JUWI's project should therefore be considered as having been queued on the date that the prior declaration receipt concerning the delivery station was received, i.e. 18 December 2008. Moreover, JUWI should not have to bear the consequences, in particular, the financial consequences of this delay.

Therefore, CoRDIS decided that the costs resulting from work to adapt infrastructure to high voltage A, work to reinforce the high voltage B network, load shedding periods, and the hours of disconnection imposed on the Saint-François project should be re-evaluated by EDF using the date of 18 December 2008 as a basis. ●

17
matters
brought before
CoRDIS in 2010.

Electricity and gas: overview of the retail market

Residential sites

In the electricity market, the number of residential clients with market-price contracts increased by 13% (+ 186,000 sites) in 2010 compared to 100% (+ 700,500 sites) in 2009.

In the gas market, the number of residential clients with market-price contracts increased by 11% (+ 125,000 sites) in 2010 compared to 33% (+ 286,000 sites) in 2009.

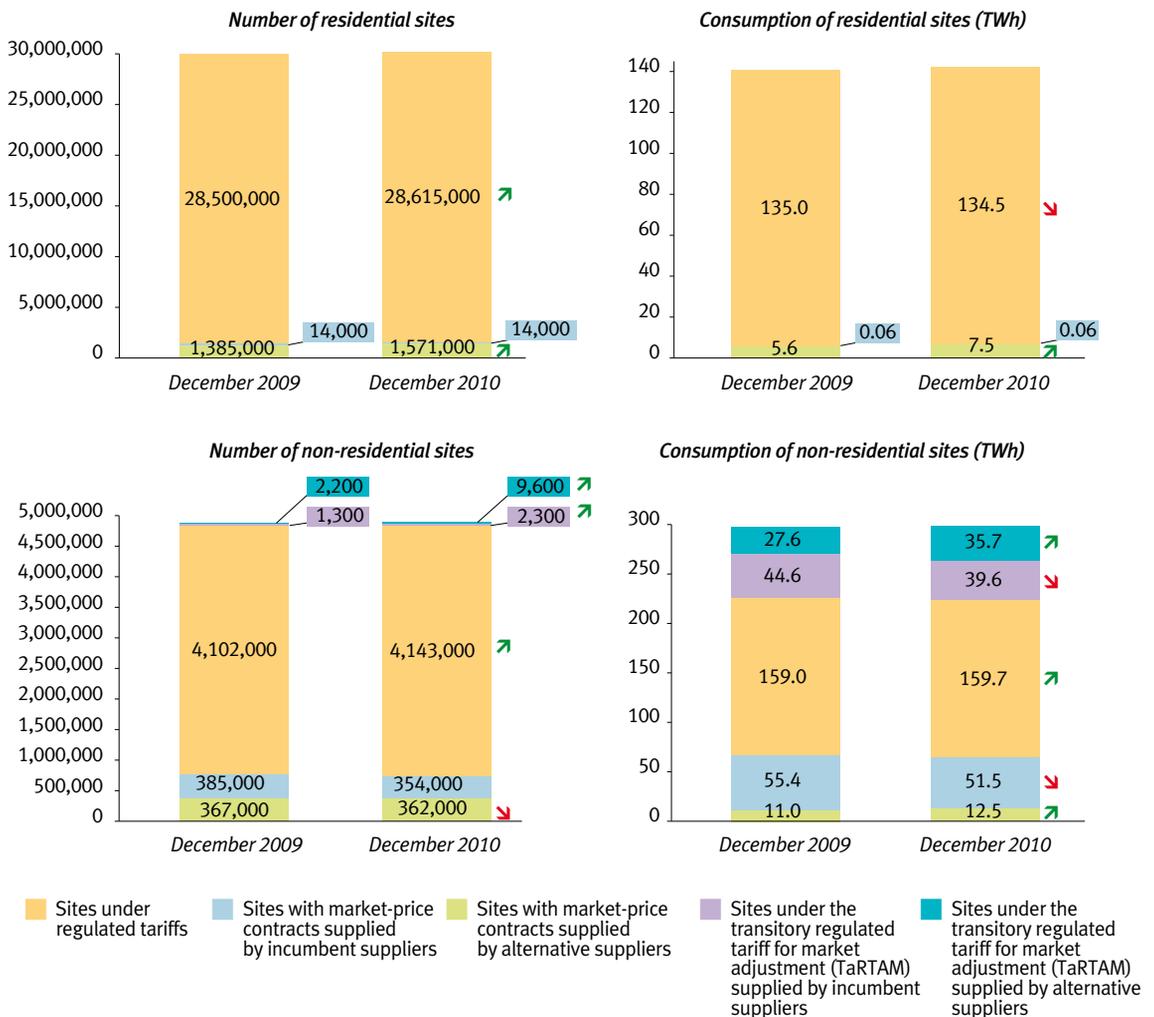
Non-residential sites

In the electricity market, the number of non-residential clients with market-price contracts decreased by 3% in 2010 (-24,000 sites).

In the gas market, the number of non-residential clients with market-price contracts increased by 11% (+ 26,000 sites).



OVERVIEW OF THE RETAIL ELECTRICITY MARKET



OVERVIEW OF THE RETAIL GAS MARKET

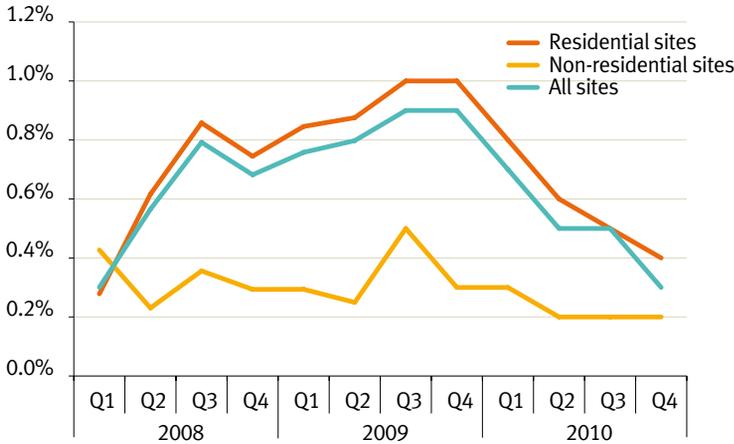


DEFINITIONS

- **The retail electricity and gas market** is divided into two customer segments:
 - **residential sites**, which are households;
 - **non-residential sites**, which combine all other customers: professionals, large industrial sites, administrations, etc.
- Since 1 July 2007, the date at which the electricity and natural gas markets were opened to competition, French customers have freely chosen their energy provider which may propose two types of offers:
 - **offers at regulated tariffs**, for which the prices are set by the public authorities;
 - **market-price contracts**, for which the prices are set freely by suppliers under a contract.
- **TaRTAM (transitory regulated tariff for market adjustment)** is a special tariff aimed at all final electricity customers. Introduced on 1 January 2007, it will be abolished following the effective implementation of regulated access to incumbent nuclear electricity (ARENH) scheduled for 1 July 2011. TaRTAM is no longer accessible since 30 June 2010.
- **The supplier switching rate:** a supplier switch is the action in which a customer decides freely to change supplier. The supplier switch rate is measured as the number of supplier switches calculated for a given period divided by the number of consumption sites at the end of this period. ●

Electricity and gas: overview of the retail market

ACTIVITY OF THE ELECTRICITY MARKET: SUPPLIER SWITCHING RATE



186,000

Number of residential sites, i.e. 0.6% of residential sites that subscribed to a market-price electricity contract in 2010.

1,585,000

Number of residential sites that have opted out of regulated electricity sale tariffs since the markets were opened* (out of 30,200,000 sites).

NATIONAL ELECTRICITY SUPPLIERS

Among the 22 suppliers that supply non-residential clients, 10 of them also have offers for residential clients



10 suppliers propose offers to residential clients

22 suppliers propose offers to non-residential clients

728,000

Number of non-residential sites that have opted out of regulated electricity sale tariffs since the markets were opened* (out of 4,871,000 sites).

* Sites that opted out of regulated sale tariffs as at 31/12/2010, since 01/07/2010 = sites with market-price contracts as at 31/12/2010 + sites that went back to regulated sale tariffs before 31/12/2010.

ACTIVITY OF THE GAS MARKET:
SUPPLIER SWITCHING RATE



125,000

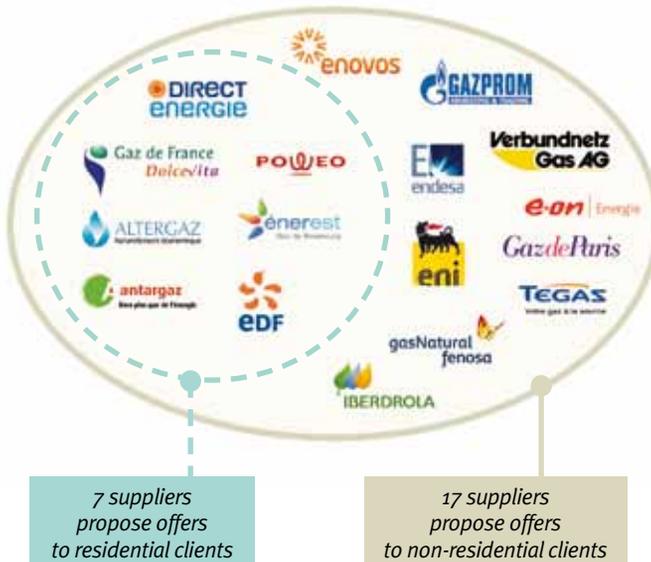
Number of residential sites, i.e. 1.2% of residential sites that subscribed to a market-price gas contract in 2010.

1,269,000

Number of residential sites that have opted out of regulated gas sale tariffs since markets were opened* (out of 10,723,000 sites).

NATIONAL GAS SUPPLIERS

Among the 17 suppliers that supply non-residential clients, 7 of them also have offers for residential clients.



269,000

Number of non-residential sites that have opted out of regulated gas sale tariffs since markets were opened* (out of 681,000 sites).

* Sites that opted out of regulated sale tariffs as at 31/12/2010, since 01/07/2010 = sites with market-price contracts as at 31/12/2010 + sites that went back to regulated sale tariffs before 31/12/2010.



27
January 2010

First CRE symposium,
co-organised with
the Paris-Dauphine University,
dedicated to electricity grids
of the future.



*Round table on the future of smart grids at the CRE symposium
on 27 January 2010.*

*From left to right: François Moisan (Executive Director of Strategy,
Research and International Action, ADEME (French Public Agency
for the energy-related issues)), Pierre-Franck Chevet, (Director-
General for Energy and Climate (French Ministry of Ecology,
Energy, Sustainable Development and the Sea)), Philippe Delorme
(General Director of Strategy and Innovation, Schneider Electric)
Dominique Maillard (Chair of the Board, RTE).*

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Smart electricity grids

KEY WORDS

- *New information and communication technologies (NICTs)*
- *Smart grid*
- *Smart metering*

The fight against climate change has resulted in the increase of renewable energy in the energy production mix.

Associated with the constant increase in electricity consumption, it requires the modernisation of electricity grids by making them communicative.

Smart grids, characterised above all by their smart metering, are a rational, proportional and necessary response to the challenges that the electricity sector faces. Grids will become intelligent through gradual modernisation. This will probably take the form of an evolution rather than a revolution that will take place over several years. It is therefore important to envisage as of present the different arrangements for this modernisation.

This is why on 8 November 2010, CRE launched the first French institutional think tank dedicated to smart grids, bringing together all the stakeholders involved in this development.

However, today we must distinguish utopic ideas from actual reality and long-term application from short-term application.

1. THE MODERNISATION OF THE ELECTRICITY GRID IMPLIES MAKING IT COMMUNICATIVE

1.1. The fight against climate change has major effects on the electricity system

Faced with climate change, in 1997 the Kyoto Protocol set quantified objectives to reduce greenhouse gases. Industrialised countries undertook to reduce their emissions over the 2008-2012 period by at least 5% compared to the levels recorded in 1990.

In December 2008, the European Union went a step further by adopting a series of ambitious directives called the climate and energy package. The “20-20-20 targets” for 2020 consists of:

- reducing greenhouse gas emissions by 20% (30% in the event of international consensus);
- improving energy efficiency by 20%;
- including a 20% share of renewable sources in final energy consumption.

France transposed these objectives in the Grenelle 1 Law, promulgated on 3 August 2009, which provides for a 25% reduction in greenhouse emissions by 2050 (factor 4) and the achievement of 23% renewable sources to cover our energy needs.

These national and European objectives have led to the reduction of peak consumption, the development of renewable energy and the improvement of energy efficiency.

1.2. Smart grids are necessary for the modernisation of networks

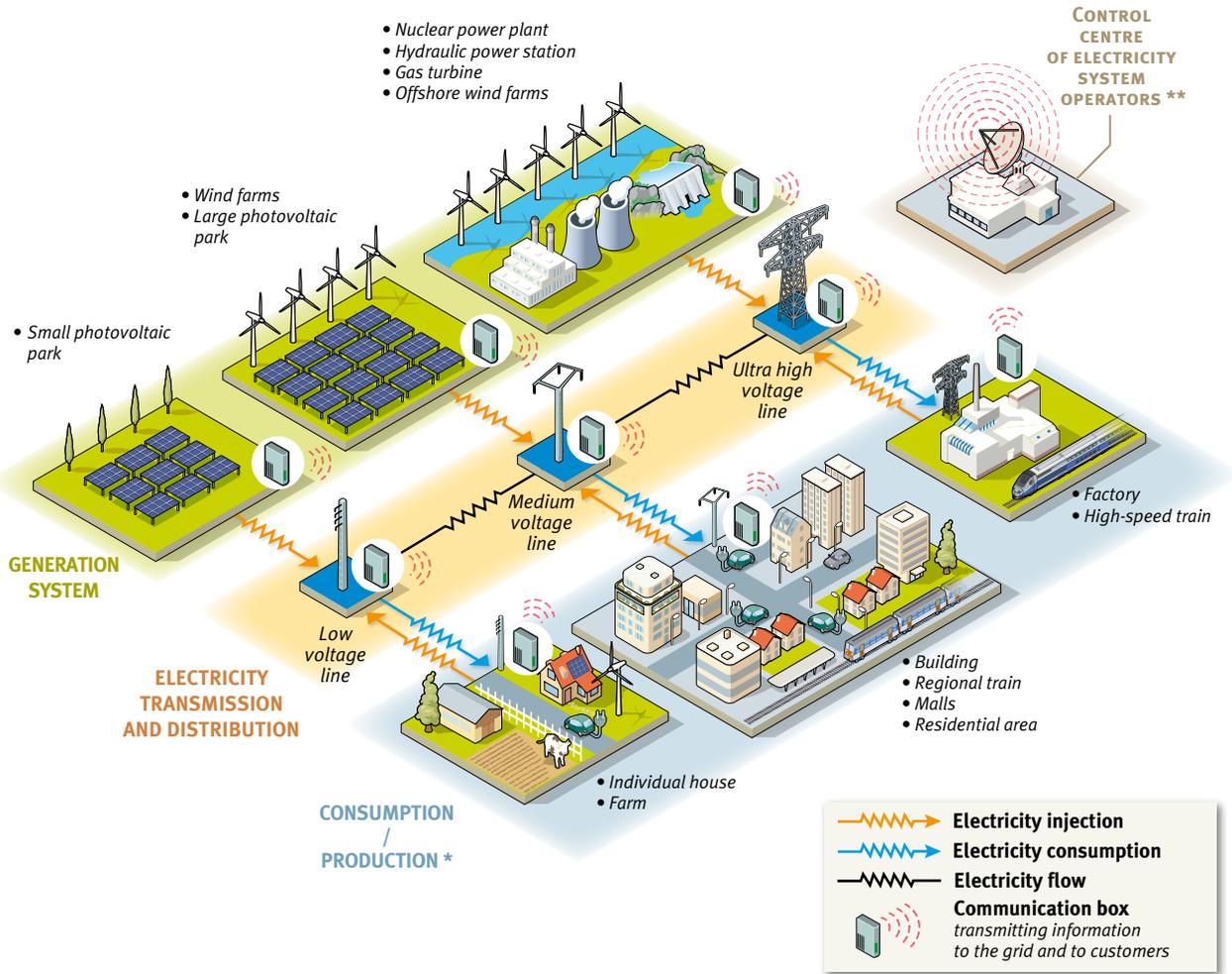
Due to the rise in electricity consumption (*see graph, page 22*) and the development of new uses and devices, such as heat pumps and electric vehicles, the grid is subject to a high level of stress. However, the construction of new infrastructure to reinforce the existing grid to deal with this increased consumption is neither socially acceptable nor financially feasible. If infrastructure cannot be heavily reinforced, the balance between electricity supply and demand can only be obtained through the optimisation of grids provided by smart grids.

Furthermore, the electricity system must include increased production from renewable sources. Some of these are centralised as in large wind farms for example. Others are decentralised such as photovoltaic panels installed on the roofs of homes. The former are mainly connected to transmission networks and the latter to distribution networks.

The number of such installations connected to distribution networks has increased exponentially since 2008. These individual sources are difficult to predict, highly variable and uncontrollable. In addition, customers no longer simply withdraw electricity, but inject it as well, which requires bidirectional flows on networks designed to transport electricity in only one direction. The management of the network is therefore even more complex.

The operating principle of the smart electricity grids

Smart grids are public electricity grids to which are added functions derived from new information and communication technologies (NICTs). Their aim is to ensure balance between electricity supply and demand at all times and provide a safe, sustainable and competitive supply of electricity to customers.



*** Consumption/production**

Customers potentially become actors of their consumption and may produce electricity. Electricity provided by their wind turbine or photovoltaic panel will be directly injected into the grid or the energy circuit of their house, apartment or factory. It will serve for example to recharge the batteries of their electric cars.

Thanks to smart meters, customers and system operators will know the exact consumption of a site or home. Energy suppliers will therefore be able to propose to customers new offers adapted to their actual consumption, as well as new energy efficiency services or services to control energy demand.

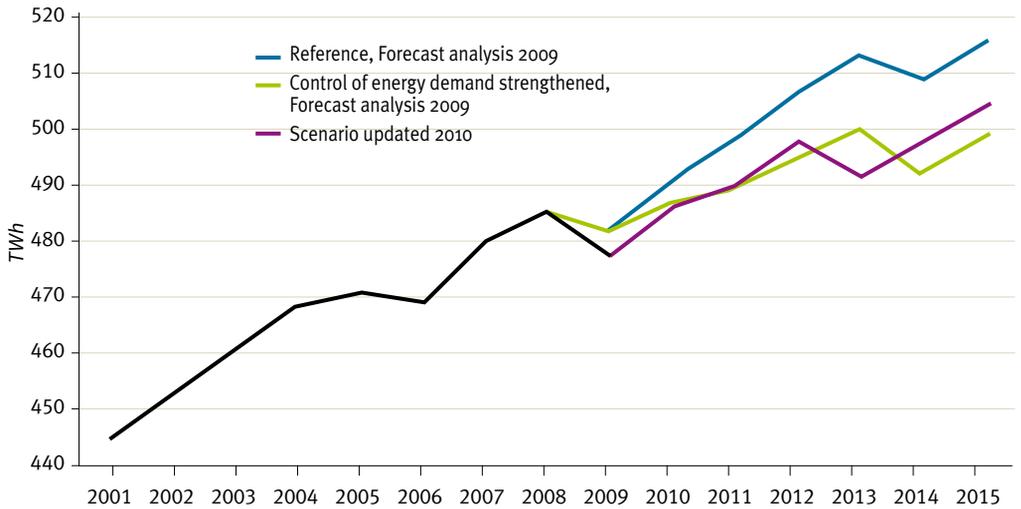
**** Control centre of electricity system operators**

Informed in real time of customers' energy needs, it distributes the required quantity of electricity in the network. Thanks to new information technologies, system operators easily detect and locate breakdowns in the network and conduct maintenance, metering and control operations remotely.

Forecast electricity consumption by 2015 (continental metropolitan France).

The use of air conditioning, audio and video equipment and electric heating has grown and has increased consumption. The emergence of new consumption uses, such as electric cars, will add to this increase.

Source: RTE, Forecast analysis of the supply/demand balance (2010 update), July 2010.



Lastly, the increase in the consumption and production of electricity generated from renewable sources is being carried out in a context of growing demand for quality – in terms of supply concerning the voltage wave form and continuity of electricity supply, and in terms of the information and services provided to clients.

These developments call for the modernisation of electricity grids. This will involve the introduction of new information and communication technologies (NICTs), which will take the form for example of sensors placed in the grid. This is the case of the smart meter on the distribution network which is the foundation of smart grids. Sensors will not only optimise the use of electricity grids thanks to a more specific knowledge of loads, the easier detection and repair of breakdowns and the exchange of data between the different players in the electricity system, but will also improve the quality of electricity supply and the distribution service.

QUOTES

Controlling peak electricity demand: the Poignant-Sido Report

In April 2010, Senator Bruno Sido and Deputy Serge Poignant submitted to the French Minister for Energy their working group’s report on controlling peak electricity demand, in which they identify a number of technical solutions to reduce peak demand through load shedding. Extracts from the report.

“The development of innovative tariff offers in the future will promote consumption load shedding when there is tension in the electricity system, but the key is the rapid implementation of the Linky smart meter that will enable customised metering. Though it is not an energy administrator, it makes it possible to (...) restrict use according to a calendar – which may be different to the tariff calendar. Up to seven additional uses may be restricted by the installation of relays capable of interpreting information output called ‘customer information system’ (...).

“The innovation downstream of the meter plays a major role in the development of consumption load shedding, both for demand response triggered by an aggregator and for consumption adjustments restricted to a tariff grid”.

1.3. The European Commission is taking action to promote smart grids

European energy policy places emphasis on the modernisation of grids to make them more reliable and capable of meeting the new energy challenges. In a message dated 17 November 2010 concerning the priorities in terms of energy infrastructure for 2020 and beyond, the European Commission declared that *“reaching the EU’s 2020 energy efficiency and renewable targets will not be possible without more innovation and intelligence in the networks at both transmission and distribution level, in particular through information and communication technologies. These will be essential*

in the take-up of demand side management and other smart grid services. Smart electricity grids will facilitate transparency and enable consumers to control appliances at their homes to save energy, facilitate domestic generation and reduce cost. Such technologies will also help boost the competitiveness and worldwide technological leadership of EU industry, including SMEs.”

Furthermore, on 1 March 2010, approval was granted for the establishment of a smart grids task force for a period of twenty months, the aim of which is to propose regulation recommendations in order to develop smart grids.

Masdar: aerial view of Central Plaza

“Giant umbrellas” shelter inhabitants and trap heat. They provide shelter during the day, trapping heat and then they close in order to release the heat at night in the centre of the ecocity of the United Arab Emirates.

© 2011 Masdar City

► FOCUS

Masdar, a Smart City project

Abu Dhabi has weighed the economic and environmental importance of sustainable development and renewable energy in light of the decrease in global oil resources. Since 2006, the emirate has implemented an ambitious project: to construct a sustainable, ecological and theoretically energy efficient city. Masdar, this model city “without CO₂ emissions and waste” will be the first city in the world that does not have a negative impact on the environment while offering an exemplary quality of life to its inhabitants.

Located in the heart of the desert, with a surface area of 6 km², it will welcome up to 50,000 inhabitants and 1,500 companies by 2016. Amounting to US\$15 billion, the project is mainly funded by the United Arab Emirates.

The energy required for the operation of the city will be produced by renewable energy: photovoltaic solar and thermal energy in a country with a lot of sunshine (100 MW plant), but also wind, hydraulic, marine, geothermal and hydrogen energy. With regard to water supply, it has been planned to limit the use of seawater desalination as much as possible, since it requires a lot of energy, and give preference to wastewater recycling.

Transportation and buildings will be clean and energy efficient. Cars will be forbidden in the city, walking and cycling encouraged and a non-polluting public transportation system will be set up. Moreover, the city has been built based on a bioclimatic approach: compact and square-shaped, partly underground and protected from the hot winds of the desert by a surrounding wall; its streets will be narrow, sheltered and will be cooled by streams.

A genuine location to test smart grid technologies before deploying them on a larger scale. Students, researchers and innovative companies are encouraged to set up there. ●



2. CRE PLAYS A DRIVING ROLE IN THE DEVELOPMENT OF SMART GRIDS

2.1. Smart meters: the foundation of smart grids

Advanced or communicative meters will enable better management and optimisation of the use of grids by promoting information exchange. A project of general interest, it offers many benefits for all stakeholders.

It will improve knowledge of the grids and congestion points, which will facilitate investment focus and the management of stress factors such as major variation in electricity withdrawal or injection due to new uses (electric cars, micro-generation). In a context in which the development of renewable energy is promoted, this meter will also allow for decentralised production to be better taken into account. Management and use of the grids will be increasingly performed remotely: interventions on the grids will therefore be optimised.

Smart meters are the first step towards smart grids that will be made up of three levels: a physical level to transport electricity, a communication infrastructure to transmit and check the data and a third level combining applications and services. Innovation will focus in particular on this last level.

An interface between public distribution grids and the private domestic grid, the smart meter opens up a major field of innovation downstream from the meter. Thanks to this, networking, coordination and automation of the operation of electric appliances in the home will develop, paving the way to smart homes. It is a preliminary step towards the implementation of a new energy services market such as distributed load shedding to develop demand-side management.

2.2. CRE is directly involved in the development of smart metering in France

The modernisation of electricity meters is part of the opening of electricity markets to competition and aims to improve the operation of these markets. In this context, CRE plays a major role in the development of a smart metering mechanism in France.

The law of 10 February 2000 provides that electricity transmission and distribution system operators must implement mechanisms enabling tariff adjustment according to the period of the year or day. Smart metering systems are therefore a necessity. To effectively implement the law of 10 February 2000, CRE assisted ERDF in 2007 with the launch of the smart meter dubbed Linky 300,000 of which were to be installed. The decree of 31 August 2010 concerning metering systems on the public electricity network reiterates that it is with regard to the technical and economic assessment conducted by CRE that the functionalities and specifications of these mechanisms will be defined.

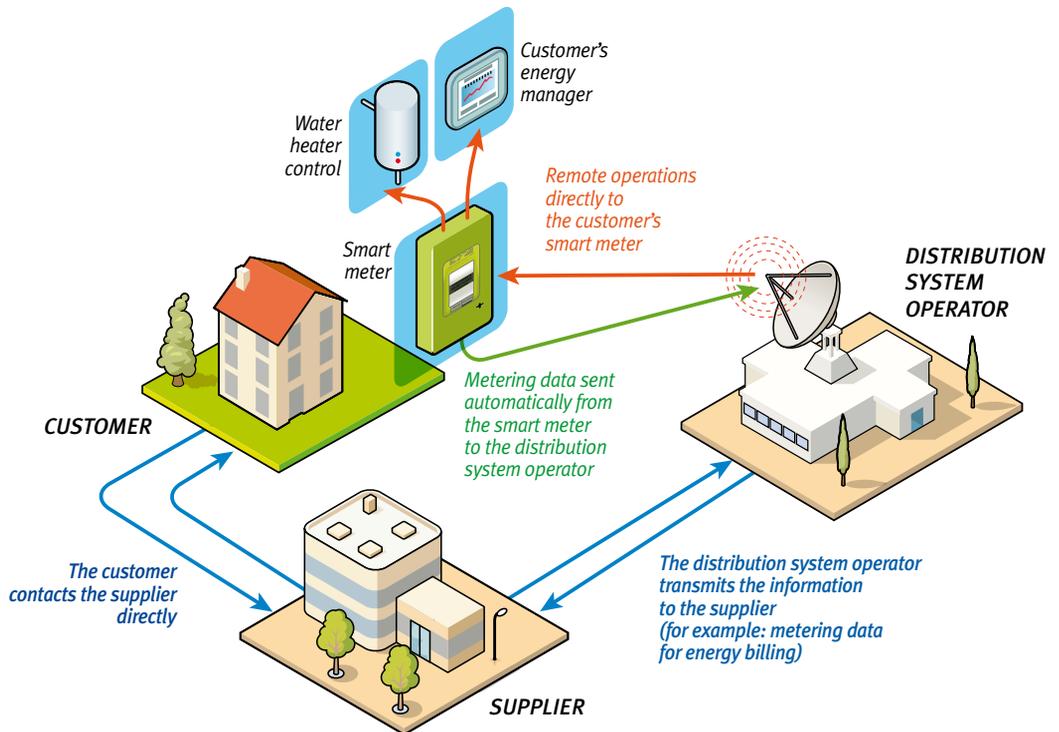
► EYE ON THE CUSTOMER

The advantages of smart meters

Advanced or communicative meters will benefit customers. First, they will be better informed of their electricity consumption, which will enable them to better control it. They will also be billed more regularly and reliably, on the basis of actual and not estimated data, which will result in fewer claims and misunderstandings with regard to invoices. Since smart meters can store a number of different consumption indices, in future customers will be able to choose the supply offers better adapted to their consumption profile. They will have tariffs that are adjusted according to the time and will be able to obtain better deals. The meter will offer remote tele-operated services (disconnection, change in the level of power subscribed, etc.). In addition to the reduction in service delivery times, the presence of the client will no longer be required for simple operations such as telemetering. Lastly, the quality of the electricity supply will be enhanced, with a reduction of outage duration and the optimisation of the operation of the electricity system, since breakdowns will be automatically located and therefore more quickly repaired. ●

Operating principle of smart meters

Smart electricity meters are the communication interface between the electricity grid and the customer's site. A concentrator, installed in a distribution station, collects all the information transmitted by the smart meter through power line carriers, gathers the data of the different electric equipment located in its environment (transformers, circuit-breakers, etc.) and sends it to the distribution system operator. The information system of the system operator is accessible by energy providers who regularly receive their clients' metering data for billing purposes. This diagram shows the relationship between the customer, supplier and system operator.



In its deliberation of 11 February 2010, CRE published the criteria that will be covered by the assessment. Among them are the functionalities and performance of the metering system, its contribution to the management of energy demand, and the quality of the information that it will deliver to customers.

Today, CRE is monitoring ERDF's Linky project on several levels:

- an internal monitoring committee assesses the experiment. It also checks for compliance with the provisions stated in CRE's message of 6 June 2007,

in particular on the objectives to be reached through the deployment of a smart metering system;

- it ensures that the experiment is conducted in consultation with all stakeholders within the framework of the Consumer Working Group;
- it organises monthly bilateral meetings with ERDF;
- it will carry out a review in the course of 2011.

An opinion will be published before the possible nationwide installation of Linky meters, which will ultimately be decided by the government.

2.3. A work programme is accompanying the consideration and development of smart grids

The electricity sector is experiencing a wave of extensive innovations which will change the way it is managed. CRE considers that this technical progress provides an opportunity to modernise grids. It has set the objective of making smart grids a prospective subject for the forthcoming years.

CRE has therefore initiated a thorough and ambitious work programme aimed at creating synergies between the numerous players in the field. To ensure long-term reflection, CRE has set up a partnership with the Paris-Dauphine University. On 27 January 2010, it organised the first institutional and international symposium on smart grids. It enabled industrial

In December 2010, Senator Ladislas Poniatowski drew up an information report on smart meters on behalf of the Senate Committee for Economy, Sustainable Development and Territorial Development. Within this framework, several players were heard, including Michèle Bellon, Chair of the Board of Directors of ERDF, who spoke about the Linky meter experiment during the round table on Wednesday, 1 December 2010. Extract of her contribution.

“ The Linky experiment involves 300,000 meters. One of the goals of the experiment is to hone the meter deployment system. General introduction will involve the installation of 5 million to 7 million meters each year for 7 years (...). The experiment aims to test the entire communication chain: smart meters, but also concentrators and the information system (...). It will enable us to define our economic cost assumptions for equipment and the installation of the meters. An important point is to prepare the adaptation of distributor jobs (...). We had a very pedagogical approach, organising information meetings in municipalities and sending a letter beforehand to all clients to inform them of the usefulness of the meter. (...) We are satisfied and reassured. The experiment is running smoothly.”

Remarks made by Michèle Bellon, Chair of the Board of Directors of ERDF during the round table on smart meters organised at the Senate on 1 December 2010.

▶ KEY POINTS

Smart metering for gas

In compliance with the provisions of the third energy package, CRE conducted a technical and economic study to analyse the effects of the deployment of the smart metering system on the GrDF natural gas distribution network.

The study focused in particular on the expected benefits for final customers in terms of demand-side management (DSM).

For the project, the results showed near economic equilibrium for the entire gas chain (customers, system operator and suppliers). It becomes profitable after the potential DSM gains made by customers are taken into account.

Among the main benefits expected of this deployment, the study highlighted:

- *improvement of the reliability and frequency of meter reading (remote reading, from quarterly to monthly reading, billing based on actual consumption data, etc.);*
- *actual consumption immediately taken into account following*

contract modifications (supplier switch, activation, termination). Customers will therefore have accurate information about their gas consumption;

– *the opportunity to develop new DSM services, which will enable gas suppliers to better differentiate their offers, and to increase competition.*

An experiment associating all stakeholders is currently being conducted by GrDF until June 2011, on approximately 20,000 clients across the municipalities of Saint-Omer (62), Étampes (91), Saint-Denis Laval/Pierre Bénite (69) and Auch (32). It will test new services aimed in particular at encouraging clients to control their gas consumption.

GrDF intends to decide on the main technical specifications of the system by mid-2011. These will remain sufficiently flexible so as to allow functionalities deemed essential following the experiment to be added. ●



Philippe de Ladoucette, Chairman of CRE, and Jean-Marie Chevalier, professor at the Paris-Dauphine University, during the opening of the CRE symposium on smart grids on 27 January 2010.

On this occasion, Jean-Marie Chevalier reiterated that with the emergence of new technologies and the management of future smart grids, the regulator is at a crucial point since it will steer investment focus.

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companies in the electricity and telecommunications sectors, politicians, suppliers and system operators to present their notion of smart grids.

The valuable contributions of this symposium were collected and described in detail in a reference book entitled *L'électricité du futur: un défi mondial* (*Electricity of the future: a global challenge*) (see box). It puts the transformation of the electricity system into perspective and highlights its magnitude and complexity.

The publication of this book by Economica editions in November 2010 coincided with the launch of the www.smartgrids-cre.fr website, which aims to encourage and gather the thoughts of the different players. This platform for dialogue, at the crossroads of diverging interests, appeals for knowledge sharing and better dissemination of the numerous experiments and projects conducted worldwide.

► IN BOOKSTORES

L'électricité du futur: un défi mondial (available in French only)



*In November 2010, CRE and the Paris-Dauphine University published a book on the development of smart grids: *L'électricité du futur: un défi mondial*. (Editions Economica)*

For the first time in France, this book gives the floor to those concerned by this development. Its goal is to examine the dynamics of this large-scale development through its technical, economic and social dimensions, and show how the emergence of smart grids requires balancing objectives that are sometimes contradictory and the strong coordination of players. ●

► PROSPECTS

CRE forums on smart grids

Since October 2010, CRE has organised forums on smart grids, which are information and knowledge-sharing meetings for smart grid players. These address numerous topics such as electric cars and smart buildings.

Electric cars (12 October 2010)

Electric car projects have developed thanks to new battery technologies and the urgent need to decarbonise transport.

The year 2011 will probably see the large-scale commercialisation of electric cars. In order to present the challenges to the large-scale deployment of this type of vehicle, and in particular, the problem of recharging, Jérôme Perrin (Director of Advanced Projects on CO₂ & the Environment, Renault), Gilles Jehan (Director of Development in the Electric Transport and Vehicles Division, EDF) and Gilles Bernard (Director of Innovative Development, ERDF) were invited to share their views.

Smart buildings (7 December 2010)

The term “smart building” covers both houses (smart homes) and apartments and offices (smart buildings). Whether referring to return on investment, individuals’ room for manoeuvre concerning the management of appliances or usage differentiation, the problems vary depending on the type of building. To discuss customers’ concerns and the development of technology, several figures participated, namely Emmanuel Rodriguez (CRE Commissioner and representative of domestic customers), Xavier de Froment (Director of Legrand, France division) and Patrick Heinrich (Head of Solutions, Siemens Technology Building). In conclusion, smart building technology exists and can be sold. The main obstacles to their large-scale dissemination are social acceptability, their conformity with customers’ requirements, their practical implementation and funding. ●



The core of the think tank on smart grids, the website brings together a community of experts with different backgrounds: consulting firms, telecommunications companies, equipment manufacturers, car manufacturers, suppliers, system operators, teacher-researchers, institutional players, etc. Together, they are the melting pot of expertise that this complex project so requires.

In collaboration with these specialists, thematic documents are drafted every two months. These are framework documents that describe the technical and economic aspects of the topic addressed and include interviews with qualified persons who present their points of view. They also incorporate reports from smart grids forums organised by CRE attended by players from the electricity sector and telecommunications industries (see box). These exchanges enable these two sectors to improve their knowledge of each other and to work together.

The website also has an informative and pedagogical customer section to raise customers' awareness of the transformations they will experience. In future, customers will in fact be much more active in the management of their energy consumption than they are today. They will be able to choose between more diversified supply offers, inject energy or shed load during peak periods. In order for customers to fulfil this role as protagonists and embrace the changes, they must be fully informed. ●

“CRE must offer a reassuring regulatory framework.”

INTERVIEW WITH...

CHRISTINE LE BIHAN-GRAF, Managing Director of CRE



How do smart grids change value creation in the electricity system?

Smart grid development is most often tackled from a technical angle. However, the technology that makes grids intelligent, either upstream and downstream of the meter, exists. Today's challenge lies more in the large-scale deployment of this technology, therefore it is mainly economic.

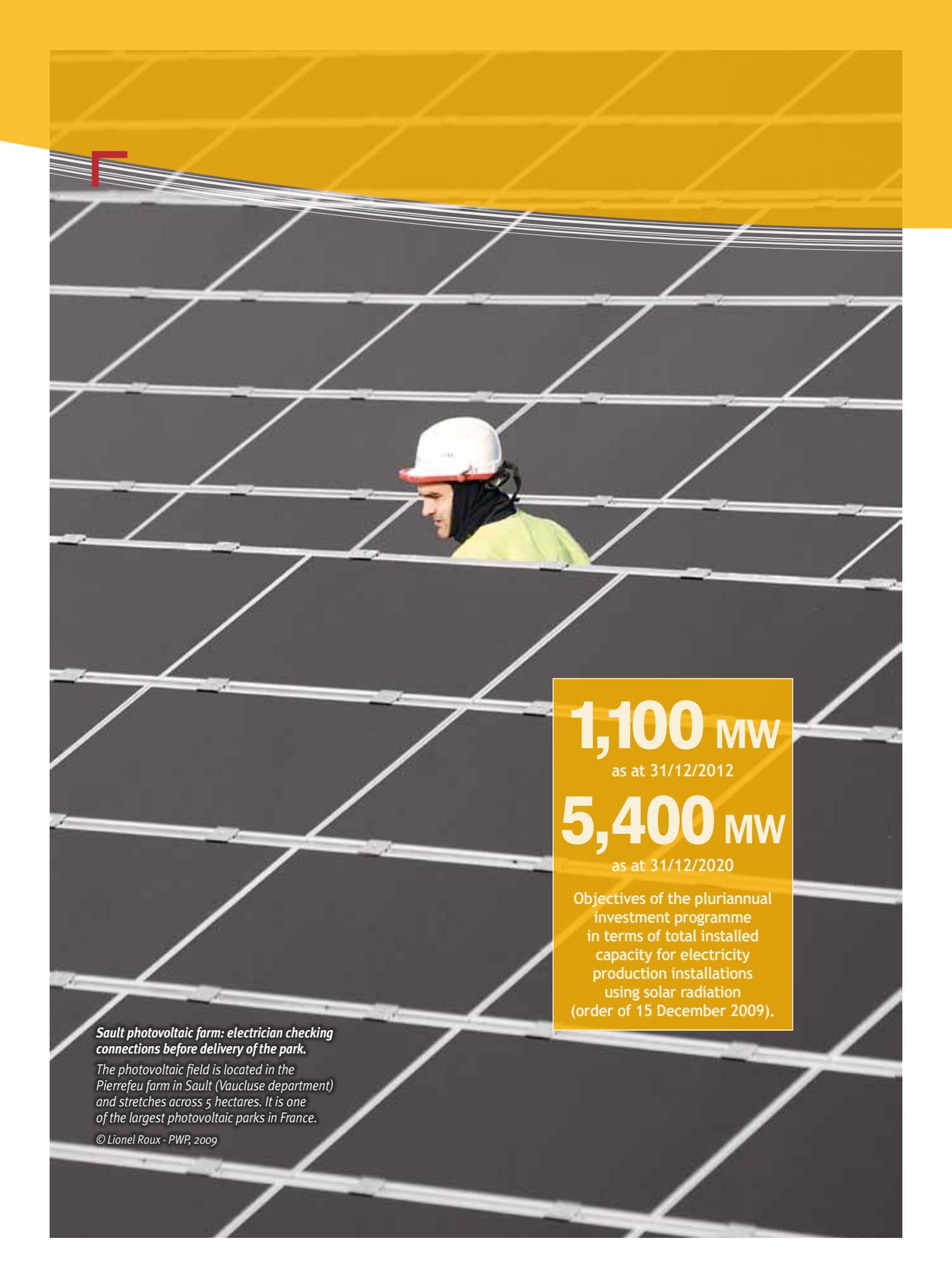
Introducing intelligence to grids changes the management of the system and the way in which value is created in the electricity chain. Today, grids are characterised by centralised and unidirectional management of energy from production to consumption. In the future, the management of smart grids will be distributed and bidirectional thanks to the integration of new information and communication technologies (NICTs). This represents a profound and unprecedented transformation of our electricity system which creates major investment opportunities.

What are the obstacles to developing business models?

The development of business models may be hindered by the complexity of the new management of the network and new interaction between the electricity system players, and by the considerable cost of investments to be injected today for positive spin-offs which will mostly be yielded later. The European Electricity Grid Initiative (EEGI) has estimated an investment of approximately €15 billion for France. Lastly, there are some uncertainties related to the development of the market, the organisation of the sector, technologies, regulation and uses. The success of smart grids depends not only on the grids' capacity to integrate information and communication technologies, but also on customers' appropriation of new uses and services.

What role can regulation play to facilitate the development of smart grids?

Smart grids raise new questions about regulation. The regulator must ensure that investment decisions of system operators are optimal for the community. It must also offer a reassuring regulatory framework while ensuring efficiency of spending. One of the regulator's main missions is to encourage system operators to offer the most effective service at the best cost. Lastly, the regulator plays a role in informing customers in order to overcome resistance to change. This is in line with the approach undertaken within the framework of our website, www.smartgrids-cre.fr. ●



Sault photovoltaic farm: electrician checking connections before delivery of the park.

The photovoltaic field is located in the Pierrefeu farm in Sault (Vaucluse department) and stretches across 5 hectares. It is one of the largest photovoltaic parks in France.

© Lionel Roux - PWP, 2009

1,100 MW
as at 31/12/2012

5,400 MW
as at 31/12/2020

Objectives of the pluriannual investment programme in terms of total installed capacity for electricity production installations using solar radiation (order of 15 December 2009).

ERDF's network in the Rhône-Alpes region.

Solar panels at the photovoltaic plant in Vinon-sur-Verdon.

© Jean-Lionel Dias - PWP, 2009

The development of photovoltaic market in France

KEY WORDS

- *Connection queue*
- *Pluriannual investment programme*
- *Public service electricity contribution*
- *Purchase obligation*

The photovoltaic segment contributes to the goal set by the Grenelle 1 law, of reaching 23% of renewable energy in France by 2020.

The purchase obligation for photovoltaic electricity at regulated incentive tariffs has led to fast and unchecked development of the segment.

Installed capacity of 5,400 MW set for 2020 in the pluriannual investment programme for electricity production could have been attained in 2014 at the latest.

Aware of the impact of photovoltaic energy on customers' bills, in December 2010 the government instituted a moratorium of three months on the purchase obligation.

Its goal was to create a mechanism to control the development while promoting the boom of a French industrial segment.

► Cumulative capacity of photovoltaic projects connected or queued, excluding local distribution companies (as at 31/12/2010):

	Connected	Queued
ERDF	808 MW	3,601 MW
EDF SEI	165 MW	547 MW
RTE	0 MW	2,250 MW
TOTAL	973 MW	6,398 MW

Data: ERDF, EDF SEI and RTE

1. SINCE 2006, CRE HAS RECOMMENDED A SUBSTANTIAL DECREASE IN PHOTOVOLTAIC PURCHASE TARIFFS AND A REVISION OF TAX EXEMPTION MECHANISMS

Introduced in March 2002, the purchase obligation for photovoltaic installations only generated real development of the industry from the year 2006. At that time, the publication of a new order proposed attractive tariffs, both for ground-mounted systems (€0.30/kWh) and roof-mounted systems (€0.55/kWh). Remaining steady between 2006 and 2010, these tariffs proved to be too great an incentive from the year 2009 because of the substantial drop in the production costs of the segment, which led to a boom

in purchase contract requests in the second half of 2009.

Purchase tariffs were modified on two occasions in 2010. Tariff orders followed CRE's recommendations:

- the tariff must take into account the substantial drop in the price of equipment in order to avoid exceedingly high profitability of projects;
- residential buildings must be distinguished from other buildings because they present greater integration constraints;
- a revision of annual indexing factors during the currency of the contract must be conducted so as to better reflect the portion of investment costs in the production cost.

› EXPERTISE

The mission of the Finance Inspectorate General: the Charpin Report

On 3 September 2010, the Finance Inspectorate General submitted a report on the photovoltaic segment drawn up under the direction of Jean-Michel Charpin. This report, drafted between April and July 2010, assessed the photovoltaic industry and the impact of its development on the French economy. The main proposals were:

The immediate decrease in the purchase tariffs for photovoltaic electricity in the summer of 2010

- Maintain the current tariff grid
- Decrease the tariffs evenly for all categories
- Decrease of over -10%
- Organise the decision process in order for the order to be published at the beginning of September 2010
- Improve ERDF information system to allow for "real time" monitoring of the flows of new projects and transmit information to the relevant administrations

A sustainable regulation system offering visibility of the sector

- Specify the strategy and objectives of photovoltaic policy
- Define an annual target of 300 to 500 MW

- Identify three relevant market segments and spread the annual target over these segments (individuals: 100 to 150 MW per year, large roof systems: 100 to 200 MW per year, ground-mounted farms: 0 to 150 MW per year)
- Introduce new regulatory tools to control quantities:
 - individuals and large roof systems: automatic quarterly degression of tariffs based on volume;
 - ground: tendering procedure.
- Improve the examination procedure for purchase requests (statement of intention, deposit when the connection request is made, freezing of the tariff when the technical and financial proposal is made)

Industrial policy/Research and development

- Make the research and development strategy consistent with the opportunities identified (activities related to the photovoltaic field and emerging technologies)
- Maintain R&D resources
- Mobilise the major industrial players likely to become involved in the photovoltaic sector and organise the networking of players at the national level. ●

Changes in purchase tariffs for photovoltaic electricity since 2006 (in €/MWh, excluding VAT and indexing)

July 2006

Type of installation (technical criteria)	Purchase tariff (€/MWh)	
	Continental France	Corsica, overseas departments, Saint-Pierre and Miquelon, Mayotte
Building-integrated	550	550
Not building-integrated	300	400

January 2010

Changes: increase in the tariff for ground-mounted installations in regions with the least amount of sunshine and a new simplified building integration category.

Type of installation		Purchase tariff (€/MWh)				
Roof installations		Residential buildings	Education and health buildings		Other buildings	
			Less than 2 years old	More than 2 years old	Less than 2 years old	More than 2 years old
Full integration	P ≤ 3 kW	580	314 ^(b)	580	314 ^(b)	500
	3 kW < P ≤ 250 kW	580	420	580	420	500
	P > 250 kW			420		
Simplified integration	P ≤ 3 kW			314 ^(b)		
	P > 3 kW			420		
Superimposition	P ≤ 250 kW			314		
	P > 250 kW			314 to 377 ^(a)		
Ground-mounted installations	P ≤ 250 kW			314		
	P > 250 kW			314 to 377 ^(a)		

(a): depending on the department in which the installation is located.

(b): €420/MWh from 1 January 2011. For building-integrated installations of less than 250 kW in buildings less than two years old, tariffs corresponding to simplified integration are applied.

September 2010

Change: 12% decrease in all tariffs, except for the tariff applied to building-integrated installations of less than 3 kW which remained the same.

Type of installation		Purchase tariff (€/MWh)				
Roof installations		Residential buildings	Education and health buildings		Other buildings	
			Less than 2 years old	More than 2 years old	Less than 2 years old	More than 2 years old
Full integration	P ≤ 3 kW	580	276 ^(b)	510	276 ^(b)	440
	3 kW < P ≤ 250 kW	510	370	510	370	440
	P > 250 kW			370		
Simplified integration	P ≤ 3 kW			276 ^(b)		
	P > 3 kW			370		
Superimposition	P ≤ 250 kW			276		
	P > 250 kW			276 to 331 ^(a)		
Ground-mounted	P ≤ 250 kW			276		
	P > 250 kW			276 to 331 ^(a)		

(a): depending on the department in which the installation is located.

(b): €370/MWh from 1 January 2011. For building-integrated installations of less than 250 kW in buildings less than two years old, tariffs corresponding to simplified integration are applied.

10 March to 30 June 2011

Changes: drop in tariffs in effect of 10% to 22% for building-integrated systems of less than 36 kW and for installations of less than 100 kW complying with the simplified integration criteria. For other installations, drop of 57% to 76%.

Type of installation		Purchase tariff (€/MWh)		
Buildings installations		Residential buildings	Education and health buildings	Other buildings
Full integration	P ≤ 3 kW	460	406	352
	3 kW < P ≤ 9 kW	460	406	352
	9 kW < P ≤ 36 kW	403	406	120
	36 kW < P		120	
Simplified integration	P ≤ 36 kW		303.5	
	36 kW < P ≤ 100 kW		288.3	
	100 kW < P		120	
Superimposition			120	
Ground-mounted			120	

1 – The tariffs applicable from 1 July 2011 will be issued by 21 July at the latest.

Order of 12 January 2010

The order that entered into force in January 2010 distinguished between residential, education and health buildings and other buildings. For the latter, the purchase price was revised downwards, especially for new projects on which windfall profits had been concentrated. Moreover, the annual degression of tariffs was steepened.

However, the tariffs retained were still much higher than those recommended by CRE. Consequently, this revision was unable to neutralise the windfall profits. The cumulative power of installations for which connection requests were made in the second quarter of 2010, close to 600 MW, is considerably higher than the objective set in the pluriannual investment programme (connection of 500 MW per year).

Order of 31 August 2010

At the end of August 2010, a new draft order was brought before CRE aimed at reducing all purchase prices by 12%, except the price applicable to building-integrated photovoltaic installations of less than 3 kW. CRE concluded that the tariffs envisaged resulted in a normal return on investment, but it recommended that the annual 10% degression to be applied from 2012 should be implemented from 2011.

2. SINCE MARCH 2011, THE NEW REGULATORY FRAMEWORK SETS TARIFFS THAT DO NOT LEAD TO EXCESSIVE PROFITABILITY

2.1. A moratorium on purchase tariffs was introduced while discussions were being conducted on the future of the photovoltaic market in France

In order to avoid windfall profits due to very advantageous prices for photovoltaic electricity producers, on 2 December 2010, the government decided to suspend for a period of three months the obligation for EDF and non-nationalised distributors to sign photovoltaic electricity purchase contracts under the tariff conditions in effect (decree of 9 December 2010). Plants with a maximum capacity of less than 3 kW and for which a technical and financial proposal was signed and notified to the system operator before 2 December 2010 were not concerned by this suspension. The suspension also led ministries for energy to consult with all of the market's stakeholders in order to establish a new regulatory framework for the French photovoltaic market (see box, page 35).

➤ *The mechanism to support photovoltaic energy is intended to be a temporary measure. Its aim is to promote the emergence of a profitable photovoltaic sector before the gradual return to a situation in which the sector can produce electricity at market price, with the benefit of public aid.*

Until its temporary suspension on 2 December 2010, the support mechanism was based on guaranteed purchase tariffs over a period of 20 years, between €280/MWh for ground-mounted systems and €580/MWh for solar panels on houses (whereas the market price is around €55/MWh).



PROGRESS REPORT

The Charpin-Trink Report on the development of the photovoltaic segment

On 7 December 2010, a mission was entrusted to Jean-Michel Charpin (Finance Inspectorate General) and Claude Trink (High Council for Industry, Energy and Technology) to consult with the players of the photovoltaic segment on the implementation of a new regulatory framework. This request was made following the entry into force of the three-month suspension on photovoltaic installation connections.

The report of this mission, published on 11 February 2011, reflects the main requests of the segment:

- set up a mechanism to ensure a development pace of at least 800 to 1,000 MW per year when the segment is fully operational and no longer consider the objectives of the pluriannual investment programme as a limit;*
- set annual objectives not according to power (MW) but in terms of annual public service charges;*
- maintain a purchase obligation mechanism for all roof projects of up to 250 kW;*
- reserve the tendering mechanism for ground-mounted projects;*
- examine the scenarios for managing the end of the suspension period introduced by the moratorium. ●*

2.2. The moratorium revised the legal situation of operators already queued for connection

The moratorium introduced by the decree of 9 December 2010 also modified the legal situation of operators queued but not yet connected to the network.

A number of them turned to CoRDIS (CRE's Standing Committee for Dispute Settlement and Sanctions) in an attempt to obtain technical and financial connection proposals from system operators.

To date, over 150 files have been submitted to CoRDIS on this matter.

2.3. Purchase tariffs are scaled down every quarter depending on the volume of connection requests

At the end of the moratorium and the consultation period, new purchase tariffs entered into force on 10 March 2011 (order of 4 March 2011). The order provides for a quarterly revision of tariffs. The decrease will depend on the volume of connection requests filed during the previous quarter. It will be nil if the cumulative peak power of the requests is lower or equal to 5 MW and will reach a maximum of 9.5% if the cumulated peak power exceeds 65 MW. The mechanism was adjusted in order for the trend decrease to total 10% per year if the volumes follow the target trajectory. It is set at 100 MW per year for building-integrated residential installations of a power lower than or equal to 36 kW and for roof installations lower than or equal to 100 kW.

Lastly, for projects higher than 9 kW, when producers file their connection request, they must now provide a loan offer or a certificate attesting that they have their own capital in the amount of €0.6/W for their entire queued project (including the project for which the request is made).

2.4. A tendering system is preferred for installations of over 100 kW

For installations between 100 and 250 kW (equal to a roof surface between 1,000 m² and 2,500 m²), a simplified tendering system is envisaged: only objective criteria, such as the price of the kWh, will be taken into account. Very large roof installations and ground-mounted systems will be selected following pluriannual tendering procedures associating several criteria (price, environment, innovation, etc.). The first calls for tenders are scheduled for summer 2011.

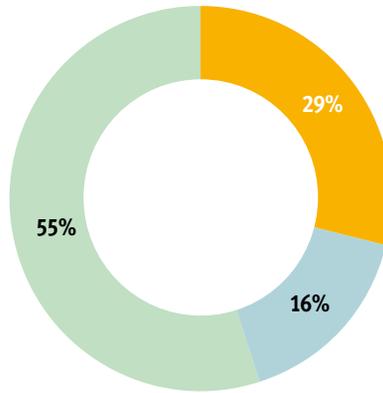
3. THE PHOTOVOLTAIC SEGMENT WILL HAVE A MAJOR IMPACT ON PUBLIC SERVICE CHARGES PAID BY CUSTOMERS

The law requires incumbent electricity suppliers (EDF, Électricité de Mayotte and local distribution companies) to fulfil public service missions. These missions generate costs that are compensated by electricity public service contribution paid by all electricity customers. The support for the development of the photovoltaic segment is part of these charges through the purchase obligations and calls for tenders. In 2011, 29% of forecast charges are related to photovoltaic energy, i.e. almost €1 billion (see graph).

The law also provides that EDF's avoided costs due to the purchase obligation "are calculated in reference to the electricity market price". To date, the costs avoided by photovoltaic installations are calculated by CRE based on the monthly averages of hourly day-ahead prices (spot price) on the EPEX electricity exchange. Therefore, the cost avoided for a given month is equal to the average of the spot prices for the month multiplied by the volume of electricity purchased by EDF. CRE proposed changing the calculation method for the following years. It will be based on the hourly spot prices and the hourly profile of photovoltaic production. This change will allow day/night and winter/summer effects to be taken into account, which are characteristic of photovoltaic production.

Changes resulting from the tariff set by the order of 4 March 2011

The public service charges generated by the tariffs in effect since the tariff order of 4 March 2011 depend considerably on how the installed power develops. CRE has assumed an increase of 100 MW per year, both for installations on residential buildings granted the building-integrated bonus and for other roof installations of less than 100 kW.



Photovoltaic energy Other renewable energy Other charges

Composition of public service charges forecast for 2011. Public service charges forecast for 2011 represent a total of €3.5 billion.

This assumption is based on a drop in purchase tariffs, excluding indexing, of approximately 10% each year, which is consistent with the drop in photovoltaic energy production costs expected in the short and medium term. For this scenario, the public service charges corresponding to the new installations targeted by the order in force would be between €390 million and €420 million per year by 2020.

Charges related to installations benefiting from previous tariffs

The public service charges related to installations benefiting from the purchase obligation under previous tariff orders are closely related to the rate of implementation of projects that have not yet been put into service. On the assumption that 50 to 65% of projects pending connection in December 2010 (see box page 37) not suspended by the decree of 9 December 2010 are implemented, these charges would be between €1.4 and €2 billion per year by 2020.

FOCUS

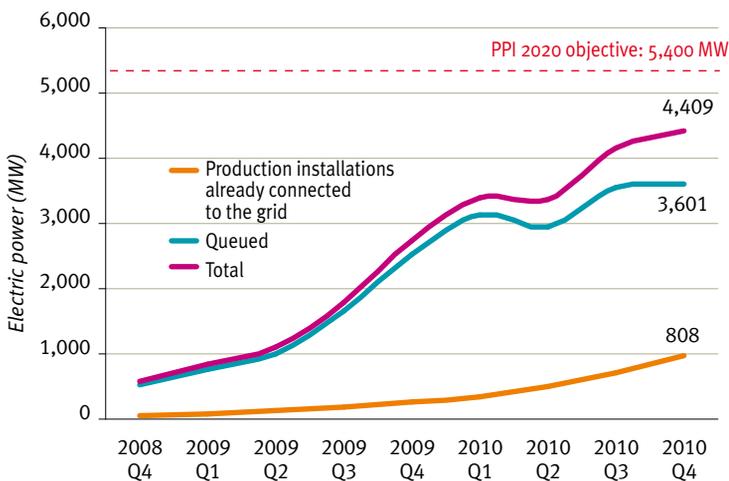
A queue for the connection of production installations to the public electricity grid

Since 2005, the number of production installations, mostly photovoltaic and wind systems, connected to the public electricity grid has multiplied by 30. The pace considerably increased from 2008.

In island areas, the queue order is used to allocate disconnection hours to proposed installations in order to comply with regulatory technical threshold of 30% to ensure the stability of these island systems.

The existence of queues does not lead to overinvestment. However, they weaken applicants' projects by imposing costly and deferred solutions on system operators.

This is why CRE established a framework for the operation of queues in its deliberations of 11 June 2009 on the connection procedures of system operators. In 2010, it approved a new RTE procedure that regulates access and determines if projects are to be kept in the connection queue. The aim is to facilitate access to capacity available to the more advanced projects. Taking into account the development of the queue, CRE will examine this new procedure in the course of 2011. If necessary, it will request that it be revised. In 2010, distribution system operators also published new connection procedures.



Connection of photovoltaic installations in continental and metropolitan France to the distribution grid, excluding local distribution companies.

(Data: ERDF and EDF SEI)

The accumulation of requests has led to the exhaustion of capacity available on the grids. Pending work to reinforce electricity grids, system operators have had to manage this situation. They have chosen to class the projects according to the order of arrival of connection requests. Queue lists were thus established. The first projects connected make use of the available capacity. The projects that follow are subject to electricity injection limits pending the necessary reinforcements.

In addition to the saturation of injection capacity, the boom of the photovoltaic segment has caused processing delays at the connection agencies of distribution system operators.

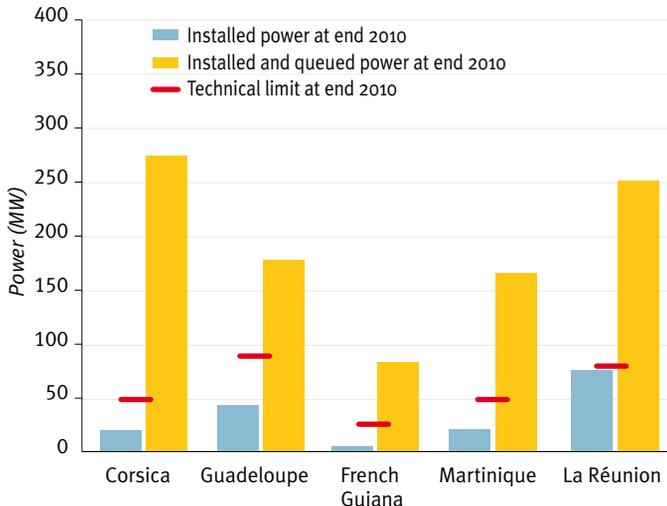
At the end of December 2010, the cumulative power of photovoltaic projects pending connection to the public grid¹ was estimated at 2,057 MW on the network managed by ERDF, 373 MW on the network managed by EDF SEI and 714 MW on the transmission network run by RTE. The power of installations of local distribution companies pending connection to the grid is estimated at 10% of that of ERDF installations pending connection. ●

1 – Complying with the provisions of Article 3 of the decree of 9 December 2010 suspending the purchase obligation (acceptance of the technical and financial proposal before 2 December 2010).

If account is also taken of the installations that are expected to be developed within the framework of tendering procedures launched by the Minister for Energy, the public services charges related to the entire photovoltaic segment by 2020 will probably exceed €2 billion per year, i.e. approximately 0.1% of GDP.

4. THE DEVELOPMENT OF THE PHOTOVOLTAIC SEGMENT IN ISLAND AREAS MUST BE CONTROLLED TO ENSURE SAFETY OF THE NETWORK

Most French island areas enjoy a high amount of sunshine which is favourable to photovoltaic energy. Because of this, the considerable development of the photovoltaic segment in these areas, which is intermittent energy (lack of production at night and variations due to cloudy intervals during the day), does not enable electricity production and consumption to be correctly balanced.



Comparison of intermittent energy production projects, in service and queued for connection, with the technical acceptability limit for island networks (as at 31/12/2010).

The regulatory technical acceptability limit for intermittent energy is equal to 30% above which it becomes difficult to balance the network. The situation is already critical in La Réunion.

4.1. Ensuring the proper operation of electricity networks has made it necessary to reduce the disconnection threshold for photovoltaic installations

In the main French overseas departments and Corsica, the production capacity pending connection to the grid exceeds local electricity demand (CRE opinion of 3 December 2009 and 31 August 2010 on draft tariff orders, CRE opinion of 14 January 2010 on draft tariff orders concerning technical connection conditions). The 30% threshold, the regulatory limit for the technical acceptability of intermittent energy relating to network stability, will be exceeded shortly. The situation is already critical in La Réunion. (*see graph*).

On several occasions, CRE highlighted the risks posed by the development of photovoltaic energy to the proper operation of island electricity systems. Published on 5 March 2011, the order of 24 November 2010, to which CRE issued a favourable opinion, modifies the grid's disconnection criteria, by reducing the power threshold over which the installation may be disconnected from 100 kVA to 3 kVA. The threshold of 100 kVA was not effective since larger projects could develop in the form of several batches of less than 100 kVA.

4.2. A revision of tax treatment may stop windfall profits

In French overseas departments and territories, supply is about to reach a stage in which all of it cannot be used. This is why CRE, in its opinion of 31 August 2010, questioned the continued coexistence of the purchase obligation and advantageous tax treatment for productive investments.

As a result, the Finance Law for 2011 provided for the end of tax relief for photovoltaic projects in overseas departments filed after 29 September 2010. The mechanism was however extended for installations of less than 20 kW until 30 June 2011. The figures revealed by the Minister for the Budget before the Senate highlight the windfall profits that companies in the sector enjoyed: while filed projects represented an investment of €526 million between 1 January and 24 September 2010, date at which the prospects of a tax exemption order was disclosed, requests reached €692 million between 25 and 29 September 2010.

In 2006, renewable energy accounted for only 9.5% of approval requests; its share now stands at 32%, to the detriment of other economic sectors (hotel sector, transport, industry). The future of tax relief for photovoltaic projects will be decided in the light of the conclusions of an evaluation commission that is expected to submit its work by 30 June 2011. ●

INTERVIEW WITH...

ESTHER PIVET, Director of Markets Development, CRE



What will be CRE's role in the new tariff regulation framework for the photovoltaic market?

The tariff order of 4 March 2011 provides for a quarterly revision of purchase tariffs. The order entrusts CRE with the calculation of the tariff degression coefficients based on volume. At the end of each quarter, the 150-odd system operators will have 15 days to address to CRE

a review of all connection requests recorded during the quarter. We will have to implement an automatic system for transmitting this data via CRE's website, for simple and fast processing.

And in the organisation of calls for tenders?

The explanatory statement in the order of 4 March states that the support mechanism preferred for large installations will be calls for tenders. For the largest projects (power higher than 250 kW), the

procedure is expected to remain the same. CRE will draw up the draft specifications in compliance with the conditions of the call for tenders transmitted by the Minister for Energy, and will then carry out the tendering procedure.

For medium-sized projects (100 to 250 kW), automatic calls for tenders will be implemented, and offers will be selected based only on price. CRE is working on the deployment of a technical platform required for simple and fast recording of offers and their classification. This new type of call for tenders will require the implementation of a specific regulatory system.

CRE has stated that it is ready to modify the calculation of charges due to photovoltaic energy. What stage is CRE at currently?

As from the next evaluation of charges related to the photovoltaic sector, which will cover the year 2010, CRE will calculate costs avoided by this sector using wholesale hourly market prices and no longer an average monthly price. This method will increase the avoided cost, but the resulting decrease in charges would remain quite low because of the high purchase price of photovoltaic energy. The amount could exceed €2 billion by 2020, to which other public service charges will be added (other renewable energy, cogeneration, tariff equalisation in island areas, social mechanisms). ●



9.5%

Portion of the volume of long-term contracts for gas imported into France indexed on wholesale gas market prices, integrated in the formula used to calculate GDF SUEZ's regulated sale tariff.

🔥 Gaz naturel 🔥

Nozay compression station.

Close-up of a thermally insulated gas pipe.

© GRTgaz, Franck Dunouau, 2010



Gas pricing and gas price changes

KEY WORDS

- *Public distribution tariff*
- *Public service contract*
- *Regulated sale tariff*
- *Unconventional gas*
- *Wholesale gas market*

Over half (56%) of the gas consumed in France is provided within the framework of a market-price contract.

This solid opening of the market to competition however concerns mostly professional clients, since the majority of residential clients have kept regulated sale tariff contracts with an incumbent supplier (GDF SUEZ or a local distribution company).

These tariffs cover the costs borne by suppliers: costs for the supply, transport, distribution and storage of gas, commercial costs.

The GDF SUEZ supply costs to be covered by regulated tariffs are estimated by a formula based on its long-term supply contracts for imported gas.

Most of these contracts are indexed to the prices of oil products, and a few of them, to wholesale gas market prices.

This is why the changes in regulated sales tariffs do not immediately correlate with those of wholesale market prices.

1. CUSTOMERS' GAS SALE PRICE

1.1. Different types of offers are available on the market

Since 1 July 2007, the retail natural gas market has been completely open. All customers may subscribe to a market-price contract with whatever supplier they choose. However, in certain cases, they may still subscribe to a regulated sale tariff offer with the incumbent supplier of their service area (GDF SUEZ in most cases, TEGAZ or one of the 22 local distribution companies in some municipalities). The law of 7 December 2010 provides that residential clients always have the possibility of subscribing to a regulated tariff or a market-price contract. However, while all professional clients may keep their regulated tariff contract indefinitely, only those that consume less than 30 GWh per year may access regulated tariffs for newly connected

sites or for sites that had previously opted for a market-price contract.

Today, two types of regulated tariffs exist:

- public distribution tariffs for residential and professional clients connected to the public distribution network whose gas consumption does not exceed 4 GWh per year;

- subscription tariffs, applicable to all professional clients that consume more than 4 GWh per year, connected to the public distribution network or the public transmission network. Subscription tariffs are extinct: customers cannot subscribe new contracts to these tariffs.

➤
Of the 10.7 million homes with a gas subscription, 88% have a subscription with a regulated tariff offer. Among them, 6.1 million use gas for heating.



“ CRE’s objective is to establish a transparent and effective framework for customers. ”

1.2. Regulated sales tariffs must cover a sum of costs: the example of the GDF SUEZ public distribution tariff

The decree of 18 December 2009 provides that regulated sales tariffs must cover non-supply costs and supply costs borne by suppliers. It also determines the arrangements for setting these tariffs (see box).

Non-supply costs

Non-supply costs are made up of costs for infrastructure use (transport networks, natural gas distribution networks, LNG terminals, storage) as well as suppliers’ marketing costs.

Their updating, specific to each tariff, is integrated at least once per year in the regulated sales tariffs, when they are set by order. The costs for the use of networks and LNG terminals are derived from the implementation of tariffs for the use of gas infrastructure decided on by the Minister for the Economy and the Minister for Energy based on CRE’s proposal.

The regulated sale tariffs entered into effect on 1 April 2010 took into account an increase in non-supply costs of €0.243/kWh, which corresponds to an average increase of regulated tariffs of 5.9%.

› ACCORDING TO LEGISLATION

A new framework for setting regulated gas sale tariffs

The decree of 18 December 2009 defines the new framework for setting regulated gas sale tariffs. For each supplier, an order adopted by the Minister for the Economy and the Minister for Energy, following CRE’s opinion, sets its sale tariffs and the formula for calculating the change in supply costs. The supplier’s tariffs then follow the development of the formula, based on CRE’s opinion, until the following tariff order enters into effect. For GDF SUEZ, this order was signed on 9 December 2010, following a favourable opinion by CRE on 2 December 2010.

The decree applies to each incumbent supplier once the order that concerns it is published. In addition to GDF SUEZ’s order, draft orders concerning 14 local distribution companies were brought before CRE in 2010. They all received a favourable opinion. The framework previously in effect for these companies (order of 21 December 2007), whose provisions were to expire as at 31 December 2010, was extended for one year in order to enable companies that had not been able to review their costs in order to enter the new framework, to have extra time.

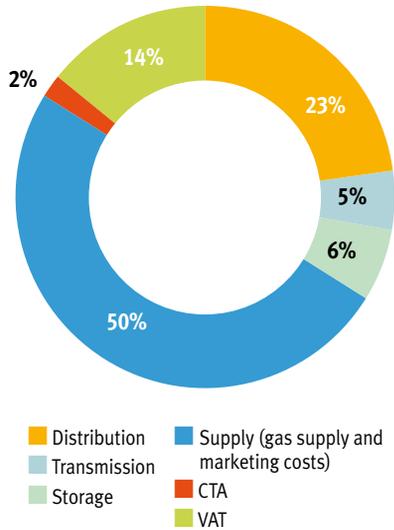
For most of the local distribution companies that entered the framework of the decree, the formula adopted enables their actual supply cost to be integrated into their tariffs. Until that time, the supply cost was calculated as the average supply cost observed over the previous months.

The current regulatory framework therefore enhances the transparency of tariff developments and ensures that each supplier’s tariffs cover its costs. ●

➤
Weight of the different items in the annual tax-inclusive invoice of a client using gas heaters.

The annual tax-inclusive invoice of a client using gas heaters covers different cost items: gas supply, marketing costs, infrastructure (distribution, transmission, storage, LNG terminals) and taxes (VAT and CTA).

CTA is a contribution that finances the retirement of employees working in the regulated electricity and gas sectors.



Supply costs

GDF SUEZ's supply is very diversified: long-term contracts, purchases on the short-term wholesale markets, its own resources. This diversity, included in the public service contract signed between the State and GDF SUEZ, contributes to the security of supply of GDF SUEZ and its capacity to serve its clients. In compliance with the public service contract, GDF SUEZ's supply costs are estimated by a mathematical formula based only on long-term contracts for gas imported into France signed between GDF SUEZ and its suppliers. The tariff formula in effect for 2008, 2009 and 2010 was established by GDF SUEZ in July 2008. The factors used for this formula were the price of oil, heavy fuel oil, heating oil and the euro/dollar exchange rate.

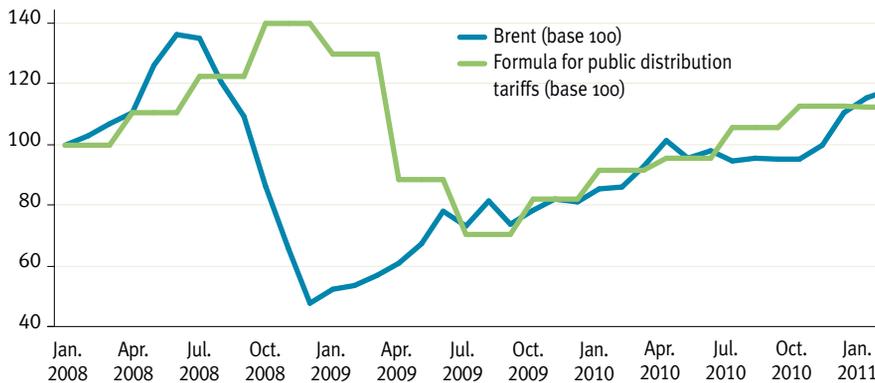
The formula used to calculate the supply cost to be covered by public distribution tariffs takes into account the average of the indices over the previous six months, with a time lag of one month, and is applied for three months (6.1.3 formula). This is why there is a time difference between the change in the price of oil and the formula, and therefore in the regulated tariffs (see graph page 45).



The entry into operation of the Fos-Cavaou LNG terminal on 1 April 2010 invigorated the markets and strengthened gas supply in the south of France.

In this photo: the Al Ghashamiya carrier of a capacity of 216 000 m³, the first Q-Flex ship to berth in a terminal in the south of France.

© Frédéric Aubert, 2010



Comparison of the development of the Brent oil price and the GDF SUEZ formula since 1 January 2008 used for public distribution tariffs (base 100).

The difference between the change in the oil prices and that of the regulated tariffs is due to the formula estimating gas supply costs: the 6.1.3 formula takes into account the average of the indices for the previous six months, with a time lag of one month, and is applied for three months.

The construction of the tariff formula automatically leads to differences with the actual costs borne by GDF SUEZ.

Two such differences exist:

- differences related to the approximation of the formula (“approximation effect”);
- differences related to GDF SUEZ’s actual supply which does not only take the form of long-term contracts (“scope effect”).

CRE performs audits at regular intervals in order to ensure that the tariff formula correctly estimates supply costs. In its deliberation of 31 August 2010, CRE considered that the tariff formula in effect had provided, for the years 2008, 2009 and the first quarter of 2010, a correct approximation of GDF SUEZ’s supply costs. However, the renegotiations by GDF SUEZ with some of its suppliers during the period audited led CRE to recommend the revision of the formula from a prospective point of view, in order to take into account the new indexing of certain long-term contracts to wholesale gas market prices. The tariff formula was therefore revised by the order of 9 December 2010 (see box).

More recently, CRE recommended in its deliberation of 30 March 2011, the modification of the scope of supply taken into account in the formula, which requires amending the public service contract.

HIGHLIGHT

A new formula for estimating GDF SUEZ’s gas supply costs

The new formula for estimating GDF SUEZ’s gas supply costs in order to set public distribution tariffs was adopted by the ministerial order of 9 December 2010. The government brought this draft order before CRE, which issued a favourable opinion of the new formula (deliberation of 2 December 2010). The revision of this formula took place in a context in which gas prices on wholesale markets had considerably decreased since 2009.

The new formula takes into account the renegotiations of long-term contracts for gas imports in 2009 and 2010 signed between GDF SUEZ and its suppliers. These renegotiations introduced an indexation of certain contracts to wholesale gas market prices, which brought the portion of the volume of these contracts indexed to market prices to 9.5%.

In compliance with the public service contract signed between the State and GDF SUEZ, the new tariff formula provides a correct approximation of the supply costs of GDF SUEZ’s long-term contracts for gas imported into France. However, wholesale gas market prices are more volatile than those of oil products. The integration of market prices in the formula could therefore cause greater upward and downward fluctuations. CRE will check the relevance of the formula at regular intervals in 2011. ●

2. THE WHOLESALE GAS MARKET IS UNDERGOING CHANGES

2.1. The price of gas in the markets has been disconnected from the prices of contracts indexed to oil

The introduction of the market price (9.5%) in the calculation of the regulated tariff formula is due to the disconnection between the price of gas in wholesale markets and the price of gas in long-term contracts. This disconnection has led suppliers to renegotiate the price conditions of long-term contracts.

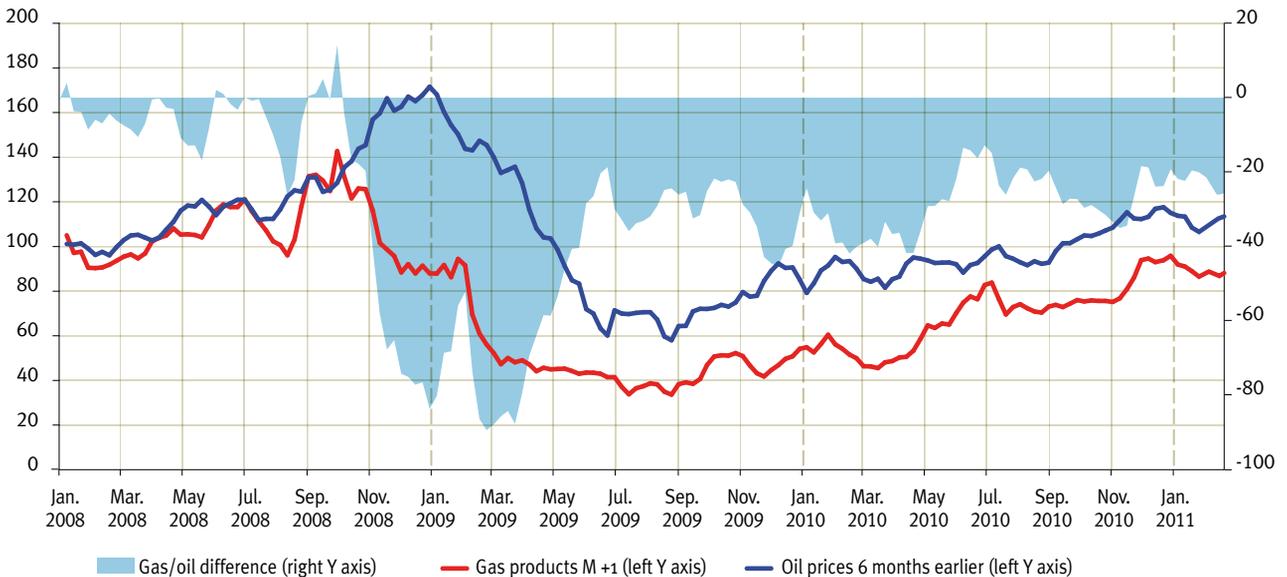
clauses, which obligate buyers to pay for a minimum quantity set out by the contract.

In parallel, wholesale markets, which cover the organised market (Pownext) and bilateral transactions, enable players to exchange different types of short- and medium-term contracts (intraday to three years).

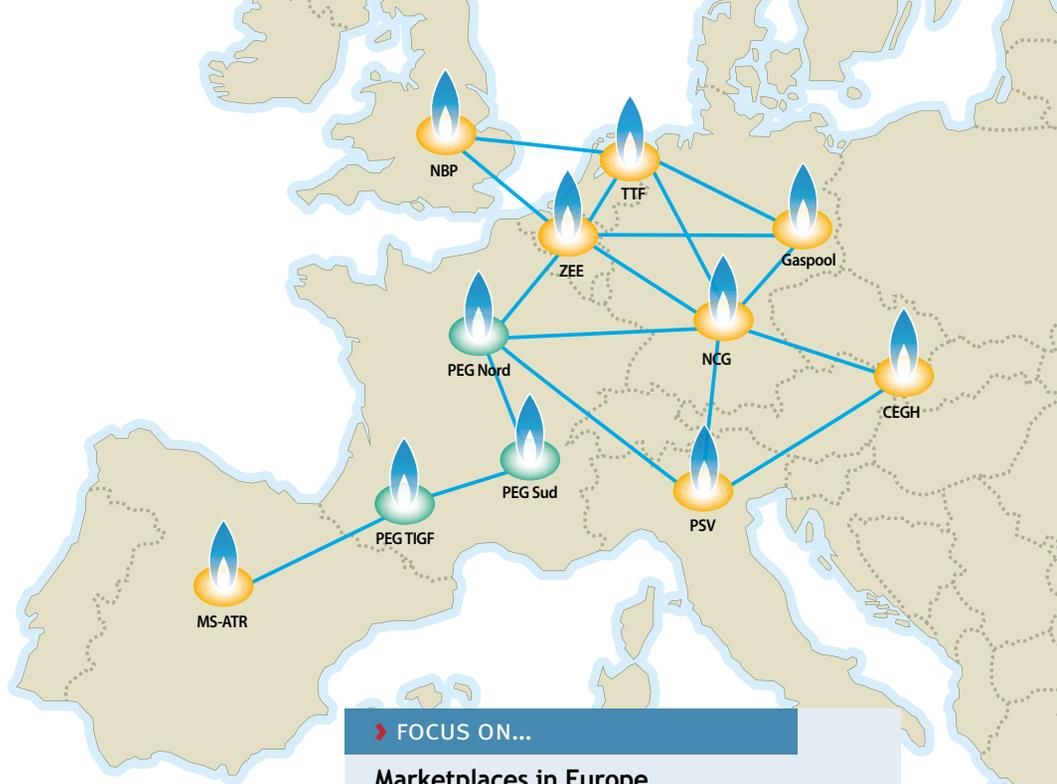
Prices on the wholesale markets collapsed in 2009 under the combined impact of a drop in demand and a profusion of supply. In fact, gas consumption of individuals and industrialists dropped in the context of the recession that hit economies in 2009. In France for example, consumption decreased by 4% compared to 2008.

Disconnection between long-term contract prices and market prices (base 100).

The graph shows the difference between oil prices six months earlier (to which long-term contracts are indexed) and wholesale gas market prices. The difference became sustainably wider from 2009 before narrowing down since the spring of 2010.



NB: The index for the gas price is the weekly average of M+1 prices on European platforms (NBP, NCG, PEG Nord, TTF, Zeebrugge) brought to base 100 for the first week of 2008. The oil index is the weekly average of the prices of heating fuel, ultra-low-sulphur diesel and Brent products for the previous six months brought to base 100 for the first week of 2008.



➤ FOCUS ON...

Marketplaces in Europe

With the opening of gas markets in Europe, several virtual exchange points (or hubs) have emerged to facilitate the exchange of gas products. Transactions may be conducted in marketplaces tied to gas title transfer points (PEGs) and give rise to physical gas deliveries on the network.

The main title transfer points and corresponding marketplaces are:

- NBP (National Balancing Point) in the United Kingdom, to which the APX-ENDEX and ICE exchanges are attached;
- NCG (NetConnect Germany) and Gaspool in Germany to which EEX is attached;
- PEG Nord in France, to which the Powernext exchange is attached;
- TTF (Title Transfer Facility) in the Netherlands, to which the APX-ENDEX exchange is attached;
- ZEE (Zeebrugge) in Belgium, to which the APX-ENDEX exchange is attached.

Transfers at these points have considerably developed over the past few years and the liquidity of these marketplaces has increased, particularly for products such as the day-ahead and month-ahead. The British hub, in which the volume of transactions is substantially higher, is a reference for gas prices. For continental Europe only, the long-term reference used most often is that of the TTF prices. The prices between the different marketplaces are however quite correlated. ●

At the same time, the quantity of gas proposed on the markets increased, due in particular to:

- the profusion of liquefied natural gas: many liquefaction units were commissioned at the same time;
- the extraction of unconventional gas in the United States, shale gas being the most widespread. Since the year 2000, the production of shale gas has been multiplied by eight in the United States and close to half of American gas production now comes from unconventional sources.

The prices of long-term gas contracts, which are indexed to oil prices, have decreased less than prices in wholesale markets. Consequently, market prices have been completely disconnected from long-term contract prices since 2009 (*see graph, page 46*).

The economic recovery in 2010 led to an increase in prices, both in markets and for long-term contracts. The difference between market prices and prices indexed to oil products has therefore decreased since the spring of 2010. The continuation of this disconnection will depend on several context factors (changes in oil prices and gas demand) and structural factors (the profusion of liquefied natural gas and the development of unconventional gas).

2.2. Gas trading has developed considerably

The year 2010 was favourable to the development of trading in wholesale gas markets. These markets were an attractive source of supply for suppliers of final customers. For producers, these markets were an outlet for unsold gas volumes within the framework of “Take or Pay” clauses in long-term contracts.

The wholesale gas market developed both in terms of the quantity of gas traded or exchanged, and in terms of the volume of gas that was actually delivered. A same volume of gas can be traded several times before finally being delivered. Exchanges therefore materialise in the form of deliveries and physical withdrawals of gas at the virtual trading points, referred to as gas title transfer points (PEGs). PEGs are attached to three balancing zones for gas transmission networks: the North zone, the South Zone and the South-West zone. The North zone is the most active.

For almost all products, the volume of transactions has substantially increased (+65%) totalling 246 TWh in 2010 compared to 149 TWh in 2009. The volumes delivered at gas title transfer points increased by 64 TWh and represented 53% of the total volume of physical deliveries in 2010 compared to 45% in 2009.

65%

Increase in volume
of transactions
at gas title
transfert points.

3. INFRASTRUCTURE IS ESSENTIAL FOR DEFINING GAS PRICES

The conditions for access to the transmission network, to LNG terminals and storage infrastructure are a decisive factor in the definition of prices in the wholesale natural gas markets.

Faced with a drop in its domestic gas production, Europe is becoming increasingly dependent on external supply sources. Facilitating gas movements within the European area is therefore a priority, not only to promote competition between suppliers, but also to enhance the security of supply.

The development of wholesale markets, accessible to an increasing number of suppliers who ship their gas either by gas pipelines, or LNG tankers in the form of liquefied natural gas, has promoted competition between many different gas supply sources to the benefit of the final customer. The quality of infrastructure access conditions is thus a decisive factor in the gas value chain.

The emergence of wholesale liquid markets implies that all suppliers can access gas infrastructure. The implementation on 1 January 2009 of the large GRTgaz North entry/exit zone (thanks to the merging of three balancing zones) is an example of the mainstreaming of network access conditions.

Furthermore, extensive consultation work conducted by the shipper GRTgaz and CRE on the improvement of transmission capacity allocation rules on the North to South link, and in particular the commissioning of the Fos-Cavaou LNG terminal in 2010, have contributed to significantly improving access conditions for the South zone in France. By 2013-2015, the open seasons organised in 2009 and 2010 between Spain and France will also contribute to this objective through a major increase of interconnection capacity between the two countries.

Moreover, GDF SUEZ has made a commitment to the European Commission to limit its share of long-term entry capacity on French natural gas transmission networks to 50%, from 2014 for a period of ten years. CRE has been involved in the definition and implementation of these structuring commitments for access to the gas market in France. These have

given rise to the sale of long-term entry capacity to new players at the land interconnection points of Obergailbach and Taisnières H, as well as at the LNG terminals of Montoir-de-Bretagne and Fos-Cavaou. ●

“ Customer information must be enhanced: only 39% of households are aware that they can choose their energy provider. ”

INTERVIEW WITH...

DOMINIQUE JAMME, Director of Gas Infrastructure and Networks, CRE



Eight years after the opening of the gas market, what conclusion can be made? Is it beneficial to customers?

The conclusion is rather positive. Thanks to competition which is fully in place in this segment, French industry has made savings on gas purchases amounting to hundreds of millions of euros per year. For the mass market, the progression is slower, but a total of 1.5 million customers have market-price contracts which is not

negligible. The fundamentals of this market are sound: it is possible for an alternative supplier to attain economic profitability for gas offers, including in the residential market.

Only 12% of residential clients have market-price contracts. What can be done in order for residential clients to also benefit from gas market dynamics?

It is certain that customer information must be enhanced: only 39% of households are aware that they can choose their energy provider.

We are also expecting a lot from the law on the new organisation of the electricity market (NOME Law). French customers are attached to dual electricity-gas offers. A better competition dynamic on the electricity market will probably benefit the gas market.

What are the medium- or long-term prospects? Will consumers be subject to successive increases in the price of gas?

Prospects are not so glum for gas customers. First, the competition dynamic on the gas market has been activated. It will accelerate with the forthcoming entry into force of the European network codes, i.e. the common market rules for the entire internal European gas market. Second, our planet has an abundant supply of natural gas. Due to new discoveries, the International Energy Agency (IEA) estimates that gas reserves correspond to more than 200 years of consumption. In the United States, gas is two times cheaper than in Europe for customers, thanks to the boom of unconventional gas production.

We do not know if such unconventional gas reserves exist in France and Europe, or if it will be possible to extract them under satisfactory environmental conditions. If such is the case, gas prices in Europe may be disconnected definitively from oil prices and prices may stop increasing. ●



The European Union Emissions Trading Scheme (EU ETS) caps the CO₂ emissions of about 11,000 industrial installations in the 27 countries of the European Union and Norway, Liechtenstein and Iceland.

The sectors covered are industrial cogeneration installations and certain high energy-consuming sectors: combustion installations, oil refineries, coke ovens, iron plants and cement, glass, lime, brick, ceramic, pulp and paper manufacturing plants.

-20%

European objective
for the reduction
of greenhouse
gas emissions
by 2020.

The European carbon market

KEY WORDS

- *CO₂ emission quota*
- *Kyoto Protocol*
- *Law on banking and financial regulation*
- *National quota allocation plan (NQAP)*

The CO₂ market is based on the “polluter pays principle”. An optimum tool in terms of cost-effectiveness, it contributes to reducing greenhouse gas emissions.

In its current phase, it combines an administrative mechanism (an allocation of CO₂ quotas) with a market mechanism (to optimise the behaviour of players).

The exceeding of emissions in relation to the quotas allocated leads to the obligation to purchase additional quotas.

All emissions reductions result in a gain generated by the sale of surplus quotas.

The proper functioning of the mechanism requires the confidence of all market players and therefore the implementation of regulation to ensure surveillance and transparency of transactions.

In France, cooperation between CRE and the Autorité des marchés financiers (AMF) enables effective supervision.

1. THE KYOTO PROTOCOL GAVE RISE TO THE EUROPEAN CO₂ MARKET

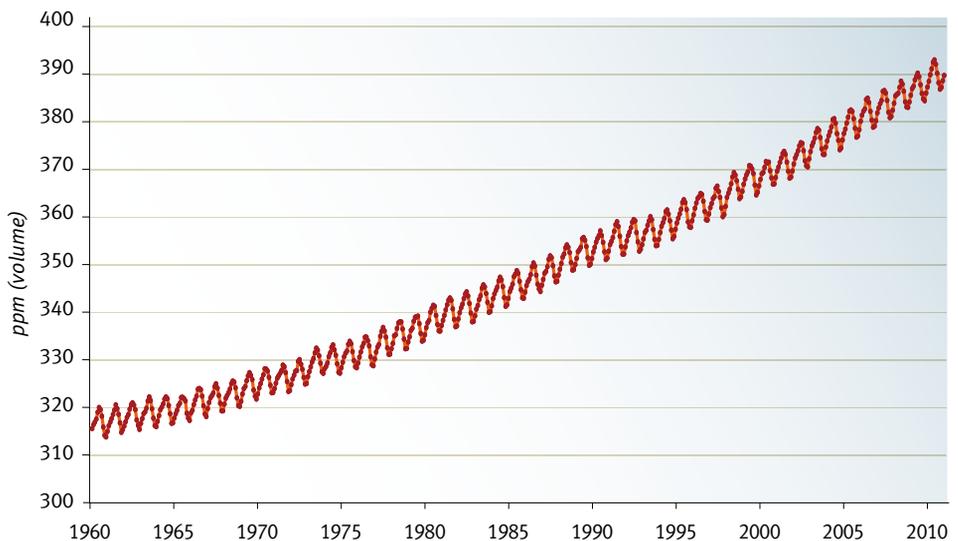
1.1. The Kyoto Protocol set objectives for the reduction of CO₂ emissions in order to limit climate change effects

To limit the consequences of climate change, governments came together within the framework of the United Nations Framework Convention on Climate Change (UNFCCC). The goal was to find solutions together to control the atmospheric concentration of greenhouse gases and maintain it at a level enabling the climate system to be stabilised. Thus, the Kyoto Protocol, an international treaty adopted in 1997, aimed to reduce the greenhouse gas emissions of approximately 40 industrialised countries. These countries bindingly committed to reducing their emissions by 5% compared to 1990 over the 2008-2012 period. It was the first initiative aimed at limiting climate changes and anticipating how to adapt to their effects.

The signing of the Protocol confirmed the recognition of “differentiated responsibility”. According to this principle, industrialised countries are the main cause of the current concentration of greenhouse gases in the atmosphere, which is the result of more than 150 years of industrial activity. In 2009, the Kyoto Protocol was ratified by 184 countries. The United States is the main industrialised country that did not sign it. China and India, two of the world’s leading greenhouse gas emitters, do not have a reduction obligation: although they ratified the treaty, these countries are not on the list of industrialised countries (Annex B of the Protocol) subject to the binding objectives.

Emission reductions must be achieved in particular through national measures: energy efficiency, renewable energy, their own technology. In addition to these, the Protocol provides for two market mechanisms (or flexibility mechanisms) enabling countries to meet their objectives (*see part 1.2.*).

➤
Increase in the atmospheric concentration of CO₂ since 1960.
 According to scientists in the Intergovernmental Panel on Climate Change (IPCC), stabilising the atmospheric concentration of CO₂ between 450 and 550 ppm (parts per million) by 2050 by limiting greenhouse gas emissions would limit the negative impacts of climate change.



Source: National Oceanic and Atmospheric Administration of the United States (Mauna Loa Observatory in Hawaii, monthly average).

More recently, in Cancun in December 2010, countries adopted a “balanced package of decisions” together with reduction commitments for industrialised countries and developing countries. The latter did not commit to an actual reduction, but to a decrease in the “carbon intensity” of their economy (i.e. their CO₂ emissions per unit of GDP).

1.2. Europe has ambitiously implemented the Kyoto objectives with the European Union emissions quota trading

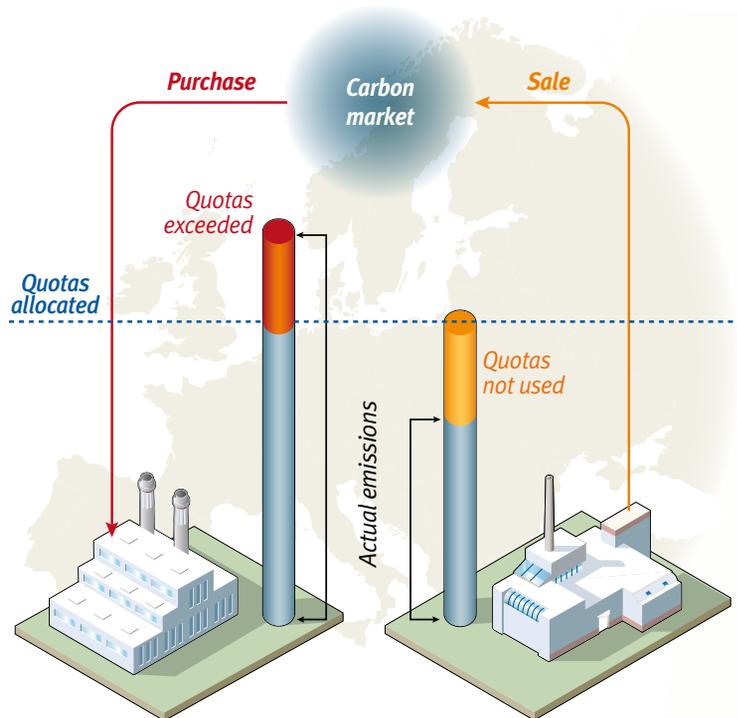
Within the framework of the Kyoto Protocol which entered into force in 2005, the 15 members of the European Union (before 2004) undertook to reduce their aggregated greenhouse gas emissions by 8% between 2008 and 2012. This collective objective resulted in different national goals which were the subject of a legally binding agreement. Germany’s reduction objective is 21% compared to 1990 and France aims to stabilise its emissions (0%: energy production is largely decarbonised). The twelve countries that became part of the European Union in 2004 and 2007 all have their own national objectives, with the exception of Cyprus and Malta.

This emission limitation is supplemented by a Community quota trading market, the European carbon market, and by the possibility of “earning” credit, in taking part in emission reduction projects in the rest of the world via two mechanisms: the clean development mechanism (CDM) and the joint implementation (JI) mechanism. Emissions permit trading and project mechanisms enable industrialised countries to receive carbon credits resulting from the financing of greenhouse gas emissions reduction projects outside their geographical zone.

This series of mechanisms forms the European Union Emissions Trading Scheme (EU ETS) which has become the cornerstone of European strategy to reduce greenhouse gas emissions.

11,000

Number of industrial installations concerned by quota allocation.



Operating principle of the CO₂ market.

CO₂ quota trading is the cornerstone of European strategy for the reduction of greenhouse gas emissions. In 2010, €70 billion were traded on the main platforms.

The Kyoto Protocol expires in December 2012. After that date, objectives for the reduction of greenhouse gas emissions have not yet been formalised within the framework of a climate agreement. The different countries have not all committed to reduction levels based on a method comparable to that of the Kyoto Protocol. A pioneer in terms of emissions reductions, the European Union has committed to a 20% reduction of its greenhouse gas emissions by 2020 and even 30% in the event of an international agreement.

2. THE EUROPEAN EMISSIONS TRADING MARKET IS THE ENGINE OF THE GLOBAL CARBON MARKET

2.1. The quota system in Europe combines an administrative constraint with a market mechanism

The arrangements for the EU ETS are described in European Directive 2003/87/EC (or Quota Directive). This scheme bindingly caps CO₂ emissions of approximately 11,000 industrial installations across a perimeter made up of the 27 countries of the European Union and Norway, Liechtenstein and Iceland. The participation of companies in the sectors concerned is compulsory. The sectors covered are industrial cogeneration installations and certain high energy-consuming sectors: combustion plants, oil refineries, coke ovens, iron plants and cement, glass, lime, brick, ceramic, pulp and paper manufacturing plants. In total, the installations covered represent approximately 50% of CO₂ emissions.

The operating principle of the EU ETS corresponds to a cap and trade system. For each facility, the system defines an emissions cap in the form of an annual allocation of tradable quotas. Each quota gives the right to emit one tonne of CO₂. This allocation is conducted at the national level by each member country via a national quota allocation plan (NQAP) which determines each year in the month of February, the number of quotas received. This corresponds to past emissions, adjusted by a reduction factor. Companies concerned can then purchase or transfer part of these emission quotas via the organised markets or bilaterally (trade). Emissions reductions are thus carried out where they are less costly. At the end of the period, each facility must give back the number of quotas corresponding to its emissions, failing which penalties are applied. In France for example, a penalty of €100 per quota, which does not exempt the facility from its obligations, is applied. A percentage of Kyoto units

4,800 million

Number of tonnes of CO₂ traded on the three main platforms in 2010.

IN BRIEF

CO₂: players, products, markets and trading platforms

Players

In the European CO₂ market, intermediaries are mainly:

- energy producers that account for approximately half of the quotas allocated;
- industrial companies that must bring themselves into compliance regarding rules limiting their emissions;
- financial intermediaries.

Products

Quotas can be purchased for long-term delivery (futures market: purchase for a given date and at a price agreed on beforehand) or for immediate delivery (spot market): for delivery within two days after the order).

Markets

Quotas are traded on exchange platforms such as Bluenext in Paris, or privately negotiated. Players may then trade quotas bilaterally, directly or through brokers.

Main trading platforms

- ECX, European Climate Exchange, London
- BNX, Bluenext, Paris
- EEX, European Energy Exchange, Leipzig

(CERs or ERUs) can also be given to replace European quotas (13.5% in France).

The total emissions thus allocated per year in France for the 2008-2012 period is approximately 130 million tonnes (Mt). The electricity and steel sectors are allocated 26 Mt each per year; refinery is allocated 16 Mt; cement, 15 Mt; and the chemicals industry, 10 Mt. For example, an average-sized European cement factory produces 700,000 tonnes of cement per year and emits approximately 450,000 tonnes of CO₂.

The three phases to attain the objectives set for the reduction of CO₂ emissions

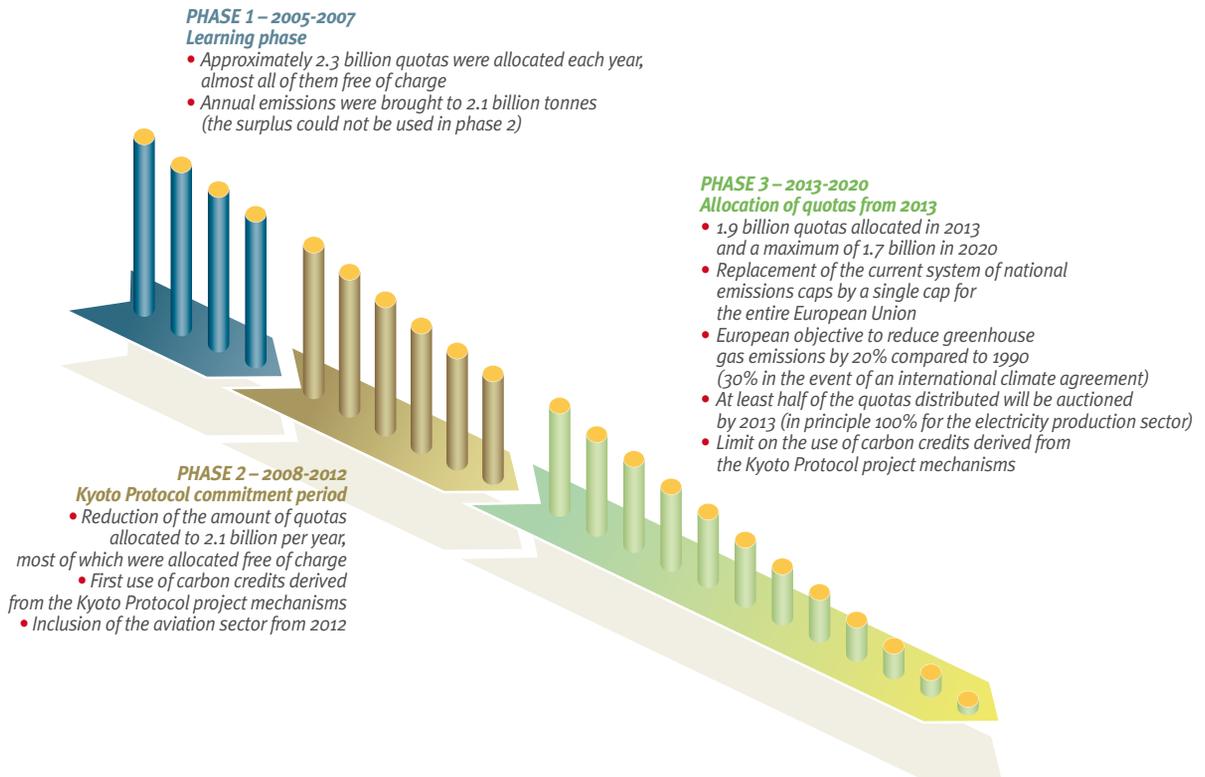
The general conditions for the operation of the EU emissions trading scheme have been defined for up to the year 2020.

By that time, the European Union hopes to have reduced its greenhouse gas emissions by 20%.

Phase 2 of the EU emissions trading system began in 2008, with the CO₂ price at approximately €20 per tonne.

The price became steady at its current level of approximately €15 towards mid-2009.

Source: European Commission, Directorate-General for Climate Action.



2.2. The carbon market is a financialised market closely related to energy markets

To honour their compliance obligation, some companies must obtain quotas if their actual emissions exceed the quotas allocated to them. Other companies manage to maintain their emissions below their cap and can therefore transfer their surplus quotas. The European quota market thus created

has been growing constantly since its creation. In 2009, despite the collapse of production and a drop in world GDP of 0.6% (3.2% in developed countries), it represented €89 billion.

The quota transactions made in organised markets represented approximately 70% of the total volume in 2010, in constant progression (60% in 2009). The remaining 30% are traded privately via brokers.

In 2010, 4,800 Mt (approximately €70 billion) of European quotas were traded on the ECX, BNX and EEX platforms. Most of the transactions on exchanges are made on one of these three platforms – 90% of which are made on the ECX alone, in which €66 billion of quotas were traded in 2010. Long-term transactions represent more than 90% of these exchanges, most of which are made on the ECX. The volumes traded on Bluenext (BNX) represented approximately €3.3 billion in 2010 and correspond mainly to spot transactions.

Concerning Kyoto units, the certified emission reduction (CER) market stood at around €10 billion in 2010 for the three main platforms (approximately 830 Mt). Lastly, the emission reduction unit (ERU) market is not very liquid and the quantities traded are low compared to the quota market and the certified emission reduction market.

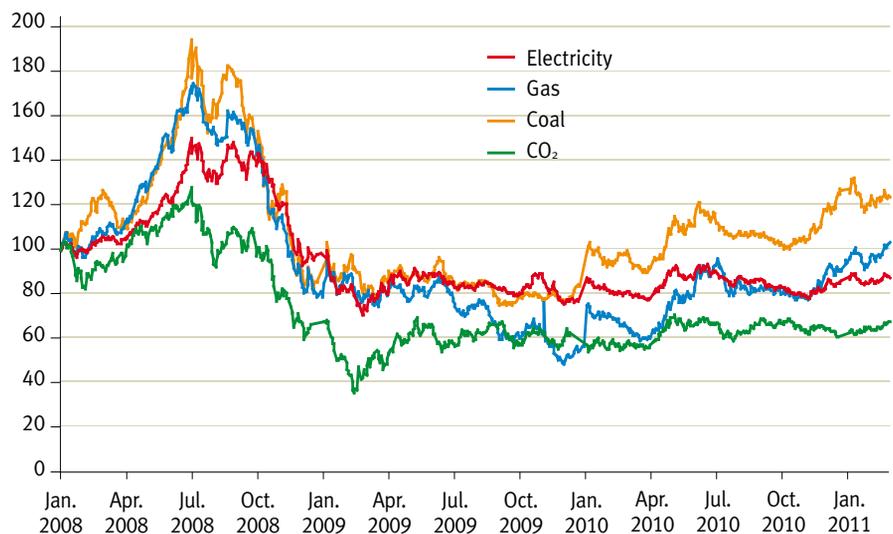
Moreover, the energy and carbon markets are closely interconnected (*see graph*). Electricity producers whose activity emits a high level of CO₂ are the primary industrial players subject to emissions quotas. In the European Union, they represent over one-third of CO₂ emissions and almost 50% of the total emission quotas allocated. Consequently, there is a strong interconnection between the main drivers of CO₂ emissions and those in the energy market. Clear common trends exist between the price of CO₂ and the price of other combustible fossils and electricity. Furthermore, the price of emissions quotas is formed in particular on the basis of the prices of other energy raw materials.

The main drivers of the market that determine quota price fluctuations are both quota demand (temperature and rainfall, price of energy, level of production, technical progress) and quota supply

Price of CO₂ and of energy (base 100).

This graph compares the change in prices of CO₂, the main combustible fossil fuels and electricity since the beginning of phase 2 of the EU emissions trading scheme. The price trajectories show a close correlation.

The graph shows a clear common trend in terms of price change and therefore reflects a strong interconnection between the factors that determine the price of CO₂ and of energy.



Source: CRE, Price Y+1 (delivery one year after the transaction date), CO₂: ECX December price, Coal: CIF-ARA, Gas: North PEG, Electricity: France



Comparison between coal- and gas-fired electricity.

The monitoring of the gap between the clean spark spread and the clean dark spread contributes to the analysis of the market in relation to its fundamentals.

The clean dark spread corresponds to the margin made on the sale of coal-fired electricity (this margin corresponds to the profit related to the sale of electricity minus the costs of the coal and CO₂ required to produce this electricity).

The clean spark spread is defined by the similar margin for gas-fired electricity.

For a fixed quantity of electricity sold, CO₂ emissions in the coal-fired line are higher than for the gas-fired line: for a sufficiently high theoretical CO₂ price, both spreads are equal.

The comparison of the actual price of CO₂ and this theoretical price provides a vital element for the assessment of the incentive given by the CO₂ market price to produce electricity using coal or gas.

determined by regulation. The relative balance between the price of coal and of gas also affects quota prices: rise in gas prices promotes electricity production by coal plants and thus leads to an increase in quota demand since the production of electricity by coal plants emits more CO₂. (see graph).

2.3. The European CO₂ market will change in 2013 with most quota allocation being sold by auction

The EU ETS has demonstrated the viability of an emission reductions system in a supranational framework. Studies indicate a 2 to 5% reduction of total European emissions in 2005-2008. Moreover, it has encouraged energy producers to anticipate investing in production plants that emit less CO₂.

Studies for the 2008-2012 period are still underway, but similar conclusions are expected for this period.

The third phase of the trading scheme which will begin in 2013 (objective of 20% reduction of greenhouse gas emissions compared to 1990) will introduce a number of changes to the cap and trade system of the European Union. An overall emissions cap will be set at European level (approximately 1,900 Mt), reducing the total level of emissions authorised to 1.74% per year. New sectors, including air transport, will be covered by the trading scheme. Emission quotas will no longer be allocated free of charge to industrialists; 50% of them will be put up for auction (100% for electricity producers). A protection mechanism will initially allow for high energy-consuming sectors that cannot pass on

costs to their clients or that are open to international competition (carbon leakage), to continue to receive their quotas free of charge.

The setting up of one or several auction platforms to auction quotas will promote the emergence of a primary CO₂ market complementary to the already existing secondary market. The gradual financialisation of the market through the increase in the number of intermediaries and the portion of long-term contracts, as well as the implementation of a paid quota allocation system is expected to increase liquidity in this market. Moreover, these developments should strengthen the carbon price signal and offer new incentives for emissions reduction projects.

The law on banking and financial regulation, adopted on 22 October 2010, defined cooperation between CRE, the energy regulator, AMF, the financial markets regulator, in the carbon market.

National assembly: question and answer session (Paris - Île-de-France)

© Antoine Arraou, Ministry of Foreign and European Affairs



3. THE MECHANISM FOR COLLABORATION BETWEEN CRE AND AMF IS THE FIRST CO₂ MARKET SURVEILLANCE SYSTEM IN EUROPE

3.1. The Prada Report stresses the need to introduce supervision of a market that was not monitored previously

The Prada Commission, charged with formulating recommendations on the regulation of carbon markets, concluded its work in the spring of 2010. It brought together all stakeholders, including regulators and market players (parties regulated, financial players). Its conclusions were recommended by all of the parties consulted.

The report recommends, in particular, the implementation before 2013 of harmonised surveillance of the European CO₂ market, based on three pillars:

- give power to financial regulators for the entire CO₂ market in all Member States and broaden the scope of competence of energy regulators to include analyse of fundamentals and interactions between the CO₂ market and the energy market;
- organise cooperation between financial regulators and energy regulators;
- grant power to the European Securities and Markets Authority to supervise the entire mechanism, in connection with the Agency for the Cooperation of Energy Regulators (ACER) and ensure that this mechanism is consistent with the surveillance system that will be proposed in the gas and electricity markets.

Prior to the implementation of such a surveillance system at the European level, the Prada Commission recommended giving power from the year 2010 to the Autorité des marchés financiers (AMF) for the CO₂ spot market in France, organising cooperation with CRE and extending CRE's scope of competence to include the analysis of interactions between the energy market and the CO₂ market.

2.1
billion tonnes
of CO₂
Current cap
of the EU emissions
trading scheme
(1.7 billion in 2020).

The implementation of a European supervisory framework appears essential for contributing to restoring confidence in a market that has been shaken by several events: the fall in prices during the first phase of the EU ETS because of an over-allocation of quotas, VAT fraud and computer piracy of the records of several European countries. It should be noted that fraud perpetrated in this market, and in particular, quota theft, raises questions about the security of records and about matters falling within the scope of EU law.

3.2. The law on banking and financial regulation establishes cooperation between finance and energy regulators

Following the recommendations of the Prada Report, a draft legislation was submitted for consultation in August 2010, then validated by the Senate. Henceforth, finance and energy regulators will operate within the framework of the law on banking and financial regulation of October 2012. It aims to set up a French market supervision system recommended by the report and based on cooperation between AMF and CRE.

Its main provisions are as follows:

– it authorises quota trading on a regulated market. In practice, the French trading platform, Bluenext, whose spot compartment had not been regulated until then, became a regulated market supervised by AMF. This also serves to meet the requirements

of the European regulation on the organisation of CO₂ quota auctions in Europe which sets robustness and supervision standards for platforms in which auctions will be conducted;

– it gives power to AMF on the CO₂ spot market. Previously, AMF only had power with regard to long-term products that met requirements in terms of legal qualification as financial instruments;

– it extends CRE's mission to include the analysis of the consistency between energy market fundamentals and transactions performed on the CO₂ market. Article 28 of the law of 10 February 2000, amended by the law on banking and financial regulation, now provides that *“the Commission de régulation de l'énergie supervises the transactions made by suppliers, brokers and electricity and natural gas producers in European Union allowances, certified emissions reductions and emission reduction units, in order to analyse the consistency of these transactions with economic, technical and regulatory constraints of the activity of these suppliers, brokers and electricity and natural gas producers”*;

› GOOD TO KNOW

Products whose transactions are covered by CRE's surveillance mission

- *European emissions quotas (European Union Allowance, EUA): 1 quota = 1 tonne of CO₂*
- *Kyoto emissions units: certified emission reductions (CERs) generated from a clean development mechanism (CDM) project activity and emission reduction units (ERUs) generated by a joint implementation (JI) project: (1 unit = 1 tonne of CO₂) ●*

– it introduces the principle of extended cooperation between AMF and CRE through the sharing of information useful for accomplishing their respective missions. The law on banking and financial regulation lifts the professional secrecy obligation with regard to the sharing of information between the two authorities. It also allows the two authorities to bring matters before each other in the event of any noncompliance by market players, such as insider trading, market manipulation, dissemination of false information, or any other act that might jeopardise the proper operation of the market.

3.3. CRE/AMF cooperation is expected to result in more effective surveillance

Cooperation between CRE and AMF will enable the complementarity between the two regulators to be used in CO₂ market supervision. This cooperation, set out by the law on banking and financial regulation, was formalised in a memorandum of understanding (protocol agreement) published in December 2010.

Within the framework of this collaboration, AMF contributes its expertise in terms of market infrastructure supervision and financial supervision (detection of market manipulation) in a context in which the CO₂ market is gradually becoming financialised.

CRE contributes its expertise in terms of the economic analysis of the balance between supply and demand and the fundamentals common to the two sectors (climate conditions, prices of combustible fossils, use of electricity production resources, etc.). It also contributes its knowledge on the main category of market players, actors in the electricity and gas industry. This is complemented by its know-how, acquired since the law of 7 December 2006, in the surveillance of wholesale electricity and gas markets, particularly in connection with their physical fundamentals.

Signing of the CRE/AMF protocol: the regulators strengthen their surveillance.

On 10 December 2010, AMF and CRE signed a protocol agreement concerning information sharing, control and surveillance of markets for greenhouse gas emissions quotas, electricity, natural gas and their derivatives.

This agreement is one of the provisions of the law on banking and financial regulation which defines the form of cooperation between the two regulators in the carbon market.

*Philippe de Ladoucette,
Chairman of CRE (left)
and Jean-Pierre Jouyet,
Chairman of AMF (right).*

© Cyril Labbé



This expertise can be used for surveillance of the carbon market, whose fundamentals are closely related to those of the energy market. Cooperation between CRE and AMF is expected to ultimately result in more effective surveillance of the carbon market. However, the national mechanism will only take on full meaning once it is implemented at the European level (see box “Interview with”). ●

“The surveillance of the carbon market will only take on full meaning once it is implemented at the European level.”

INTERVIEW WITH...

FADHEL LAKHOUA, Director of Finance and Wholesale Markets Surveillance, CRE



For what reasons is the shift from CO₂ market surveillance at the national level to the European level desired?

The national surveillance mechanism is the first of its kind in Europe and a genuine move forward, since it is the first supervisory framework for a secondary quota market. It also introduced for the first time in Europe, the principle of cooperation between the energy sector regulator and the financial regula-

tor. This principle was already included in the European Directives referred to as the third energy package.

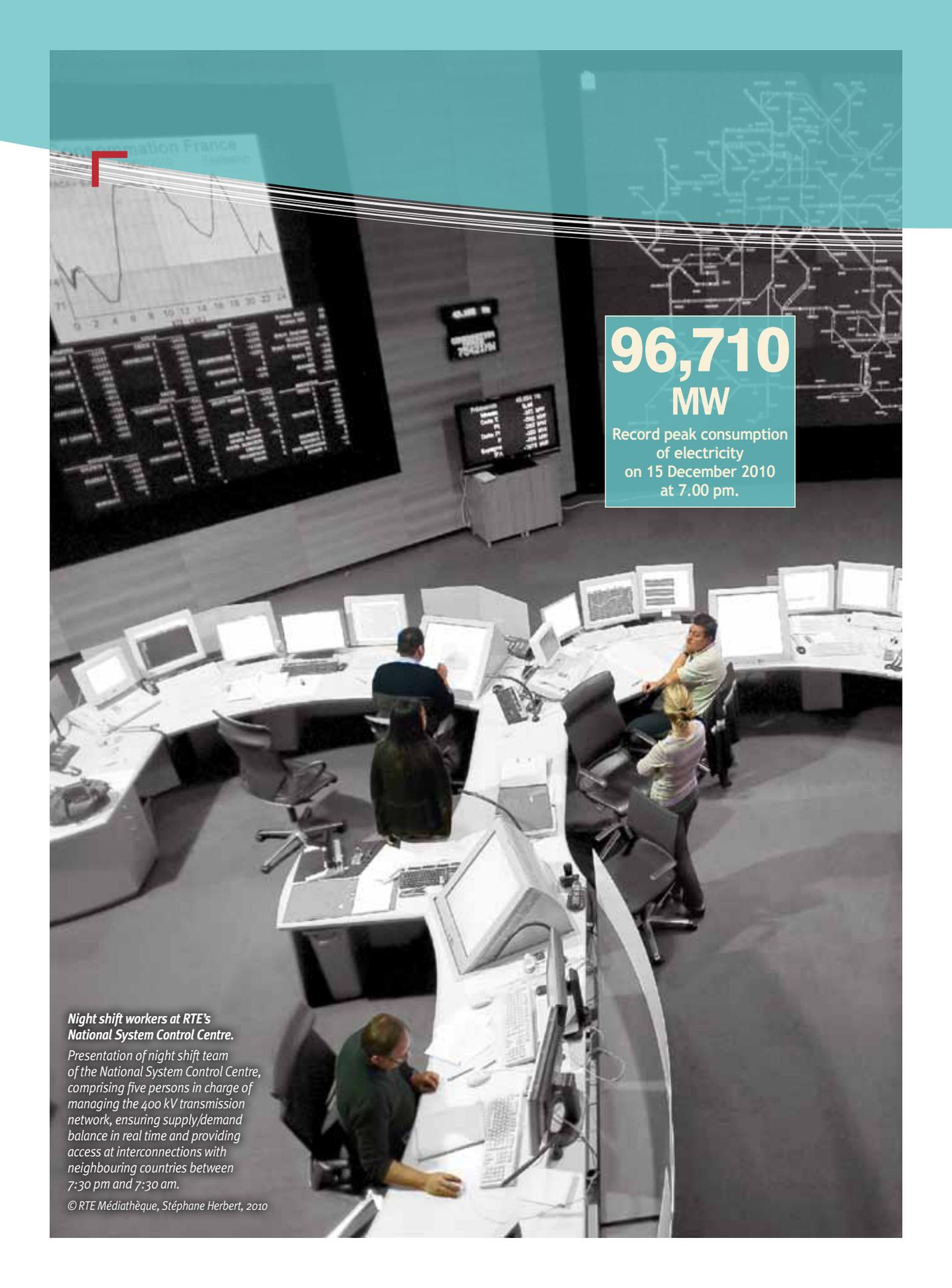
This mechanism must however be seen as a transitional mechanism before generalisation at the European level. Quota supply and demand, as well trading on the markets, operate at the European Union level. It is therefore difficult to assess the relevance of the quota price from a national perspective only. Furthermore, the national mechanism does not cover all French players, since a player on the European carbon market, with the exception of Bluenext (regulated by AMF), that is not a French electricity or gas market player (regulated by CRE) does not fall within the scope of surveillance of the AMF nor

that of CRE. A European mechanism is therefore required to cover the entire market. The current national regulation mechanism will only take on full meaning once it is extrapolated to all European countries.

What are the prospects for the development of European legislation on CO₂ market surveillance?

The only European text adopted to date is the regulation on quota auctions, which places the primary quota allocation market under the responsibility of financial regulators from 2013. No other European text at the time being oversees quota trading on the secondary market. Only the French mechanism provides a supervision framework for trading between players.

In December 2010, the Commission published an announcement on this matter. It raised the question of implementing a specific framework, or including CO₂ quotas within the scope of financial regulation. CO₂ futures trading on regulated markets is already subject to the implementation of the Markets in Financial Instruments Directive (MiFID) and the Market Abuse Directive (MAD). A specific quota framework will be expected to link up with the current financial regulation revisions, and the specific framework proposed for the integrity and transparency of energy markets (the draft Regulation on Energy Markets Integrity and Transparency (REMIT)). Such a framework will have to address, in particular, the matter of the legal qualification of quotas, which is not harmonised at the European level. A legislative proposal may be made in 2011. ●



**96,710
MW**

Record peak consumption
of electricity
on 15 December 2010
at 7.00 pm.

**Night shift workers at RTE's
National System Control Centre.**

*Presentation of night shift team
of the National System Control Centre,
comprising five persons in charge of
managing the 400 kV transmission
network, ensuring supply/demand
balance in real time and providing
access at interconnections with
neighbouring countries between
7:30 pm and 7:30 am.*

© RTE Médiathèque, Stéphane Herbert, 2010

Inauguration of the Obergailbach interconnection station, 9 July 2009.

View of the station's meter runs.

© GDF SUEZ, Ramon Guillaume / Abacapress, 2009

The security of supply

KEY WORDS

- *Framework guidelines*
- *Interconnections*
- *Network codes*
- *Security of supply*
- *Third energy package*

Ensuring the security of electricity and gas supply is an objective whose importance has continued to grow for the European Union over the last few years.

This concern is at the heart of the EU's energy strategy as shown by the different initiatives undertaken by the European Commission in 2010.

Market integration and interconnection development are the preferred means both at the European and national levels, for ensuring this security.

CRE's action contributes fully to the achievement of these objectives.

Increase in annual gas consumption

515 TWh

on the GRTgaz network
(+ 13% compared to 2009)

34 TWh

on the TIGF network.



◀ **Reinforcement of the Morelmaison interconnection.**

Two GRTgaz technicians working on the Morelmaison interconnection station.

© GRTgaz, Cedric Helsly, 2010

1. THE SECURITY OF ENERGY SUPPLY REQUIRES COORDINATED ACTION BY THE EUROPEAN UNION

1.1. Global energy prospects and the economic and financial context pose a risk to the security of supply in the European Union

Over the past few years, the factors of uncertainty in the energy sector have increased. Prospects of the growth of global energy demand suggest increased competition for access to fossil resources. Furthermore, the objectives set within the framework of the fight against climate change require a profound modification of the EU's energy system. In particular, the development of new applications and technologies is expected to increase the EU's dependence on electricity, thus requiring a fast response from Member States.

The integration, modernisation and reinforcement of the EU's electricity and gas infrastructure have therefore become an essential prerequisite to guarantee the supply required by its economy. Estimating the investment requirements in energy transmission networks alone at €200 billion by 2020, the European Commission presented new guidelines in March 2010 to offset the effects of the global financial crisis and avoid any investment delays that may compromise the security of supply in the EU.

The Heads of State and European governments confirmed the key role of energy infrastructure in the global strategy "Europe 2020: A strategy for smart, sustainable and inclusive growth", which they adopted in June 2010. The sectoral form of this strategy, the document "Energy 2020: A strategy for competitive, sustainable and secure energy", was presented by the European Commission in November 2010. It will serve as the basis of the EU's activity in the upcoming years.

1.2. Cooperation and coordination between European players are key elements for enhancing the security of supply in the medium-term

For the European Commission, the implementation of the third energy package regulation framework will increase market players' visibility and promote investment that is essential for the security of supply. It thus confirms the key role of national regulators, the Agency for the Cooperation of Energy Regulators (ACER) and the European Networks of Transmission System Operators for Electricity and Gas (ENTSO-E and ENTSO-G), in improving the operation and stimulating the development of energy infrastructure.

The European Commission also appeals for the enhancement of external energy policy: EU agreements with its strategic partners, in particular, supplier and transit countries, must be harmonised.

Moreover, coordination between Member States in terms of supply must be improved.

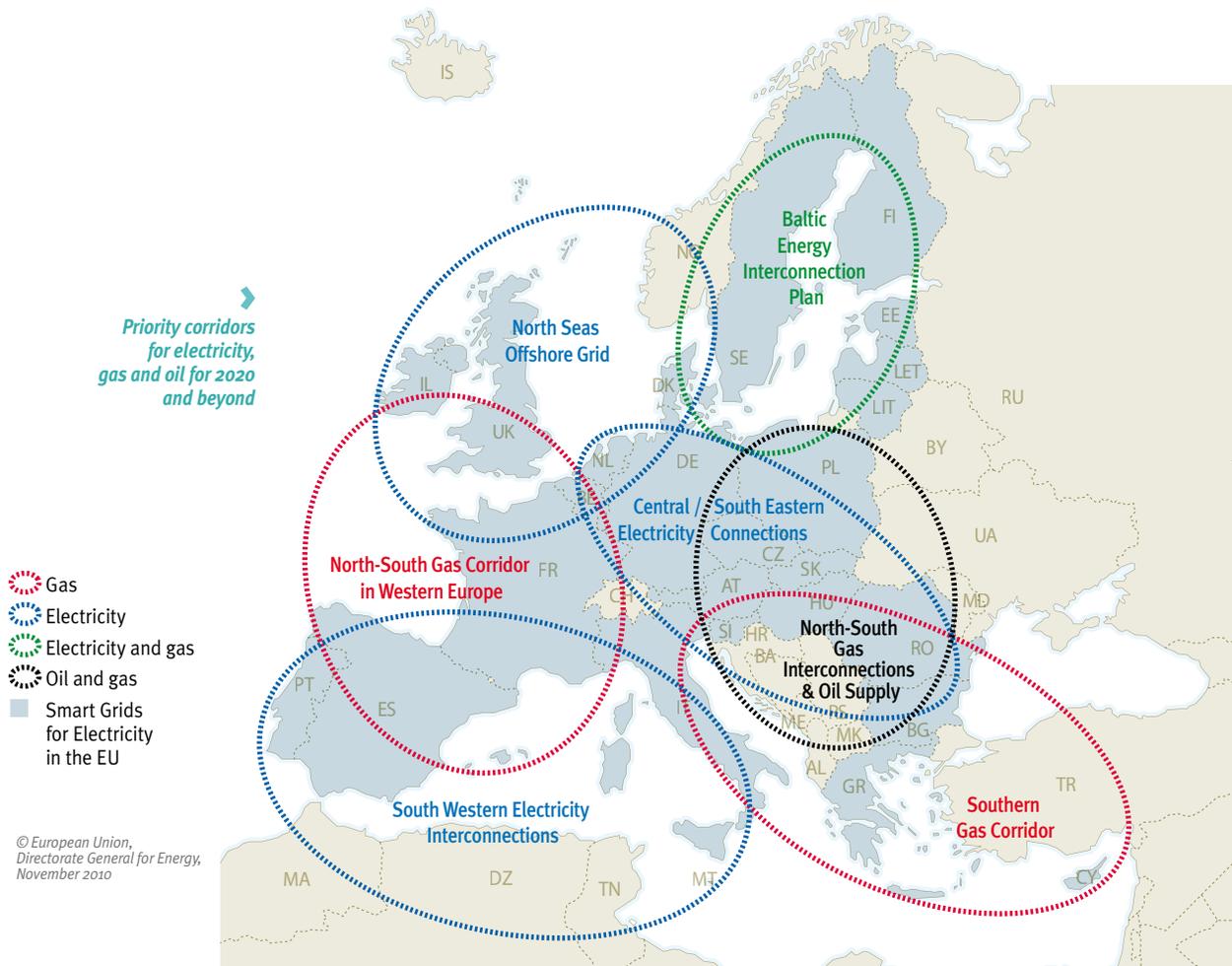
The growth of energy efficiency and technological development will contribute to improving the EU's energy supply.

Lastly, the strategy developed by the European Commission provides for the definition of a master plan for an integrated energy network by 2020 for all of the EU as well as the implementation of new EU tools to make the investments not made by the market in spite of the incentives put in place.

1.3. A new method for strategic infrastructure planning for the European Union is operational

Published in mid-November 2010, the master plan for an integrated energy network by 2020 is based on eight major priorities in terms of electricity and gas infrastructure (*see map*).

With regard to electricity networks, the main challenge is to adapt them to the increase of electricity production from renewable sources. In particular, the development of an offshore network in the North Sea and the reinforcement of interconnections in south west Europe are considered essential for capitalising on the renewable energy potential of the southern and northern regions of the EU.



With regard to gas, the reinforcement of the gas corridor of western Europe is expected to fluidify exchanges and improve the use of external supply. The construction of the southern gas corridor is also considered a decisive step in the diversification of the EU's supply sources in the Caspian region. Projects for the reinforcement of interconnections in central and eastern Europe and the interconnection of energy markets in the Baltic region must reduce the isolation and dependence of these regions.

According to the European Commission, improved regional cooperation and cross-border distribution of costs should further encourage companies to mobilise the investments necessary to complete these projects. Fearing nevertheless an investment

deficit of approximately €60 billion, the European Commission proposes to define new planning rules to target the EU funding required based on the urgency of the projects and their inherent risks. Infrastructure projects of European interest are also expected to benefit from simpler and faster administrative procedures for authorisation. An initial list of eligible projects for preferential treatment and EU funding is scheduled to be established by 2012.

Preparatory work for the implementation of ACER, conducted in 2010 by national regulators within the Council of European Energy Regulators (CEER) and the European Regulators' Group for Electricity and Gas (ERGEG), gives a view of the changes to be expected from the implementation of these guidelines.

► VIEW OF EUROPE

Adoption of a new regulation on the security of gas supply

Following the gas crisis of January 2009 between Russia and Ukraine, the revision of the 2004 directive on the security of natural gas supply in the European Union was accelerated. Published on 12 November 2010 after one year of discussions, the new European regulation strengthens coordination obligations of Member States and gas companies at the regional and European levels for the prevention and management of emergency situations.

By 3 December 2011, each Member State must have designated a competent authority. It will be charged with assessing risks, establishing a preventive action plan aimed at reducing the country's vulnerability and preparing an emergency plan defining the measures to be taken in the event of supply disruption. Furthermore, countries must comply with infrastructure and supply standards, such as the implementation of bidirectional flows at border points, the supply of electricity and gas to protected customers in the event of severely cold conditions or disruption of the main supply infrastructure.

Of the four crisis levels defined, only the last two will justify an intervention by the public authorities.

This text stresses the European dimension of the handling of supply crises. The European Commission will ensure consistency of national plans and will verify that the measures taken by each State do not jeopardise supply of neighbouring countries. It may declare a Community or regional emergency and convene the Gas Coordination Group¹ which evaluates the consistency of national actions and ensures cooperation with non-EU countries.

The regulator will be associated with risk assessment work and preparations for the preventive and emergency plans. Moreover, tariffs must take into account the costs for bringing infrastructure into compliance with infrastructure norms. Lastly, since the Agency for the Cooperation of Energy Regulators (ACER) is a member of the Gas Coordination Group, regulators will also be involved in the management of emergencies. ●

¹ – Composed of representatives of Member States' competent authorities, as well as ACER, ENTSO-G and representatives of industry and customer associations, the Gas Coordination Group facilitates the coordination of measures related to the security of gas supply.

2. MARKET INTEGRATION MUST ENABLE OPTIMAL USE OF EXISTING RESOURCES

2.1. The security of supply is addressed differently for electricity and gas

The creation of a single market increases the importance of solidarity between Member States. Cross-border infrastructure must therefore be designed to deal with the most extreme situations.

In the electricity sector

France has seen a major increase in its electricity consumption, particularly during peak periods. A drop in its net export balance has been observed, as well the increasing use of flexibility in its exchanges at borders to ensure electricity supply during consumption peaks. While the French electricity system can export up to 13,000 MW, the level of imports required to meet the balance between production and consumption may, under long periods of extreme cold, amount to 9,000 MW, i.e. the forecast limit that can be accepted by the French network. The guarantee of supply security is one of the major reasons that has driven CRE to work in favour of implementing effective and flexible mechanisms to manage electricity interconnections, thereby optimising their use.

In the gas sector

National gas production represents only a very marginal portion of French consumption (approximately 2%). Gas interconnections therefore play an essential role for the country's supply. In addition to import capacity, gas pipelines and LNG terminals, the balance between supply and demand largely hinges on underground storage fields whose capacity totals 25% of annual consumption. These underground storage fields respond to seasonal changes in demand and considerably lessen the effects of a possible supply disruption. At the

› IN MORE DEPTH

ACER plays a key role in favour of greater market integration



The Agency for the Cooperation of Energy Regulators (ACER) aims to strengthen coordination of work conducted by national regulation

authorities and to settle any disputes concerning cross-border matters. It must also draft framework guidelines setting clear and objective principles for the elaboration of network codes by the European Networks of Transmission System Operators for Electricity and Gas (ENTSOs) on twelve priority topics. These topics have been identified in the third energy package. Most of them are related to the improvement of market integration. Each framework guideline must contribute to ensuring non-discriminatory treatment, effective competition and operation of markets. ACER must supervise the cooperation of transmission system operators and issue an opinion on the network codes, the work programme and the ten-year electricity and gas network development plans prepared by ENTSOs.

In order to prepare ACER's missions, during the transitional period between the adoption of the third energy package and its implementation, the European Regulators' Group for Electricity and Gas (ERGEG) started work on:

- the rules for the allocation of gas and electricity transmission capacity;*
- the balancing of gas transmission networks and the tariffs at natural gas interconnection points;*
- the connection to the electricity network and the operational management of the electricity grid. ●*

European level, market integration and interconnection development must promote the pooling of flexibility resources, a policy reinforced by the European regulation on the security of gas supply published in November 2010 (see box, page 66).

2.2. CRE participates in draft pilot framework guidelines launched since 2009

Sitting on the Council of Regulators which prepares ACER's decisions, CRE is closely involved in the framework guideline drafting process.

In the gas sector

CRE, in cooperation with the German regulator, directed work on transmission capacity allocation at interconnections. Gas exchanges at borders are currently hindered by allocation rules that vary according to Member States. This results in heterogeneous capacity on both sides of the border points and the extensive application of the "first come, first served" rule. The aim of the framework guideline is to facilitate gas exchanges by harmonising capacity allocation arrangements within the EU.

Work on the framework guideline concerning tariffs for the use of gas transmission networks also began in 2010 within ERGEG under the joint direction of CRE and the Belgian and Austrian regulators. The scope of the text must cover interconnections in order to facilitate gas exchange and promote competition based on the following principles:

- providing incentives required for the implementation of investments;
- guaranteeing the collection of income authorised for the transmission system operator;
- avoiding cross subsidies between cross-border and domestic network usage.

CRE also takes part in the preparation of the framework guideline on the balancing of gas networks, steered by the British regulator. CRE has already requested GRTgaz and TIGF to make provisions in anticipation of the contents of the framework guideline by working on the development of market balancing.

In the electricity sector

CRE contributed to the drafting of the framework guideline on the allocation of interconnection capacity and congestion management. This framework guideline, prepared in coordination with other regulators in 2010 and validated by CEER in February

2011, aims to improve the operation of cross-border markets. For this, it sets out the target models to be implemented by 2014, for the definition of price-forming zones, the calculation of interconnection capacity and the allocation of this capacity for different time frames (forward, day-ahead and intraday). These target models have already been applied at certain French borders, such as

the coupling of day-ahead markets at the Belgian and German borders (*see box, page 69*), the implicit continuous allocation of intraday capacity at the German border and compensation of long-term capacity reductions based on the difference in day-ahead market prices applied at the Belgian and Spanish borders.

CRE also contributed to the framework guidelines on connection, approved by CEER in December 2010, and on operational security which is currently being drafted. These framework guidelines aim to facilitate market integration and improve the safety of the network by harmonising national practices.

**7,794
MW**

Record electricity imports attained on 6 January 2010 (i.e. 9% of consumption).

▶ DECODING

Coupling of electricity markets

On 9 November 2010, one of the major market integration projects successfully came into operation: market coupling between the countries of the West Central region (Belgium, France, Germany, Luxembourg and the Netherlands). Approved by CRE on 28 October 2010, this mechanism received consensus among the electricity players at the December 2009 Florence Forum ¹.

Market coupling enables the day-ahead markets of these five countries to be operated in synergy. It uses price signals to steer electricity exchanges in the most relevant direction from a cost-effective and security of supply point of view, thus ensuring optimum use of the electricity transmission network and the supply of electricity at the best cost for the community.

How much it costs, how much is earned?

Market coupling allocates interconnection capacity where electricity supply and demand cross on the market. It selects, at the regional level, the best electricity offers to meet demand by using the electricity networks optimally. **This mechanism therefore generates an economic surplus for the community estimated at over €42 million per year.**

To implement market coupling, **transmission system operators of the West Central region invested approximately €30 million between 2007 and 2010.** Therefore, this project is very profitable for

¹ – Created in 1998, the Florence Forum brings together the European Commission, national regulatory authorities and competent ministries, transmission system operators, industry companies and customers. The main topics currently examined involve the tariffs of cross-border electricity exchanges and the distribution and management of interconnection capacity.

the community since the economic surplus generated by coupling exceeded its cost from the end of the first year of operation.

A concrete example

On 19 October 2009, supply on the organised day-ahead markets was not enough to meet demand. Prices reached the French market's price cap of €3,000/MWh. However, interconnection capacity, in particular, Spanish and Italian capacity, was still underused. If France had been coupled with all of its neighbours, the efficient use of the cross-border electricity network would have enabled demand to be met in the organised market and the market price to be reduced to around €200/MWh. This is why CRE promotes the extension of market coupling.

And in future?

The next goal is to extend market coupling in Europe. Transmission system operators and exchanges, an increasing number of which are holding discussions, must work together. In this respect, the main European exchanges have launched the region coupling project ², covering 80% of Europe in terms of electricity consumption. Their work will be part of the transmission system operators' project which covers the West Central region, Scandinavian countries and Great Britain. ●

² – Zone which may cover Austria, the Baltic states, Belgium, Denmark, Finland, France, Germany, Italy, Luxembourg, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

3. INFRASTRUCTURE DEVELOPMENT IS ESSENTIAL FOR MAINTAINING THE SECURITY OF SUPPLY

3.1. The preparation of ten-year investment plans enables medium-term investment needs to be identified

The objective of ten-year plans is to increase transparency, promote competition and strengthen the security of energy supply in the EU. The obligation to publish ten-year investment plans has been introduced at three levels in the third energy package: at the European, regional and national levels.

At the European level

Ten-year gas and electricity network development plans must be published by the ENTSOs every two years and are not binding. Ahead of the implementation of the third energy package, the ENTSOs produced pilot versions published in January 2010 for gas and in June 2010 for electricity. Extremely instructive with regard to methodology and content, they show that these plans must provide for bottom-up and top-down approaches in order to properly take into account the European dynamics of the gas and electricity industries.

EREGG has followed this work in view of the future missions of ACER, which will be responsible for evaluating European ten-year plans. EREGG has published recommendations for the preparation of plans and has issued opinions on the first two versions. The preparation of these plans requires considerable cooperation and harmonisation efforts in terms of planning on the part of shippers and the involvement of all stakeholders. EREGG recommends testing several alternative scenarios and simulating the impact of supply crises in the gas sector.

At the regional level

Shippers will have to develop regional plans that will complete European plans, placing more emphasis on cross-border interconnection projects and the market integration dimension.

At the national level

French shippers will be required to submit a ten-year network development plan each year to CRE, which

will then conduct the necessary consultations and evaluate the consistency of the plans with the European ten-year plan.

In the gas sector, since 2008 GRTgaz and TIGF have prepared a ten-year plan each year that they address to CRE. In 2010, the investment needs presented in these plans amounted to approximately €8 billion, including €4 billion for projects that have already been approved (interconnection development with Spain at the Larrau point in 2013 and Biriadou in 2015 and interconnection capacity development at the interconnection with Belgium at the Taisnières point).

Investment needs mainly cover:

- the connection or development of several LNG terminals (Dunkerque, Fos-Tonkin, Fos Faster, Montoir-de-Bretagne) and the merging of balancing zones for GRTgaz;
- the creation or development of interconnections with border countries (Belgium for GRTgaz and Spain for the two shippers).

➤
11 April 2011.
Inauguration
of the new natural
gas power plant
in Montoir-
de-Bretagne.

© GDF SUEZ,
Burbant Rudy /
Abacapress, 2011



3.2. In the electricity sector, investments have increased, in the gas sector, certain decisions have been postponed

For the gas sector, the 2010 investment programmes approved by CRE totalled €629 million for GRTgaz and €77 million for TIGF. At their mid-year execution points, the two transmission system operators revised their forecasts to €609 million for GRTgaz and €103 million for TIGF.

The programmes still mainly covered main network fluidification projects and the development of new interconnection capacity with adjacent countries. GRTgaz dedicated €127 million for the reinforcement of the network core, capacity development at the Belgian border (Taisnières) and the Spanish border (Larrau). TIGF dedicated almost half of its budget to interconnection capacity development with Spain (Larrau).



€8 billion
 GRTgaz
 and TIGF investment
 needs over 10 years.

The GRTgaz programme approved by CRE for 2011 is lower than that of 2010: it amounts to €482 million. The MidCat project related to the development of a new interconnection point with Spain has not been validated due to the lack of sufficient market demand. Furthermore, the investment decision for the Dunkerque LNG terminal project has been postponed to 2011 by EDF. TIGF's programme stands at €90 million for 2011.

In the electricity sector, RTE has completed the implementation of measures initiated in 2007. They aim to reinforce the network in the north of France, which sees major energy flows related to production in this area and cross-border exchanges. RTE has also decided to adapt the network to welcome additional production in this area. In the Provence-Alpes-Côte d'Azur region, in 2010 work was started on the creation of a new 400 kV zone to allow production connection in the Fos-Lavéra zone (scheduled for completion in 2011).

For 2011, the RTE investment programme approved by CRE amounts to €1.255 billion. The year 2011 will be marked by the start of two significant undertakings: the 400 kV double-circuit power transmission line, called Cotentin-Maine, aimed at integrating a third production plant in Flamanville, and the France-Spain interconnection through the eastern Pyrenees (Baixas-Santa Llogaia).

3.3. A new tariff service has been introduced on the GRTgaz network to meet users' needs

Since 2006, connection requests to GRTgaz and TIGF have been made for many projects for electricity production plants using natural gas. These projects are part of the pluriannual investment plan for the gas sector adopted in 2009 by the public authorities.

Inauguration of the strengthening of the electricity interconnection connecting the Moulaine (Meurthe-et-Moselle) high-voltage station to that of Aubange (Belgian Ardennes).

RTE and Elia, the French and Belgian electricity transmission system operators have invested €13.2 to increase exchange capacity between France and Belgium by 10 to 15%, while avoiding the construction of a new electric line. A second 225 kV line (three-phase) was therefore installed on an existing 15 km electric line connecting Moulaine and Aubange.

© RTE Médiathèque, Stéphane Harter, 2010



Given networks' gas consumption level and flexibility requirements (consumption variations) during the day, constraints in the operation of the networks were identified in 2008 by shippers.

A study conducted by GRTgaz and TIGF at CRE's request, shows that the combined cycle gas turbine plants lined up will generate considerable intraday (during the day) flexibility requirements, exceeding in 2012 the needs of the traditional market (13 TWh), reaching up to 21 TWh in 2015. To meet these new requirements, GRTgaz will have to adapt the management of its network and rely on external flexibility sources.

In this context, consultation with market players was carried out in order to cover the costs generated on GRTgaz's network, and to guarantee the flexibility

required by gas power plants. In the tariffs on the transmission network which entered into effect on 1 April 2011, CRE therefore introduced an intraday flexibility service aimed at sites with strong flexibility needs, including gas power plants.

For this, shippers make their flexibility sources existing on the French transmission network open to competition and use them optimally. This service is billed according to use and is set so as to cover only the costs generated by sites with strong flexibility needs.

It is part of the general daily balancing system for the gas market in France, in which it is the responsibility of shippers to meet the intraday flexibility needs of network users under transparent and non-discriminatory conditions.

➤
Combined
cycle gas
turbine plants
in France (as at
31/12/2010).

	Plants	Electric power (MWe)	Date of commercial operation
Plants in operation (or being tested)		4,917	
EDF Genevilliers	CT	210	Re-starting scheduled in April 2011
GDF SUEZ DK6	CCGT	790	2005
POWEO Pont-sur-Sambre	CCGT	412	September 2009
GDF SUEZ Cycofos Fos	CCGT	480	September 2009
E.ON LA SNET St-Avoid	CCGT	860	March 2010
GDF SUEZ Combigoles Fos	CCGT	425	July 2010
GDF SUEZ Montoir	CCGT	435	November 2010
EDF Blénod	CCGT	430	April 2011
ALPIQ Bayet	CCGT	410	April 2011
EDF Martigues I	CCGT	465	July 2011
Plants being constructed or pending start of tests		1,248	
POWEO Toul Croix de Metz	CCGT	413	First half 2013
EDF Montereau	CT	370	September 2011
EDF Martigues II	CCGT	465	First half 2012

CCGT plant: combined cycle gas turbine

CT: combustion turbine

Source: GRTgaz

This new service is expected to address the increasing use of gas aimed at replacing electricity production generated from combustible fossils and make up for the intermittent nature of renewable energy. ●

INTERVIEW WITH...

CÉCILE GEORGE, Director for Electricity Grid Access, CRE

FLORENCE DUFOUR, Assistant Director of Gas Infrastructure and Networks, CRE



What is an exempt infrastructure?

European legislation provides that developers of electricity or gas infrastructure projects (interconnections, natural gas storage and LNG terminals) can request an exemption from certain regulatory obligations concerning third party access to this infrastructure and the tariffs for this access established or approved by the regulator. For electricity, the exemption may also concern the use of revenue generated from the use of the infrastructure.

What are the issues related to exempt infrastructure?

CRE considers that granting an exemption may contribute to the construction of projects whose feasibility may be limited within the context of a regulated framework. For both exempt and regulated infrastructure, the use and allocation of capacity must be optimised so that they contribute fully to the security of supply in France and to European market integration. The analysis prior to the granting of an exemption therefore pays particular attention to the security of supply and competition. The exemption must not lead to distortions

to the benefit of a specific player, nor jeopardise the proper operation of the networks to which the new infrastructure is connected.

How is the principle of exemption applied in practice?

Exemptions have been granted to most LNG terminal projects in Europe over the last few years, but much fewer electricity and gas interconnections between Member States and gas storage installations have been granted exemptions.

In France, several LNG projects have been developed and Dunkerque LNG obtained full exemption from third party access in March 2010.

In 2010, two public discussions were held: one for Fos Faster, a project proposed by Vopak and Shell, and the other for the extension of the operation of the Fos-Tonkin terminal. The Fos Faster company intends to operate this terminal within the framework of an exemption. Fos-Tonkin, an existing terminal, is operated under a regulated framework.

For electricity, the law assigns to RTE the responsibility for regulated interconnections. An exemption is therefore required to enable other investors to undertake an interconnection project.

On 30 September 2010, CRE published an announcement on the regulation of new exempted interconnections. These guidelines provide for a transparent and non-discriminatory regulation framework giving the visibility required to project developers while protecting the interests of users of the electricity transmission network.

In practical terms, investors will not be subject to the tariff for the use of the transmission network nor the reinforcement costs required for their connection, but CRE will only grant an exemption if the overall impact for the network's users is positive. ●



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Summary of CRE's main deliberations in 2010

Deliberation of 29 April 2010 providing guidelines on the development of a new gas interconnection enabling firm capacity to be created from France to Belgium.

CRE and the Belgian energy regulator (CREG) were in favour of a new gas interconnection in Veurne at the French-Belgium border connecting both networks, if the open season, conducted in 2010, showed that there was sufficient transmission capacity demand from market players.

By allowing gas to be exported from France to Belgium, the project would facilitate exchanges between the two countries and contribute to strengthening the security of supply and gas market integration in Europe.

CRE and CREG greatly wished for that that new capacity to be developed between the adjacent transmission networks within a regulated and consensual framework, ensuring transparent and non-discriminatory access to all players.

The regulators hoped for the open season to be conducted in close collaboration between the Belgian shipper (Fluxys) and the French shipper (GRTgaz) under their surveillance, in compliance with the Guidelines for Good Practice on Open Seasons Procedures (GGPOS) published by the European Regulators' Group for Electricity and Gas (EREG). In an effort to ensure consistency with recent European developments, they considered it essential for the project to immediately take into

account the framework guidelines proposed by EREG on the management of gas transmission capacity allocation in Europe.

CRE and CREG requested Fluxys and GRTgaz to work on ensuring the smooth running of the open season in consultation with market players with a view to the launching of the first phase before the summer.

Deliberation of 29 April 2010 providing guidelines on the development of gas interconnections with Spain as part of the 2015 open season

The development of gas interconnections with Spain was the priority of work conducted by the EREG South Gas Regional Initiative. The project was backed by French and Spanish public authorities and the European Commission.

The development of interconnections between France and Spain aimed to step up the integration of the Iberian, French and North-European markets. In that regard, the project would improve the security of supply for France and the Iberian Peninsula and develop the French gas market in the southern part of the country. The development plan coordinated by the French and Spanish transmission system operators published in 2007 provided for the consolidation of the Western axis (Larrau and Biriadou) by 2013 and the creation of a new Eastern axis (Perthus) for 2015 (called the Midcat project).

The guidelines concerning the 2015 open season regarding the development of interconnections with Spain covered the capacities sold and the conditions for the validation of capacity allocation.

With regard to capacity sold, based on the binding requests received, capacity created in the France to Spain direction (from GRTgaz South to Spain) could be adjusted since intermediary levels of investment were possible. Therefore, in accordance with Article 2 of the French law dated 3 January 2003, the allocation rules for the 2015 open season for the development of interconnections with Spain were sent to CRE then published by the transmission system operators prior to the launch of the open season.

Concerning the conditions for the validation of capacity allocation, if the 2015 open season results were validated, the tariff charge for entry to France from Spain applicable to all available capacity as from 2015 would be based on the tariff that would be applicable at that date at the other land entry points in addition to the tariff increase applied to validate the 2010 open season economic test.

An economic test would also be applied to the development of capacity between GRTgaz Nord and GRTgaz Sud. The same principle of a cost coverage threshold of 70% to validate allocations was envisaged. However, there was no plan to increase the price of that capacity to validate the project by economic test.

Furthermore, the distribution terms between TIGF and GRTgaz of income from the Midcat project would have to be defined. Through the pricing structure in effect, TIGF would receive most of the income from the sale of capacity created at the new interconnection whereas most of the investments would be made by GRTgaz.

Deliberation of 15 April 2010 on the approval of the processing procedure for requests for electricity production installation connection to the public electricity transmission network.

Since the entry into effect of the specifications contained in the Annex of the third amendment made on 30 October 2008 to the agreement dated 27 November 1958 awarding concession to RTE EDF Transport (RTE) of the public electricity transmission network, CRE had been in charge of approving the processing procedures for requests for connection to users' public transmission networks and public distribution networks. In that framework CRE specified, in a deliberation on 11 June 2009, the approval conditions and the minimum content of those procedures.

In that context, RTE submitted to CRE for approval in April 2010 a draft procedure for processing requests for electricity production installation connection to the public transmission network.

CRE approved the draft procedure since, by explaining the method of classing the "connection queue" and in limiting unjustified attempts to reserve injection capacity, it established an appropriate framework for assessing connection requests, which contributed to improving the transparency and non-discrimination of access to the public electricity network.

Deliberation of 17 June 2010 approving the rules for interconnection capacity allocation in the West Central region and also import/export rules.

In accordance with Article 30 of the specifications contained in the Annex to the agreement of 27 November 1958 awarding concession to RTE EDF Transport SA of the public electricity transmission network, and adopting the wording of decree No. 2006-1731 of 23 December 2006 approving the standard concession specifications of the public

electricity transmission network, RTE submitted to CRE for approval on 31 May 2010, a proposal concerning the rules for capacity allocation for the West Central region, including in particular the France/Germany and France/Belgium borders. The proposal defined the conditions for access at interconnections and the criteria for allocation for the different timeframes (annual, monthly and daily if market coupling was unavailable). RTE also submitted to CRE for approval on 30 March 2010 a proposal for import/export rules.

CRE approved the West Central rules concerning capacity allocation for the France/Germany and France/Belgium interconnections submitted to it on 31 May 2010, whose entry into force was scheduled for when West Central market coupling started, subject to the approval of the other regulators in the region.

Furthermore, CRE approved the import/export rules submitted to it on 30 March 2010 whose entry into force was scheduled for the when West Central market coupling started.

Deliberation of 11 August 2010 giving CRE's opinion of the draft order on regulated tariffs for the sale of electricity.

The Minister for the Economy and the Minister for Energy solicited CRE for its opinion on a draft order concerning regulated tariffs for the sale of electricity, in compliance with Article 4 of the French law No. 2000-108 of 10 February 2000, to enter into force on 15 August 2010.

The draft order established the price lists of regulated tariffs excluding tax for the sale of electricity applicable by EDF and non-nationalised distributors. The price lists envisaged resulted from a change in structure and in the level of price lists in effect. The level of tariffs envisaged by the government was to be increased by an average 3% for residential blue tariffs, 4% for non-residential blue tariffs, 4.5% for yellow tariffs and 5.5% for green tariffs.

To prepare its opinion, CRE consulted the different players concerned and on 11 August 2011, it heard EDF, associations for non-nationalised distributors, alternative suppliers and competent authorities.

CRE issued a favourable opinion for the draft order submitted to it, in considering the following elements:

- the tariff structure envisaged for 2010 had developed under the dual constraint of the convergence of all clients' baseload consumption throughout the year and the elimination of tariff traps;
- CRE however considered that specific attention should be paid to the development of tariff arbitration at the following structure change, in order to encourage more virtuous behaviour;
- the planned increase, once again higher for yellow and green tariffs than for blue tariffs, would cover supply costs for the blue, yellow and green categories, and was in line with the implementation of the decision by the Conseil d'Etat on 1 July 2010, instructing the Minister of State and the Minister for Ecology, Energy, Sustainable Development and the Sea, to issue a new tariff order within two months as from the notification of the decision.

Deliberation of 31 August 2010 on the audit of the formula used to calculate the change in GDF SUEZ's regulated tariffs for the sale of natural gas.

French Decree No. 2009-1603 of 18 December 2009 overseeing the setting of regulated tariffs for the sale of gas, provided that the gas supply costs to be covered by the tariffs were to be calculated using a formula.

The formula used by GDF SUEZ in 2010 was established by the operator and sent to CRE on 21 July 2008. It had been designed to be applied to the years 2008, 2009 and 2010. An audit had been performed on the formula by CRE, the conclusions of which had been published in a deliberation on 17 December 2008. The audit had followed an initial audit conducted by CRE in 2005 on the formula

previously used, of which the main conclusions had been published in a CRE deliberation of 28 February 2006.

CRE periodically audited formulas used by GDF SUEZ and previously, by Gaz de France. The first audit of the formula established in 2008 had occurred at a time when GDF SUEZ was incorporating into the formula an additional indexing to the price of oil (Brent) expressed in euros, compared to previously used indices: heavy fuel oil (low sulphur), heating oil and the euro/dollar exchange rate. In its deliberation of 17 December 2008, CRE had concluded that the new formula provided a correct estimation of GDF SUEZ's supply costs on the French market. CRE had also specified that that tariff formula did not take into account any profit or losses related to the arbitration between the different supply modes. That deliberation had also specified that the verification of the robustness of the formula would be subject to a new audit, given the major fluctuations in the price of oil.

CRE made several recommendations:

- a new formula would be implemented to take into account the new indexing of certain long-term contracts to wholesale gas market prices;
- the difference observed between the formula and the actual costs of long-term contracts for gas imported into France would be examined annually to enable changes to be made to the formula if necessary;
- the impact on the average import price of supply sources other than gas imported through long-term contracts would be measured.

Deliberation of 30 September 2010 on the application of Article 7 of Regulation (EC) No. 1228/2003 dated 26 June 2003 and on conditions for access to the French public electricity transmission grid for new exempt interconnections

Article 14 of the amended French law No. 2000-108 dated 10 February 2000, relating to the modernisation

and development of the electricity public service, entrusted the operator of the public electricity transmission system with developing the public transmission grid in order to enable interconnection with other networks in particular.

Article 7 of Regulation (EC) No. 1228/2003 of the European Parliament and Council dated 26 June 2003 on the conditions for access to the network for cross-border exchanges in electricity, set the terms under which a new interconnection could be exempted by the national regulatory authorities, from all or part of the regulation in force in terms of third party access, approval of tariff-setting mechanisms, and use of revenue from the allocation of interconnection capacity.

Pursuant to Article 7 of Regulation (EC) No. 1228/2003 and in the absence of conflicting legislative provisions, the national regulatory authority in principle, had the power to process applications and grant exemptions to new interconnections.

During the public consultations carried out by CRE from 2 April to 2 May 2009 and from 3 May to 3 June 2010, electricity market players expressed their views on the exemption conditions and the grid access conditions applicable to new exempt interconnections. CRE took those contributions into account when drawing up the deliberation.

Deliberation of 28 October 2010 approving the daily implicit allocation method for interconnection capacity within the West Central region.

In accordance with Article 30 of the third amendment made on 30 October 2008 to the agreement of 27 November 1958 awarding concession to RTE EDF Transport SA of the public electricity transmission network, adopting the wording of decree No. 2006-1731 of 23 December 2006 approving the standard concession specifications of the public electricity transmission network, RTE requested CRE's approval, on 19 October 2010, of the implicit

allocation method for daily interconnection capacity (market coupling) within the West Central region (France, Benelux and Germany) and the arrangements for collecting inherent operation costs.

CRE welcomed RTE's proposal and approved the implicit allocation method for daily interconnection capacity allocation within the West Central region. The launch of market coupling in the West Central region took place on 9 November 2010.

CRE however requested RTE:

- to monitor in detail the impact of coordinated capacity calculation adjustments and to transmit to it the corresponding reports;
- to evaluate the economic gains of market coupling
- by estimating the social well-being generated by cross-border exchanges and the congestion cost
- and to publish them monthly.

Furthermore, CRE reiterated the agreement reached in the West Central region regarding the effect of the size of the price zone. The preliminary results of the study are scheduled for summer 2011.

Deliberation of 2 December 2010 on CRE's opinion concerning the draft order relating to GDF SUEZ's regulated tariffs for the sale of natural gas for public distribution.

Pursuant to Article 7 of the French law No. 2003-8 of 3 January 2003 on gas and electricity markets and the public energy service, CRE was called upon for its opinion on 16 November 2010, by the Minister of the Economy, Finance and Industry and the Minister attached to that Minister, responsible for Industry, Energy and the Digital Economy, on a draft order concerning GDF SUEZ's public distribution tariffs.

The draft order set the new tariff formula for estimating the change in GDF SUEZ's supply costs to be taken into account to establish public distribution tariffs. Moreover, the draft order provided that the price lists entered into effect on 1 July 2010 would not change on 1 January 2011.

French Decree No. 2009-1603 of 18 December 2009 overseeing the setting of regulated tariffs for the sale of gas, provided that the gas supply costs to be covered by the tariffs would be calculated using a formula.

The formula used at the time had been designed to be applied in 2008, 2009 and 2010. Two audits had been performed on the formula by CRE, the conclusions of which had been published in the deliberations of 17 December 2008 and 31 August 2010.

CRE therefore issued a favourable opinion on the draft order. It considered that the new tariff formula provided a correct estimation of GDF SUEZ's supply costs for long-term contracts for gas imported into France, some of which were indexed to gas market prices.

However, CRE would check the relevance of the formula at regular intervals during 2011. Lastly, CRE considered that the choice of market reference should be examined periodically. In particular, the reference to indices specific to the French wholesale gas market, whose liquidity was increasing, could be envisaged in the long term.

Glossary

Advanced metering

Advanced metering aims, at a minimum, to provide customers each month instead of every six months, with accurate information on their gas consumption, with a view to improving the quality of billing and enabling clients to better control their energy consumption. An advanced metering system stores data (index, load curves), records information (supply disruption, exceeding of capacity) and may be set, interrogated and controlled remotely (two-way operation). Advanced metering involves the installation of smart meters that can store measurement information and the establishment of data transmission systems enabling fast and reliable circulation of information contained in the meters between users, system operators and suppliers.

Agency for the Cooperation of Energy Regulators (ACER)

The Agency for the Cooperation of Energy Regulators (ACER) is a Community body with a legal personality, established by EC Regulation No. 713/2009 and set up in 2010. ACER has been operational since 3 March 2011. Its headquarters is in Ljubljana, Slovenia.

ACER's objective is to assist national regulatory authorities to exercise and coordinate their regulatory tasks at the community level, and if necessary, complement their actions. It plays a key role in the integration of electricity and natural gas markets.

Its competences consist in:

- drafting and submitting non-binding framework guidelines to the European Commission;
- participating in the creation of European electricity and natural gas network codes in compliance with framework guidelines;
- taking binding individual decisions on terms and conditions for access and operational security for cross-border infrastructure if national regulatory authorities cannot agree or jointly request the intervention of the Agency;
- take decisions on exemptions when the infrastructure concerned is located within the territory of more than one Member State and if the national regulatory authorities cannot agree or jointly request the intervention of the Agency;

- providing opinions to ENTSO-G (European Network of Transmission System Operators for Gas) and ENTSO-E (European Network of Transmission System Operators for Electricity), in particular with regard to network codes and the Community-wide network development plan;
- monitor the execution of tasks of ENTOSOs;
- monitor regional cooperation of ENTOSOs;
- advise European institutions on matters concerning the internal electricity and natural gas markets;
- monitor, in cooperation with the European Commission, Member States and national regulatory authorities, the internal electricity and natural gas markets, in particular the retail prices of electricity and natural gas, network access, including access to electricity generated from renewable energy sources, and respect of consumer rights.

Alternative supplier

Suppliers that are not incumbent suppliers are considered as alternative.

Autorité des marchés financiers (AMF)

Established by the French Financial Security Act No. 2003-706 of 1 August 2003, the Autorité des marchés financiers was formed from the merger of the Commission des opérations de bourse (COB), the Conseil des marchés financiers (CMF) and the Conseil de discipline de la gestion financière (CDGF).

The Autorité des marchés financiers (AMF) is an independent administrative authority. This independent public body has a legal personality and financial autonomy. Its missions are to:

- safeguard investments in financial instruments;
- ensure that investors receive information;
- ensure the smooth running of financial markets.

It takes part in the regulation of these markets at the European and international levels.

Clean development mechanism (CDM) and joint implementation (JI) mechanism

The clean development mechanism (CDM) enables industrialised countries to invest in emission reduction projects in developing countries, in exchange for certified emission reductions (CERs) which can then be used for conformity purposes by the players concerned. The joint

implementation (JI) mechanism works in the same way, except that the projects are conducted in industrialised countries and generate Kyoto units called emission reduction units (ERUs).

CO₂ emission quota

1 quota = 1 tonne of CO₂. The allocation method is described for each country in a national quota allocation plan, validated by the European Commission.

Combined cycle gas turbine (CCGT)

Thermal power plant running on gas-fired turbines, in which electricity is generated in two consecutive cycles: first, through combustion gas in the turbines; and second, using the steam produced by this combustion gas. This process achieves high thermal efficiency (55 to 60%, compared to only 33 to 35% for conventional thermal power plants).

Connection queue

Requests by a production installation for connection to the grid are managed by the system operators based on a queue. A system operator's queued power is the cumulated power of all installations in the queue.

Council of European Energy Regulators (CEER)

The Council of European Energy Regulators (CEER) is an association created in 2000 by national energy regulators from Member States of the European Union and the European Economic Area. CEER's organisational structure includes a General Assembly (the sole decision-making body), an Executive Board, Working Groups specialised in a range of fields (including electricity and gas, consumer rights, international strategy, etc.) and a Secretariat located in Brussels. A work programme is published every year. In accordance with the association's statutes, decisions are taken by consensus or, failing that, by qualified majority vote.

Distribution grid access contract

Contract signed between an operator of a public electricity distribution grid and a grid user. It sets the legal, technical and economic conditions for access to and use of the grid.

DSO-S contract

(Distribution System Operator – Supplier)

In the electricity sector, a two-way contract between a distribution system operator (DSO) and a supplier (S), which outlines the rights and duties of the parties in terms of network access and use, and the exchange of information required, in relation to the delivery points of clients connected to the distribution network, in order to enable suppliers to propose to clients for whom it ensures exclusive supply, to sign a single contract covering electricity supply, access to and use of the distribution network.

Electricity public service contribution

Created by the French law No. 2003-8 of 3 January 2003, the electricity public service contribution aims:

- to compensate the electricity public service charges paid by incumbent suppliers, EDF for the most part, Electricité de Mayotte and local distribution companies;
- to compensate part of the charges related to the transitional regulated tariff for market adjustment (TaRTAM), once the electricity public service charges have been compensated (in practice, the electricity public service contribution has not compensated the charges related to TaRTAM since 2009);
- to fund the budget of the national energy ombudsman (le médiateur national de l'énergie).

Electricity public service charges cover:

- extra costs resulting from policies to support cogeneration and renewable energy and extra costs resulting from “dispatchable” contracts ;
- extra production costs in zones not interconnected to the French continental metropolitan electricity grid, resulting from the national tariff equalisation scheme (Corsica, overseas departments, Mayotte, Saint-Pierre and Miquelon and the Molène, Ouessant and Sein islands off Brittany). The tariffs in these zones are the same as in continental France although the production costs are higher;
- suppliers' loss of income and costs paid by due to the implementation of the special basic commodity tariff and suppliers' participation in the mechanism introduced in favour of persons in situations of financial uncertainty;
- management costs of the Caisse des dépôts et consignations (a French financial organisation serving the general interest and economic development).

Electricity transmission and distribution grid

System designed for the transmission of electricity between power plants and consumption sites. It consists of power lines that provide connections at given voltage levels and substations consisting of voltage transformers, connection and cut-off devices, measuring instruments, command and control equipment and equipment to compensate reactive energy. There are three grid hierarchies:

- bulk transmission and interconnection grid which routes large amounts of energy at 400 kV or 225 kV over long distances, with a little loss;
- regional distribution grids that distribute energy at a regional level over 225 kV, 90 kV and 63 kV power lines, supplying the public distribution grid and large industrial customers;
- distribution grids at 20 kV and 400 V supplying final customers with medium voltage (SME-SMI), or low voltage (household customers, tertiary sector and small industrial facilities).

European network codes

Created by European associations of gas and electricity transmission system operators, European network codes are common rules on different cross-border matters listed in Community regulation. They may become legally binding through a Comitology procedure if the Agency for the Cooperation of Energy Regulators (ACER) makes such a recommendation to the European Commission.

European Network of Transmission System Operators (ENTSO)

There is a European Network of Transmission System Operators for Electricity (ENTSO-E) and for Gas (ENTSO-G). Transmission system operators cooperate at the level of the European Union, via the ENTSOs, to promote the creation and the operation of the internal electricity and natural gas markets and cross-border exchanges, and to provide optimum management, coordinated exploitation and a solid technical development of the electricity and natural gas transmission systems. Within this framework, the ENTSOs create European network codes, on the basis of the framework-guidelines laid down by the Agency for the Cooperation of Energy Regulators (ACER) and working closely with the latter.

European Regulators' Group for Electricity and Gas (EREGG)

The European Regulators' Group for Electricity and Gas (EREGG) was created by the European Commission as part of the implementation of the 2003 directives.

EREGG's role is to advise and assist the Commission in consolidating the internal energy market by contributing to the full implementation of European directives and regulations, and preparing future legislation in the areas of electricity and gas. EREGG is composed of the European Commission and the independent regulators from the 27 European Union Member States. Member States of the European Economic Area and countries that have applied for membership to the Union are invited as observers. To achieve its objectives, which are also part of a public work programme, EREGG has a structure similar to that of the Council of European Energy Regulators (CEER). In addition, EREGG widely consults energy sector players on issues where its opinion is required. These opinions also involve the European Commission, which can then give them legally binding status through the Community comitology process. EREGG will no longer exist once the Agency for the Cooperation of Energy Regulators (ACER) is operational.

Framework guidelines

Drafted by the Agency for the Cooperation of Energy Regulators (ACER), these non-binding guidelines set clear and objective principles with which the European network codes prepared by the European Networks for Transmission System Operators for Electricity (ENTSO-E) and for Gas (ENTSO-G) must conform.

Gas title transfert point (PEG)

Exchanges on the wholesale natural gas market are performed at virtual points on the French gas transmission called gas title transfert points (PEGs). This is where exchanges between gas suppliers occur and where gas is supplied to transmission system operators for daily balancing.

There is a PEG in each of the French network's balancing zones: the North PEG and the South PEG located on GRTgaz's transmission network and the South-West PEG located on TIGF's transmission network.

Incumbent supplier

For electricity, incumbent suppliers are EDF, local distribution companies and their subsidiaries; for gas, the incumbents are GDF SUEZ, Tégaz, local distribution companies and their subsidiaries. An incumbent supplier is not considered an alternative supplier outside its incumbent service area.

Independent Administrative Authority

In France, an independent administrative authority is a State institution, empowered by the State to regulate sectors considered essential and in which the government wishes to avoid direct intervention.

Independent administrative authorities have three characteristics. These are:

- authorities: they have a certain number of powers (recommendation, decision, regulation, sanction);
- administrative: they act on behalf of the State and certain competences devolved upon the administration are delegated to them (e.g. regulatory power);
- independent: both from the sectors monitored but also from the public authorities.

Independent administrative authorities are separate to traditional administrative structures and are not subject to the authority of the State. Their members are not dismissible.

Interconnection

Equipment used to connect two electrical grids or pipes connecting two gas transmission networks.

Liquefied natural gas (LNG)

Natural gas brought to its liquid state by cooling to -160°C , mainly so that it can be carried in LNG tankers.

LNG terminal

A port facility used to receive and store liquefied natural gas, and transport it to the main network after regasification.

Local distribution company

Private company or public corporation that distributes and/or supplies electricity or gas within a given geographical area, not served by ERDF or GrDF.

Main and regional gas transmission network and gas distribution network

- the main transmission network is a set of large-diameter, high-pressure pipes linking interconnection points with neighbouring networks, underground storage facilities and LNG terminals, and to which the regional transmission networks, distribution networks and high-consumption industrial customers are connected;
- the regional transmission network is part of the transmission network used to transport natural gas to the distribution networks and high-consumption final customers;
- the distribution network is a set of medium- and low-pressure pipes transporting gas to final customers and to other distribution networks, as necessary. It comprises mainly distribution pipes, connection pipes, riser pipes, pressure regulators and meters, valves and accessories.

Market-price contract

Prices of market-price contract are set freely by suppliers within the framework of a contract.

Médiateur national de l'énergie (National energy ombudsman)

An independent administrative authority, the national energy ombudsman is charged with recommending solutions to disputes concerning the performance of electricity or natural gas supply contracts and with contributing to informing customers of their rights. All individual customers as well as small professional customers that have subscribed to electricity power equal or less than 36 kVA, or using less than 30,000 kWh of natural gas per year may address the ombudsman. The ombudsman's scope of competence is defined by the energy sector law of 7 December 2006.

Metering

Measurement of the production or consumption of gas or electricity.

National quota allocation plan (NQAP)

The allocation of CO₂ quotas is defined in a plan that sets a maximum number of quotas based on the reduction potential and growth forecast of the sectors concerned, then distributes these quotas among these sectors. In

each sector, the allowance is then distributed in proportion to the emissions of each installation. Lastly, the quotas are delivered by wire transfer from the State's account to an account open for each installation in a national registry.

New information and communication technologies (NICTs)

These are generally defined as all of the mechanisms and computer systems for the storage, communication, processing and management of data. They constitute a converging set of technologies in microelectronics, computing (hardware and software) and telecommunications. In short, it is an interaction between electronics and informatics.

Nome Law

The French Law No. 2010-1488 of 7 December 2010 on the organisation of the electricity market, called the Nome Law, aims to effectively open the market, since EDF, the market's incumbent operator, has a near monopoly of the electricity production sector in France. As the European Commission considered following an investigation procedure concerning State aid, the existence of regulated tariffs combined with the lack of access of EDF's competitors to electricity sources as cheap as the incumbent nuclear reactors, is an obstacle to the development of effective competition.

The Nome Law, resulting from the work of the Champsaur Commission must therefore:

- give alternative suppliers regulated access to incumbent nuclear electricity (ARENH), on a transitional basis with a limited volume, under the same conditions as for the incumbent supplier EDF, in order to ensure genuine competition downstream and in all individual and professional client segments;
- preserve EDF's incumbent nuclear fleet (ensure funding of the existing fleet by enabling EDF to secure its long-term commitments for the dismantling and management of waste and also to make the necessary investments required for extending the operating life of the reactors of its incumbent fleet);
- maintain competitive prices in France for final customers.

The Nome Law provisions include, among others, the maintenance of regulated sale tariffs for small customers

(blue tariffs) and the elimination of regulated tariffs for large customers as at 31 December 2015 (green and yellow tariffs).

The ARENH mechanism is based on three pillars:

1. an ARENH volume for each supplier ensuring equality among electricity market players;
2. an ARENH price reflecting the economic conditions for the production of electricity by nuclear plants;
3. a new regulated tariff architecture.

Non-nationalised distributor

See local distribution company.

Open season

Procedure aiming to dimension new infrastructure according to market needs and to allocate the corresponding capacities in a non-discriminatory manner.

Photovoltaic peak power

Unit of measurement of the maximum power of a photovoltaic installation. For example, an installation of 1 kWp (kilowatt-peak) can produce annual energy of 850 kWh in the north of France and 1,250 kWh in the south.

Pluriannual investment programme

Under French law, objectives set by the Minister for Energy in terms of the distribution of electricity generating capacity according to primary energy source and, if necessary, according to the generating technology and geographical area. The pluriannual investment programme is in line with the Grenelle Environment and the adoption of the European Union's energy and climate package in December 2008. It outlines the objectives of the energy policy (security of supply, environmental protection and competition) in terms of the development of the electricity production mix by 2020. It contributes to leading France to develop a plan for non-carbon energy production from renewable or nuclear energy.

In terms of renewable energy, the pluriannual investment programme provides for the following development objectives for 2020:

- 25,000 MW of wind energy with 19,000 MW on land and 6,000 MW offshore;

- 5,400 MW of solar energy;
- 2,300 MW of biomass;
- 3 TWh per year and 3,000 MW of peak capacity for hydraulic energy.

Prada Commission

A CO₂ market regulation mission was entrusted to Michel Prada, the honorary Finance Inspector-General and former Chairman of the Autorité des marchés financiers (AMF). He submitted his report comprising 28 recommendations to the Minister for the Economy and the Minister for Energy in April 2010.

To complete his work, Michel Prada drew on a commission made up of roughly 50 members representing all CO₂ market players (industrialists, financial players, regulatory authorities).

The Prada Commission recommended:

- promoting a stabilised organisation of the European CO₂ market before 2013, by harmonising the legal, accounting and tax framework;
- better supervision of CO₂ market participants;
- improved transparency of market fundamentals;
- implementing an appropriate framework for the prevention and suppression of market abuse;
- setting up a European system for the supervision of the CO₂ market;
- promoting international coordination on CO₂ market regulation.

The recommendations submitted for consultation received the consensus of the different stakeholders.

The law on banking and financial regulation was adopted on 22 October 2010 by the French Parliament following the recommendations of the Prada Commission.

Producer

Natural person or legal entity that produces natural gas or electricity.

Public service contract between the State and GDF SUEZ Article 16 of the French law of 3 January 2003 on gas and electricity markets and the public energy service, and

the decrees implementing this law, set forth the public service obligations imposed on transmission and distribution operators and suppliers of natural gas.

Article 1 of the French Law of 9 August 2004 on the public electricity and gas service and electricity and gas companies provides for the formalisation of these services and company obligations in a public service contract covering the following points in particular;

- public service requirements in terms of security of supply, consistency and quality of the service rendered to customers;
- the means of ensuring public service access;
- the pluriannual development of regulated tariffs for the sale of gas;
- companies' research and development policy;
- environmental protection policy, including the rational use of energy and the fight against the greenhouse effect.

The current public service contract signed between the State and GDF SUEZ covers the 2010-2013 period. It may be extended for a period of six months if a new contract is not signed.

It aims to be the long-term reference in terms of GDF SUEZ SA commitments, concerning activities managed directly, as well as activities falling within the scope of the distribution system operator (GrDF), the transmission system operator (GRTgaz), the storage subsidiary (Storengy) and the subsidiary in charge of the operation and development of LNG terminals (Elengy), in order to ensure the continuity of the public service missions entrusted to it by the legislator.

Purchase obligation

Legislative and regulatory provision requiring EDF and local distribution companies (LDCs) to purchase electricity produced by certain production sectors (wind, photovoltaic, biomass, etc.) under imposed tariff and technical conditions.

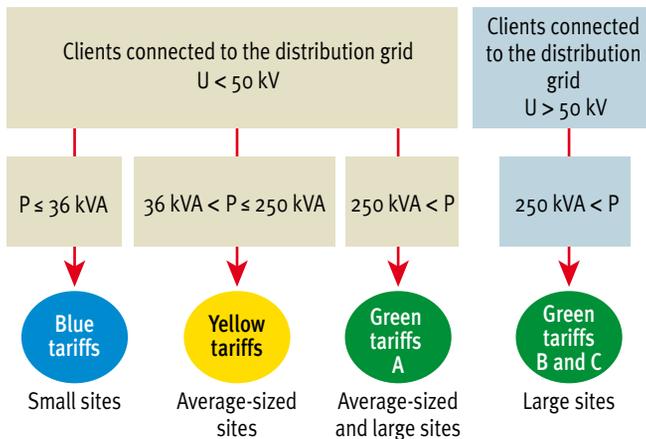
Quality of electricity

Quality level of the electricity delivered to the network, evaluated in terms of the frequency and the duration of long and short outages as well as the quality of the voltage wave.

Regulated sale tariff offer

The prices of regulated tariff offers are set by the public authorities.

For electricity, the main categories of regulated tariffs depend on the power subscribed and the connection voltage.



P: power subscribed U: connection voltage

With the entry into force of law No. 2010-1488 of 7 December 2010 concerning the new organisation of the electricity market (Nome Law), yellow and green tariffs will be eliminated as from 1 January 2016.

For gas, there are two types of regulated tariffs:

- public distribution tariffs for residential and professional clients connected to the distribution network using less than 4 GWh per year;
- subscription tariffs for professional clients connected to the gas transmission network and those connected to the distribution network using more than 4 GWh per year. These tariffs are no longer available: only clients to whom these tariffs are currently applied may keep their contract.

Renewable energy

Renewable energy sources comprise the following: wind, sun, geothermal, aerothermal, hydrothermal, marine and hydraulic, as well as energy from biomass, landfill gas, gas from sewerage treatment stations and biogas.

Retail market

The retail electricity and natural gas market is divided into two client segments:

- residential clients, which are the consumption sites of individual clients;
- non-residential clients, combining all other clients: professionals, large industrial sites, administrations, etc.

Security of supply

Capacity of electricity and gas systems to continuously meet foreseeable market demand.

Smart grids

These are public electricity grids to which are added functions derived from new information and communication technologies (NICTs). The aim is to ensure balance between electricity supply and demand at all times and to provide a safe, sustainable and competitive supply to customers. Making grids smart entails improving the integration of energy systems and the participation of grid users. These grids must be thoroughly reconfigured to integrate large-scale decentralised production from renewable sources, and to promote supply that is adapted to demand by providing final customers with tools and services enabling them to follow their personal consumption and therefore act accordingly.

Supplier

A legal entity, holding a licence for the gas sector, or registered with the public authorities for the electricity sector, supplying at least one final customer with electricity or gas, using either energy it produces itself or energy that it has purchased.

Take or Pay clause

Clause in a gas or electricity supply contract in which the seller guarantees the availability of gas to the buyer, who in turn guarantees payment of an agreed minimum quantity of energy, whether or not the buyer takes delivery.

Telemetering

Remote reading of the quantity of electricity injected into and withdrawn from the grid, measured by meters. This metering method, often associated with meters that record load curves and not only indices, is mainly

used by sites with a high level of consumption and production sites.

Third energy package

The third energy package aims to foster homogenous competition conditions in European Union Member States, with a view to the achievement of an internal energy market. It is composed of two directives concerning the electricity and gas markets, two regulations on the conditions for access to natural gas networks, and the conditions for access to the network for cross-border exchanges in electricity, as well as a regulation establishing the Agency for the Cooperation of Energy Regulators (ACER).

Transitory regulated tariff for balancing markets (TaRTAM)

Specific tariff for all final electricity customers that have exercised their eligibility and wish to return to the regulated sale tariff. Implemented on 1 January 2007, it will no longer exist once the regulated access to incumbent nuclear electricity (ARENH) is effectively in place, scheduled for 1 July 2011. TaRTAM has not been accessible since 30 June 2010.

Transmission system operator or distribution system operator

Entity responsible for the design, construction, operation, maintenance and development of a public transmission or distribution network for electricity or gas, performing contracts relative to third party access to these networks.

Unconventional gas

These are gas resources trapped in low-permeability rocks or coal fields. This gas is therefore not extracted from classic reservoir rocks. There are three types of unconventional gas: shale gas, (49% of total reserves), tight sand gas (23% of total reserves) and coal-bed methane (28% of total reserves).

Wholesale market

The wholesale market is the market in which electricity and gas are traded (bought and sold) before delivery in the network to final customers (individuals or companies).

Abbreviations and acronyms

ACER: Agency for the Cooperation of Energy Regulators

AMF: Autorité des marchés financiers

APX-ENDEX: Energy exchange for the Netherlands, the United Kingdom and Belgium, located in Amsterdam (APX: Amsterdam Power Exchange, ENDEX: European Energy Derivatives Exchange)

ARENH: regulated access to incumbent nuclear electricity

BNX: Bluenext (carbon exchange in France)

CCGT: combined cycle gas turbine

CDM: Clean Development Mechanism

CEER: Council of European Energy Regulators

CER: Certified Emission Reduction (Kyoto unit)

CoRDIS: Comité de règlement des différends et des sanctions (Standing Committee for Dispute Settlement and Sanctions)

CRE: Commission de régulation de l'énergie (French energy regulator)

CT: Combustion turbine

ECX: European Climate Exchange (United Kingdom)

EEX: European Energy Exchange (Germany)

ENTSO: European Network of Transmission System Operators

ERGEG: European Regulators' Group for Electricity and Gas

ERU: Emission Reduction Unit (Kyoto unit)

EUA: European Union Allowance (EU quota)

EU ETS: European Union Emissions Trading Scheme

ICE: Intercontinental Exchange

IPCC: Intergovernmental Panel on Climate Change

JI: Joint Implementation

NBP: National Balancing Point (gas title transfert point in the United Kingdom)

NCG: NetConnect Germany (gas title transfert point in Germany)

Nome Law: French Law on the new organisation of the electricity market

NICTs: New information and communication technologies

NQAP: National quota allocation plan

PEG: Gas title transfert point

TaRTAM: transitory regulated tariff for market adjustment

TTF: Title Transfer Facility (gas title transfert point in the Netherlands)

UNFCCC: United Nations Framework Convention on Climate Change

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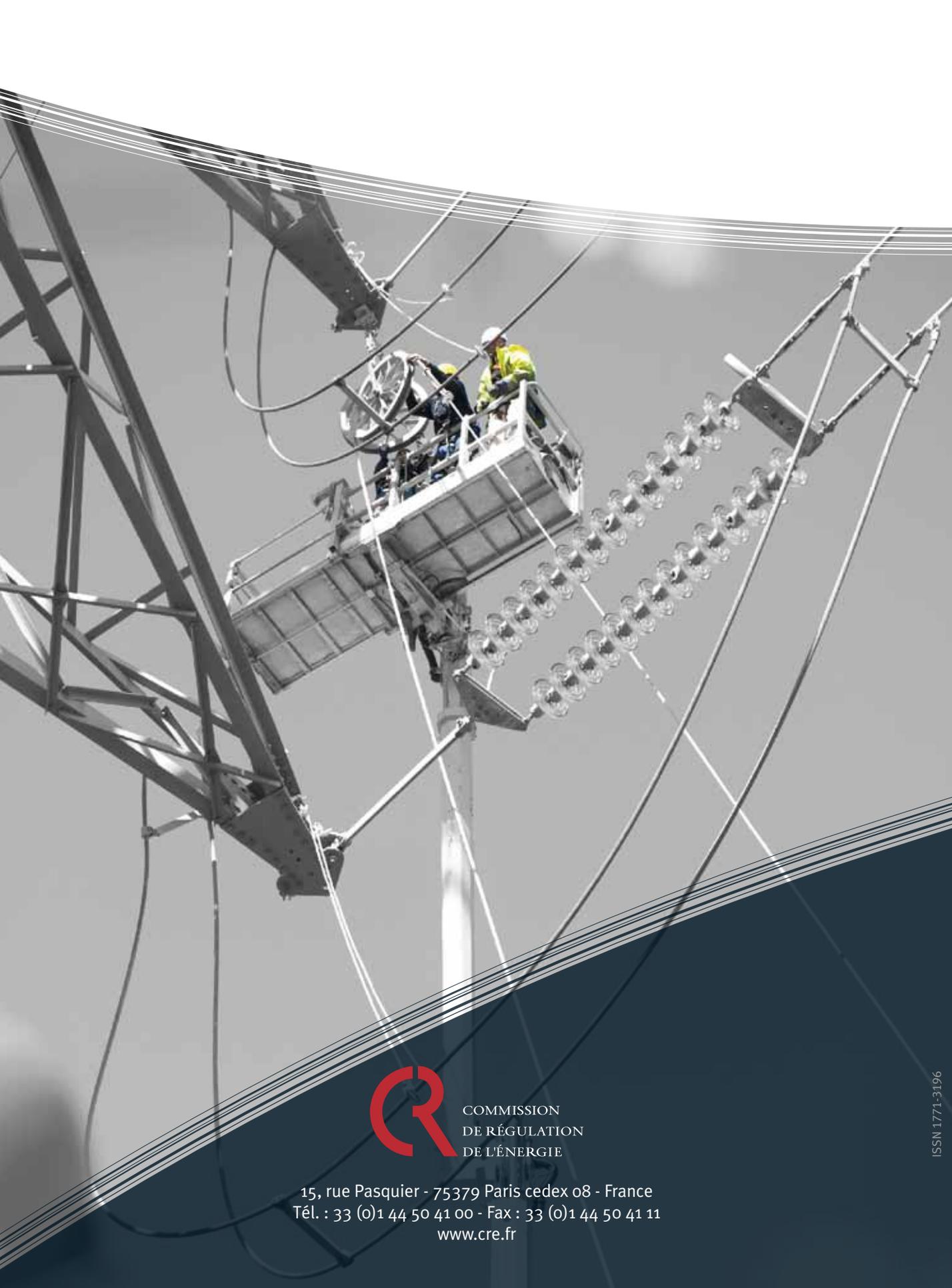
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