

# Gas flexible exit capacity products

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A EURELECTRIC position paper

April 2016

***EURELECTRIC is the voice of the electricity industry in Europe.***

*We speak for more than 3,500 companies in power generation, distribution, and supply.*

***We Stand For:***

***Carbon-neutral electricity by 2050***

We have committed to making Europe's electricity cleaner. To deliver, we need to make use of **all low-carbon technologies**: more renewables, but also clean coal and gas, and nuclear. Efficient electric technologies in **transport and buildings**, combined with the development of smart grids and a major push in **energy efficiency** play a key role in reducing fossil fuel consumption and making our electricity more sustainable.

***Competitive electricity for our customers***

We support well-functioning, distortion-free **energy and carbon markets** as the best way to produce electricity and reduce emissions cost-efficiently. Integrated EU-wide electricity and gas markets are also crucial to offer our customers the **full benefits of liberalisation**: they ensure the best use of generation resources, improve **security of supply**, allow full EU-wide competition, and increase **customer choice**.

***Continent-wide electricity through a coherent European approach***

Europe's energy and climate challenges can only be solved by **European – or even global – policies**, not incoherent national measures. Such policies should complement, not contradict each other: coherent and integrated approaches reduce costs. This will encourage **effective investment** to ensure a sustainable and reliable electricity supply for Europe's businesses and consumers.

***EURELECTRIC. Electricity for Europe.***

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## KEY MESSAGES

- The electricity generation mix in Europe is drastically evolving. Accordingly, the inherited position of gas fired power plants as providers of baseload electricity generation is being challenged. Gas fired power stations are nowadays operated with more volatile and unpredictable running patterns. Their flexibility should be properly appraised, owing to the relevance this has for the adequacy and safety of electrical systems and for providing back-up to variable renewables generation.
- Due to this new environment, the approach according to which gas system operators allocate exit capacity to power stations looks increasingly outdated. EURELECTRIC is keen to see all system operators across Europe provide flexibility to power station operators in profiling their exit capacity bookings and suggests that it could be optionally booked on an annual, monthly, daily and within-the-day basis, up to the level of peak-load consumption.
- Adding more flexibility in exit capacity products will allow power station operators to better incorporate variable costs into the price of their offers on wholesale electricity markets. This will ultimately have a positive impact on the capacity factor of plants and on the overall gas sector.
- EURELECTRIC also encourages a detailed analysis by system operators of requirements for ramp rates, offtake variation notice periods and offtake pressure arrangements, in conjunction with gas fired power station operators. At European level, ENTSOG could extend the analysis, including the flexibility adequacy in EU transmission systems, of gas fired generation's use to back-up renewables.

WG Gas to Power

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# Table of Contents

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Background .....	1
Options for more flexible exit capacity products .....	2
Options for more flexible exit capacity charging .....	4
Other considerations.....	5
Summary of gas-fired power station exit products and charging across Europe	6
Indicative costs.....	8

## Background

In its paper “Flexible Gas Markets for Variable Renewable Generation” of May 2014, EURELECTRIC highlighted the potential role that gas fired generation can play in providing back-up to variable renewables generation. Increasing renewables’ penetration across Europe has occurred along with a rapid decline in the number of running hours for gas-fired power stations in many EU member states and with more volatile and unpredictable running patterns.

The purpose of the 2014 paper was to investigate how gas market rules could be designed to reflect changes in the electricity system and the nowadays more flexible operation of gas-fired power stations. A number of recommendations were included where decisive actions by policymakers, national regulators and system operators should be taken. One such recommendation was that gas system operators should explore options for more flexible gas-fired power station exit capacity products and that they should consider the possibility of a charging mechanism that better reflects the fact that gas-fired power stations are expected to operate more intermittently and at very low running hours over the year.

This follow-up paper expands on this particular recommendation by highlighting the issues that gas system operators should consider and by suggesting ideas. It also includes a snapshot of existing gas-fired power station exit products and charges applicable in certain member states today, along with an indication of the relative transmission exit costs payable in different member states, based on a standard operating scenario but applying different booking strategies.

Our response and proposals are those of a customer – indeed gas-fired power stations are important customers of the gas system and they represent key assets for the adequacy and safety of electrical systems. Examples from many countries prove that it should be possible to develop such products in all countries, which should lead to a higher degree of utilisation of gas-fired power stations.

## Options for more flexible exit capacity products

As gas fired power stations' capacity factors continue to decline, the traditional approach of gas system operators that consisted in allocating power station exit capacity based on evergreen flat annual capacity contracts set at the level of peak-load consumption, looks increasingly outdated. As can be seen from table 1 (page 6), system operators in a number of member states have already responded to these changing circumstances by allowing power station operators to book exit capacity on a short-term, firm and interruptible basis, to varying extents, in addition to the traditional annual product.

This is a welcome development. But EURELECTRIC is keen to see flexibility for power station operators in profiling their exit capacity bookings being applied by all system operators across Europe. A more consistent approach could possibly be achieved through the adoption by ACER and/or ENSTOG of guidelines of good practice (GGP). The following ideas are ones that TSOs and NRAs could consider to make exit capacity booking arrangements more suited to gas fired power stations' changed operating environment:

1. TSOs across Europe should ultimately allow power station operators to book firm exit capacity on an annual, monthly, daily and within-day basis up to the level of peak-load consumption. TSOs that currently offer only annual products, or not all of these short-term products, should progressively offer the full range of products, taking into account the development of the gas balancing market and the extent to which gas-fired power stations show more flexible running over time.
2. Within-day exit capacity is important because it helps address inconsistencies between the gas day (06:00 CET – 06:00 CET) and the power day (00:00 CET – 00:00 CET). With just a daily product, two full days of gas capacity may need to be booked to fulfil one full day's power generation requirement.
3. Within-day capacity should be made available from each hour bar within the gas day until the end of the gas day. Gas fired power station's operators should be able to make requests for within-day capacity within a 30 minute window starting from each hour bar and TSOs should confirm within-day bookings within 30 minutes of the end of each window. Within-day capacity should commence as soon as possible and, in any case, as from the start of each hour bar up to the end of the gas day. For example, any within-day capacity requested at 14:22 should be confirmed by 15:00 to commence no later than 17:00, or 16:00 if operationally possible and to apply until the end of the gas day at 06:00 CET.
4. Where firm capacity is not available due to congestion in a TSO's system, equivalent interruptible capacity products should be made available instead, but interruptible capacity should not be offered as an alternative where firm capacity is available.
5. Firm and interruptible capacity should typically be allocated by way of transparent booking procedures. Suggested maximum lead times for booking capacity prior to the start of the period in question are as follows:
  - a) 10 business days before the start of each year in the case of annual capacity;
  - b) 5 business days before the start of each month in the case of monthly capacity;
  - c) 12 hours before the start of the gas day in the case of daily capacity; and
  - d) 1.5 hours before the starting hour of the within day product (see point 3 above).

6. The design and definition of these flexible exit capacity products should be done in such a way as to ensure, on the one hand, the promotion of the use of CCGTs with the consequent need of additional volumes in gas systems across Europe and, on the other hand, a positive impact in the viability of gas systems, since extra volumes will generate additional remuneration for gas stakeholders.
7. At this stage, within-day capacity should remain bookable commencing from any hour within the gas day (including the first hour 06:00 CET) through until the end of the gas day. However, over time, as the importance of gas-fired power stations in providing back-up to variable renewables generation becomes more critical and is better understood, consideration should be given as to whether within-day capacity should be booked just for specific hour-blocks within a gas day. Consideration could also be given to restructuring power station exit capacity products in such a way that they are allocated on a power day basis, as offered by Fluxys as from January 1st, 2016 (“fix/flex” service).

## Options for more flexible exit capacity charging

Reduced gas fired power station's load factors and the development of more variable and unpredictable generation increase the financial burden for gas fired power station operators of having to book gas exit capacity that they will rarely use. So, in addition to considering what exit capacity flexibility they may be able to make available, TSOs and NRAs should also consider how they could adapt exit capacity charging arrangements to alleviate this burden. Whilst power station operators cannot expect to be unduly subsidised by other system users, consideration should be given to changing the balance of cost recovery at power station exits away from a purely fixed cost approach toward a more variable cost basis.

Rebalancing the recovery of gas fired power station exit capacity costs from a purely fixed cost basis to a variable cost basis should not increase the risk of under-recovery and power station operators would be better able to incorporate variable costs into the price of their offers in wholesale electricity markets.

The following ideas are ones that TSOs and NRAs could consider to make their exit capacity charging arrangements more suited to gas fired power stations' changed operating environment:

1. Multipliers and seasonal factors could be adopted but their levels need should not prevent TSOs from offering greater flexibility in exit capacity booking. In that respect, multipliers and seasonal factors ought not to be too high and should not excessively distort booking decisions.
2. Gas fired power station operators could be offered the choice of moving to a more variable cost structure. Fluxys' new fixed/flex type product is an example of how the exit capacity cost structure for gas fired-power stations could be favourably adapted.
3. Lower priced annual exit capacity products could be offered to power station operators based on pre-defined rates of capacity utilisation (e.g. hours or days) rather than a standard flat annual peak capacity product. In the event that utilisation rates exceed those defined for the product, a pre-defined surcharge could be applied or capacity could have to be booked on a more expensive short-term basis.
4. Exit capacity should, for the time being, continue to exist as an ex-ante bookable product against which nominations should be made. However, over time, as the importance of gas-fired power stations in providing back-up to variable renewables generation becomes more critical and is better understood, consideration should be given to a commodity charge applied retrospectively based on consumption (to be defined in advance to let generators pass this charge through electricity prices).



## Other considerations

Gas fired power station's connection agreements invariably include ramp rates and notice periods for offtake variation, which are set by system operators to avoid the risk of power stations causing line pack and pressure problems elsewhere on the system. These parameters tend to be set conservatively and applied equally to all gas fired power stations. They are rarely updated to reflect changes in the system or in the power station's modus operandi and so they can be challenging to strictly comply with, bearing in mind the increasingly unpredictable and intermittent role of gas fired power stations.

Minimum offtake pressures are also common, although invariably these are set lower than the typical pressure that can be expected under normal operating conditions. However, in the event minimum offtake pressures were to apply, the ability of gas fired power stations to respond quickly and optimally to sudden variations in renewables generation would be compromised.

Whilst gas fired power station operators recognise why offtake and pressure conditions need to apply, these should reflect current operating reality and be reviewed regularly. As long as they persist at unrealistic levels, there is an increasing danger of non-optimal investment and operation by system operators and an inability to fulfil generation commitments in the electricity wholesale market by power station operators.

EURELECTRIC encourages system operators to review their ramp rates, offtake variation notice periods and offtake pressure arrangements on a national basis, in conjunction with gas fired power station operators. On a European basis, we think there would be merit in ENTSOG analysing the extent of flexibility adequacy in EU transmission systems as a consequence of gas fired generation increasingly providing back-up to variable renewables generation. This could become a feature of ENTSOG's ten year network development plan and ENTSOG should work closely with ENTSOE to ensure consistency in its assumptions.

Table 1

## Summary of gas-fired power station exit products and charging across Europe

Capacity Product	CZ	UK	DE	FR <sup>7</sup>	IT	IE	ES <sup>12</sup>	SE	PT	BE	NL
Annual Firm	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Monthly Firm	✓	X	✓	✓	X	✓	✓	✓	✓	✓ <sup>18</sup>	✓
Daily Firm	✓	✓	✓	✓	X	✓	✓	X	X	X	✓
Within Day Firm	✓	✓	X	X	X	✓ <sup>10</sup>	X	X	X	X	X
Annual Interruptible	✓ <sup>1</sup>	X	✓ <sup>5</sup>	✓	X	X	✓ <sup>13</sup>	X	X	X	✓
Monthly Interruptible	✓	X	✓	X	X	X	X	X	X	X	✓
Daily Interruptible	✓	✓ <sup>2</sup>	✓	✓	X	X	X	X	X	X	✓
Within Day Interruptible	✓	X	X	X	X	X	X	X	X	X	X
Other	✓	✓ <sup>3</sup>	✓ <sup>6</sup>	✓ <sup>8</sup>	X	X	X	✓ <sup>15</sup>	✓ <sup>16</sup>	X	✓ <sup>20</sup>
Commodity	✓	✓ <sup>4</sup>	X	✓ <sup>9</sup>	X	✓ <sup>11</sup>	✓ <sup>14</sup>	X	✓ <sup>17</sup>	✓ <sup>19</sup>	X
Multipliers	a) Individual Monthly & Standard Daily and Within Day	X	Standard Monthly and Daily to apply from 1/1/16	(R) capacity component only	X	Individual Monthly & Daily	Monthly and Daily	Seasonal and Monthly	Seasonal Monthly	Individual Monthly	Seasonal Monthly

## Notes

- 1) Annual, Monthly, Daily and Within Day Interruptible are priced on the same basis as their firm equivalents but are discounted ex-post in the case of interruption
- 2) Available via auction D-1 at zero reserve price
- 3) Enduring Annual Firm Capacity where booking persists until reduced
- 4) SO and TO commodity charges apply but can be replaced by an optional short haul commodity charge at exit points which are close to entry points
- 5) Annual Interruptible Capacity along with Monthly and Daily Interruptible Capacity based on probability of interruption
- 6) Conditionally firm and dynamically allocable capacity are also offered by certain TSOs
- 7) Exit Capacity Charges comprise of 3 components – Main Network Exit Capacity (M), Regional Network Transmission Capacity (R) and Delivery Capacity (D)
- 8) Fixed € per meter posts (CCGT typically has 2 meter posts) and monthly pension fund fee based on 4.7% of booked capacity
- 9) Solidarity fee for vulnerable customers and Biomethane fee – both levied 6 monthly
- 10) Within Day Firm Capacity price the same as Day Ahead Firm Capacity
- 11) Current 90:10 capacity/commodity will switch to 100:0 in 2017
- 12) Within day firm capacity can be booked with certain limitations.
- 13) Set multipliers (<1) based on the maximum number of days of interruption per year. Available only in congested transmission and distribution networks identified by the TSO.
- 14) Range of commodity tariffs applied based on annual consumption
- 15) Summer and 3 x Winter Seasonal Capacity products also available
- 16) Seasonal summer capacity product can be combined with Annual Firm Capacity
- 17) Shippers can choose to have a low commodity charge with a high Firm Annual Capacity charge (annual tariff – long term use) or vice versa (annual tariff – short term use)
- 18) By negotiation
- 19) Applied for odorization
- 20) Capacity shifting service

Table 2

## Indicative costs

Assumptions:

- GGCT Capacity = 410 MW | Efficiency rate = 0.48 kWh electricity/kWh of gas consumed
- Load factor = 100% full load | Number of days running = 12 days in winter (Oct – Mar) and 8 days in summer (Apr – Sep) | Running hours per day = 8 hours

Product	CZ <sup>1</sup>	UK	DE	FR	IT	IE	ES	SE	PT	BE	NL <sup>2</sup>
<b>Annual Firm Capacity</b>	11.15m (CK) 0.41m €	2.17m (£) <sup>3</sup>	2.99m €	3.26m €	6.1m € <sup>4</sup>	0.18m €	2.5m €	41m (SK) 4.4m €	2.26m €	0.92m €	2.94m € <sup>5</sup>
<b>Monthly Firm Capacity</b>	24.3m (CK) 0.88m €	N/A	2.99m €	8.13m €	N/A	0.28m €	3.8m €		2..26m €	1.47m €	5.51m € <sup>6</sup>
<b>Daily Firm Capacity</b>	13.4m (CK) 0.49m €	0.72m (£) <sup>7</sup>	0.98m €	3.08m €	N/A	0.2m €	1.97m €	N/A	N/A	N/A	1.48m € <sup>8</sup>
<b>Within Day Firm Capacity</b>	22.3m (CK) 0.81m €	N/A		N/A	N/A	N/A	N/A	N/A	N/A	N/A	
<b>Annual Interruptible Capacity</b>		N/A			N/A	N/A	1.5 – 2.2m €	N/A	N/A	N/A	2.06m € <sup>9</sup>
<b>Monthly Interruptible Capacity</b>		N/A			N/A	N/A	N/A	N/A	N/A	N/A	3.86m €
<b>Daily Interruptible Capacity</b>		0			N/A	N/A	N/A	N/A	N/A	N/A	1.04m €
<b>Within Day Interruptible Capacity</b>		N/A	N/A		N/A	N/A	N/A	N/A	N/A	N/A	
<b>Other Capacity</b>					N/A	N/A	N/A			N/A	
<b>Commodity Charge</b>	3.1m (CK) 0.11m €	0.29m (£) 0.4m €	N/A	0.001m €	N/A	N/A	0.56m €	N/A	0.018m- 1.9m € <sup>10</sup>	0.0003m €	

## Notes

- 1) Excludes entry costs into CZ
- 2) Excludes entry cost into NL
- 3) Exit tariffs differ in UK and this is the maximum figure – the lowest figure is around £7k
- 4) Includes metering charge
- 5) Exit tariffs differ in NL and this is the maximum figure – the lowest figure is around €0.9m
- 6) Assuming monthly capacity is booked separately on different days (1.875 x the annual capacity charge) – minimum figure = €1.64m
- 7) Exit tariffs differ in UK and this is the maximum figure – the lowest figure is around £1k
- 8) Assuming daily capacity is booked separately on different days (1/30th of monthly capacity charge) – minimum figure = €0.59m
- 9) Interruptible capacity can be booked if the equivalent form product has sold out at a 30% discount
- 10) Included in the annual and monthly numbers above

EURELECTRIC pursues in all its activities the application of the following sustainable development values:

Economic Development

▶ Growth, added-value, efficiency

Environmental Leadership

▶ Commitment, innovation, pro-activeness

Social Responsibility

▶ Transparency, ethics, accountability



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