entsog

european network
of transmission system operators
for gas

ENTSOG
SUMMER SUPPLY REVIEW

2018

Table of Contents

Executive Summary 3
Introduction 4
Seasonal Overview 4
Market Overview 4
Gas Prices at European hubs 5
Supply 10
Transported volumes 16

Executive Summary

ENTSOG has completed the review of the European gas picture for Summer 2018, 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 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 activities.

The key findings of this review are:

- Seasonal Gas demand in Europe was lower (-5,6%) than the one from previous summer reaching 1,673 TWh, changing a trend from two previous seasonal increase in a row.
- European indigenous production share in supplies decreased significantly (from 25 to 21%) and Russian gas increased (+2%) reaching a 38% of the supplies share during last summer season.
- The stock levels increased enough along the season to reach a high level of 83% by the end of September and 88% by the last days of October. Very low stock level at the beginning (19% average for EU) was caused by cold spell in the end of February 2018,
- Low storage levels were observed in UK (58,3%) and Belgium (50,6%) at the end of the summer season.

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 activities and be beneficial to the quality of further reports.

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

Introduction

This review is published on a voluntary basis and aims at providing an overview of the demand and supply balance during summer 2018. 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 can not be captured at national level 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 Overview[2]

Different events on the European gas market caused fluctuations in the supply and demand balance from April to September 2018. The major ones were:

- Dutch TTF natural gas spot pricing posted a solid annual increase in July, despite a relatively mild monthly increase, as maintenance work on Russian pipelines failed to boost spot pricing significantly.
- Lower gas export from Norway to Continental Europe and UK at the beginning of the summer period.
- The Netherlands continued to look abroad to meet its gas demand on the back of falling production from the Groningen field.

Market Overview[2]

Other general gas related topics of sifnificance were also noticeable during the previous summer period, standing out:

- Cold spell at the end of winter period caused significantly higher storage usage than previous winter. Due to this situation, average stock level in the UGS in Europe at the beginning of the April was very low comparing to the previous years.
- Heatwave in Europe boosted air conditioning demand for electricity while reducing output at hydroelectric and river-cooled nuclear power plants, keeping high the need for flexible gas-fired generation.

[2] Source: Platts

Gas Prices at European hubs

The following graphs show the evolution of gas prices in Europe during Summer 2018, and also the overall monthly ranges and averages in comparison to those of 2017.

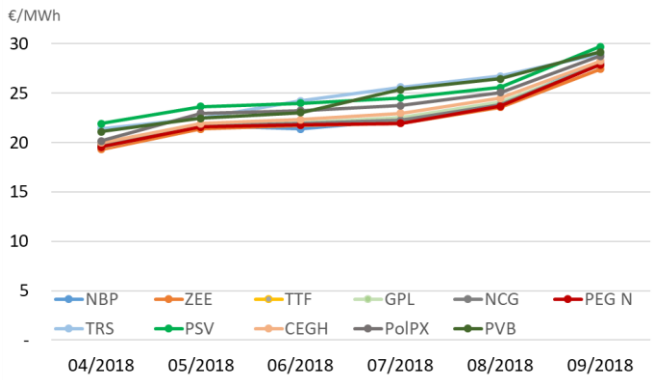


Figure 1 - Month-ahead average price at EU Hubs [3]

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 2 compares the maximum range and average of the month-ahead summer price for the last two summers over all the European hubs (source Bloomberg).

The average price over all hubs increased significantly in 2018, showing as general trend much higher price levels when compared to the ones seen in the previous summer.

The price ranges were smaller in first half and higher in second half of the year than price ranges in 2017. The price convergence between the European hubs continued and were following similar price signal.

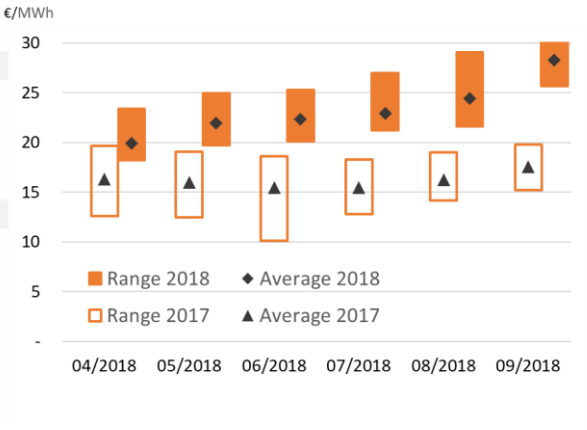


Figure 2 - Range and average of the prices

[3] Source: Bloomberg

Demand

> European seasonal gas demand

Total gas demand was 1,673 TWh in Summer 2018, 5,6% lower than the one in the previous summer.

Figure 3 shows how the average demand levels in July and August were very close to those from the previous summer.

In beginning and end of the summer the average decreases significanly, in line with the maximum levels reached each month.

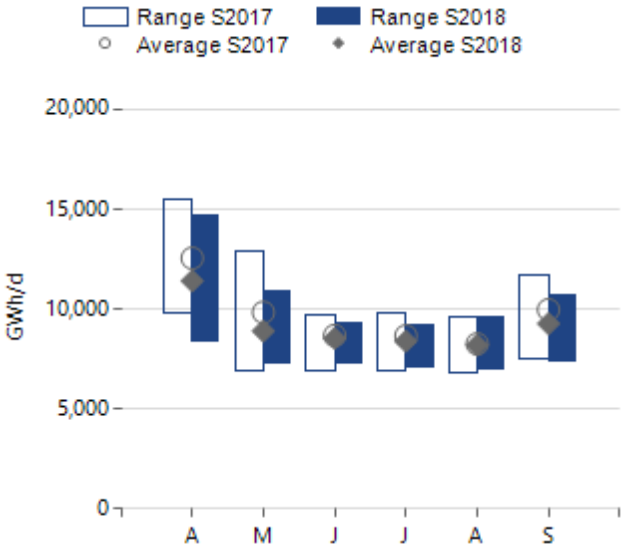


Figure 3 – Total gas demand

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.

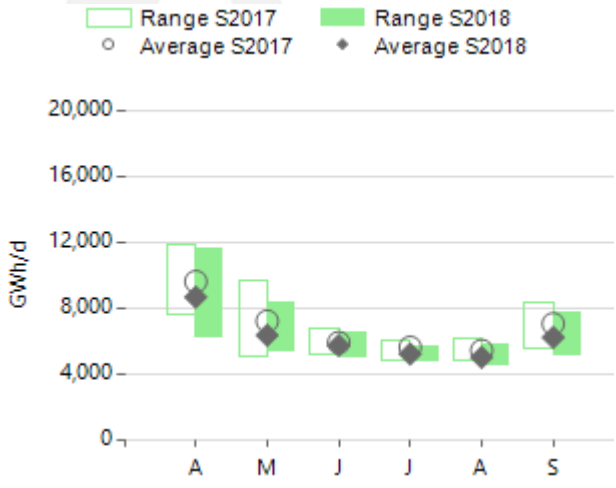


Figure 4 - Residential, Commercial and Industrial *

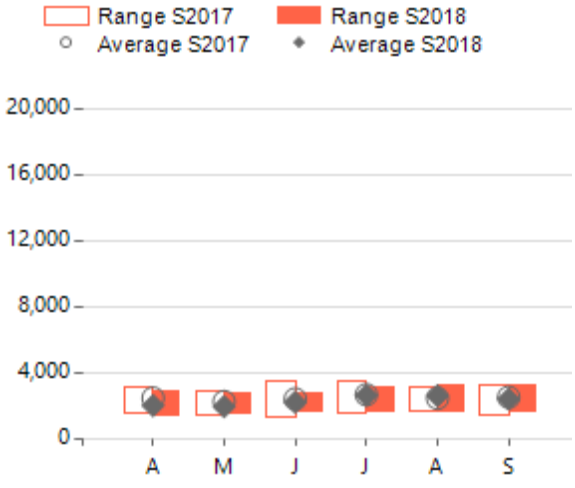
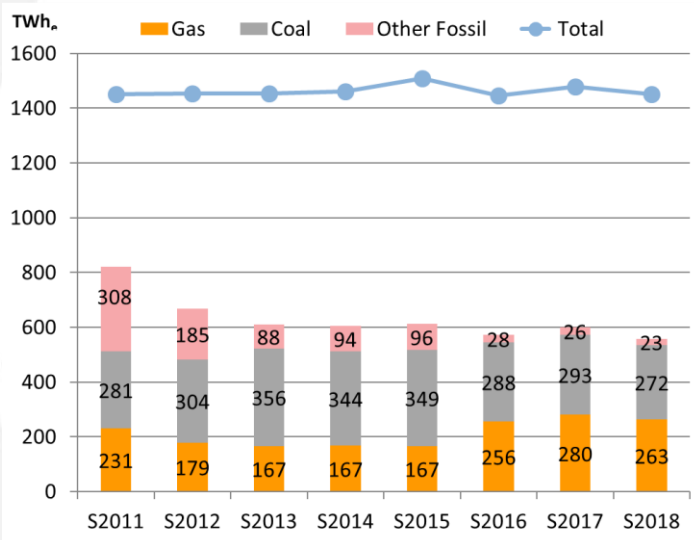


Figure 5 - Power Generation gas demand *

(*) These graphs use data from the countries for which demand breakdown is available (except Austria, Bulgaria (from 2016 breakdown included), Latvia and Poland)

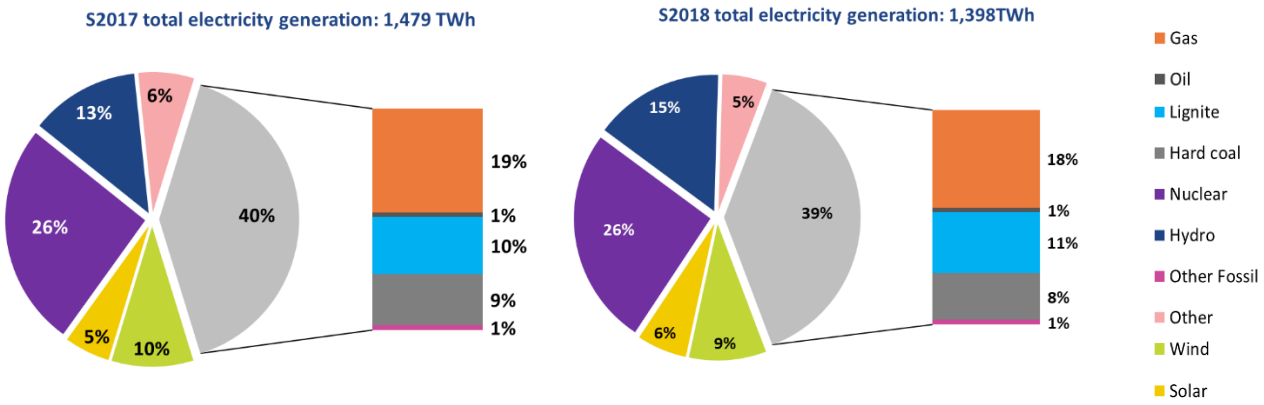
> Electricity power generation from gas (TWhe)

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 since 2016 the recovery of gas for power generation in the EU resulted in a significant coal to gas switch that has been confirmed in summer 2017 and 2018, even in case of slightly lower power gereration in summer 2018 than comparing to the previous year.



Source: own elaboration based on data provided by ENTSO-E

In absolute terms, the electricity produced from gas was 245 TWh in summer 2018, representing 18% of the generation mix. According to ENTSO-E figures, compared to summer 2017, gas demand for power generation decreased in line with the overall trend.



> Summer demand evolution 2014-2018

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% since 2010. After a significant increase in 2016 (+7.4%) and 2017 (+2,85%) summer 2018 registered drop in demand (-5.5%).

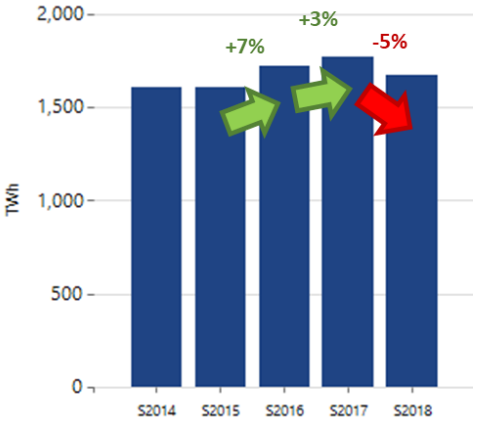


Figure 9 - Total consumption Summer 2014-2018

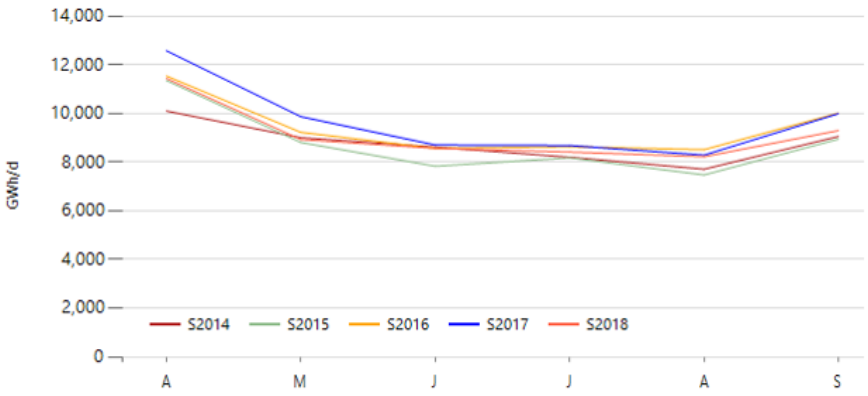


Figure 10 - Demand Monthly average. Summer 2014-2018

As shown below by sector in **Figures 11 and 12**, for those countries where the gas demand breakdown is available, Residential, Commercial and Industrial consumption slightly decreased during summer 2018. Same trend was observed for power generation where demand decreased in comparison to the 2017.

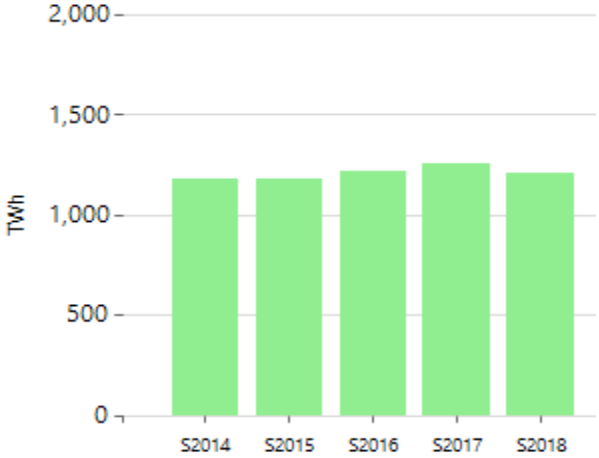


Figure 11 - Residential, commercial and industrial consumption. Summer 2014-2018 *

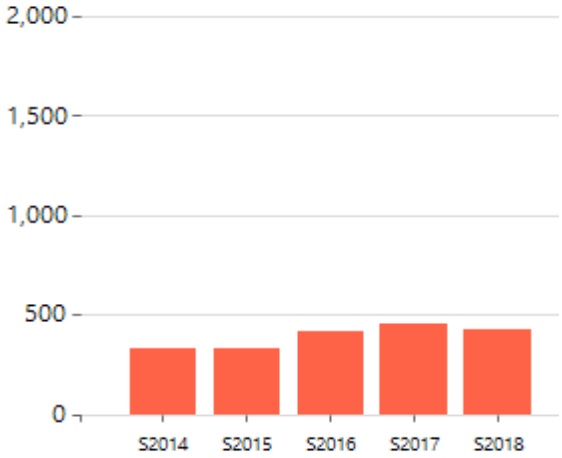


Figure 12 - Gas consumption for power generation. Summer 2014-2018 *

(*) These graphs use data from the countries for which demand breakdown is available (except Austria, Bulgaria (from 2016 breakdown included), Latvia and Poland)

> Country detail

The evolution of gas demand on a country level was diverse and showed variations in both directions but in main cases demand was lower comparing to previous year. Based on the received data, demand for natural gas in Germany significantly dropped comparing to the previous summer period. Only in few countries (Bulgaria, Estonia, Finland, Ireland, Latvia and United Kingdom) noticed increase in the demand, while in case of UK it was very significant comparing to summer 2017.

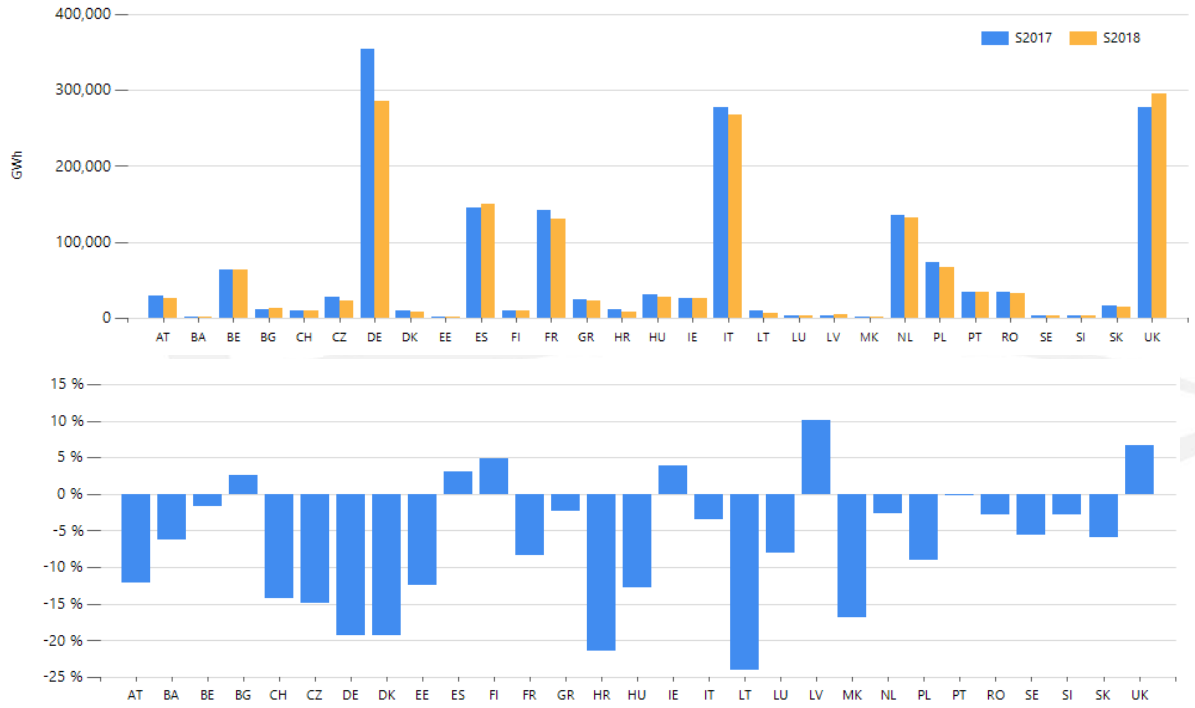


Figure 13 – Summer total gas demand. Country detail

> Seasonal modulation

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

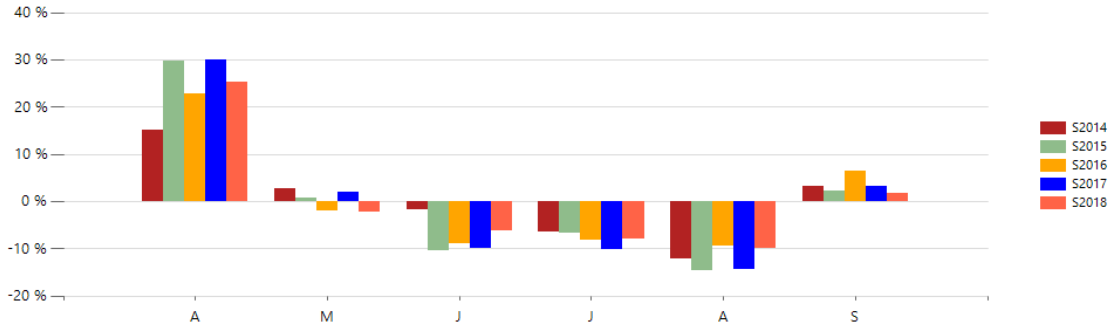


Figure 14 - Summer modulation 2014-2018

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
- March and September are always very close to the summer average gas demand.

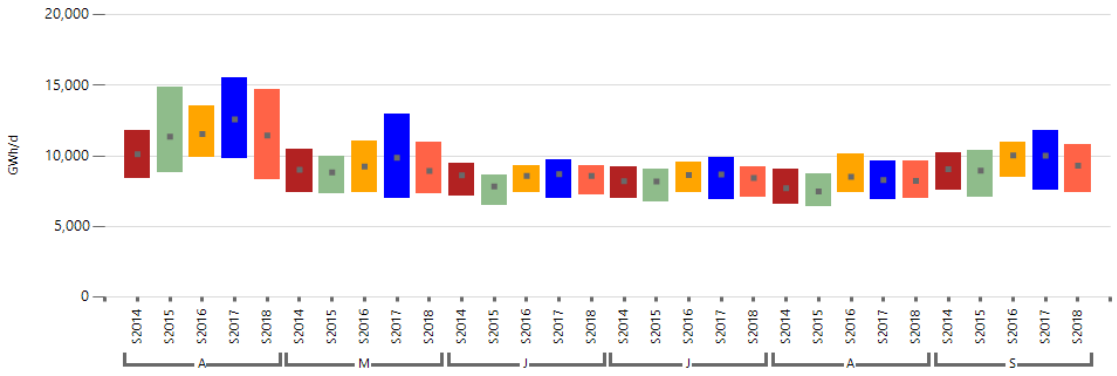


Figure 15 - Monthly demand: average and ranges

Figure 15 shows the monthly variation between the maximum and the minimum daily demand. From 2015, the rising trend followed during the last years has been constant and overall averages have increased over again in 2017 with higher values from April to June, and constant ones in August and September. Last summer, daily average demand decreased from the levels in 2017 in every month.

Supply

> European seasonal gas supply

Figure 16 shows the evolution of the aggregated gas supply in Europe during summer 2018.

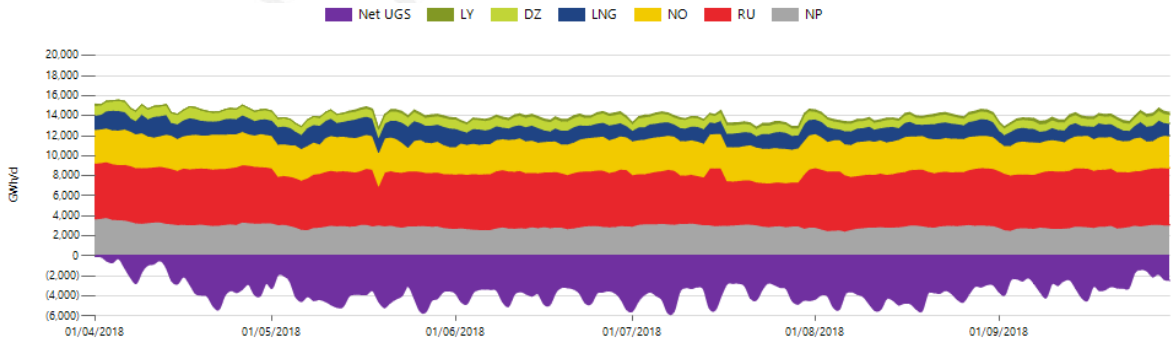


Figure 16 - Summer 2018 supply profile

The next graphs give an overview of National production and supply imported shares during the summers 2018 and 2017 in both absolute and relative terms.

The total summer supply in 2018 was 2,578 TWh.

Figure 17 shows the seasonal supplies by source for the last two summers in absolute figures.
The increase in Russian supply was notable. National Production significantly decreased comparing previous summer (15% less - from 649 TWh to 553 TWh).

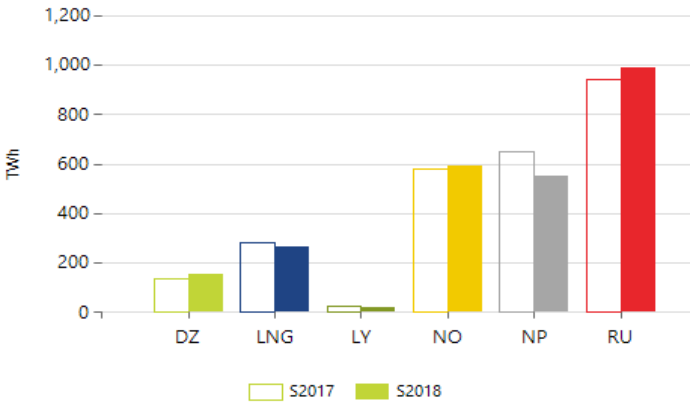


Figure 17 - Seasonal supply

LNG slightly decreased with a small growth in Norway and Algeria supply compared to last summer.

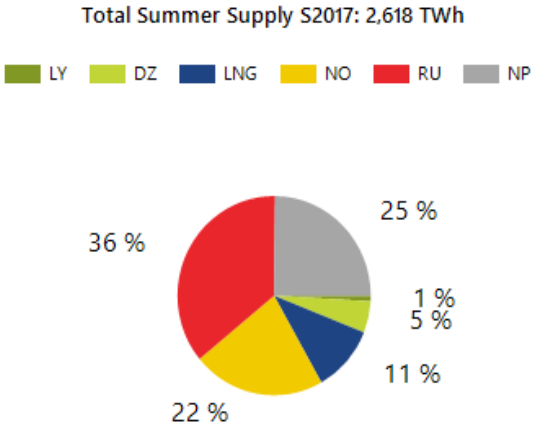


Figure 18 - Supply shares. Summer 2017

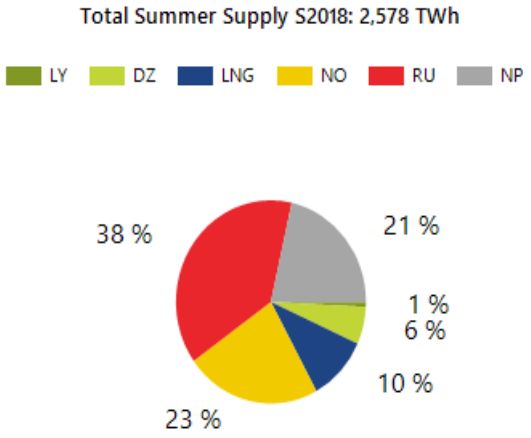


Figure 19 - Supply shares. Summer 2018

National Production share in supplies decreased (4%) comparing with previous summer. Rest of the supply sources remained at similar levels to the ones from 2017 with slight increase in Norway and Algeria (+1%) and slight decrease in LNG (-1%) and Lybia (<-1%). Only share of Russian supply in the Europe raised 2% comparing with summer 2017.

> Supply modulation

The following graphs illustrate for each of the import supply sources, as well as for national production, the average flow per month and the monthly and seasonal range of the last two years (lowest and highest daily flow of each month for the summer).

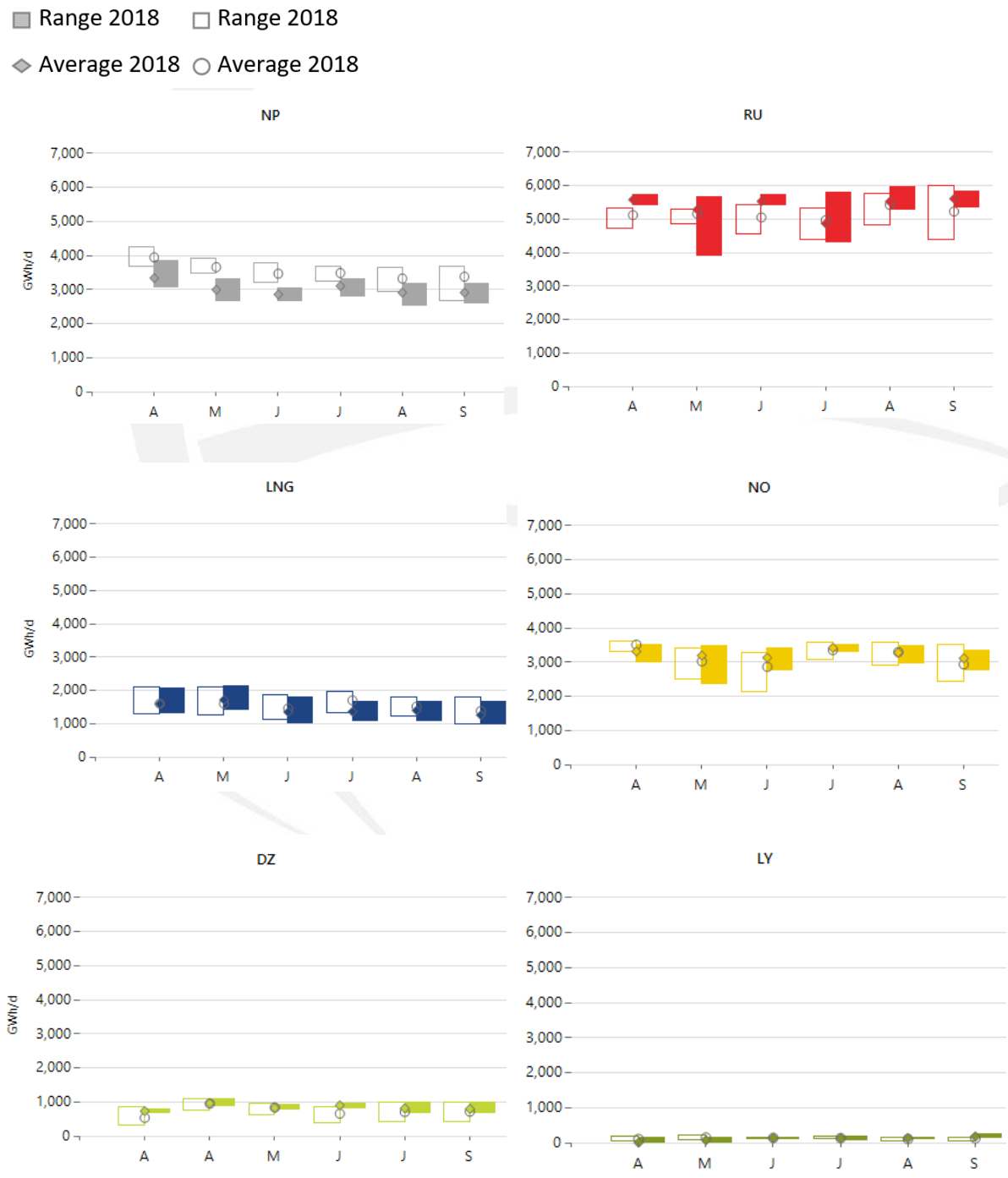


Figure 20 - Supply modulation

> Summer supply evolution 2014-2018

The following graphs show the evolution of the different supply sources both in absolute and relative terms during the last six summers.

Figure 21 - Evolution of summer gas supplies 2014-2018

> Underground Storages[4]

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.

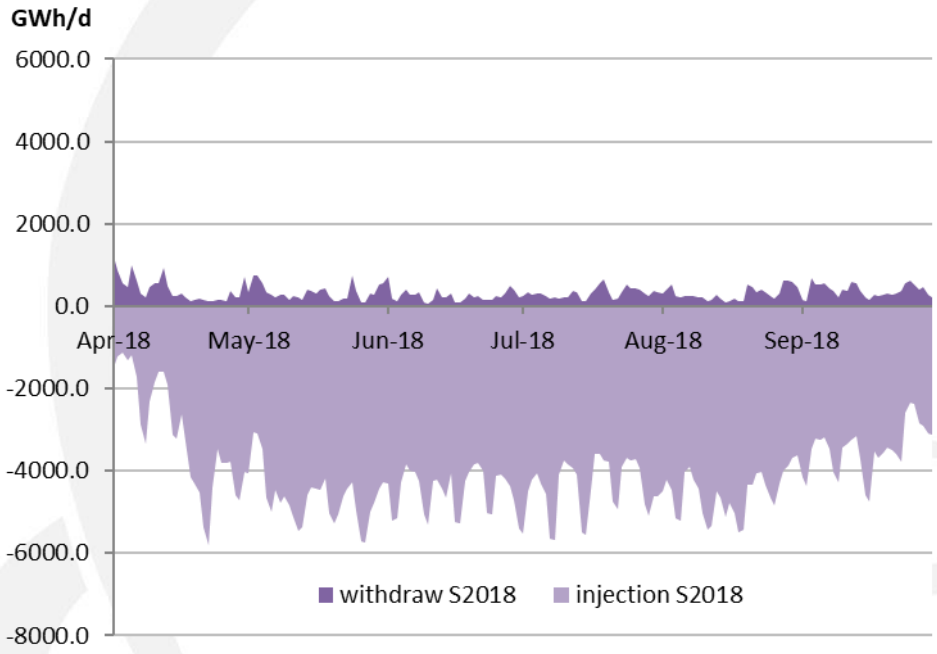


Figure 22 - UGS injection/withdraw profile EU-28 storages.

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 2017.

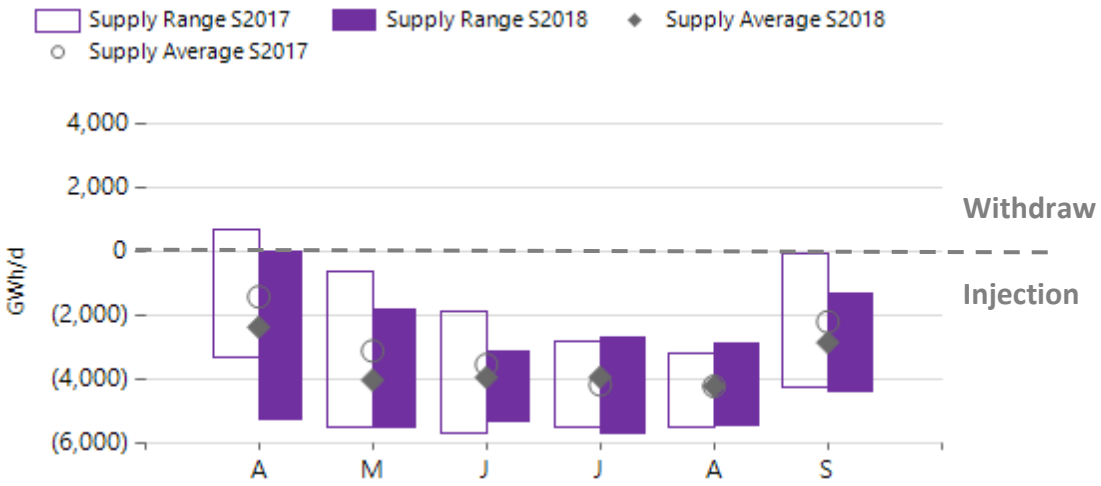


Figure 23 - UGS net injection (negative figures mean positive net injection)

[4] for the purpose of this summary Latvian storage is not taken into account as there was no injection/withdrawal data on AGSI platrofm for Summer 2018 period

The next table provides the evolution of the stock level as a percentage of the WGV during summer (source GSE AGSI platform):

Country (%)	1-Apr-18	1-May-18	1-Jun-18	1-Jul-18	1-Aug-18	1-Sep-18	1-Oct-18	max stock level	date
AT	14.6	23.8	32.6	42.1	51.5	62.5	69.3	78.4	2018-11-17
BE	2.0	0.3	13.4	24.0	38.1	46.7	50.6	54.5	2018-10-24
BG	26.2	31.6	41.1	57.0	66.8	76.4	84.1	84.1	2018-10-10
CZ	21.5	27.7	39.5	50.4	64.0	79.6	89.0	92.2	2018-10-29
DE	14.4	22.1	36.8	47.5	59.4	72.4	80.3	87.9	2018-11-12
DK	13.8	15.1	24.1	37.9	55.8	69.6	82.7	95.3	2018-11-18
FR	2.9	10.6	26.1	41.1	59.8	76.4	88.6	94.4	2018-10-27
ES	56.5	59.9	61.4	63.8	65.2	68.1	72.6	76.5	2018-10-24
HR	26.7	29.4	39.5	50.9	67.7	79.4	85.7	93.8	2018-11-12
HU	20.2	25.9	34.9	47.8	55.7	63.5	71.2	71.2	2018-10-01
IT	45.6	43.7	57.9	69.8	80.0	89.2	95.5	97.6	2018-10-30
NL	6.0	17.8	30.6	46.1	60.7	77.3	91.4	96.4	2018-10-30
PL	35.7	41.4	54.3	69.4	82.2	90.4	98.3	98.6	2018-10-10
PT	35.7	41.4	54.3	69.4	82.2	90.4	98.3	98.6	2018-10-10
RO	12.6	21.3	28.3	36.6	47.4	57.9	68.4	71.9	2018-11-04
SK	4.8	13.4	23.1	31.2	39.2	54.3	61.9	69.8	2018-11-15
UK	10.4	18.3	18.7	35.9	60.5	83.9	58.3	100.0	2018-11-20
EU Total	**18.6**	**26.0**	**38.3**	**50.2**	**62.2**	**74.5**	**83.0**	**87.6**	**2018-11-07**

Figure 24 - Stock level (%WGV)

Figure 25 compares average stock level evolution curve of the last five summers (source AGSI).

Having started from lowest level compared to the previous summers, 19% on the 1st April, the stock level increased enough to reach an 83% level by the end of September.

For many operators, the injection season continued in October and November 2018.

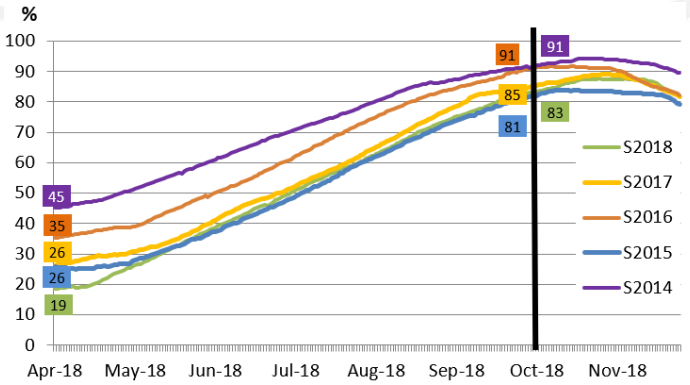


Figure 25 - Evolution of stock level. Summers 2014-2018 (AGSI)

Summer	30-Sep	maximum stock level	
S2014	92%	94%	23/10/2014
S2015	81%	84%	13/10/2015
S2016	91%	92%	09/10/2016
S2017	85%	89%	29/10/2017
S2018	83%	88%	07/11/2018

Figure 26 - Stock level: 30 Sept vs. max (AGSI)

Figure 26 shows the stock level on the 30th September in comparison with the maximum stock level setting the end of the injection season. The maximum stock level reached in 2018 was 88%, one percent lower than the previous summer season and 6% under 2014 maximum.

Transported volumes

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

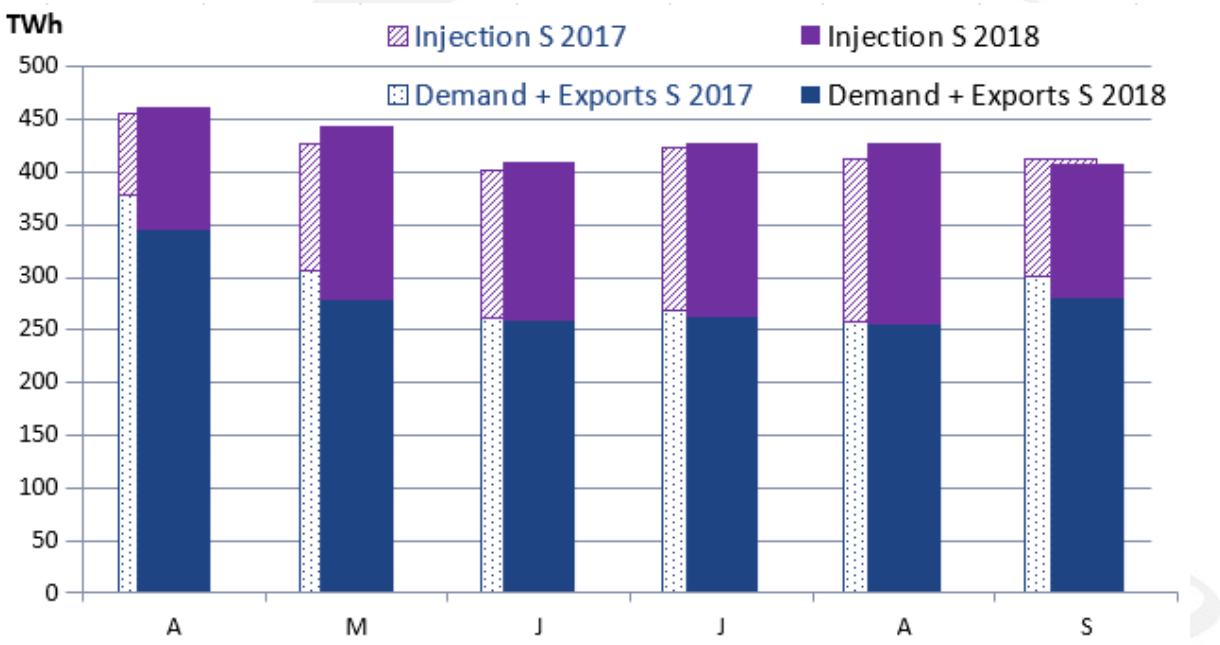


Figure 27 - Transported gas

The total transported volumes during Summer 2018 (2,572 TWh) in comparison with those of the previous summer season(2,532 TWh) were 1,6 % higher .

The transported volumes were higher than the ones from the previous summer, every month during the whole season except September, mainly due to an increase in the UGS injection. Even if sum of demand and export of the gas in 2018 were lower, injection to the storages was higher in every month.

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Cover picture Courtesy of Snam

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