entsog
european network
of transmission system operators
for gas

ENTSOG
SUMMER SUPPLY REVIEW

2019

Table of Contents

Executive Summary

ENTSOG has completed the review of the European gas picture for Summer 2019, April to September. The seasonal Reviews aim at a deeper comprehension of the development of the demand and supply in the previous seasons and the identification of trends that cannot be captured at national or regional level.

Summer Reviews help to build experience and a solid background for the assumptions considered in the Summer Supply Outlook. Such knowledge is also factored in the recurrent TYNDP process in order to ensure a consistent improvement over ENTSOG reports, as well as in the ongoing R&D plan.

The key findings of this review are:

Seasonal gas demand in Europe

- Seasonal gas demand in Europe was 14% higher than the previous summer, reaching 1,902TWh. This reflects the increasing trend shown during the summers in 2016 and 2017 and is the highest gas demand since summer 2010.
- The stock levels reached the highest level of the last five summers (97%) by the end of September driven by a very high stock level at the beginning of the season (43% average for EU). Mainly attibuted to comparatively more comfortable supply and flexibility during the winter season (2018/2019) and summer season 2019, as well as favorable situation on the European gas market and climatic conditions.
- European gas prices fell during the summer season.
- Notable increased of LNG supply from 265TWh to 531TWh compared with previous season.
- European indigenous production kept the decreasing trend already observed in previous summer decreasing from 554TWh to 476TWh, driven by a falling domestic production in the Netherlands and other European countries, along with a remarkable higher stock levels during the summer season and a robust inflows of LNG.

Detailed data for the cross-border flows is available on the Transparency Platform[1].

Stakeholders' comments on this seasonal analysis are welcome and would enable ENTSOG to improve its knowledge of seasonal and market dynamics influencing the use of infrastructure. Comments would serve as basis for the R&D plan and be beneficial to the quality of further reports.

[1] Transparency Platform: https://transparency.entsog.eu/

Introduction

This review, as part of the ENTSOG Annual Work Program 2020, is published on a voluntary basis and aims at providing an overview of the demand and supply balance during summer 2019. The report brings transparency on the internal analysis carried out by ENTSOG for the purpose of developing the seasonal Supply Outlooks as well as the Union-wide TYNDP.

The report aims to provide an overview of European trends that cannot be captured at national or regional level and to build experience for future reports. This report should not be seen as a direct review of previous Seasonal Outlooks as outlooks do not aim to provide a forecast but to better explore infrastructure resilience in view of actual past trends.

Regarding European dynamics, the report highlights the wide heterogeneity of national demand profiles and supply sources. These differences are linked among others to physical rationales such as climate, demand breakdown or producing field flexibility for example.

Seasonal and Market Overview[2]

Different events on the European gas market caused fluctuations in the supply and demand balance from April to September 2019. The major ones were:

- UGS utilisation was significantly lower than the one from previous winters. UGS average stock level in Europe at the beginning of the summer season was the highest (43%) comparing with the last seven seasons and it reached the highest level of the last five summers (97%).
- Robust inflows of LNG weighed on the market following the high trend of LNG regasification observed during winter 2018/2019 , and potentially into the first quarter of 2019, driven by an offert increased, a decreased of Asian LNG prices and high shipping rates, which stoped the Atlantic-produced LNG of being shipped to the Pacific Market.
- Russian gas supplies remained robust despite European gas prices falling to 10-year lows mainly driven by high levels on strong demand for storage injections in central and eastern Europe until June, and high sales on Gazprom Export's Electronic Sales Platform (ESP).
- The average Dutch natural gas spot prices in June and August were lower year on year, driven by high stock levels and robust inflows of LNG weighed on the market.
- Spanish LNG regas hit their highest level in July for a calendar month since January 2011. Low Algerian pipeline gas nominations allied to strong gas-for-power demand led to regas rates nudging close to record levels.

[2] Source: Platts

- Italian (PSV) natural gas spot prices fell by 55% in August, compared with previous year, as LNG regasification remained high in the country and imports from Switzerland almost doubled on the year.
- Norwegian pipeline gas supplies to Europe decreased significantly as a heavy maintenance schedule and significant commercial turndown on low European gas prices impacted flows. Monthly LNG sendout displaced Norwegian imports in part on heavy Norwegian Continental Shelf maintenance.

Gas Prices at European hubs

The following graphs show the evolution of gas prices in Europe during Summer 2019, as well as the overall monthly ranges and averages in comparison to those of 2018.

Figure 1 displays the evolution of the month-ahead average prices for the different European gas hubs. The graph shows how the majority of the European hubs follow a similar trend by reacting in the same direction, with rather no exceptions.

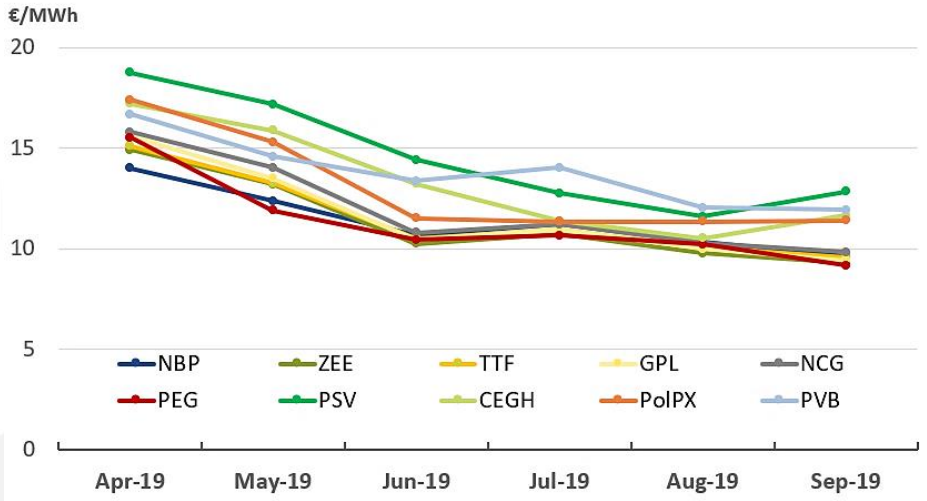

Figure 1. Month-ahead average price at EU Hubs.

Figure 2 compares the maximum range and average of the month-ahead summer price for the last two summers over all the European hubs. The average price over all hubs decreased significantly in 2019, showing as general trend lower prices levels when compared to the ones seen in the previous summer. The price ranges were higher in all the season compared with 2018. The price convergence between the European hubs continued and were following similar price signal.

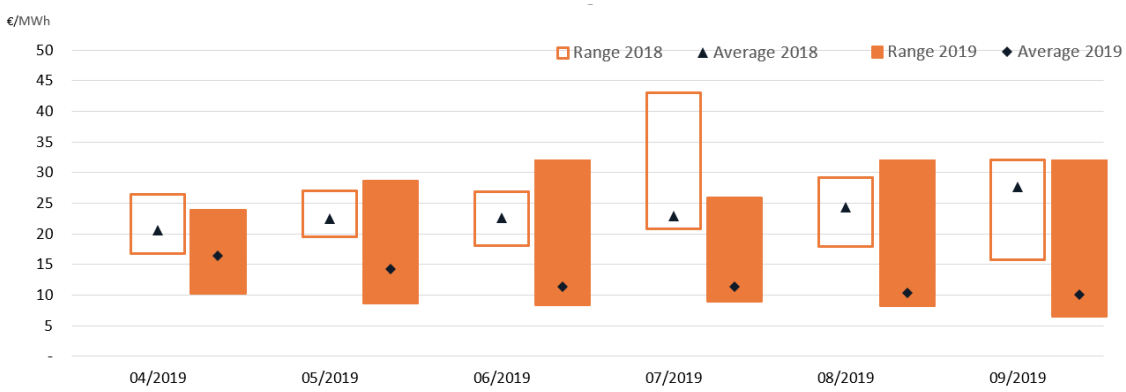

Figure 2. Range and average of the prices. Source: Bloomberg.

Demand

> European seasonal gas demand

Total gas demand was 1,902TWh in Summer 2019, 13.7% higher than the one in the previous summer (1,673TWh) and the highest gas demand since summer 2010.

Figure 3 shows how the monthly average demand levels in the summer season 2019 are higher than the previous summer, as well as the maximum and minumun values. At the beginning of the summer the average decreases significanly, in line with the maximum levels reached each month.

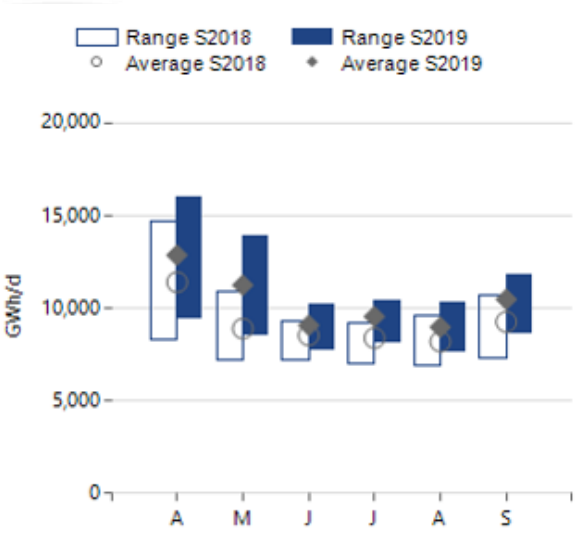

Figure 3. Total gas demand

Figures 4 and 5 show the demand range and average on a monthly basis when split into residential, commercial and industrial or power generation sectors, for the countries where the demand breakdown is available. Differing from previous season, April and May gas demand for residential, commercial and industrial sector had a quite remarkable increased particularly driven by the climatic conditions in Europe. Additionally, favorable European gas market and a heat wave around Europe mainly led to an increased of gas demand for power generation.

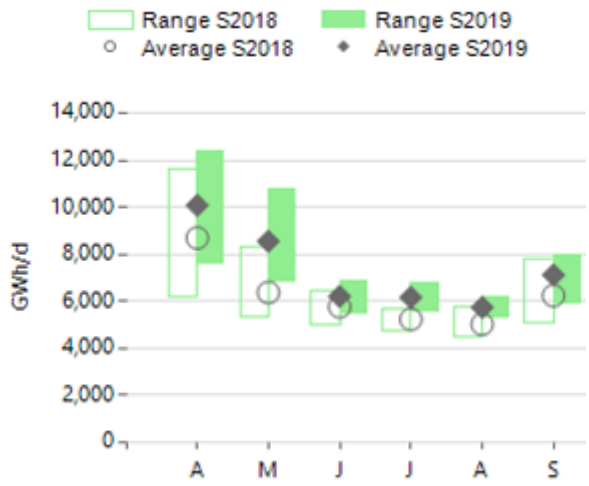

Figure 4. Residential, Commercial and Industrial demand (*).

Figure 5. Power Generation gas demand (*).

(*) *These graphs use data from the countries for which demand breakdown is available (except Austria, Bosnia and Herzegovina, Latvia and Poland).*

> Electricity power generation from gas (TWhe)[3]

The generation of electricity from gas has evolved during last years with slight decrease until 2015 connected with increase of the generation from renewable energy sources (RES). The data also shows a stable thermal gap since 2013 (i.e. power generation coming from thermal fuels) that has been clearly led by coal generation until 2016. It is noticeable that, from summer 2016 onward, the recovery of gas for power generation in the EU resulted in a significant coal to gas switch, even in case of slightly lower power gereration in summer 2019 comparing to the previous year. **Figures 6** and **7** show the seasonal electricity power generation from the different production type.

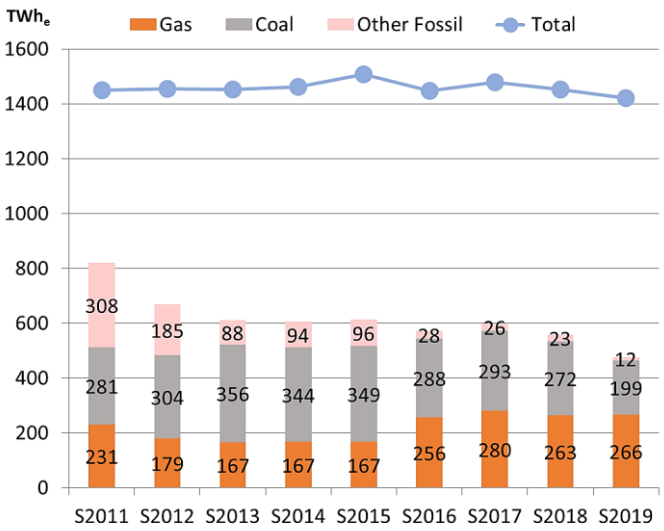

Figure 6. Seasonal electricity power generation. Source: own elaboration based on data provided by ENTSO-E.

In absolute terms, the electricity produced from gas was 266TWhe in summer 2019, representing 19% of the generation mix. According to ENTSO-E figures, compared to summer 2019, gas demand for power generation increases in line with the overall sesonal gas demand trend.

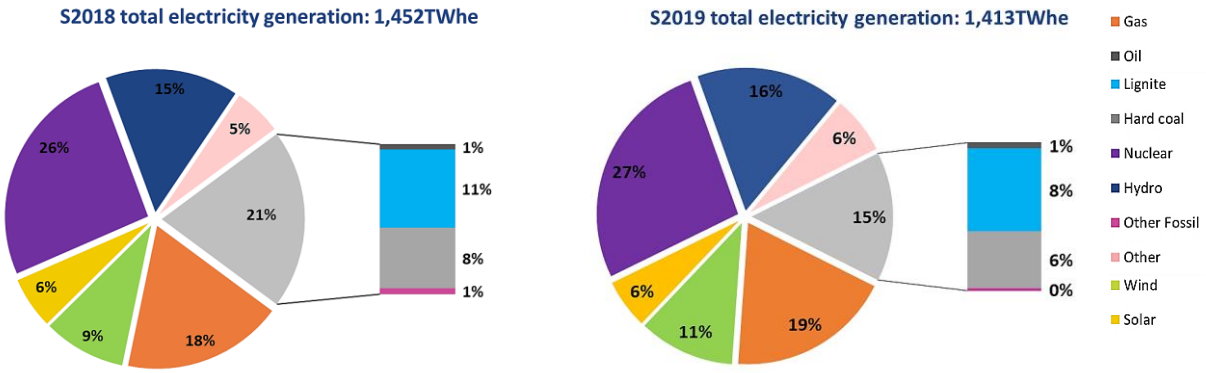

Figure 7. Power generation production type share. Source: own elaboration based on data provided by ENTSO-E.

[3] Efficiency needs to be applied for conversion.

> Summer demand evolution 2015-2019

Figures 8 and 9 show the total consumption and the demand monthly average for summer 2015-2019. In summer 2010 the demand reached 1,945 TWh (maximum not shown in the graph). Since then, the demand has decreased for five years in a row with an accumulative decrease of 18% mainly as a consequences of the economic crises. From 2016 onwards the demand started to increase again until summer 2018, when a drop has been registered. Again, a remarkable increased of demand (14%) has been obserded in summer 2019.

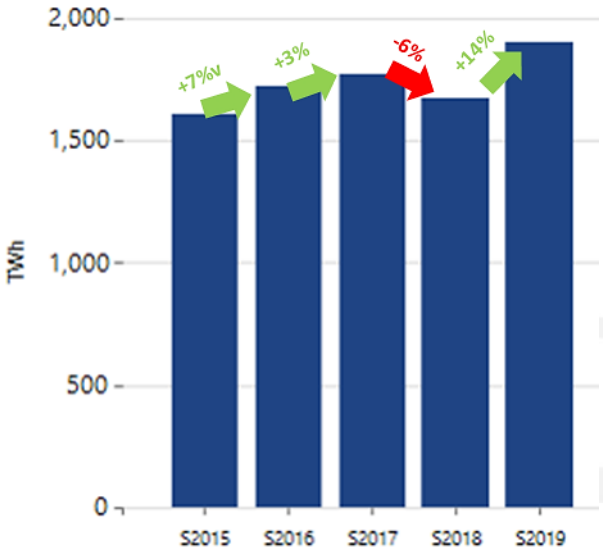

Figure 8. Total consumption Summer 2015-2019.

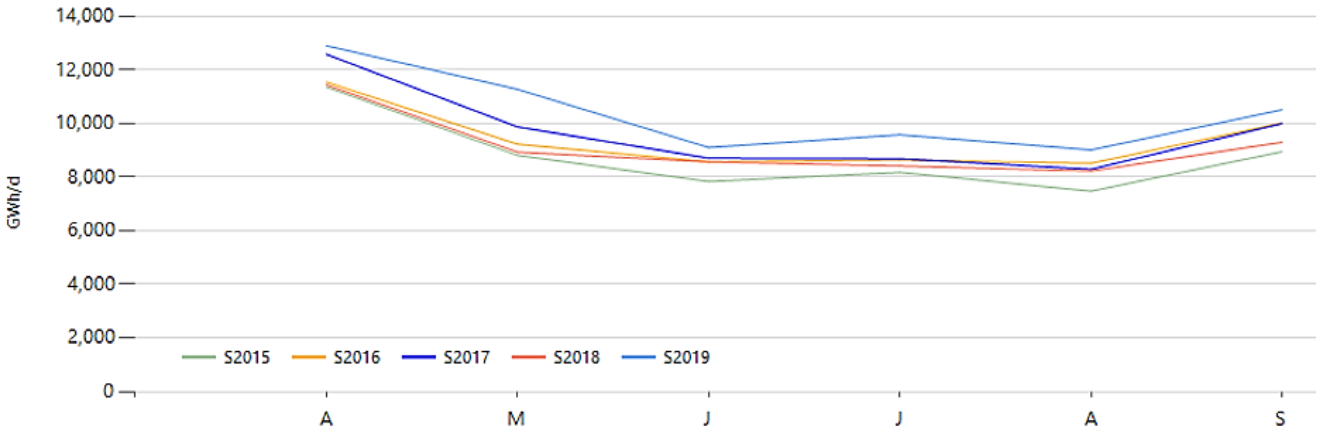

Figure 9. Demand monthly average, Summer 2015-2019.

Figures 10 and 11, show by sector (residential, commercial, industrial and power generation), for those countries that the gas demand breakdown is available. The summer consumption slightly increased from summer 2018 to 2019 in both sectors driven by particular climatic conditions in Europe and favorable European gas market.

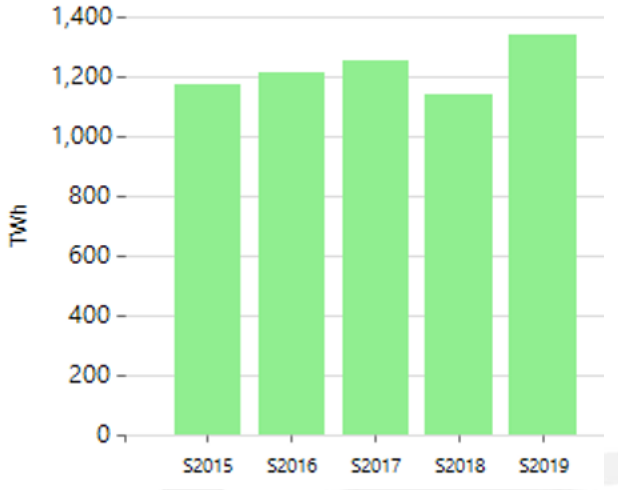

Figure 10. Residential, commercial and industrial consumption. Summer 2015-2019 (*).

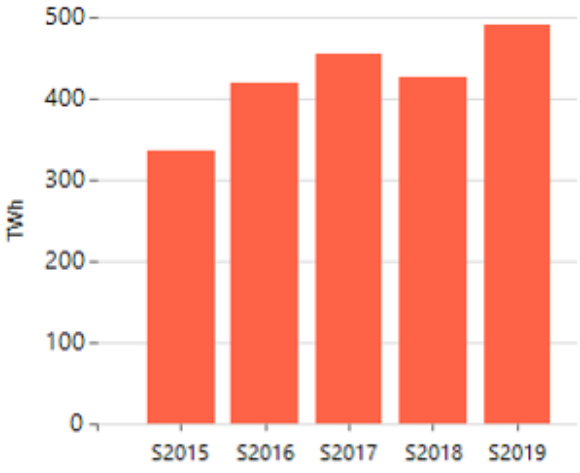

Figure 11. Gas consumption for power generation. Summer 2015-2019 (*).

(*) These graphs use data from the countries for which demand breakdown is available (except Austria, Bosnia and Herzegovina, Latvia and Poland).

> Country detail

The evolution of gas demand on a country level show an increasing, or rather stable in some countries, trend in most of the countries comparing with previous year. Based on the received data, demand for natural gas in all the major European gas markets (Germany, Spain, Italy, France and United Kingdom) increased comparing to the previous summer period at a double digit rate.

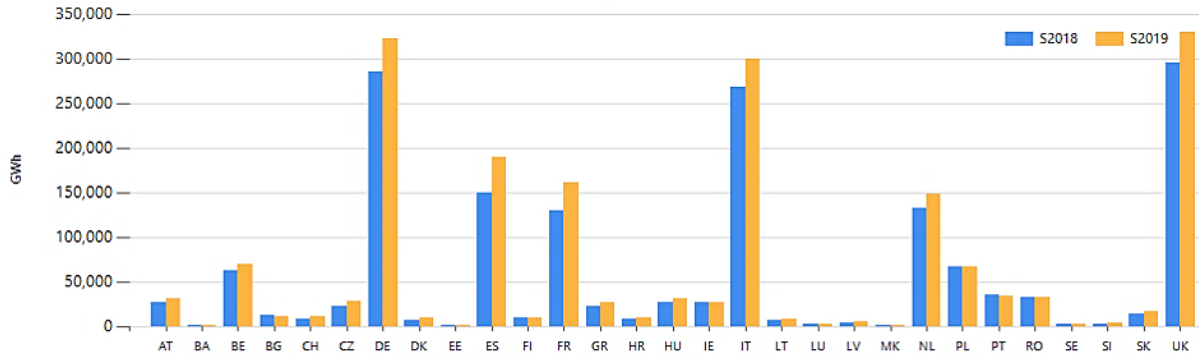

Figure 12. Summer total gas demand. Country detail.

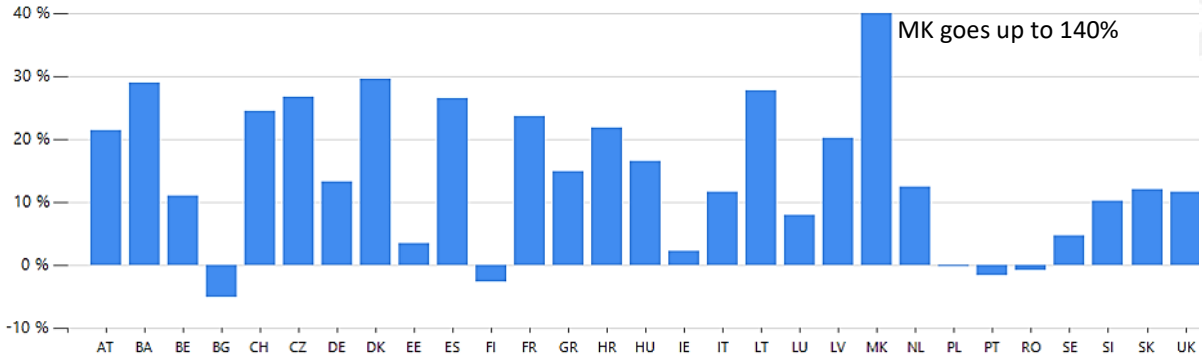

Figure 13. Summer total gas demand. Country detail (difference in % between seasons).[4]

[4] North Macedonia has 140% difference between seasons driven by a significant increase of total gas demand between summer 2018 and 2019, eventhough in volumetric measures the demand is not high compared with other countries within Europe.

> Seasonal modulation

The pattern followed by demand is linked to the climatic conditions from April to September.

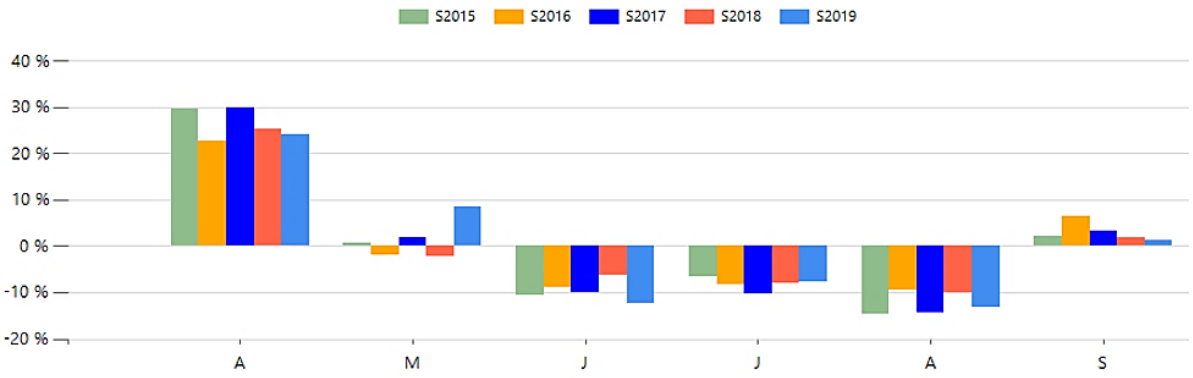

Figure 14. Summer modulation 2015-2019

Figure 14 shows the deviation of the monthly average demand from the summer average for each of the last five summers:

- April is regularly the month with the highest demand.
- Demand in June, July and August are systematically lower than the average.
- May and September are closer to the summer average gas demand, nevertheless in May summer 2019 the demand is slightly higher than the average.

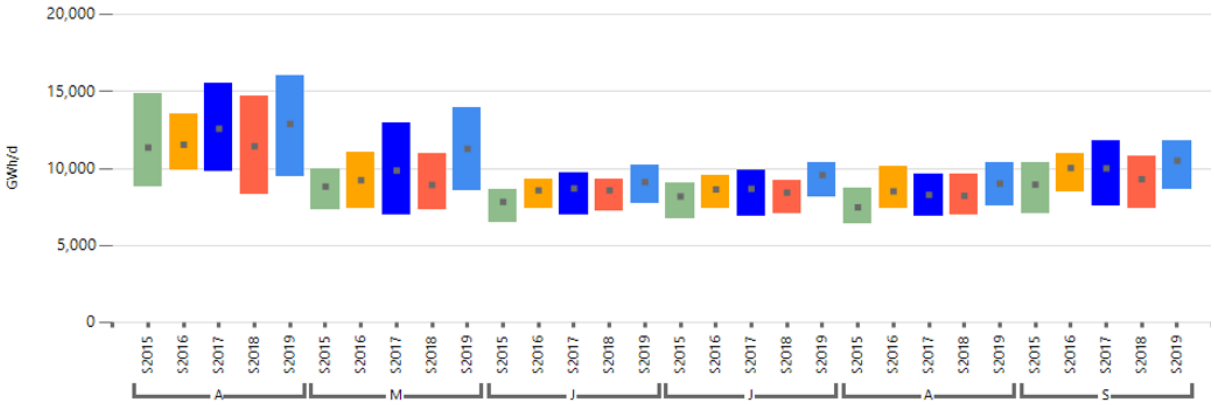

Figure 15. Monthly demand: average and ranges.

Figure 15 shows the monthly variation between the maximum and the minimum daily demand. The rising trend from 2015 to 2017, followed by a decrease in 2018, of the overall averages showing higher values in April and May, and constant values from June to September. Summer 2019, shows an increased in the daily average demand from the levels in 2018 in every month.

Supply

> European seasonal gas supply

Figure 16 shows the evolution of the aggregated gas supply in Europe during summer 2019.

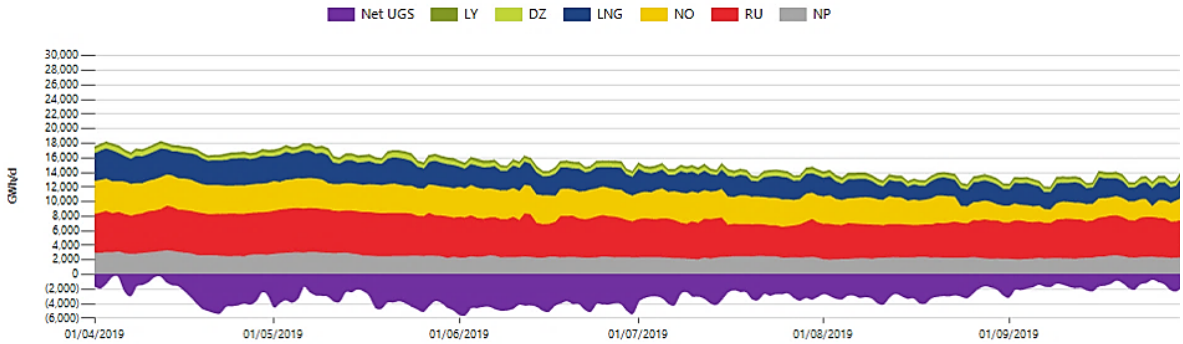

Figure 16. Summer 2019 supply profile.

The next graphs give an overview of National production and supply imported shares during the summers 2018 and 2019 in both absolute and relative terms. The total summer supply in 2019 was 2,757 TWh. **Figure 17** shows the seasonal supplies by source for the last two summers in absolute figures.

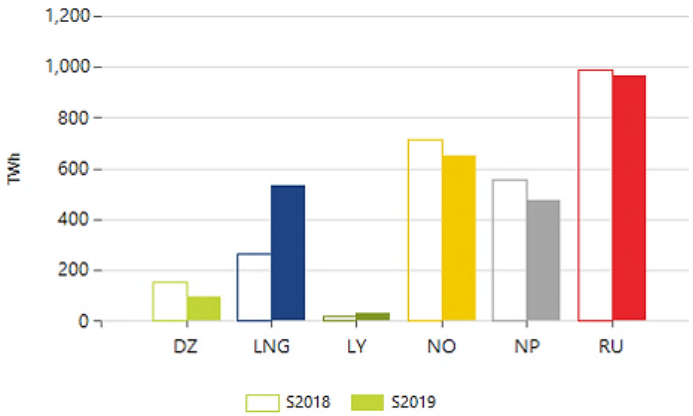

Figure 17. Seasonal supply.

National Production keeps a deacresing trend, as it was observed in previous summer season, deacreasing from 554TWh to 476TWh(14% less). This reduction was driven by a falling domestic production in the Netherlands and other European countries, along with a remarkable higher stock levels during the summer season and arobust inflows of LNG.

Differing from previous summer season, robust inflows of LNG weighed on the market were observed, increasing LNG supply from 265TWh to 531TWh following the high trend of LNG regasification observed during winter 2018/2019, and potentially into the first quarter of 2019, driven by the decrease of Asian LNG prices and high shipping rates, which stoped the Atlantic-produced LNG of being shipped to the Pacific Market. Russian gas supplies to Europe slightly deacreased compared with summer 2018. Moreover, annual Norwegian pipeline gas supplies to Europe slighltly decreased during the summer season compared with previous season, due to maintenance works during August and September.

Figures 18 and 19 show the supply shares in summer 2019 compared with summer 2018. LNG share in supplies faced a remarkable increased of 9% compared with previous summer. The rest of the supply sources remained at similar levels compared to the ones from 2018 with slight decrease in Norway (-2%), Russia(-2%), Algeria (-2%) and european indigenous production (-3%).

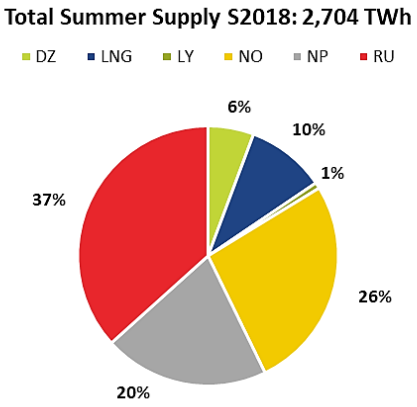

Figure 18. Supply shares. Summer 2018.

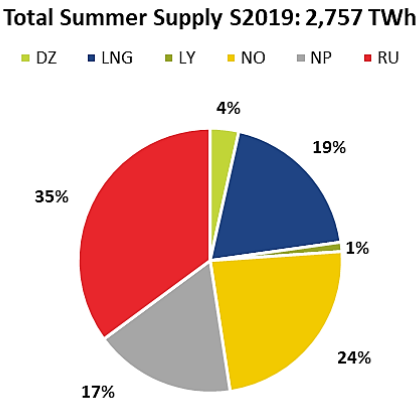

Figure 19. Supply shares. Summer 2019.

> Supply modulation

The following graph (**Figure 20**) illustrates for each import supply sources, as well as for indigenous production, the average flow per month and the monthly range of the last two summer season (lowest and highest daily flow of each month for the summer season).

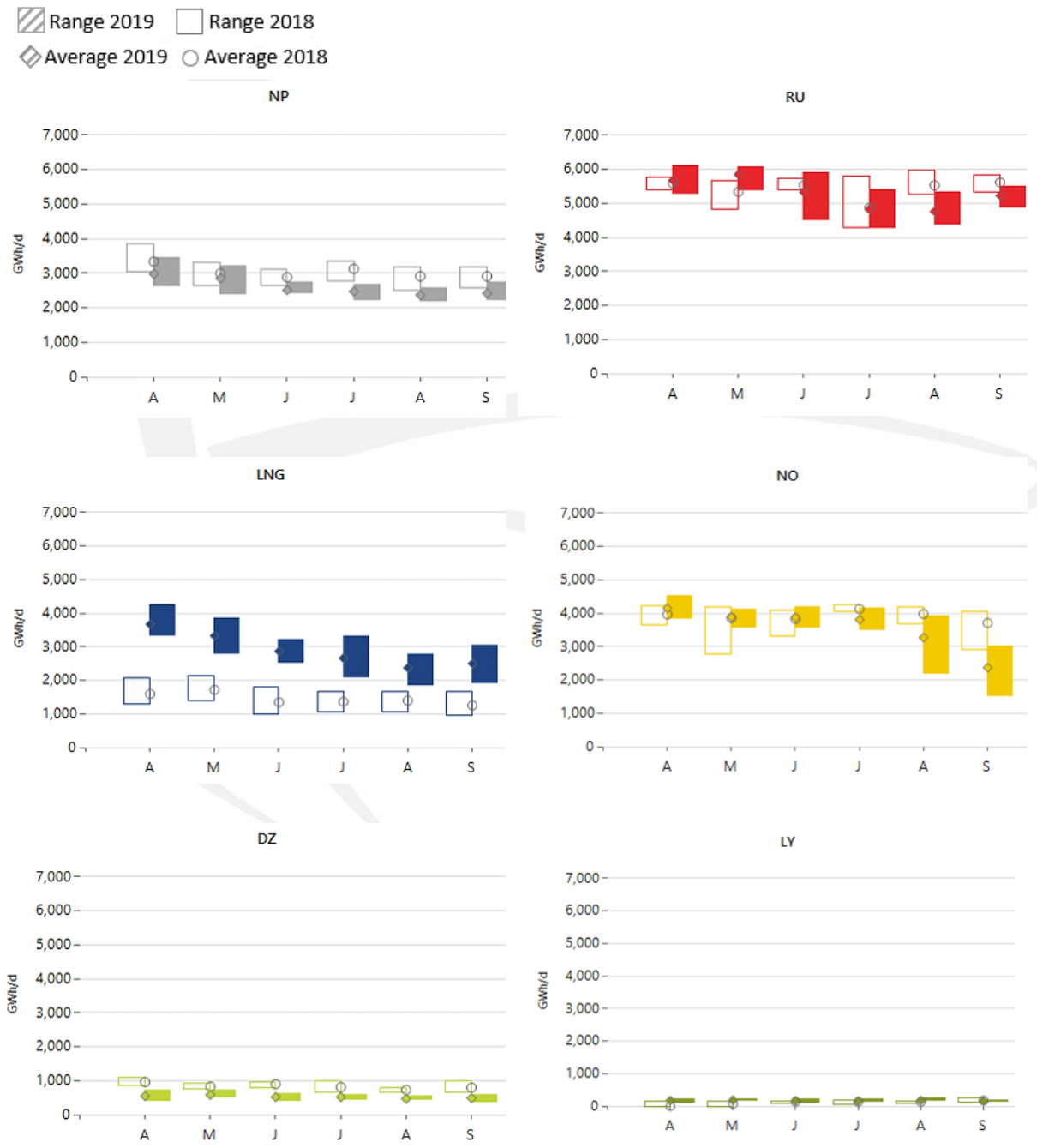

Figure 20. Monthly supply modulation.

Differing from previous season, Russian gas supplies to Europe edged up from April to May, mainly driven by a strong demand for storage injections in central and eastern Europe, droppeding from June to September as demand for Russian gas remained limited by the lack of storage injection capacity. Moreover, annual Norwegian pipeline gas supplies to Europe

decreased significantly during August and September due to maintenance works and increased in the LNG supply.

> Summer supply evolution 2015-2019

Figure 21 shows the evolution of the different supply sources per season, both in absolute and relative terms, during the last five summers.

Figure 21. Evolution of summer gas supplies 2015-2019.

> Underground Storages

The evolution of the injection season depends on many factors, in particular the willingness of shippers to inject gas and the actual amount of gas available for injection after the gas demand is satisfied. The first factor may be linked to price signals such as summer/winter spread, unless the national regulatory framework implies some mandatory injection, and the second one is linked to climatic and economic considerations. **Figure 22** shows USG injection and withdraw profile of European storages.

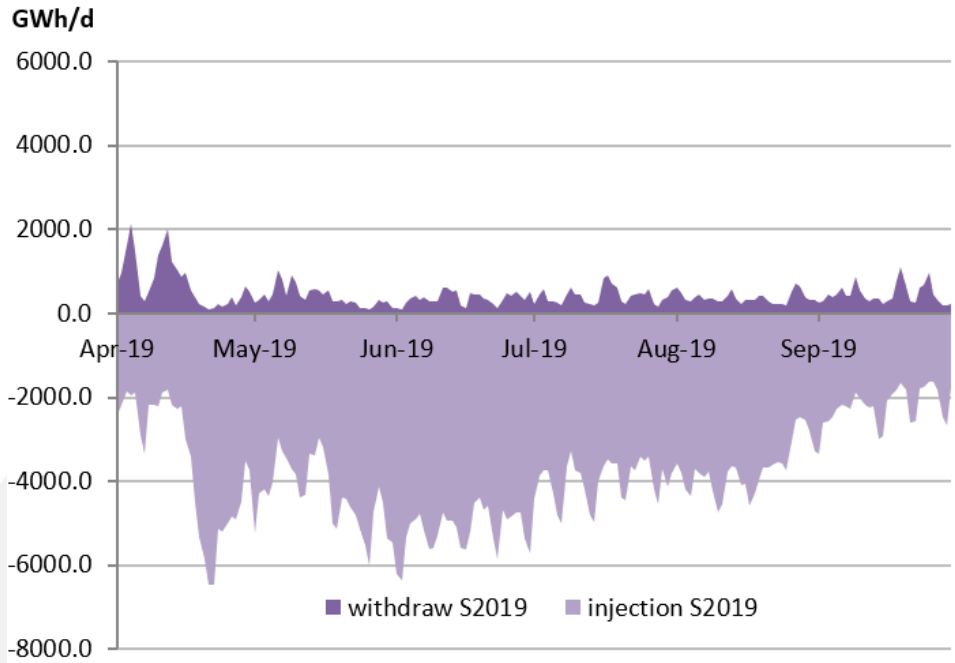

Figure 22. UGS injection/withdraw profile EU-28 storages.

Figure 23 provides the average injection and the daily range between the lowest and highest injection for the whole Europe for every month of the Summers 2018 and 2019.

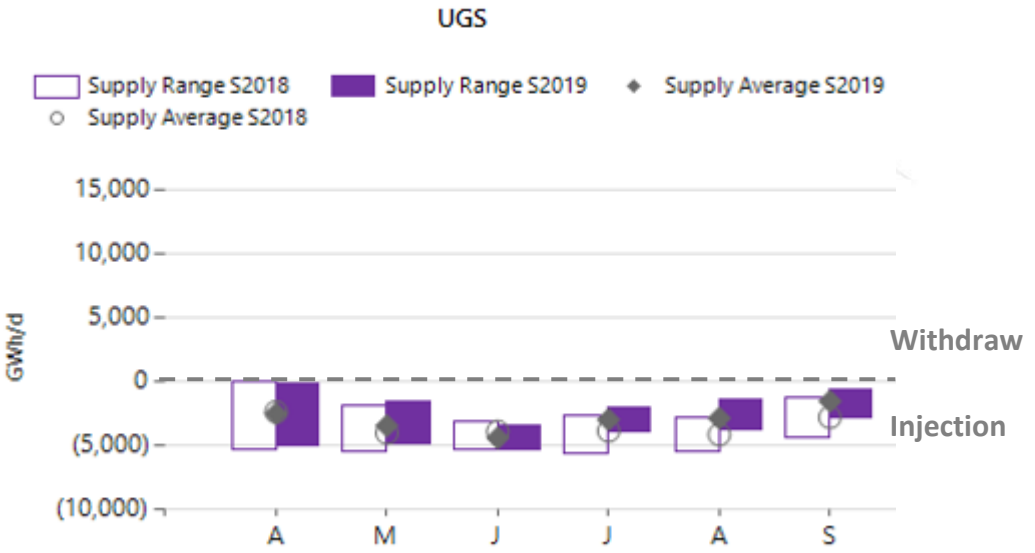

Figure 23. UGS net injection (negative figures mean positive net injection).

Table 1 provides the evolution of the stock level as a percentage of the WGV during summer (source GSE AGSI platform).

Table 1. Stock level 2019

Country (%)	01-Apr	01-May	01-Jun	01-Jul	01-Aug	01-Sep	01-Oct	max stock level	date
AT	48.56	59.9	71.1	81.3	92.41	97.14	100	100	15/10/2019
BE	34.91	44.73	57.18	74.45	85.67	97.2	97.3	97.36	09/10/2019
BG	24.87	29.1	43.7	58.82	73.98	84.83	96.53	99.35	13/10/2019
CZ	37.97	47.39	58.97	79.7	89.01	96.16	97.49	97.61	18/10/2019
DE	53.94	60.96	70.59	81.92	85.88	95.61	98.24	99.7	10/11/2019
DK	56.06	66.02	77.22	88.28	95.87	98.15	97.31	98.24	27/11/2019
FR	29.33	43.09	55.22	69.61	82.77	95	98.09	99.72	19/10/2019
ES	57.34	58	61.38	66.2	74.44	79.47	87.93	95.77	19/11/2019
HR	24.78	34.49	47.06	63.27	77.25	88.9	96.6	98.72	29/10/2019
HU	48.56	59.9	71.1	81.3	92.41	97.14	100	97.84	26/10/2019
IT	38.05	47.07	59.25	71.58	81.81	91.01	96.99	98.99	03/11/2019
LV	14.97	11.55	19.78	32.6	47.22	60.18	72.03	74.77	21/10/2019
NL	49.61	54.3	64.4	78.03	87.33	96.05	100	100	02/10/2019
PL	41.38	44.18	55.7	67.45	83.59	93.68	100	100	29/10/2019
PT	41.38	44.18	55.7	67.45	83.59	93.68	100	100	29/10/2019
RO	11.44	14.89	26.82	44.74	60.23	75.53	89.31	98.7	21/11/2019
SK	28.96	44.08	65.57	84.95	85.67	96.47	97.68	99.65	22/10/2019
UK	43.51	46.33	52.61	37.78	64.24	83.47	78.83	96.07	11/11/2019
EU Total	41.06	49.15	60.29	73.1	82.71	92.36	96.93	97.83	27/10/2019

The storage level at the beginning of the summer 2019 was the highest storage level compared to the previous summers, 43% on April 1st. The stock level increased reaching the highest level of the last five summers (97%) by the end of September. These high stock level have been mainly attibuted to comparatively more comfortable supply and flexibility during the winter season (2018/2019) and summer season 2019, as well as favorable situation on the European gas market and climatic conditions. For many operators, the injection season continued in October and November 2019. **Figure 24** compares average stock level evolution curve of the last five summers (source AGSI).

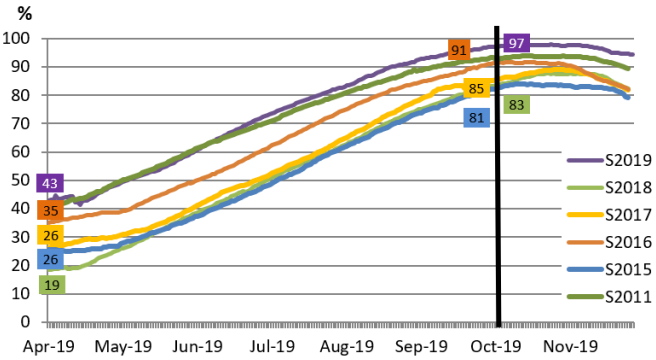

Figure 24. Evolution of stock level. Summers 2015-2019 (AGSI)

Table 2. Stock level: 30 September vs. maximum of the year (AGSI).

Summer	30 Sep.	Maximum stock level	
S2015	81%	84%	13/10/2015
S2016	91%	92%	09/10/2016
S2017	85%	89%	29/10/2017
S2018	83%	88%	07/11/2018
S2019	92%	98%	27/10/2019

Table 2 shows the stock level on September 30th in comparison with the maximum stock level at the end of the injection season. The maximum stock level reached in 2019 was 98%, 10% higher than previous summer season and the highest maximum of the last five summers.

Transported gas

The overall transported gas at the EU aggregated level is the sum of gas demand, exports and injection for each month.

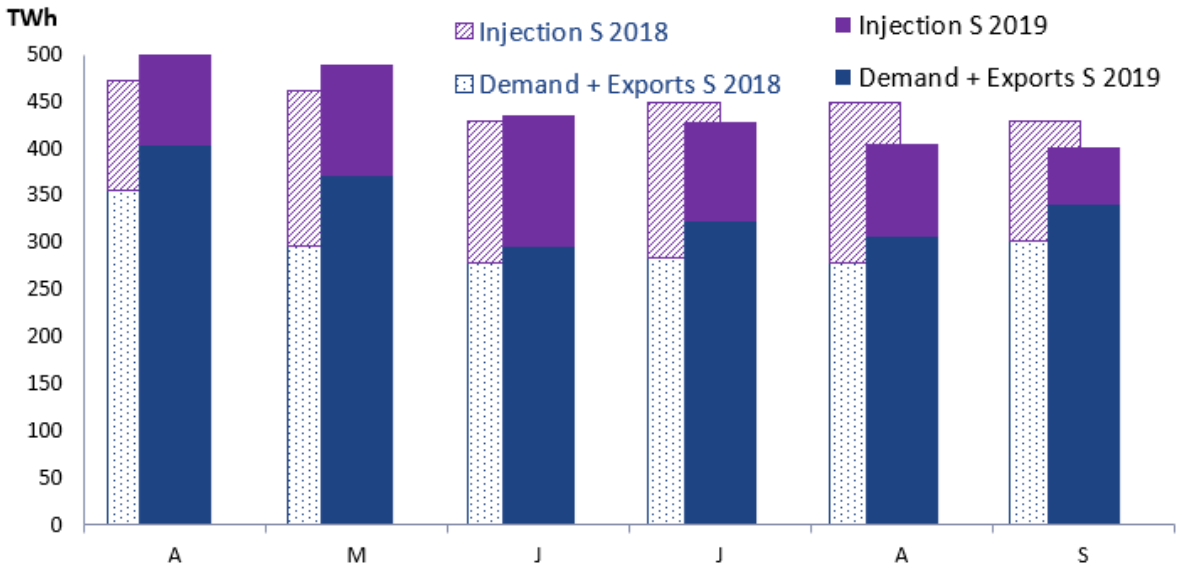

Figure 25. Transported gas.

As observed in **Figure 25**, the total transported gas during Summer 2019 (2,665TWh) in comparison with those of the previous summer season (2,698TWh) were 1,2 % lower. Demand plus exports were higher, every month during the whole season, than the ones from the previous summer; while UGS injection was lower, mainly driven by a higher level of the storages at the beginning of the summer.

Publisher ENTSOG AISBL
Avenue de Cortenbergh 100
1000 Brussels, Belgium

Co-Authors Paula Di Mattia, Kacper Zeromski and Jacques Reberol

Cover picture Courtesy of Teréga

ENTSOG AISBL
Avenue de Cortenbergh 100 | 1000 Brussels, Belgium
Tel. +32 2 894 51 00

info@entsog.eu | www.entsog.eu