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Statistical compendium of ACER Gas Target Model metrics for the year 2016

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1 Introduction

This statistical compendium displays the full results and clarifies the assumptions adopted for the calculation of the ACER Gas Target Model (AGTM¹) metrics presented in the Gas Wholesale volume of the Market Monitoring Report 2016 (MMR 2016²).

The AGTM envisages a competitive and integrated European gas market constituted around well-functioning entry-exit market zones with liquid Virtual Trading Points (VTPs³); market integration is served by the right amount of infrastructure, utilised efficiently, this enabling gas to move freely between areas to where it is valued highest. The AGTM emphasises that a well-functioning wholesale market requires a liquid spot market but also, crucially, a liquid wholesale forward market to enable cost effective wholesale market risk management

The AGTM defines nine metrics for assessing the overall performance of wholesale markets. The metrics are divided in two blocks

- ‘Market participants’ needs’ metrics assess the well-functioning degree of gas hubs by examining if products and liquidity are available such that effective management of wholesale market risk is possible
- ‘Market health’ metrics evaluate whether gas markets are structurally competitive, resilient and exhibit a sufficient degree of diversity of supply

Table 1 summarises AGTM metrics and their numbering.

Table 1 List of AGTM metrics

| Market participant needs metrics | Market health metrics |
|-----------------------------------|--|
| 1. Order book volume availability | 5. Herfindahl-Hirschmann Index |
| 2. Bid-ask spread | 6. Number of supply sources |
| 3. Order book price sensitivity | 7. Residual Supply Index |
| 4. Number of trades | 8. Market concentration for bid and offer activities |
| | 9. Market concentration for trading activities |

Source: ACER Gas Target Model.

¹ See the AGTM here: <http://www.acer.europa.eu/events/presentation-of-acer-gas-target-model-documents/european%20gas%20target%20model%20review%20and%20update.pdf>

² The Gas Wholesale volume of the MMR 2016 presents the AGTM metric values and analyses the reasons behind the diverse results across EU markets. See latest MMR edition here: [http://www.acer.europa.eu/Official documents/Acts of the Agency/Publication/ACER%20Market%20Monitoring%20Report%202016%20-%20GAS.pdf](http://www.acer.europa.eu/Official%20documents/Acts%20of%20the%20Agency/Publication/ACER%20Market%20Monitoring%20Report%202016%20-%20GAS.pdf)

³ The term VTP refers to an entry/exit system where gas can be traded independently of its location and which offers users the possibility of transferring the title of gas and/or swap imbalances. Each VTP has an operator that tracks the ownership of traded gas and handles gas balancing aspects. Trading is facilitated by the establishment of organised exchanges and/or OTC platforms that attract traders by offering different products and services, thus creating a liquidity pull, all of which constitutes a ‘gas hub’.

The AGTM determines for each metric an orientation threshold. ACER outlined the threshold values using a questionnaire that was distributed among sector participants in 2014. Metric thresholds were set, for selected metrics, based on the estimated performance of British NBP and Dutch TTF hubs in the year 2013. Metric thresholds are showed at the last part of this document.

In accordance to the AGTM process, the metric results and where they stand against the orientation thresholds should be used as an indicative basis for a holistic analysis about the EU MSs gas markets' performance. This type of analyses shall also take into account the individual markets' specificities. As such, based on the metric results but also on overall market facts - including the gradual implementation of Network Codes -, NRAs should conduct a periodic analysis about whether or not their respective Member States are on the way of meeting the well-functionality targets defined at the AGTM.

For those markets where well-functionality requirements are not met, NRAs should assess whether the natural evolution of the market (e.g. as a result of implementation of Network Codes or due to expected infrastructure investments, etc.) can reasonably be expected to come across the criteria or whether more active intervention could be required. More active intervention could take the form of market mergers along the three models defined in the AGTM⁴; Cost Benefit Analyses (CBAs) should validate the viability of market integration measures.

2 Clarifications about REMIT data utilisation

The calculation of the nine AGTM metrics is performed in accordance to the methodologies established in the AGTM Annex 3⁵. This Annex also specifies the type and sources of the data that need to be employed.

For the evaluation of the AGTM *market participant needs*' metrics number 1,2,3, and 4, and for *the market health metrics* number 8 and 9, it is required to process data about the orders placed and trades concluded at gas hubs, either on broker platforms or organised exchanges.

In order to appraise these metrics the Agency has used the data as reported under REMIT⁶. The data are collected by the Agency for the purpose of market surveillance activities. It is to be noted that these metrics can only be assessed for those markets hosting *transparent trading venues*⁷.

The REMIT data processed to assess the metrics presented in this document cover the whole of the 2016 calendar year. They correspond specifically to data on orders placed and trades executed in trading venues within the framework of a standard contract⁸. All data were used in an anonymized and aggregated form.

⁴ i.e. market mergers, trading regions or satellite markets described at AGTM section 4.5. See footnote 1.

⁵ See AGTM Annex 3 *Calculation Specification for Wholesale Market Metrics* here: http://www.acer.europa.eu/Events/Presentation-of-ACER-Gas-Target-Model-/Documents/A14-AGTM-13-03a_GTM_Annex%203%20-%20Calculation%20specification%20metrics_final.pdf

⁶ [Regulation \(EU\) No 1227/2011](#) on wholesale energy market integrity and transparency.

⁷ Transparent trading venues refer to organised wholesale market places, either exchanges or OTC deals facilitated via brokers, with enough liquidity and accessible reference price. AGTM Annex 3 further clarifies the metrics methodology and provides a definition of technical concepts.

⁸ From October 2015, all orders placed and trades executed at organised gas wholesale market places and within the framework of a standard contract are collected under REMIT. From April 2016, orders for transmission capacity and for non-standard contracts concluded outside organised markets are also reported. AGTM *Market participants' needs metrics* are built solely on the basis of standard contracts.

The list below explains the assumptions taken when processing REMIT data. Several of these assumptions make reference to the *REMIT transaction user reporting manual* (TRUM⁹).

- The trade data used cover the whole calendar year 2016. Only data for transactions executed in organised market places and within the framework of a standard contract have been processed;
- The 17 listed hubs constitute separate virtual¹⁰ trading points for products' delivery, holding either one or several transparent organized trading venues. The identification of VTPs is based on ENTSOG EIC delivery point codes¹¹. Both H and L calorific gas are taken into consideration in those markets where both types of gas are consumed;
- For some metrics, separate results for OTC and exchange trading are provided, while for other metrics combined results of the two trading mechanisms are given. OTC covers transactions executed via broker platforms. Exchange data covers transactions supervised and cleared by an organised central market operator;
- The results of the metrics are shown as ranges in order to avoid any potential confidentiality (see article 17 of REMIT regulation¹²) issues as well as for reasons of data quality;
- A number of conditions are used to process data in a consistent manner: only limited¹³ price orders and orders with a definite status¹⁴ are included in the calculations. Orders referring either to locational physical swaps and/or spread trade with relative value between two hubs concluded under one sole agreement¹⁵ were not considered;
- For the bid-ask spread metric, those orders whose prices are set via a spread to an index (e.g. of a price of an adjacent hub) are not taken into consideration. However, these orders are used in the order volume assessments;
- "n.a." means metric not assessed, "n.r." means no relevant data obtained due to, for example, the absence of the product being traded. "tnm" means for metric 2 that threshold of more than 60% of trading days showing results is not met;
- For NBP and TTF order-related metric values for prompt and forward products, a sample of days were taken. In concreto, data for 30 days along the year were taken due to data processing limitations. Also for NCG, GPL, PSV and PEG-Nord forward-order related metrics a sample of 180 days was employed.

⁹ See:

[http://www.acer.europa.eu/official_documents/acts_of_the_agency/publication/transaction%20reporting%20user%20manual%20\(trum\).pdf](http://www.acer.europa.eu/official_documents/acts_of_the_agency/publication/transaction%20reporting%20user%20manual%20(trum).pdf)

¹⁰ Physical in the case of Zeebrugge.

¹¹ See: <http://www.entsog.eu/eic-codes/eic-connection-point-codes-z>

¹² "(...) Confidential information (...) may not be divulged to any other person or authority, except in summary or aggregate form such that an individual market participant or market place cannot be identified."

¹³ See REMIT TRUM pages 44 and 45; limited price orders are orders executed either fully or in part at the limit or at a higher price. These constitute the bulk of reported orders.

¹⁴ See REMIT TRUM page 47; orders whose status is reported as 'OTH' are not taken into account.

¹⁵ See REMIT TRUM page 51; orders whose contract type is reported as 'SW' or 'SP' are not taken into account. In selected pairs of hubs swaps and spread trade orders are an extended practice: e.g. NBP-ZEE, GPL-NCG, TRS-AOC.

3 AGTM metrics results

a) MARKET PARTICIPANT NEEDS' METRICS¹⁶

AGTM metric 1: Order book volume availability measure of the median bid and ask-side volumes available in the order book across the day¹⁷ - 2016

| Metric 1 Order book volume availability | | | | | | | | | | | | |
|---|--|-----------|-----------|-----------|--|-----------|--|----------|----------|----------|----------|----------|
| Market | Spot products (DA). Median volume in the order book (MW) | | | | Prompt products (MA). Median volume in the order book (MW) | | Forward products (QAs, SAs, YAs). Time horizon with at least the below volumes in the order book (in months) | | | | | |
| | Ask side | | Bid side | | Ask side | Bid side | 10 MW | | 60 MW | | 120 MW | |
| | OTC | Exchange | OTC | Exchange | Ask side | Bid side | Ask side | Bid side | Ask side | Bid side | Ask side | Bid side |
| AT-VTP | 600-700 | 300-400 | 700-800 | 300-400 | 100-200 | 100-200 | 8-12 | 8-12 | 0-4 | 0-4 | 0-4 | 0-4 |
| BE-ZEE | 300-400 | n.p. | 400-500 | n.p. | 0-100 | 0-100 | 8-12 | 8-12 | 4-8 | 0-4 | 0-4 | 0-4 |
| BE-ZTP | 100-200 | - | 100-200 | - | 0-100 | 0-100 | - | - | - | - | - | - |
| CZ-VOB | 100-200 | - | 100-200 | - | 0-100 | 0-100 | 4-8 | 4-8 | 0-4 | 0-4 | 0-4 | 0-4 |
| DE-GPL | 700-800 | 1700-1800 | 800-900 | 1800-1900 | 400-500 | 400-500 | 16-20 | 20-24 | 0-4 | 4-8 | 0-4 | 0-4 |
| DE-NCG | 1000-1100 | 1500-1600 | 1100-1200 | 1600-1700 | 100-200 | 100-200 | 20-24 | 20-24 | 8-12 | 8-12 | 4-8 | 4-8 |
| FR-PEG NORD | 100-200 | 500-600 | 100-200 | 800-900 | 100-200 | 100-200 | 28-32 | 28-32 | 20-24 | 20-24 | 0-4 | 4-8 |
| FR-TSR | 0-100 | 300-400 | 0-100 | 500-600 | 0-100 | 0-100 | 4-8 | 4-8 | 0-4 | 0-4 | 0-4 | 0-4 |
| IT-PSV | 200-300 | - | 200-300 | - | 100-200 | 100-200 | 28-32 | 28-32 | 20-24 | 24-28 | 0-4 | 0-4 |
| NL-TTF | 2000-2100 | 1100-1200 | 2400-2500 | 1100-1200 | 1600-1700 | 2000-2100 | 36-42 | 36-42 | 36-42 | 36-42 | 24-28 | 28-32 |
| UK-NBP | 1500-1600 | 400-500 | 1600-1700 | 400-500 | 2400-2500 | 2400-2500 | 32-36 | 36-42 | 24-28 | 28-32 | 24-28 | 24-28 |
| SK-OTC | 0-100 | - | 0-100 | - | 0-100 | 0-100 | 4-8 | 0-4 | 0-4 | 0-4 | 0-4 | 0-4 |
| PL-VPGZ | 0-100 | 200-300 | 0-100 | 200-300 | 0-100 | 0-100 | 20-24 | 16-20 | 0-4 | 0-4 | 0-4 | 0-4 |
| SP-PVB | n.p. | 100-200 | n.p. | 100-200 | 0-100 | 0-100 | 4-8 | 4-8 | 0-4 | 0-4 | 0-4 | 0-4 |
| DK-GPN | - | 800-900 | - | 800-900 | 0-100 | 0-100 | - | - | - | - | - | - |
| HU-MGP | - | 0-100 | - | 0-100 | 0-100 | 0-100 | 0-4 | 0-4 | - | - | - | - |
| LI-GET | - | 0-100 | - | 0-100 | - | - | - | - | - | - | - | - |

Source ACER calculations based on REMIT data.

Notes: If spread trade orders¹⁸ are also accounted results for the Zeebrugge and NBP hubs significantly increase for OTC. For the Danish hub only exchange transactions are covered. In Finland trading on the exchange occurs via hourly products, therefore metrics are not assessed for DA, MA and FWA products

¹⁶ AGTM metric number 3: order book price sensitivity is not assessed

¹⁷ According to the AGTM methodology, 'across the day' means a snapshot every fifteen minutes.

¹⁸ See initial assumptions listed below, point 2.

AGTM metric 2: Bid-ask spread measure of the average delta between the lowest ask price and the highest bid-price expressed as a percentage of the highest bid-price across the day - 2016

| Metric 2 Orders Bid-Ask spread (%) | | | | | | | | |
|------------------------------------|--------------------|-----------|----------------------|-----------|----------------------------------|-----------|------------|-----------|
| Market | Spot products (DA) | | Prompt products (MA) | | Forward products (QAs, SAs, YAs) | | | |
| | OTC | Exchange | OTC | Exchange | 6th month | | 12th month | |
| | | | | | OTC | Exchange | OTC | Exchange |
| AT-VTP | 0.4%-0.6% | 0.6%-0.8% | 0.8%-1% | 1.6%-1.8% | 1.2%-1.4% | tnm | 1%-1.2% | tnm |
| BE-ZEE | 0.6%-0.8% | n.p. | 1%-1.2% | n.p. | 1.2%-1.4% | n.p. | 1%-1.2% | n.p. |
| BE-ZTP | 0.8%-1% | - | 1.6%-1.8% | - | tnm | tnm | tnm | tnm |
| CZ-VOB | 1.4%-1.6% | - | 1.4%-1.6% | - | tnm | tnm | tnm | tnm |
| DE-GPL | 0.6%-0.8% | 0.8%-1% | 0.6%-0.8% | 0.6%-0.8% | 1%-1.2% | 1.2%-1.4% | 1.4%-1.6% | 2%-2.2% |
| DE-NCG | 0.6%-0.8% | 0.6%-0.8% | 0.8%-1% | 1.6%-1.8% | 0.8%-1% | 1%-1.2% | 0.8%-1% | 1.4%-1.6% |
| FR-PEG NORD | 0.8%-1% | 0.8%-1% | 1.2%-1.4% | 1.8%-2% | tnm | 1.8%-2% | tnm | 2.2%-2.4% |
| FR-TSR | 1.6%-1.8% | 1.4%-1.6% | 2.4%-2.6% | 3.4%-3.6% | tnm | tnm | tnm | tnm |
| IT-PSV | 0.8%-1% | - | 0.8%-1% | 1.8%-2% | 0.8%-1% | 1.8%-2% | 1%-1.2% | 1.8%-2% |
| NL-TTF | 0.4%-0.6% | 0.6%-0.8% | 0.4%-0.6% | 0.8%-1% | 0.6%-0.8% | 0.8%-1% | 1%-1.2% | 1.6%-1.8% |
| UK-NBP | 0.6%-0.8% | 0.6%-0.8% | 0.8%-1% | 0.6%-0.8% | 0.6%-0.8% | 0.8%-1% | 0.6%-0.8% | 1.6%-1.8% |
| SK-OTC | 2.8%-3% | tnm | 2.8%-3% | tnm | tnm | tnm | tnm | tnm |
| PL-VPGZ | tnm | 1%-1.2% | tnm | 1.2%-1.4% | tnm | 1.2%-1.4% | tnm | 1.8%-2% |
| SP-PVB | tnm | 1.6%-1.8% | 2%-2.2% | 2.2%-2.4% | tnm | tnm | tnm | tnm |
| DK-GPN | 1.4%-1.6% | 1%-1.2% | tnm | 3%-3.2% | tnm | tnm | tnm | tnm |
| HU-MGP | - | 3.4%-3.6% | - | 3.8%-4% | tnm | tnm | tnm | tnm |
| LI-GET | - | 2.2%-2.4% | - | - | - | - | - | - |

Source ACER calculations based on REMIT data.

Notes: For forward products sufficient liquidity - more than 60% of days showing results - is required as a condition to calculate and show metric values. If the condition is not fulfilled, this is indicated as "tnm". The bid-ask spread metrics may be particularly affected by data quality and assumptions taken aspects. Therefore the results need to be treated with caution.

AGTM metric 4: Number of trades executed on a daily average in transparent trading venues - 2016

| Metric 4 | Median daily number of executed trades | | | Trading horizon in months for Forward products (QAs, SAs, YAs) | |
|-------------|--|----------------------|----------------------------------|--|----------------------------|
| market | Spot products (DA) | Prompt products (MA) | Forward products (QAs, SAs, YAs) | At least 2 executed trades | At least 8 executed trades |
| AT-VTP | 100-200 | 0-50 | 0-50 | 9-12 | 3-6 |
| BE-ZEE | 100-200 | 0-50 | 0-50 | 6-9 | 0-3 |
| BE-ZTP | 0-50 | 0-50 | 0-50 | 0-3 | 0-3 |
| CZ-VOB | 0-50 | 0-50 | 0-50 | 3-6 | 0-3 |
| DE-GPL | 300-400 | 0-50 | 0-50 | 12-15 | 6-9 |
| DE-NCG | 300-400 | 0-50 | 0-50 | 9-12 | 3-6 |
| FR-PEG NORD | 200-300 | 0-50 | 0-50 | 6-9 | 0-3 |
| FR-TSR | 100-200 | 0-50 | 0-50 | 0-3 | 0-3 |
| IT-PSV | 100-200 | 0-50 | 0-50 | 9-12 | 6-9 |
| NL-TTF | 700-800 | 600-700 | 900-1000 | 30-33 | 27-30 |
| UK-NBP | 400-500 | 900-1000 | 900-1000 | 24-27 | 24-27 |
| SK-OTC | 0-50 | 0-50 | 0-50 | 0-3 | 0-3 |
| PL-VPGZ | 50-100 | 0-50 | 0-50 | 9-12 | 3-6 |
| SP-PVB | 0-50 | 0-50 | 0-50 | 0-3 | 0-3 |
| DK-GPN | 0-50 | 0-50 | - | 0-3 | 0-3 |
| HU-MGP | 0-50 | 0-50 | 0-50 | 0-3 | 0-3 |
| LI-GET | 0-50 | 0-50 | 0-50 | 0-3 | 0-3 |

Source ACER calculations based on REMIT data.

Note: This metric combines both OTC and exchange trading. Intragroup trades are included. The calculation for the forward products looks also at the time horizon in which more than two and eight trades per day are taking place.

b) **MARKET HEALTH METRICS**¹⁹

AGTM Metric 5: Herfindhal-Hirschman Index as a measure of the supply-side concentration

This metric examines the concentration at company level for upstream companies selling gas destined for final consumption within individual MSs.

Assumptions made:

- The indicator does not take into account secondary sales from intermediaries as those that could take place on hubs;
- The market shares of the upstream companies selling gas from the respective supply source countries were assigned in accordance with desktop research methodology used for the GTM 2014. Upstream companies' market shares are derived from production statistics, shareholder structure of export facilities and desktop research;
- The shares of the upstream companies' selling gas from a specific MS origin are not tailored to the situation of the individual importing MS (e.g. the totalised export market shares of all Norwegian companies exporting gas from the country are equally applied to all MSs that declare imports of Norwegian gas);
- Declared imports from a market with a liquid organised market with minor domestic production (Germany, Austria, Italy, France and Belgium are considered as such) are used to calculate the concentration of the market hosting the hub (e.g. Slovenia and Hungary declare sizeable imports from Austria; for those volumes the share of the upstream companies selling gas are considered proportional to Austrian market concentration levels²⁰).

¹⁹ AGTM Metric number 8: market concentration for bid and offer activities is not assessed

²⁰ In this case, both Hungarian and Slovenian suppliers declare imports of most volumes from Russia (fully assigned to Gazprom) and second most of the remaining imported gas comes from Austria – where Gazprom is also the main supplier. The Estonian imports from Lithuania have been fully assigned to a Norwegian (LNG) origin.

AGTM Metric 5: Herfindhal-Hirschman Index a measure of the supply-side concentration

| Country | HHI |
|----------------|--------|
| Finland | 10,000 |
| Latvia | 10,000 |
| Bulgaria | 9,359 |
| Lithuania | 3,357 |
| Estonia | 8,603 |
| Romania | 3,781 |
| Denmark | 2,598 |
| Sweden | 1,789 |
| Ireland | 2,356 |
| Slovenia | 8,256 |
| Hungary | 6,347 |
| Austria | 6,303 |
| Greece | 6,478 |
| Portugal | 5,167 |
| Poland | 4,394 |
| Croatia | 4,889 |
| Czech Republic | 4,952 |
| Germany | 2,949 |
| Be-Lux | 1,941 |
| United Kingdom | 1,109 |
| Slovakia | 3,800 |
| Spain | 4,215 |
| France | 1,865 |
| Netherlands | 2,662 |
| Italy | 3,065 |

Source ACER based on ENTSOG capacity data, Eurostat, NRAs and Frontier Research

AGTM metric 6: Number of supply sources

This metric examines the number and diversity of supply sources in terms of the geographical origin of gas consumed in each MS.

Assumptions made:

- The geographical supply source country origin refer to the upstream gas producer country (e.g. Russia) or to an EU MS with a liquid organised market where gas has been purchased (shown in the figure with an asterisk, e.g. Austria*). The supply origin of the gas should not be considered as the adjacent border from which gas is imported (e.g. Spain for Portugal) but the supply origin of the sourced/purchased gas (e.g. Algeria for Portugal);
- Calculations primarily look at imported and domestically produced gas devoted to final consumption within individual MSs.

Notes to the table below

Notes: The asterisk refers to MSs with liquid organised markets where the gas has been purchased. For Denmark, the Danish domestic production share also includes the Norwegian off-shore fields connected to the Danish network. The Netherlands and Denmark are both net exporters. The split in those two MSs refers to the origins of overall traded volumes. For Czechia Eurostat volumes reported as imported from Germany are deemed to also include Norwegian supply contracts. Estonian imports from Lithuanian refer to gas purchased in the Lithuanian GET hub of which the physical origin is deemed to be Norwegian LNG. For the EU as a whole, Algeria is the fourth supplier (8.5%), Qatar is the fifth (5%) and other origins account for 3.5%. Around 4% of the EU's primary supply, i.e. imported or domestically produced volumes, are re-exported to non-EU countries, mainly to Ukraine and also as LNG re-loadings. For Ukraine, the EU label origin corresponds to purchases from EU companies. These are deemed to comprise mostly Russian but also Norwegian gas geographical origin.

AGTM metric 6: Estimated number and diversity of supply sources in terms of the geographical origin of gas in 2016

| EU MSs | 1st supply origin country | | 2nd supply origin country | | 3rd supply origin country | | Other supply origins |
|-----------------|---------------------------|--------------------|---------------------------|-----------------|---------------------------|--------|----------------------|
| | % | Origin | % | Origin | % | Origin | Number |
| FI | 100% | RU | 0% | | 0% | | 1 |
| LV | 100% | RU | 0% | | 0% | | 1 |
| RO | 87% | RO | 13% | RU | 0% | | 2 |
| IE | 56% | UK* | 44% | IE | 0% | | 2 |
| BG | 97% | RU | 3% | BG | 0% | | 2 |
| DK ^T | 96% | DK-NO ^T | 4% | DE* | 0% | | 3 |
| LT | 60% | NO | 40% | RU | 0% | | 2 |
| SE | 75% | DK | 25% | DE* | 0% | | 2 |
| HR | 57% | HR | 18% | RU | 15% | AT* | 5 |
| PT | 69% | DZ | 21% | NI | 8% | QT | 4 |
| EE | 93% | RU | 7% | LT* | 0% | | 2 |
| SK | 44% | RU | 21% | UK* | 15% | AT* | 7 |
| GR | 66% | RU | 16% | TK | 16% | DZ | 4 |
| ES | 59% | DZ | 15% | NI | 9% | NO | 8 |
| SI | 66% | AT* | 36% | RU | 1% | IT* | 3 |
| AT | 66% | RU | 20% | NO | 14% | AT | 3 |
| NL ^T | 51% | NL | 23% | NO | 17% | RU | 9 |
| PL | 57% | RU | 23% | PL | 14% | DE* | 4 |
| CZ ^T | 46% | RU | 34% | DE* | 16% | SK* | 5 |
| UK | 48% | UK* | 34% | NO | 11% | QT | 6 |
| HU | 57% | RU | 24% | AT* | 19% | HU | 3 |
| DE | 43% | RU | 28% | NO | 22% | NL* | 5 |
| IT | 40% | RU | 29% | DZ | 9% | IT | 11 |
| FR | 41% | NO | 25% | RU | 15% | DZ | 7 |
| Be-Lux | 39% | NL* | 35% | NO | 15% | UK* | 3 |
| EU26 | 34% | RU | 27% | EU IP | 22% | NO | - |
| EnC CPs | | | | | | | |
| UA | 63% | UA | 37% | EU ^T | | | 2 |
| SB | 82% | RU | 18% | SB | | | 2 |
| MD | 100% | RU | | | | | 1 |
| FYRM | 100% | RU | | | | | 1 |
| BiH | 100% | RU | | | | | 1 |

Source ACER calculations based on Eurostat, IEA, British Petroleum, NRAs and EnC Secretariat.

AGTM metric 7: Residual Supply Index (RSI)

RSI aims to quantify whether MSs gas markets have sound enough foundations to support the development of a competitive gas hub. The RSI measures what percentage of MSs yearly natural gas demand can be met excluding the largest source of natural gas supply to that MS.

Assumptions made:

- The residual supply of gas is approximated by the capacity of interconnection points that connect gas producers other than the largest source of supply into that market. Natural gas storage is not part of residual supply, domestic production and liquefied natural gas capacities, however, are considered;
- In practice, to perform the calculation RSI looks at the level of supply-side upstream gas producing companies. The concentration analysis developed in metric 4 (HHI supply-side concentration index) is leveraged to evaluate the share per supply-company in IP(s).

The method for the RSI calculation set out in the AGTM can be broken down into the following steps. For more on the methodology see Annex 3 of the AGTM.

- Calculation of a MS's total gas supply delivery capacity: IPs entry capacity, LNG entry capacity and domestic production.
- Determination of the largest gas supplier to the MS, i.e. major upstream supply-side company.
- Categorization of gas supply delivery capacity and estimation of what part is controlled by the largest supplier.
- Calculation $RSI = \frac{MS\ total\ gas\ supply\ delivery\ capacity - largest\ supplier's\ controlled\ capacity}{MS\ gas\ consumption}$

AGTM metric 7: Residual Supply Index (RSI)

| MS | RSI |
|----------------|------|
| Finland | 0% |
| Latvia | 140% |
| Bulgaria | 4% |
| Lithuania | 138% |
| Estonia | 353% |
| Romania | 155% |
| Denmark | 143% |
| Sweden | 235% |
| Ireland | 247% |
| Slovenia | 95% |
| Hungary | 102% |
| Austria | 127% |
| Greece | 125% |
| Portugal | 99% |
| Poland | 79% |
| Croatia | 134% |
| Czech Republic | 158% |
| Germany | 120% |
| Be-Lux | 418% |
| United Kingdom | 125% |
| Slovakia | 326% |
| Spain | 177% |
| France | 174% |
| Netherlands | 317% |
| Italy | 110% |

Source ACER based on ENTSOG capacity data, Eurostat, NRAs and Frontier Research

AGTM Metric 9: Market concentration of finalised transactions

Assumptions made:

- See assumption considered in market participants' needs metrics assessment
- Metric values combine both OTC and exchange trading.
- Intragroup companies are not treated separately (i.e. concentration of holding groups could be higher).

AGTM metric 9: Market concentration of finalised transactions in EU hubs

| Market | Metric 9 HHI of traded volumes | | | | | | Metric 9 CR3 of traded volumes | | | | | |
|-------------|--------------------------------|-----------|-----------|--------------|-----------|-----------|--------------------------------|---------|---------|--------------|---------|---------|
| | Buying side | | | Selling side | | | Buying side | | | Selling side | | |
| | DA | MA | Forward | DA | MA | Forward | DA | MA | Forward | DA | MA | Forward |
| AT-VTP | 0-1000 | 0-1000 | 0-1000 | 0-1000 | 0-1000 | 0-1000 | 20%-30% | 20%-30% | 20%-30% | 40%-50% | 30%-40% | 20%-30% |
| BE-ZEE | 0-1000 | 1000-2000 | 0-1000 | 1000-2000 | 0-1000 | 0-1000 | 30%-40% | 30%-40% | 30%-40% | 40%-50% | 30%-40% | 30%-40% |
| BE-ZTP | 1000-2000 | 1000-2000 | 1000-2000 | 1000-2000 | 1000-2000 | 3000-4000 | 40%-50% | 40%-50% | 60%-70% | 50%-60% | 60%-70% | 70%-80% |
| CZ-VOB | 0-1000 | 0-1000 | 0-1000 | 0-1000 | 0-1000 | 1000-2000 | 30%-40% | 30%-40% | 40%-50% | 30%-40% | 30%-40% | 50%-60% |
| DE-GPL | 0-1000 | 0-1000 | 0-1000 | 0-1000 | 0-1000 | 0-1000 | 20%-30% | 20%-30% | 30%-40% | 20%-30% | 30%-40% | 40%-50% |
| DE-NCG | 0-1000 | 0-1000 | 1000-2000 | 0-1000 | 0-1000 | 1000-2000 | 30%-40% | 30%-40% | 50%-60% | 30%-40% | 40%-50% | 50%-60% |
| FR-PEG NORD | 0-1000 | 0-1000 | 0-1000 | 0-1000 | 1000-2000 | 0-1000 | 30%-40% | 40%-50% | 40%-50% | 40%-50% | 50%-60% | 40%-50% |
| FR-TSR | 0-1000 | 0-1000 | 0-1000 | 0-1000 | 1000-2000 | 0-1000 | 30%-40% | 30%-40% | 40%-50% | 30%-40% | 40%-50% | 40%-50% |
| IT-PSV | 1000-2000 | 0-1000 | 1000-2000 | 1000-2000 | 1000-2000 | 0-1000 | 50%-60% | 40%-50% | 30%-40% | 50%-60% | 50%-60% | 40%-50% |
| NL-TTF | 0-1000 | 0-1000 | 0-1000 | 0-1000 | 0-1000 | 0-1000 | 20%-30% | 20%-30% | 20%-30% | 20%-30% | 20%-30% | 20%-30% |
| UK-NBP | 0-1000 | 0-1000 | 0-1000 | 0-1000 | 0-1000 | 0-1000 | 20%-30% | 10%-20% | 20%-30% | 20%-30% | 10%-20% | 20%-30% |
| SK-OTC | 0-1000 | 1000-2000 | 1000-2000 | 1000-2000 | 1000-2000 | 2000-3000 | 40%-50% | 40%-50% | 50%-60% | 50%-60% | 40%-50% | 70%-80% |
| PL-VPGZ | 2000-3000 | 2000-3000 | 3000-4000 | 4000-5000 | 4000-5000 | 5000-6000 | 70%-80% | 70%-80% | 80%-90% | 80%-90% | 80%-90% | 90-100% |
| SP-PVB | 0-1000 | 1000-2000 | 1000-2000 | 1000-2000 | 1000-2000 | 1000-2000 | 50%-60% | 40%-50% | 40%-50% | 60%-70% | 50%-60% | 40%-50% |
| DK-GPN | 2000-3000 | 1000-2000 | - | 1000-2000 | 1000-2000 | - | 70%-80% | 60%-70% | - | 60%-70% | 60%-70% | - |
| HU-MGP | 2000-3000 | 4000-5000 | 5000-6000 | 2000-3000 | 5000-6000 | 5000-6000 | 70%-80% | 90-100% | 90-100% | 50%-60% | 90-100% | 90-100% |
| LI-GET | 1000-2000 | - | - | 2000-3000 | - | - | 60%-70% | - | - | 70%-80% | - | - |

Source ACER calculations based on REMIT data.

4 AGTM metric thresholds

'Market participants' needs' metrics

| Metric | Day Ahead | Month Ahead | Forward (QAs, SAs, YAs) |
|-----------------------------------|--|---|---|
| 1. Order book volume availability | $\geq 2,000$ MW on each bid- and offer-side | $\geq 2,000$ MW on each bid- and offer-side | $\geq 2,000$ MW on each bid- and offer-side |
| 2. Bid-ask spread | $\leq 0.4\%$ of bid-price | $\leq 0.2\%$ of bid-price | $\leq 0.7\%$ of bid-price for 24 months ahead |
| 3. Order book price sensitivity | $\leq 0.02\%$ price distance between average price for 120 MW and best price on each bid- and offer-side | $\leq 0.1\%$ price distance between average price for 120 MW and best price on each bid- and offer-side | $\leq 0.2\%$ price distance between average price for 120 MW and best price on each bid- and offer-side for 24 months ahead |
| 4. Number of trades | ≥ 420 trades per day | ≥ 160 trades per day | ≥ 8 trades per day for 22 months ahead |

'Market health' metrics

| Metric | Spot, prompt and forward market together |
|--|--|
| 5. Herfindahl-Hirschmann Index | ≤ 2000 |
| 6. Number of supply sources | ≥ 3 |
| 7. Residual Supply Index | $\geq 110\%$ |
| 8. Market concentration for bid and offer activities | $\leq 40\%$ market share per company (or group of companies) for the best 120 MW on each bid- and offer-side |
| 9. Market concentration for trading activities | $\leq 40\%$ market share per company (or group of companies) for the sale and purchase of gas |



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