

## PUBLIC CONSULTATION

### Public consultation by the CRE (French Energy Regulatory Commission) regarding ten-year plans for the development of GRTgaz and TIGF

Article L. 431-6 of the French Energy Code (*Code de l'énergie*) transposing article 22 of directive 2009/73<sup>1</sup>, imposes on transmission system operators (TSOs) to prepare, every year, a ten-year development plan of their networks, after consultation with the stakeholders.

This plan is subject to a review by the *Commission de Régulation de l'Énergie* (CRE) in order to allow it to determine, on the one hand, that all the needs are covered in terms of investments, and on the other hand, the consistency of the plan submitted with the European ten-year network development plan published by the European Network of Transmission System Operators for Gas (ENTSOG). The ENTSOG published its most recent network development plan, covering the period 2015-2024, on 13 April 2015. GRTgaz and TIGF have presented their ten-year plans 2016-2025 in the context of the Gas Concertation of 25 October 2016. These plans are published on the operators' websites<sup>2</sup>.

#### Answering the consultation

The CRE would like to invite all interested parties to send their input by no later than 2 December 2016:

- by email to: [dr.cp2@cre.fr](mailto:dr.cp2@cre.fr);
- by post to: 15, rue Pasquier - F-75379 Paris Cedex 08.

The CRE will publish non-confidential contributions, subject to respecting privacy and confidentiality as required by law.

Please indicate in your response whether you wish your response to be considered as confidential or anonymous. Otherwise, your contribution will be considered to be neither confidential nor anonymous. Interested parties are invited to send their observations justifying their positions.

<sup>1</sup> [Directive 2009/73/EC of the European Parliament and of the Council of 13 July 2009 concerning common rules for the internal market in natural gas and repealing Directive 2003/55/EC](#)

<sup>2</sup> Ten year development plans of [GRTgaz](#) and [TIGF](#)

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## 1. CONTEXT

### 1.1 Legal framework

Article 8 §3-b of regulation (EC) No. 715/2009<sup>3</sup> provides that the European Network of Transmission System Operators for Gas (hereafter "ENTSOG") adopts, every two years, a non-binding ten-year network development plan (hereafter "TYNDP"), after carrying out an open and transparent consultation with all of the players on the market. The Agency for the Cooperation of European Regulators (ACER) issues an opinion on this plan and monitors its implementation.

Article L. 431-6, I of the French Energy Code provides that, after consultation with stakeholders, the TSOs prepare a ten-year network development plan (hereafter "ten-year plan") based on:

- The current supply and demand for gas;
- Reasonable mid-term forecasts for the development of gas infrastructures;
- Reasonable mid-term forecasts for gas consumption;
- Reasonable mid-term forecasts for international exchanges;
- The hypotheses and the needs identified in the report on the planning of investments in the gas sector prepared by the French Minister for Energy.

This plan must specify the main transmission infrastructures that must be built or upgraded in the next ten years, list the investment projects that have already been decided, identify any new investments to be made in the next three years and provide a provisional schedule for all the investment projects.

The ten-year plan is submitted to the CRE for review in order to allow it to ensure, on the one hand, that all the needs are covered in terms of investments, and on the other hand, the consistency of the plan submitted with the ENTSOG network development plan. In the event of any doubt on the latter point, the CRE may consult the ACER.

The CRE may, if it deems that the requirements are not met, oblige the TSOs to modify their ten-year plan.

### 1.2 The multi-year forecast balance for network operators in the energy transition.

The French Energy Transition and Green Growth Act of 17 August 2015 (hereafter the "LTECV"<sup>4</sup>) defined the action plan regarding the consumption of energy from fossil fuels and limiting the demand for energy, which should lead to a reduction in the consumption of gas.

This law defined in particular the strategy for new uses of gas, both as a complement to using renewable energy sources to generate electricity or as a replacement for oil products in the transmission sector. It set an aim for the French consumption of natural gas to be equivalent to 10% of renewable energy by 2030.

The multi-annual energy programme (PPE)<sup>5</sup>, which defines the action plan to achieve the energy policy objectives defined in articles L. 100-1, L. 100-2 and L. 100-4 of the French Energy Code, was published on 28 October 2016. It defines in particular the following objectives for the gas sector:

- Achieve a reduction in primary consumption of gas of between 9 and 16% in 2023 compared with 2012;
- Achieve a proportion of heavy goods vehicles powered by NGV (natural gas vehicles) of 3% in 2023 and 10% in 2030;
- Develop the provision of LNG (liquefied natural gas) marine fuel in ports, and LNG/NGV infrastructures for road fuel;
- Achieve an annual production capacity of biomethane injected into the grid of more than 8 TWh by 2023;
- Support the development of bioNGV to achieve 0.7 TWh consumed in 2018 and 2 TWh in 2023, with an outlook for bioNGV to represent 20% of NGV consumption by 2023, in the segments complementing electrical vehicles and hybrid rechargeable vehicles;
- Continue and finalise the studies on converting L gas due to the extinction of the Groningue gas field (Netherlands) by the end of 2029. Also finalise the emergency scenario in the event that an accelerated conversion will be required due to an earlier end to the operation of the Groningue field than is anticipated.

Furthermore, article L. 141-10 of the French Energy Code as amended by the LTECV provides that "*at least every two years, natural gas transmission network operators prepare a multi-annual forecast balance under the control*

<sup>3</sup> [Regulation \(EC\) No 715/2009 of the European Parliament and of the Council of 13 July 2009 on conditions for access to the natural gas transmission networks and repealing Regulation \(EC\) No 1775/200](#)

<sup>4</sup> [Loi relative à la transition énergétique pour la croissance verte](#)

<sup>5</sup> [Programmation pluriannuelle de l'énergie](#)

of the State." This balance takes into account the developments in consumption, capacities for transmission, distribution, storage, regasification, renewable energy source generation and exchanges with foreign gas networks."

GRTgaz and TIGF have worked together with GRDF and the distribution networks operators (DNOs) to prepare the first multi-annual forecast balance from now until 2035. The hypotheses chosen to prepare the document were presented to the market players at a consultation meeting on 23 June 2016.

This document entitled "*Perspectives gaz naturel et renouvelable : bilan prévisionnel 2016*"<sup>6</sup> (Outlook for natural and renewable gas: 2016 forecast balance) was published on 27 October 2016. It presents different scenarios for the development of the consumption of natural gas that are specified hereafter.

### **1.3 The ENTSOG's ten-year development plan for the period 2015-2024 (TYNDP)**

The TYNDP produced by the ENTSOG includes different scenarios for the development of demand for gas and the development of the networks in Europe.

Regulation 347/2013<sup>7</sup> increased the role of the TYNDP, by providing that it should include cost-benefit analyses of the projects that it contains. These projects must then serve as a basis for choosing the Projects of Common Interest (PCI) provided for by the regulation.

The methodology adopted by the ENTSOG makes it possible to analyse projects by considering variations in the values of indicators and the cash benefits of the different scenarios studied in the TYNDP.

The 2015 TYNDP<sup>8</sup> was published on 13 April 2015, and submitted to the Agency for the Cooperation of Energy Regulators (ACER) on 23 July 2015. The ACER issued its opinion on 13 October 2015.<sup>9</sup>

### **1.4 Ten-year development plans from the TSOs**

Pursuant to article L. 431-6 of the French Energy Code the TSOs are obliged to consult the stakeholders when preparing their ten-year plan. The TSOs use several systems to gather information from players in the market:

- The Gas Concertation that has been in place in the French market since 2008; the working group has in particular met regarding the ten-year plans on 25 October 2016, following the request by the CRE as part of its decisions on 19 December 2013 for GRTgaz and TIGF;
- The work carried out in the context of the North-West and South Regional investment plans managed by the European regulators;
- The work carried out under the ENTSOG as part of the preparation of the TYNDP;
- Two-way exchanges, in particular with the operators of neighbouring infrastructures;
- The open season calls for tenders to gather subscription commitments of a duration of no less than ten years from shippers interested by the new capacities at PIR (network interconnection points).

On 23 June 2016, the TSOs and the DSOs organised a consultation meeting for all the players on the market, as requested by the CRE in its decisions on 17 December 2015 in which it asked the TSOs to "*regularly present the progress of the work on preparing [their] ten-year plan in gas concertation, without waiting for it to be finalised*";

These systems make it possible to detect the emergence of new needs, in addition to the network studies and the requests of those suggesting projects (industrial customers, neighbouring infrastructure operators).

Q1: Do you find the current methods used for tenders by the TSOs satisfactory?

## **2. SCENARIOS FOR THE DEVELOPMENT OF DEMAND**

### **2.1 Hypotheses for the consumption of natural gas in France in the network operators' multi-annual forecast balance**

<sup>6</sup> Multi-annual forecast balance

<sup>7</sup> Regulation (EU) No. 347/2013 of the European parliament and of the Council of 17 April 2013 on guidelines for trans-European energy infrastructure

<sup>8</sup> TYNDP 2015

<sup>9</sup> The opinion from the ACER

Pursuant to article L. 141-10 of the French Energy Code, on 27 October 2016 GRDF, GRTgaz, SPEGNN and TIGF published their first multi-annual forecast balance<sup>10</sup> presenting their forecasts for the development of the consumption of gas and the production of renewable gas in France between now and 2035. This forecast balance is structured around three scenarios: A (the reference scenario), B (the pro-active scenario) and C (the low scenario).

	Inducers for the scenarios	Scenario A (central)	Scenario B (high scenario)	Scenario C (low scenario)
Principal factors	Demography	Monitoring developments in the number of households		
	Economic growth	Moderate	Stronger	Weaker
	Energy efficiency	High	Greater	Lower
Secondary factors	<i>Renovation of existing buildings</i>	High	Greater	Lower
	<i>Development of renewable energy sources</i>	High	Significant	Less significant
	<i>Substitutions</i>	Moderate	High	Low
	<i>Gas mobility</i>	High	Very high	Low
	<i>CO2 constraints</i>	High	Very high	Low

Source: forecast balance of regulated infrastructure operators

**Scenarios presented in the operators' multi-annual forecast balance**

- Scenario A – central trajectory

The reference scenario forecasts demand for gas at 385 TWh in France by 2035, or a 16% reduction compared with 2015 (461 TWh<sup>11</sup>). This is based on all of the hypotheses aimed at maintaining the current trend for the development of renewable energy sources and energy efficiency. This fall in the overall volume of gas consumption in France is mostly due to the fall in unitary consumptions (estimated at 35% between 2015 and 2035) due to progress in energy efficiency.

The described fall is partially compensated by an increase in the number of houses heated by gas (about 1.4 million more houses in 2035), the increase in third spaces heated by gas (+108 million m<sup>2</sup>), and by the strengthening of the position of gas in industry and generating electricity, due to its economic and environmental competitiveness—regarding emissions of CO<sub>2</sub> and particles in particular.

In scenario A mechanisms for assisting with the purchase of NGV and support for the development of NGV stations will boost growth in the mobility branch.

- Scenario B – high trajectory

The proactive scenario forecasts demand for gas at 450 TWh in France by 2035, or a reduction of 2% compared with 2015. In a context of an economic upturn, it targets a major increase in residential areas heated by gas, with 500,000 new homes every year (compared with 350,000 in scenario A), a high number of building renovations (400,000 per year), and a consistently expanding market share for gas in industry and electricity generation.

This scenario is the most proactive with regard to changes in heating systems (gas microgeneration and heat pumps), with a major increase in market share in existing fuel oil heated homes. The major development in efficient systems increases the phenomenon of reduced unitary consumption of gas (estimated fall of 40% between 2015 and 2035).

Anticipating environmental regulations that will favour the use of gas in the services sector, scenario B sees gas technologies take a position in the new-builds market, with a constant market share in branches of activity where electricity is traditionally dominant (Offices, Trade), and an increase in market share in branches where gas is already present (Health, Education-Research, Community housing, Sports-Leisure-Culture and Transport). The drop in consumption in the tertiary sector is therefore less marked than in scenario A.

<sup>10</sup> Multi-annual forecast balance

<sup>11</sup> Corrected climate data



In the industrial sector, the favourable economic dynamic and the economic competitiveness of gas should lead to conversions to gas (annual development rate of 0.70%). Scenario B forecasts a greater development in the mobility business line, based in particular on major promotion of biomethane as a fuel, with a fleet of 1.2 million NGV vehicles consuming 41 TWh in 2035.

- Scenario C – low trajectory

The low scenario forecasts demand for gas at 335 TWh in France by 2035, or a reduction of 27% compared with 2015. It is marked by relatively weak economic growth and environmental regulations that are unfavourable to gas technologies.

In the residential sector, scenario C gives a number of new-builds per year (300,000 new homes per year) that is lower than the government's current targets, as well as a weak dynamic for renovation (200,000 homes renovated per year), which has a mechanical effect on the development of efficient gas solutions.

In this scenario, the tertiary and industrial sectors are particularly affected by successive regulations to reduce the use of gas in favour of electricity. Although in the tertiary sector the fall in the market share for new-builds would be reduced by the "captive" areas, such as catering and hotels, it would be greater in other fields of activity and in renovations of existing buildings. In the industrial sector, scenario C sees fuel oil being replaced by other energy sources rather than gas (electricity and biomass).

Regarding mobility, with no incentive other than taxation on fuel and due to the reticence of infrastructure builders and vehicle manufacturers regarding NGV, scenario C forecasts weak growth in the fleet of NGV vehicles, reaching 235,000 by 2035.

Segment	Consumption in 2015	Scenario A	Scenario B	Scenario C
Residential & Tertiary	247.6	191.0	207.0	173.2
Industry	165.5	145.5	170.1	125.6
Elec. Gen.	47.0	23.5	44.1	11.1
Gas mobility	0.9	25.0	28.8	25.1
Total change 2035/2015	-	-0.9%	-0.1%	-1.6%
Consumption in 2035	461 TWh	385 TWh	450 TWh	335 TWh

### 2.1.1 The development in consumption in the GRTgaz areas by 2025

Based on the forecast balance scenarios, GRTgaz presents scenarios for the development of demand for gas by 2025. It estimates a total difference in consumption in its areas of 90 TWh between the high scenario B, which reaches 455 TWh and the low scenario C at 365 TWh by 2025.

Scenario A shows two trajectories for electricity generation and cogeneration:

- A high version was defined in accordance with the PPE and that is consistent with the high scenario from the 2016 forecast balance from RTE<sup>12</sup> (French electricity TSO). It forecasts an installed plant pool of gas-fired power stations complemented by the power plants at Bouchain and Landivisiau (the latter will enter into service in 2020), stability for cogeneration installed power and the construction of ten combustion turbines between 2023 and 2026. This high hypothesis therefore forecasts an overall increase in gas-fired power generation of 67 TWh in 2025. This high trajectory is also the basis for GRTgaz's scenario B (proactive). The forecast gas consumption is 431 TWh by 2025.
- The low hypothesis chosen for scenario C, which anticipates the mothballing or closure of more than half of the electricity generation capacity of the plant pool in 2016, leading to stagnation in demand for gas from 2017 for these uses at 25 TWh per year (or 10 TWh for centralised electricity generation and a limited activity for cogeneration of 15 TWh per year). The forecast gas consumption is 389 TWh by 2025.

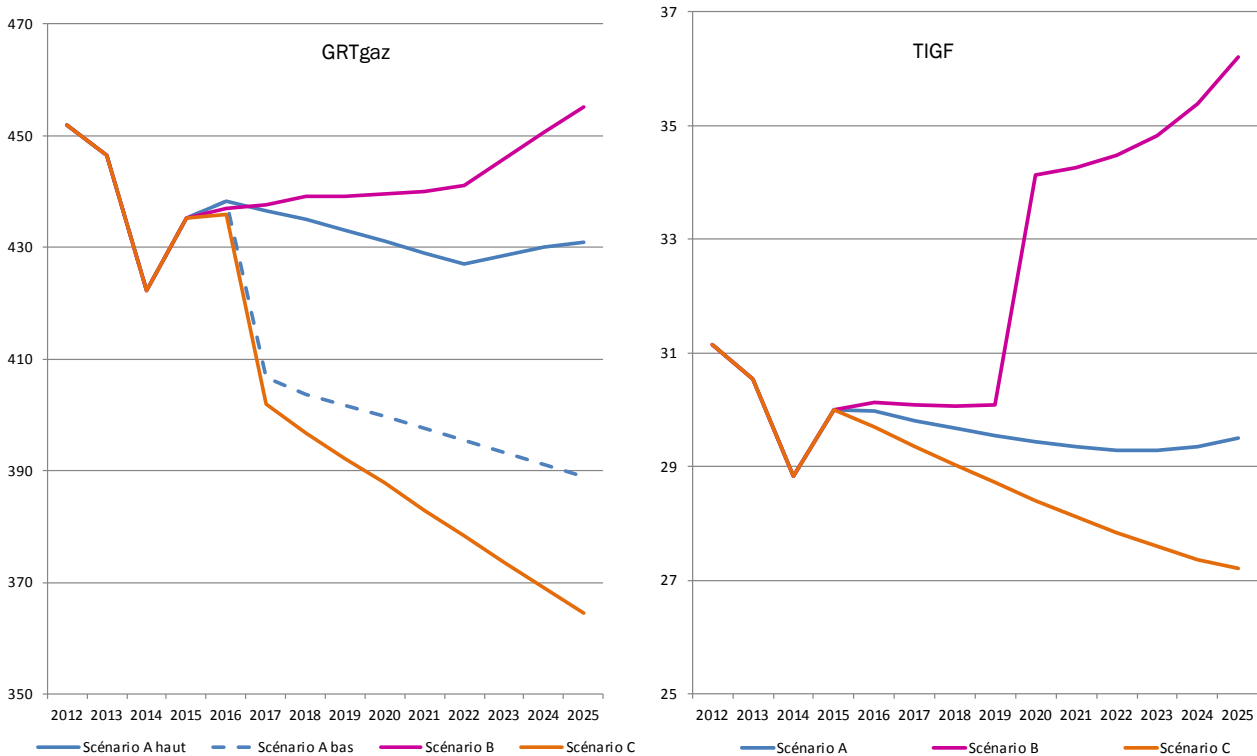
### 2.1.1 The development in consumption in the TIGF area by 2025

<sup>12</sup> RTE's forecast balance

Based on the forecast balance scenarios, TIGF forecasts a fall of 9% in consumption in scenario C by 2025 compared with 2015 and stagnation in scenario A.

In scenario A, TIGF foresees, as for scenario C, a lack of demand for gas for electricity generation in its network.

For scenario B, TIGF forecasts the building of a gas fired power plant, increasing gas consumption in its network to 4 TWh from 2020, which entails an increase of 21% in gas consumption by 2025.



**Development in the demand for gas in the GRTgaz and TIGF areas by the end of the plans**

**2.2 Hypotheses for the consumption of natural gas in Europe in the ENTSOG network development plan**

The latest ENTSOG plan was published in 2015. In its decisions on 17 December 2015, the CRE analysed the consistency of the TSOs' ten-year plans with those of the ENTSOG.

The ENTSOG is currently working on its future TYNDP for 2017. Pursuant to the decisions of the CRE on 15 December 2015, the scenarios presented by the GRT in their ten-year plans were sent to the ENTSOG as part of the work on the 2017 plan. The TYNDP will be submitted for consultation in December 2016.

**2.2.1 TYNDP 2015**

In its TYNDP published in 2015, the ENTSOG based its network development plan on two scenarios called the "green scenario" and the "grey scenario". These scenarios were a combination of the different configurations for demand for gas for industrial and residential end consumers and demand for gas for electricity generation.

In terms of demand from industrial and residential end customers, all of the GRT provided the ENTSOG with annual consumption forecasts based on the two scenarios, which should reflect economic and financial conditions that were favourable (2015 "30 less" scenario for GRTgaz, used for the green scenario) or unfavourable (2015 "reference" scenario for GRTgaz, used for the grey scenario).

Demand for gas for electricity generation for its part is based on a combination of two scenarios. Two scenarios were created by the ENTSOG based on the scenarios: "Vision 1: slow progress" (used for the grey scenario) and "Vision 3: green transition" (used for the green scenario). These were drawn from the ENTSOE 2014 ten-year plan to model the capacities of the electricity plant pool, the yield and the durations of use for the plants, as well as demand for electricity that must be covered by gas-fired power stations.



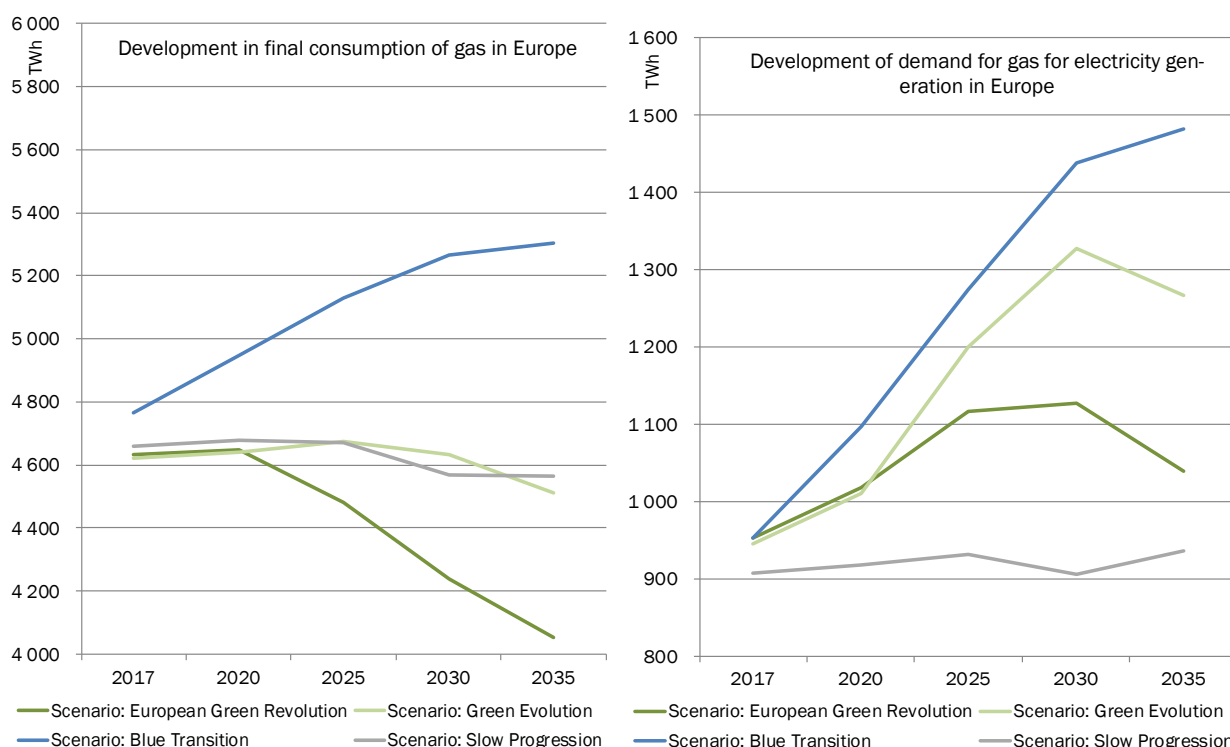
### 2.2.2 TYNDP 2017

In its work on the draft 2017 TYNDP, the ENTSOG offers four scenarios:

- The "Vision 1 – *slow progression*" scenario shows current indicators holding stable;
- The "Vision 3 – *blue transition*" scenario forecasts strong growth in gas consumption, particularly due to a rise in gas over coal for electricity generation and the development of NGV;
- The "Vision 4" scenario is made up of two variants "*green evolution*" and "*European green revolution*". In these two scenarios, gas is in high competition with electricity in the heating and mobility sectors.

These scenarios were presented during the ENTSOG workshops on 11 May and 13 July 2016<sup>13</sup>. They forecast an increase in consumption of 11% between 2017 and 2035 in the "Vision 3 – *blue transition*" scenario and an estimated fall of between 2% and 12% in the final consumption of gas in the other scenarios. By 2035, there is therefore a difference in the consumption of gas of 4,000 TWh between the "Vision 4 – *European green revolution*" scenario and 5,300 TWh in the "Vision 3 – *blue transition*" scenario, compared with an estimated level of about 4,650 TWh for 2017.

Demand for gas for electricity generation increase in three out of four scenarios. It is estimated at 1,000 TWh in 2017 and varies between an equivalent level (Vision 1) and 1,500 TWh (Vision 3) by 2035.



Source: ENTSOG

### Total demand for gas in the scenarios from the ENTSOG 2017 network development plan

### 2.3 The CRE's preliminary analysis

The CRE notes that TSOs and DSOs have carried out a coordinated analysis, both for the creation of the three scenarios and the multi-annual forecast balance. All of the scenarios show a falling trajectory for demand for gas by 2035. By 2025, scenario B forecasts an increase in consumption, particularly due to electricity generation using gas.

The scenarios chosen by the TSOs in the forecast balance and the ten-year plans take into account the targets of the LTECV and the PPE. The PPE indicates a fall in consumption of between 9% and 16% by 2023 compared with the 2012 level, which was 483 TWh.

According to the chosen scenarios, the operators therefore forecast a fall of between 10.6% (scenario B) and 19.4% (scenario C) over the period 2012-2023.

<sup>13</sup> Scenarios for TYNDP 2017





In accordance with the decisions of the CRE on 17 December 2015, the TSOs have described the scenarios in the ten-year plans that they have sent to the ENTSOG to prepare the next TYNDP, which shall be submitted for public consultation in December 2016.

With regard to gas-fired electricity generation, the CRE notes that the forecasts chosen by TSOs are consistent with RTE's forecast balance.

Q2: What is your analysis of the forecasts of consumption presented in the TSOs' multi-annual forecast balance and ten-year plans?

### 3. ASSUMPTIONS ON CHANGES TO THE INJECTION OF GAS FROM RENEWABLES INTO NETWORKS

#### 3.1 Assumptions on changes to the injection of gas from renewables into networks in ten-year plans

##### 3.1.1 Biomethane

The PPE has set the common objective of achieving a production capacity for biomethane injected into networks of 1.7 TWh/year as from 2018 and 8 TWh/year in 2023 (which equal to 6 TWh/year from GRTgaz). Globally, the LTECV has set an objective of 10% of gas consumption in France coming from renewable energy in 2030, i.e. 12 TWh at a national level and (with 9 TWh from GRTgaz).

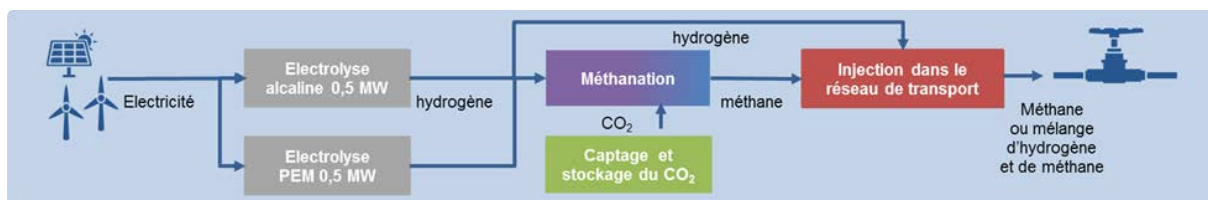
In September 2016, there were 24 biomethane injection sites in service in France. Of those, two injection sites have been directly connected to the GRTgaz transmission networks since 2015 (Chagny methanisation plant) and TIGF (Biovilleneuveois methanisation plant).

GRTgaz has signed six connection and injection contracts with biomethane producers, four of which should be in service by the end of 2017. GRTgaz estimates that this current project portfolio will make possible the injection of close to 1 TWh/year of biomethane by 2020. Beyond that date, the operator envisages, in its reference scenario, achieving 8 TWh/year in 2023, in accordance with PPE objectives. GRTgaz makes these assumptions in scenarios A and B.

With regard to TIGF, in the short term it anticipates doubling the injection capacity from the Biovilleneuveois site (to 1,200 m3(n)/hr compared to 595 m3(n)/h today). Subsequently, TIGF plans to connect one production unit a year until 2022, then a more significant development of the system with two injection sites connected each year between 2023 and 2025. TIGF is in step with the objectives of the PPE and LTECV with regard to direct injections into its transmission network. The injection level is estimated at 0.4 TWh/year in 2025. Furthermore, with regard to the sites on the distribution network in the south-west, TIGF has identified several tens of potential production sites, although few projects are currently in service.

##### 3.1.2 Power to gas

Power to gas consists of transforming electricity into gas, in order to make it possible to store electricity. The aim of the system is to promote the insertion of intermittent energy, by facilitating the balancing of electrical networks and deriving value from surplus electricity production from renewable sources. The hydrogen produced during the electrolysis process can then be directly injected into the networks (in small quantities) or be converted into methane (CH<sub>4</sub>) synthesised by combining with CO<sub>2</sub> (Value derived from capturing CO<sub>2</sub> emissions from industrial processes, agriculture or electricity production) and injecting it into the gas networks. The synthesised methane produced is, by its nature, a renewable gas.



Source: Provisional multi-year plan

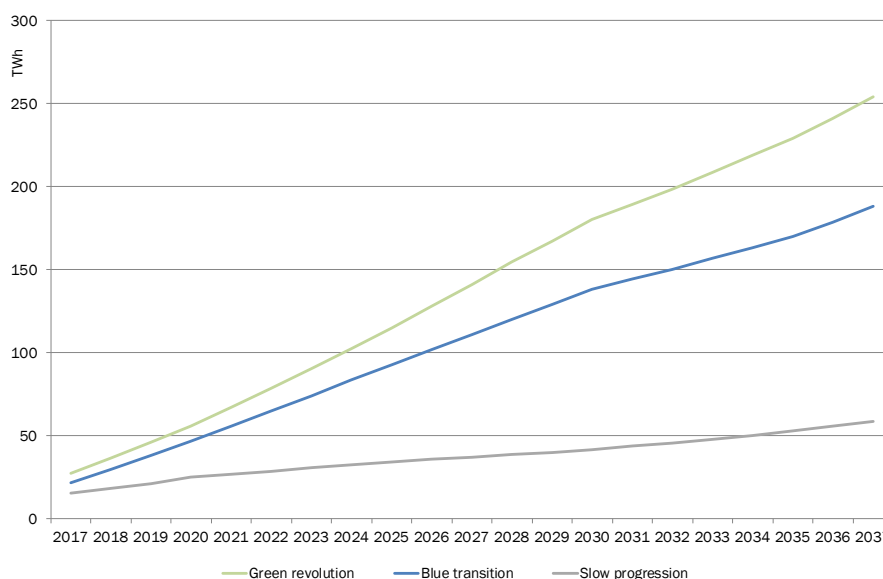
**Block diagram of the JUPITER 1000 project**

Network operators anticipate massive development in intermittent renewables between now and 2050, with excess electricity production that could exceed 50 TWh per year<sup>14</sup>. With this assumption in mind, GRTgaz and TIGF consider that *Power to gas* technology, which today seems the most suitable for the long-term storage of electricity, could amount to an estate of 100 *Power to gas* installations in 2030, able to manage surplus electricity production of 2.5 to 3 TWh<sub>e</sub> per year.

### 3.2 Assumption on the growth of biomethane production in the ENTSOG network development plan

Work done as part of the 2017 TYNDP<sup>15</sup> takes into account growth in the injection of biomethane, according to three scenarios: Vision 1 – slow progression, Vision 2 – Blue transition and Vision 4 – Green revolution.

In all three scenarios, ENTSOG forecasts an increase in injections of biomethane within the currency of its TYNDP. The level could reach 58 TWh in the "Slow progression" scenario, as against 254 TWh in the "Green revolution" scenario.



Source: ENTSOG

### Growth in the production of biomethane

### 3.3 The CRE's preliminary analysis

#### 3.3.1 Biomethane

The CRE has noted that the data produced by ENTSOG for the 2017 TYNDP are taken from the TSOs' 2015-2024 ten-year plans, for GRTgaz based on the ADEME road map. The ENTSOG and TSOs plans highlight significant growth for France in the biomethane area, consistent with the dynamic instigated by the energy transition law.

The CRE notes that the "Vision 3 – Blue transition" scenario corresponds to the trend assumption of 12 TWh injected in 2030, with 9 of it going into the GRTgaz network and the "Vision 4 – Green revolution" scenario with the intention to inject 30 TWh in 2030, with 22.5 of it going into GRTgaz networks.<sup>16</sup>

The CRE notes that TIGF has not advised its schedule for injecting biomethane as part of the work done under the 2017 TYNDP and intends to ask TIGF to advise its plans under the 2018 TYNDP.

#### 3.3.2 Power to gas

<sup>14</sup> Study by ADEME in September 2014, produced with GRTgaz and GRDF, on hydrogen and methanation as a process for extracting value from excess electricity production.

<sup>15</sup> TYNDP 2017 – biomethane injection projections

<sup>16</sup> The ADEME road map, repeated in the CRE public consultation on GRTgaz and TIGF ten-year development plans

TSOs have made *Power to gas* an important development area in its ten-year plans. However, the CRE has noticed that the energy storage facilities that would make this process possible have not been taken into account in RTE's ten-year development plan, although it committed itself to the Jupiter 1000 project in 2016 (cf. 4.2.3).

Q3: What is your analysis of the injection forecast for gas from renewables, presented by the TSOs in their ten-year plans?

#### **4. DEVELOPMENT PROJECTS IDENTIFIED BY THE TSOs IN THE TEN-YEAR PLANS**

##### **4.1 Growth in transmission capacity offered on the French network in 2016**

Three wide-ranging projects have come into service in 2015 and 2016, in accordance with the CRE's decisions approving those projects:

- On GRTgaz network, connection of the Dunkirk LNG terminal: associated with connecting the Dunkirk terminal came on stream in December 2015. The terminal should enter commercial service between now and the end of 2016.  
Also, in May 2010, GRTgaz, in cooperation with Fluxys, launched an *open season* to create firm capacity to take non-odorised gas from France to Belgium. The open season's initial phase resulted in a favourable investment decision in 2012. The firm capacity developed for Belgium is 270 GWh/d and came on stream in December 2015. It is divided between an input capacity towards Belgium from the Dunkirk terminal sold by Fluxys, which pays GRTgaz for a service and an interconnection capacity between France and Belgium, sold in a coordinated manner by GRTgaz and Fluxys via auctions on the PRISMA platform;
- On GRTgaz network, the Arc de Dierrey project<sup>17</sup>, approved by the CRE in its deliberation dated 22 December 2011 commissioned in 2016. That project was necessary for the decongestion of the north-south link and the creation of the single market place by 2018;

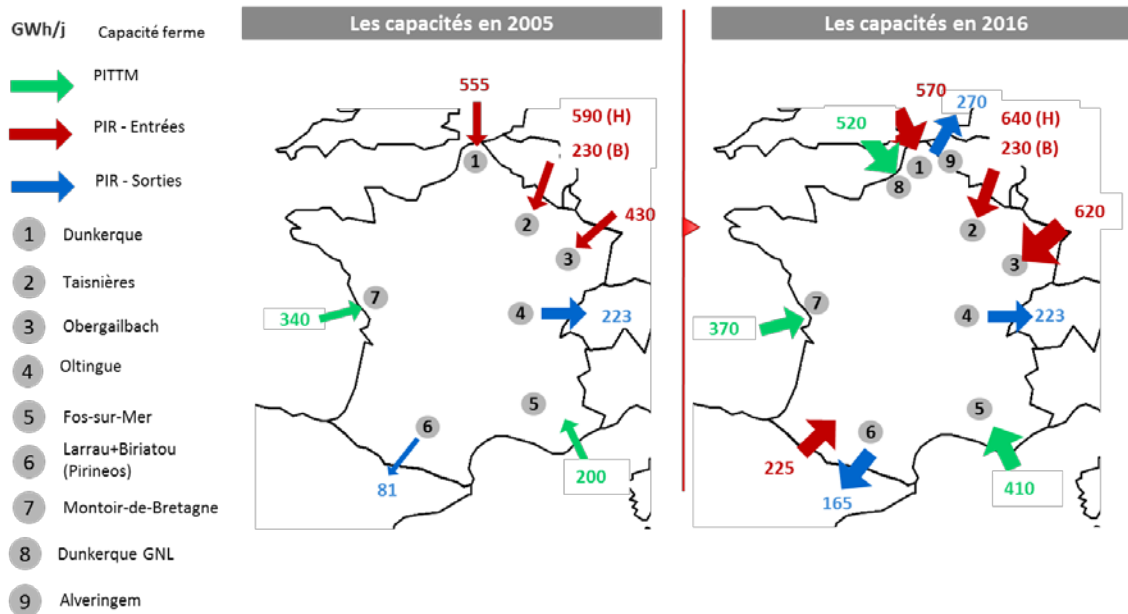
Those investments have an estimated final cost of €1,119 million, close to the provisional budget approved by the CRE of €1,185 million.

- On the TIGF network, the *Artère de l'Adour* project came into service on 15 December 2015 as part of the *2010 open season* for interconnection capacities between France and Spain. It created capacity of 60 GWh/d at Biriadou. The cost on completion of the project is estimated at €160 million, up by €30 million against the provisional budget approved by the CRE. Given the significant budget overshoot, the CRE is currently conducting an audit of the project's execution to check that the operator acted efficiently.

At the end of 2016, firm capacities input in France amount to 3,585 GWh/day, up by more than 50% compared to 2005, and are split between input capacities from nearby networks and input capacities from LNG terminals.

At the end of 2016, firm output capacities have increased steeply by 116% since 2005 and amount to 658 GWh/d.

<sup>17</sup> The project appeared on the list of " Projects of Common Interest (PCI) adopted by the European Commission on 14 October 2013 for the 2014-2016 period.



GWh/day	2005	2016	Change 2005-2016
<b>Firm input capacities</b>	<b>2,345</b>	<b>3,585</b>	<b>+52 %</b>
of which pipeline	1,805	2,285	+27 %
of which LNG	540	1300	+141 %
<b>Firm output capacities</b>	<b>304</b>	<b>658</b>	<b>+116 %</b>

Q4: Do you have any observations on the level of input and output capacities?

## 4.2 Developments decided on

### 4.2.1 A single marketplace in France by 2018

In its resolution dated 7 May 2014<sup>18</sup>, the CRE adopted the scheme linking the Val de Saône projects on the GRTgaz network and Gascogne-Midi on the GRTgaz and TIGF networks, to enable the creation of a single marketplace in France by 2018. In its decision dated 30 October 2014<sup>19</sup>, it set the target budgets for these projects (€650 million and €152 million respectively) and set the incentive regulation parameters applicable to them.

The Val de Saône project consisted of doubling the Artère de Bourgogne between Etrez and Voisines, uprating the power of the compression station and consequently adapting the interconnections at Etrez, Palleau and Voisines. It is one of the Common Interest Projects (PCI) appended to delegated European regulation 1391/2013 of 14 October 2013, updated on 18 November 2015<sup>20</sup> (project no. 5.7.1), allowing it to benefit from European Union financial aid in the purchase of pipes up to a maximum value of €76 million. The cost of the project, other than subsidies, is borne by the French market.

The CRE has noticed that TIGF and GRTgaz plan the entry into service of infrastructures in November 2018, consistent with the assumptions made in the CRE decision dated 7 May 2014. In the ENTSOG ten-year plan, these

<sup>18</sup> CRE resolution dated 7 May 2014 containing guidelines for the creation of a single marketplace in France in 2018

<sup>19</sup> CRE resolution dated 30 October 2014 containing guidelines for the incentive regulation mechanism of the Val de Saône and Gascogne Midi projects

<sup>20</sup> Delegated regulation (EU) no. 1391/2013 of the Commission dated 14 October 2013, updated on 18 November 2015 modifying regulation (EU) no. 347/2013 of the European Parliament and Council on guidance for trans-European energy infrastructures, with regard to the list of the Union's list of common interest projects

two projects are shown as coming on stream in 2018. These two projects have been adopted as projects of common interest in the list issued on 18 November 2015.

#### **4.2.2 The creation of input capacities at Oltingue in 2018**

In its decision dated 17 December 2014, the CRE approved the project to create 100 GWh/d of capacity at the Oltingue interconnection point for a sum of €12 million ( $\pm 30\%$ ) in 2018. The cost of the project is now estimated at €15 million. GRTgaz forecasts that this capacity will come on stream in 2018, at the same time that the output capacity in Italy and the south-north transit in Switzerland become available.

#### **4.2.3 The Jupiter 1000 power to gas pilot project in 2018**

The Jupiter 1000 pilot project consists of constructing a power to gas demonstrator at Fos-sur-mer, planned to enter into service in 2018. This project must allow the technical and economic viability of the power to gas process to be studied, with a view to its industrial deployment by 2030. This demonstrator will have a hydrogen production capacity of 1 MWelec and will test two electrolysis technologies on the same site (membrane and alkaline).

The project, approved by the CRE in its decision dated 17 December 2014,<sup>21</sup> represents a total investment of €30.3 million. After public subsidies have been deducted, the part to be financed by GRTgaz is €13.1 million (€10.1 million of which as investments) and TIGF's share is €1.8 million.

The financing of that project is also based on a partnership with several technical industrial companies (CNR, Atmosstat, CEA, Leroux & Lotz, McPhy Energy), which are providing their technology and technical expertise, as well as RTE and the Grand Port Maritime de Marseille.

Q5: Do you have any comments on projects already decided by the TSOs and already approved by the CRE?

### **4.3 Projects to be studied**

#### **4.3.1 The MidCat and STEP projects**

The possibilities for developing additional interconnection capacities between France and Spain were the subject of a joint technical study by GRTgaz, TIGF and Enagas in 2015.

The MidCat project, which supposes the development of additional firm capacity of 230 GWh/d in the Spain-France direction and 160 GWh/day in the France-Spain direction, would require, apart from the new interconnection itself, a strengthening of the French internal network, in particular via the implementation of the Eridan and Arc Lyonnais projects. The total cost of the investments necessary on the French side has been estimated at more than €2 billion by the three TSOs (GRTgaz, TIGF and Enagas).

The STEP (*South Transit East Pyrenees*) project would account for only a part of these investments, that is, those located in the TIGF and Enagas networks. On the French side, it would include a 120 km pipeline between Le Perthus and Barbaira at a total estimated cost of approximately €300 million. The joint studies by the TSOs concluded that, in this case, only interruptible capacities would be created. In particular, the internal stresses specific to the Spanish and French networks mean that the actual availability of additional interconnection capacities between France and Spain would depend, in particular, on emissions levels at the LNG terminals in Fos and Barcelona. Thus, the capacities in the north-south direction would be largely reduced in the event of significant send-out from the Barcelona terminal and vice versa, the capacities in the south-north direction would be reduced in the event of significant send-out from the Fos terminals.

In its 2016 report on interconnections<sup>22</sup>, the CRE stressed that, given the ability of the French system to deal with supply crises, additional interconnection capacities with Spain (*all the more so if they are interruptible*) would not make any useful contribution to security of supply for France.

<sup>21</sup> Resolution by the Energy Regulation Commission dated 17 December 2014 on the examination of the ten-year development plan, including the decision to approve the GRTgaz investment programme for 2015

<sup>22</sup> Electricity and gas interconnections in France - A tool in the service of the construction of an integrated European market

Furthermore, unless new demands from players in the market manifested themselves, resulting in firm commitments to subscription in the form of an *open season*, the CRE considers that current interconnection capacities allow market needs to be met, as evidenced by the existence of capacities not taken up in both directions, and the non-use of a significant part of capacities subscribed to, in particular in the Spain-France direction.

Given the absence of identifiable benefits for France and unless unjustified expenses are borne by French consumers, the development of additional interconnection capacity between France and Spain could only be envisaged in the context of a cross-border allocation of costs between beneficiary countries, as provided for in European regulation 347/2013 and with European subsidies, where applicable.

### 4.3.2 Reverse flow towards Germany and decentralised odourisation

The possibility of allowing physical flows from France to Germany at a rate of 100 GWh/d of firm output capacity at the Obergailbach interconnection point is being studied by GRTgaz, together with the European network code on interoperability. In addition to the constructions that would need to be built to allow capacities to be created, such a project would require growth in odourisation processes.

With this in mind, the Odicée project is studying solutions, consisting, in particular, of decentralising the odourisation of gas on the GRTgaz network. The total investment necessary to decentralise odourisation and build the structures necessary to allow reverse flows to Germany was estimated at €600 million in 2013. A pilot installation is currently being commissioned by GRTgaz on two sites, at Etroeungt and Bas Lieu (Nord), in order to evaluate the technical feasibility and cost of the solution in greater detail. Initial indications, taken from the cost-benefit analysis in the 2015 TYNDP, show insufficient benefits to cover the cost of such a project.

GRTgaz is therefore looking at alternative solutions, such as recourse to a deodorisation unit on the north-east feeder and the development of firm capacities from France to Germany, based on contractual tools.

As indicated in its 2016 report on interconnections, the CRE considers that if demand from market players is insufficient, and taking into consideration the lack of benefits for France with regard to security of supply, the project could only be implemented if there were a cross-border allocation of costs framework (if security of supply benefits of advantage to other member states were identified and with European subsidies, where applicable).

### 4.3.3 Conversion of zone L into H gas

A part of the north of France, known as "L zone" (with reference to gas with a low calorific value) is supplied with gas that comes from a production field at Groningen in the Netherlands. The Dutch government has announced that the field will close in 2029. To prepare for the end of the importation of this L gas, GRTgaz and the operators of adjacent infrastructures (Storengy, GRDF and two DSOs) are examining a conversion plan with the aim of ending conversion when the import contract expires, i.e. 2029.

Decree no. 2016-348 of 23 March 2016<sup>23</sup> states the regulatory framework and general organisation of the conversion. It provides for the opening of a pilot phase in the 2016-2020 period. In this context, GRTgaz and adjacent infrastructure operators submitted a conversion plan to the ministers responsible for energy, industrial security and the economy on 23 September 2016 and the CRE will analyse it from a technical and economic point of view in 2017. The budget for the pilot project for GRTgaz is estimated at €42 million. It is also mentioned in the ENTSOG development plan for 2018.

The conversion plan, so long as it is approved by the ministers concerned, provides for modifications to the GRTgaz offering.

- The hi-tech service converting L gas into H gas will end in the summer of 2021;
- The reduction in the firm input capacity at Taisnières L from 230 GWh/d to 115 GWh/d in 2025.

GRTgaz says that the development of new H gas input capacities will depend on the demand from those active in the market.

### 4.3.4 The development of adjacent infrastructures

#### 4.3.4.1 Re-gasification capacities

Fosmax LNG, owner of the Fos Cavaou terminal, is studying the possibility of doubling its regasification capacity between now and 2022, with a first stage by 2020. GRTgaz has stated that the investment in the Eridan and Est Lyonnais project will be necessary to allow the evacuation of gas at the exit from the terminal. The terminal

<sup>23</sup> Decree no. 2016-348 of 23 March 2016

extension project is planned for 2022 with an intermediate phase in 2020 (2017 TYNDP), whereas the development of the structures necessary for the evacuation of gas could be possible by 2022 on the GRTgaz network in the TYNDP.

Elengy, owner of the Montoir de Bretagne terminal plans to increase its regasification capacity by 2020-2022. To do that, it will be necessary to strengthen the artère du Maine on the GRTgaz network. As with the Fos Cavaou terminal, there is a possible offset of one or two years between regasification facilities coming on stream and the development of all the facilities necessary on the GRTgaz network.

	Planned entry into service by promoters	Entry into service published by ENTSG	Planned capacities	Project status
Extension of the Montoir de Bretagne terminal	2020 or 2022	2020	+2.5 Bm <sup>3</sup>	Not decided
Doubling of the capacity at the Fos Cavaou terminal	2020-22	2022	+8.5 Bm <sup>3</sup>	Not decided

#### 4.3.4.2 Storage capacities

Géométhane plans to renew the storage facility in Manosque, with an increase in injection capacity in 2020, and in withdrawal capacity in 2021.

Furthermore, Storengy plans to connect a new cavity on its Etrez site and to resume studies on its Hauterives site, although it gives no indication of time scale.

	Planned entry into service by promoters	Entry into service published by ENTSG	Project status
Etrez and Hauterives	-	2022	Not decided
Manosque	2020 and 2021	2022	Not decided

#### 4.3.5 The development of the network linked to electricity production

The Bouchain plant at Hauts de France entered service in 2016.

The Landvisiau plant in Brittany, initially scheduled for 2018, will not be ready by then. It is now expected by 2020 in the provisional multi-year assessment. As part of this project, GRTgaz is examining upgrading the network in Brittany in order to make the gas supply in the region more secure. The South Brittany upgrading project consists of constructing a 111 km pipeline between Pleyben (Finistère) and Plumergat (Morbihan). The budget for the project is currently estimated at €100 million. GRTgaz obtained the public utility declaration and ministerial authorisation in 2015. The project's progress depends on the decision of the developer behind the Landvisiau project.

In the lesser variant, GRTgaz does not envisage any electricity from gas production coming on stream before 2035, consistent with RTE's provisional assessment. In the greater variant, GRTgaz plans to double the units connected to the gas network, but considers that these developments should not cause structural modifications to its network.

#### 4.3.6 Development of the network linked to biomethane

In accordance with the CRE's decision of 17 December 2015, GRTgaz and TIGF have examined the consequences of developing the biomethane activity on the investment needs of the transmission networks. The TSOs do not anticipate any reduction in investment associated with the development of biomethane injections and see the possible emergence of the need for new investments.

The TSOs anticipate a case where biomethane injections would exceed gas consumption, especially in summer, in rural areas. Solutions are being studied on the distribution network (meshing of networks, peak-shaving, growing local consumption). The TSOs are studying the possibility of implementing reverse flows. These installations would reverse the flow of gas in relation to the normal between networks with different pressure conditions, in order to return excess gas produced to networks upstream.

In the light of the current development in the field, GRTgaz estimates that one or two Distribution/Transmission (D/T) reverse flows could materialise by 2018. GRTgaz has also conducted a statistical study to estimate the number of reverse flows necessary by 2025 to meet the objectives of the LTECV, depending on a certain number of assumptions: the study shows an order of magnitude of some thirty D/T reverse flows and less than five regional/principal Transmission reverse flows in the GRTgaz area, i.e. a total investment of approximately €100 million. The financing of that load and its division between the various parties involved in the field is not mentioned by GRTgaz.

On the TIGF network, the necessity to implement reverse flows would appear less imminent, since the operator considers that their likelihood is linked to the growth of injection on to distributor networks: the GRT thus anticipates the implementation of one reverse flow unit per year as from 2023. A reverse flow unit is financially equivalent to three or four direct injection units.

Forecasts for biomethane injection into the gas networks have an influence on the investment needs of distribution operators. The CRE has noticed, at this stage, that the TSOs are presenting which additional networks might be necessary on their networks. The CRE considers that TSOs should deepen their analyses in order to assess in which cases the injections of renewable gas would be likely to avoid investment in the gas transmission networks.

Q6: Do you have any observations on projects to be studied?

Q7: Do you have any other comments with regard to ten-year development plans for GRTgaz and TIGF?

## 5. SUMMARY OF QUESTIONS

Q1: Are you satisfied with the TSOs' current market consultation procedures?

Q2: What is your analysis with regard to the consumption forecasts presented by the TSOs in the provisional multi-year assessment and the TSOs' plans ten years out?

Q3: What is your analysis of the injection forecast for gas from renewables, presented by the TSOs in their ten-year plans?

Q4: Do you have any observations on the level of input and output capacities?

Q5: Do you have any comments on projects decided by the TSOs and already approved by the CRE?

Q6: Do you have any observations on projects to be studied?

Q7: Do you have any other comments with regard to ten-year development plans for GRTgaz and TIGF?