



# Summer Review 2017

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## Executive Summary

ENTSOG has completed the review of the European gas system for Summer 2017, April to September. The seasonal Reviews aim at a deeper comprehension of the development of demand and supply for 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 to ensure a consistent improvement of ENTSOG reports, as well as in the ongoing R&D activities.

The key findings of this review are:

- Seasonal Gas demand in Europe was higher (+5.4%) than the previous summer, reaching 1,817 TWh- a second seasonal increase in a row.
- This last summer registered the highest gas demand for power generation since 2010 with 280 TWh.
- European indigenous production remained constant and Russian supplies increased (+3%) reaching a 36% share of supplies during last summer season.
- The stock levels increased enough along the season to reach a high level of 85% by the end of September and 89% by the last days of October.
- Low storage levels were observed at the end of the summer season in Latvia (49%), UK<sup>1</sup> and Portugal (both at 53%).

Detailed data for the cross-border flows is available on the Transparency Platform<sup>2</sup>.

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<sup>1</sup> Rough storage is not considered for UK in [AGSI platform](#).

<sup>2</sup> Transparency Platform: <https://transparency.entsog.eu/>

## Introduction

This review, undertaken as part of work for the ENTSOG Annual Work Programme 2018, is published on a voluntary basis and aims at providing an overview of the demand and supply balance during summer 2017. 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 TYDNP.

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.

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.

## Seasonal Overview

Different technical events on the European gas system caused fluctuations in the supply and demand balance from April to September 2017. The major ones were:

- Dutch Economic Affairs Minister planned for a further restriction to the L-gas yearly average production of the Groningen gas field, from 24 to 21 bcm.
- Strong gas demand for power generation, plus storage injection, incentivised more LNG regasification during the summer.
- Norwegian exports in August and September were at high levels despite the maintenance works on the Continental Shelf.
- Russian flows in August and September remained over 10 Bcm, well above five-year average, despite Nord Stream capacities dropping on maintenance.

## Market Overview

Other general gas related topics and news were also noticeable during the previous summer period, in particular:

- Strong demand supported gas prices in the EU hubs.
- Russian gas average price dropped more than 20% year on year, for Europe including the Former Soviet Union Countries, remaining competitive compared with EU hubs thanks to the low oil price environment.

**The total LNG for the first nine months of the year increased over 27 bcm, the highest volumes observed sGas Prices at European hubs**

The following graphs show the evolution of gas prices in Europe during Summer 2017, and also the overall monthly ranges and averages in comparison to those of 2016.

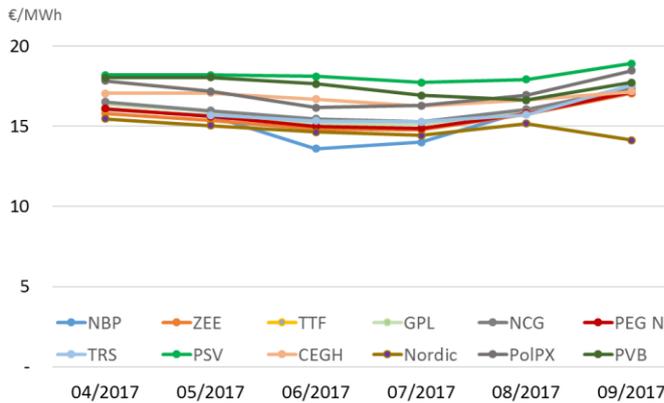


Figure 1 - Month-ahead average price at EU Hubs <sup>3</sup>

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 a few exceptions. Only NBP shows a sharp decline in June and Gaspoint Nordic registered a different trend in September ending on lower values at the end of the summer season.

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 in 2017, showing a general trend a bit higher when compared to the one seen in the previous summer.

The price range was constantly smaller than the one for 2016. The price convergence between the European hubs continued and Italian PSV remained slightly above the others during the whole season.

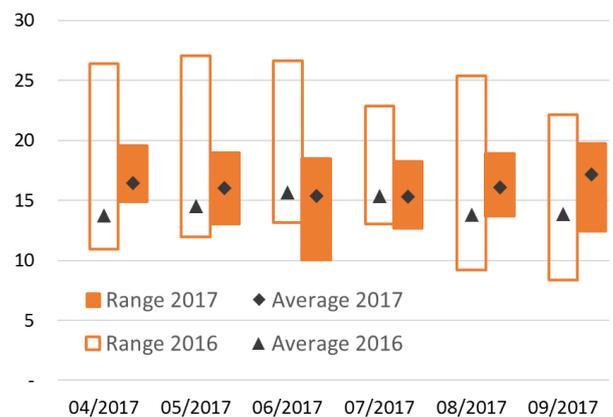


Figure 2 - Range and average of the prices

<sup>3</sup> Source: Bloomberg

## Demand

### > European seasonal gas demand

Total gas demand was 1,817 TWh in Summer 2017, +5,4% higher than the one in the previous summer.

**Figure 3** shows how the average demand levels in August and September were very close to those from the previous summer. From April to July the average experienced significant increases, in line with the maximum levels reached each month.

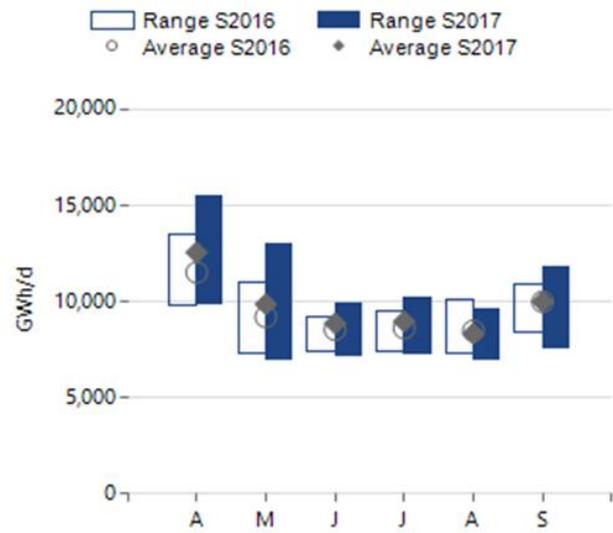


Figure 3 – Total gas demand

**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 (all except for Austria, Bulgaria, Latvia and Poland)

### > Electricity power generation from gas (TWh)

The generation of electricity from gas has followed a constant fall for many years while generation from renewable energy sources (RES) increased. The data also shows a stable thermal gap since 2013, 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.

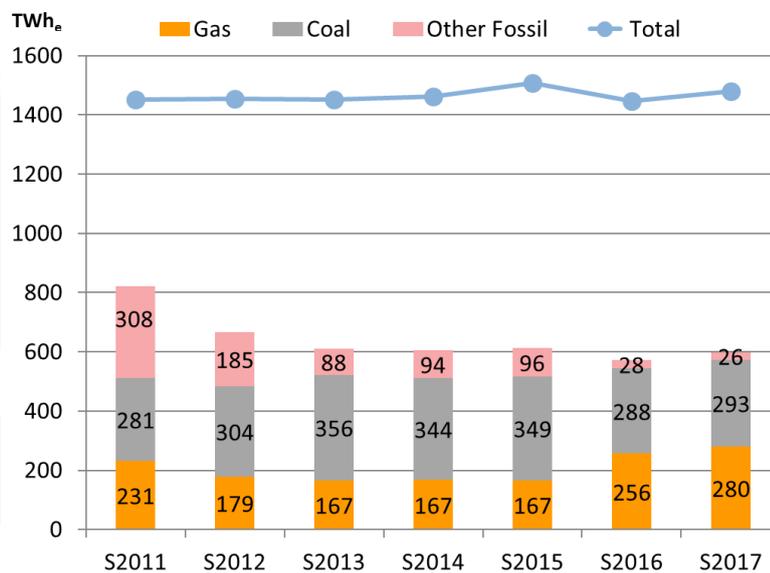


Figure 6 - Gas and coal in the electricity mix Summers 2011 - 2017

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

In absolute terms, the electricity produced from gas was 280 TWh in summer 2017, representing 19% of the generation mix. According to ENTSO-E figures, compared to summer 2016, gas demand for power generation increased 9%. This represent the highest gas seasonal demand for power generation since 2010.

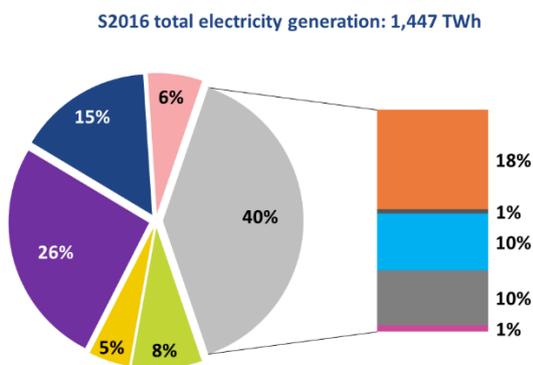


Figure 7 - Summer 2016 Electricity generation mix

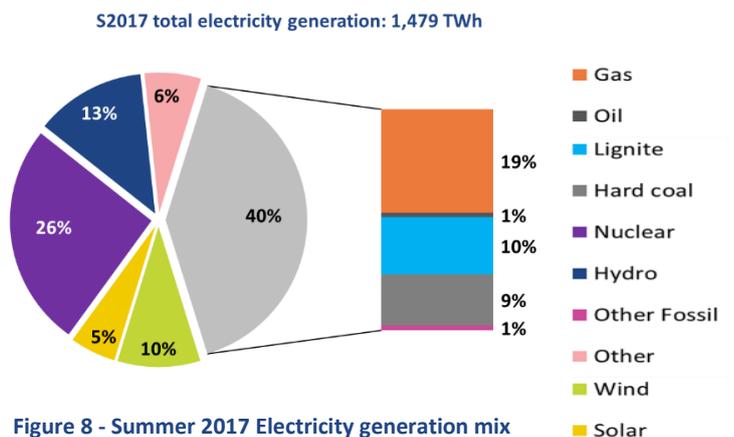


Figure 8 - Summer 2017 Electricity generation mix

As shown in **Figures 7 and 8**, there was a 2% switch from Hydro to Wind and the thermal fuels share remained constant in 40% where Gas increased from 18% to 19%.

> **Summer demand evolution 2012-2017**

In summer 2010 the demand reached 1,945 TWh (maximum not shown on the graph). Since then, the demand has decreased for five years in a row with an accumulative decrease of 18% since 2010. Finally, summer 2016 registered a significant increase for the first time in many years (+7.4%) and continued in 2017 (+5.4%) with the second seasonal consecutive increase.



Figure 9 - Total consumption Summer 2012-2017

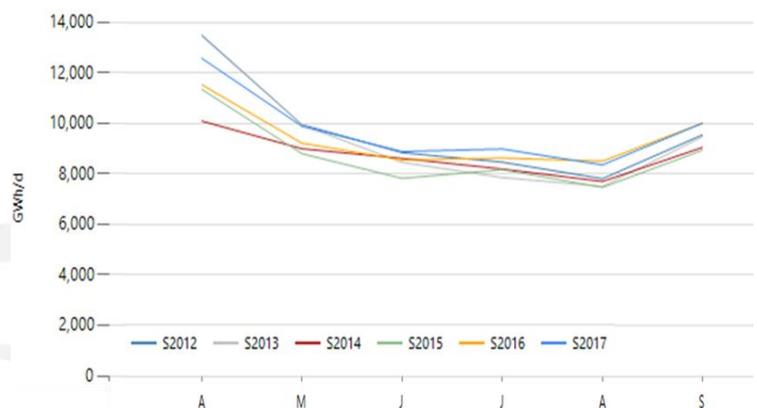


Figure 10 - Demand Monthly average. Summer 2012-2017

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 increased during summer 2017. Also the demand for power generation increased again following the huge rise (+25%) of summer 2016.

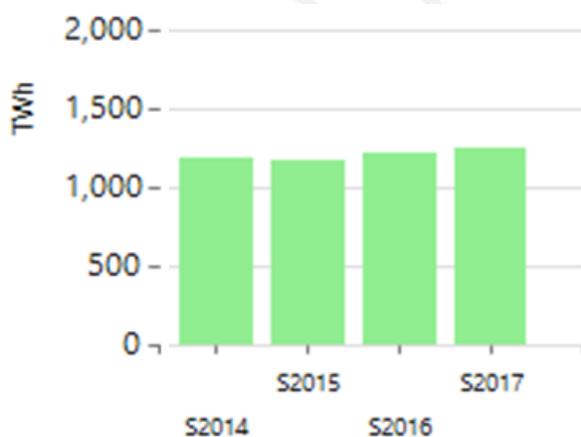


Figure 11 - Residential, commercial and industrial \*

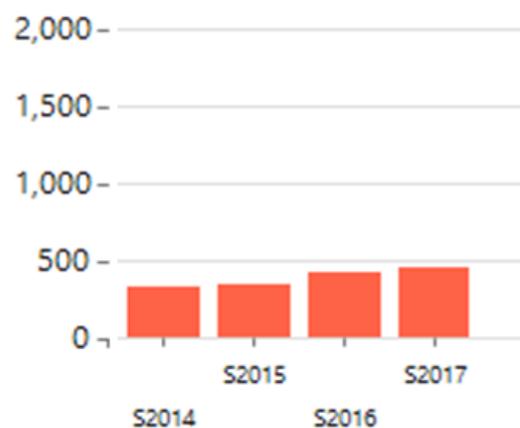


Figure 12 - Gas consumption for power generation \*

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

### > Country detail

The evolution of gas demand on a country level was diverse and showed significant variations in both directions. FYROM, Greece, Croatia and Poland were the countries with the higher rate of gas demand increase, whereas the countries where the rate of demand decreased over the summer season were UK, France and Luxemburg.

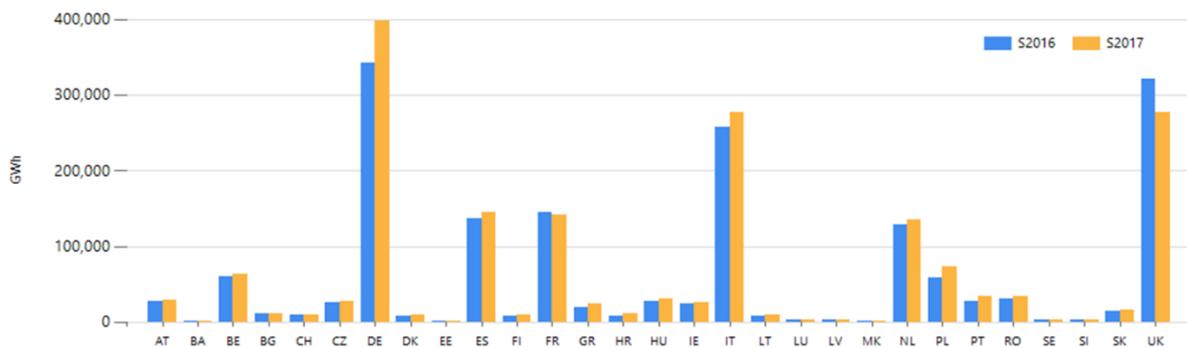


Figure 19 - Summer Total Gas Demand. Country Detail (Total Figures)

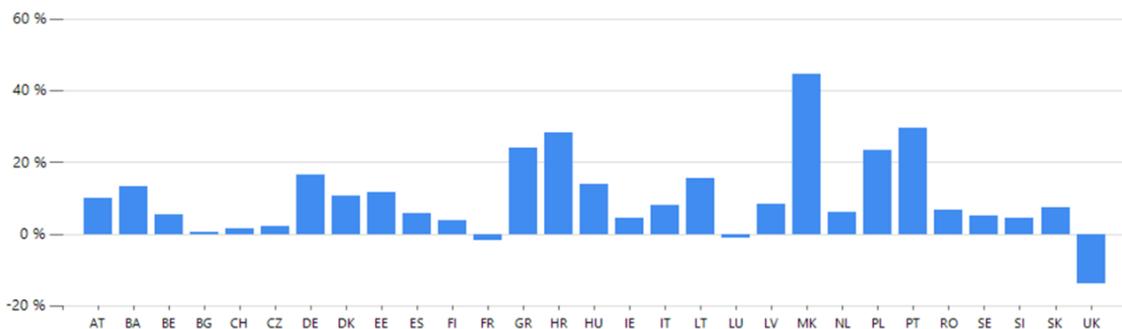


Figure 19 - Summer Total Gas Demand. Country Detail (Difference in % between seasons)

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.

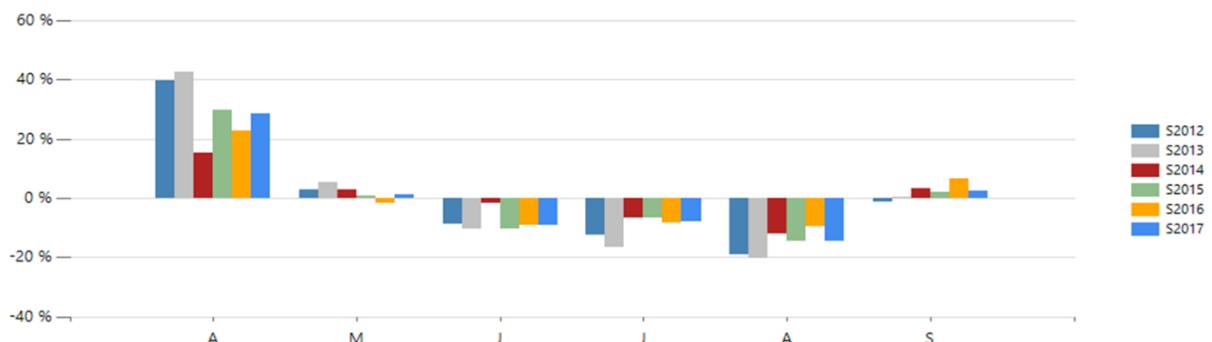
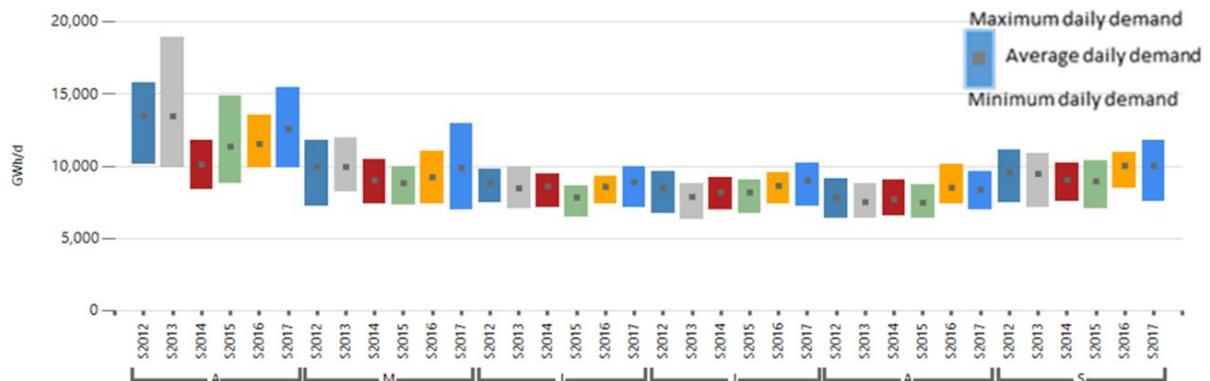


Figure 14 - Summer modulation 2012-2017

**Figure 14** shows the deviation of the monthly average demand from the summer average for each of the last six 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 always very close to the summer average gas demand.



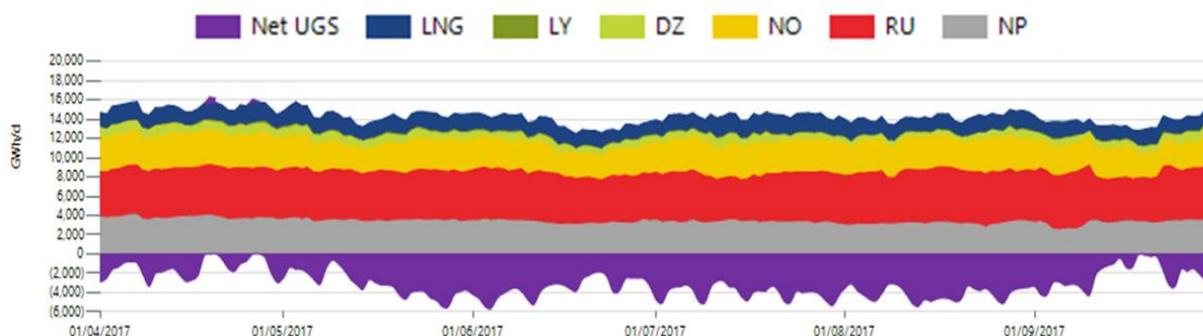
**Figure 15 - Monthly demand: average and ranges**

**Figure 15** shows the monthly variation between the maximum and the minimum daily demand. Comparing the evolution of the daily average per month, there was a clear gradual decrease in the summer gas demand until 2014, which was stabilised in 2015. After that, the rising trend followed during the last years has been constant and overall averages have increased again in 2017 with higher values from April to June, and constant ones in August and September.

## Supply

### > European seasonal gas supply

**Figure 16** shows the evolution of the aggregated gas supply in Europe during summer 2017.



**Figure 16 - Summer 2017 supply profile**

The next graphs give an overview of national production and supply imported shares during the summers 2017 and 2016 in both absolute and relative terms.

The total summer supply in 2017 was 2,617 TWh. **Figure 17** shows the seasonal supplies by source for the last two summers in absolute figures.

The increase in Russian supply, that was probably triggered by the low oil price factor, was notable. Also LNG imports and national production during summer season increased a little bit last year.

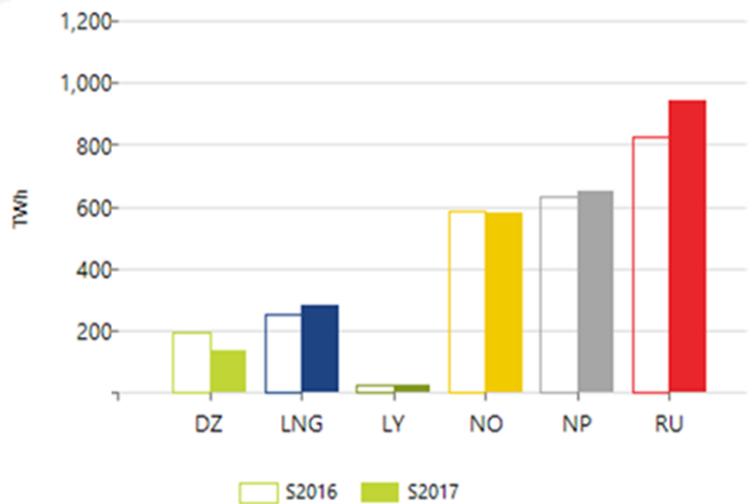


Figure 17 - Seasonal supply

Libya and Norway remained at similar levels compared to last summer season and Algerian imports registered the biggest decrease during summer 2017.



Total Summer Supply S2016: 2,521 TWh

Total Summer Supply S2017: 2,617 TWh

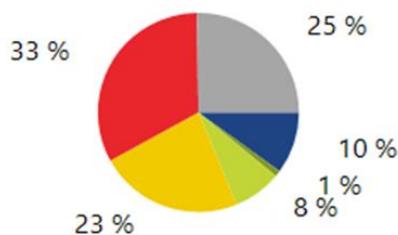


Figure 18 - Supply shares. Summer 2016

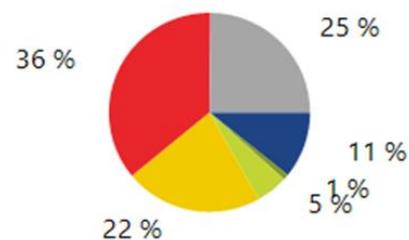


Figure 19 - Supply shares. Summer 2017

Indigenous production has stabilised in 2017, after years of decrease. Libya, Norway (-1%) and LNG (+1%) remained at similar levels to the ones from 2016. On the other hand, Algerian share experienced a high decay in the supply mix when compared to last year (-3%), contrary to the Russian one (+3%).

### > 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).

- Range 2017    □ Range 2016
- ◆ Average 2017    ○ Average 2016



Figure 20 - Supply modulation

> **Summer supply evolution 2012-2017**

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

■ Supply (absolute values)    ○ Supply share

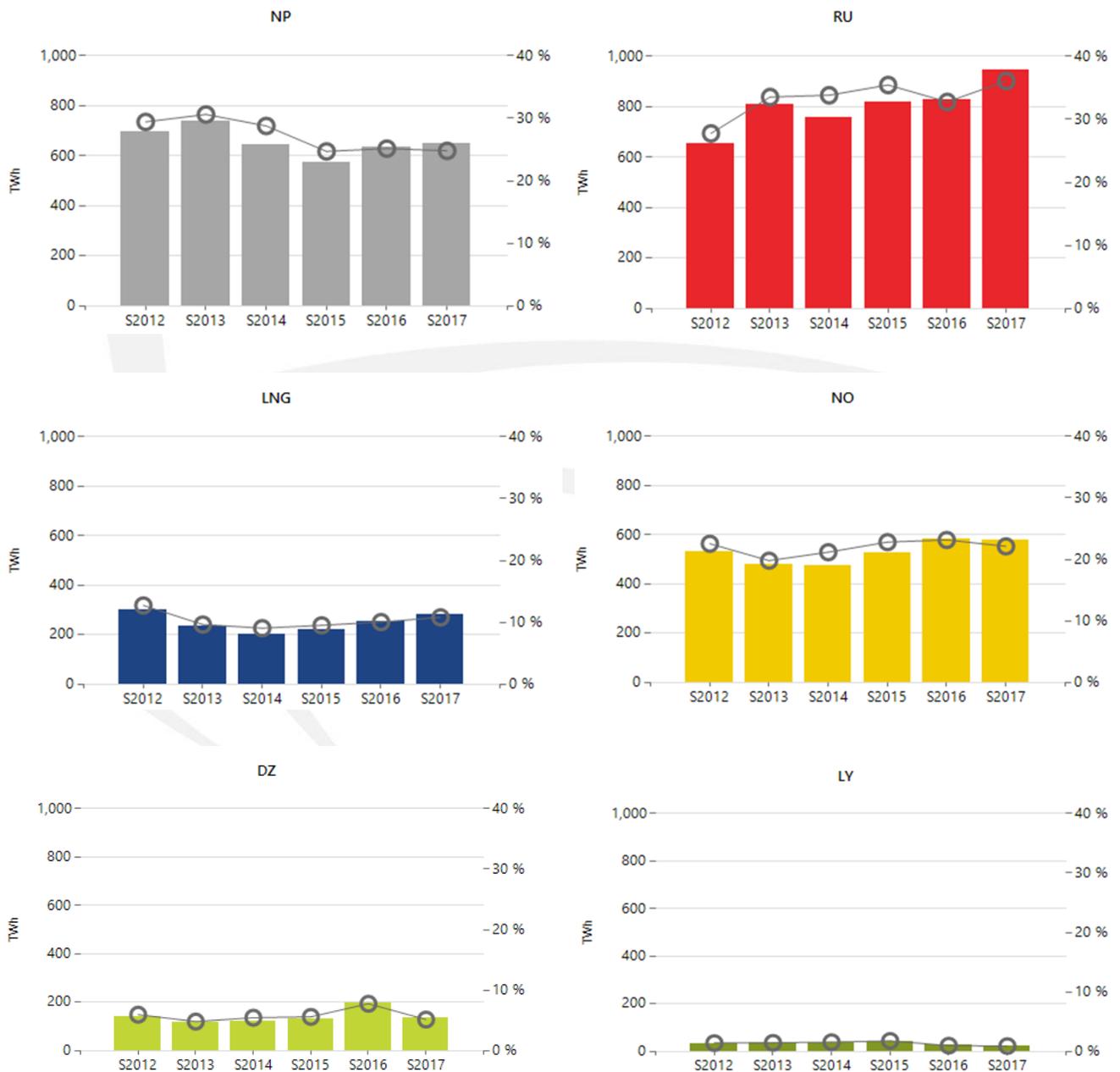


Figure 21 - Evolution of summer gas supplies 2012-2017

## 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.

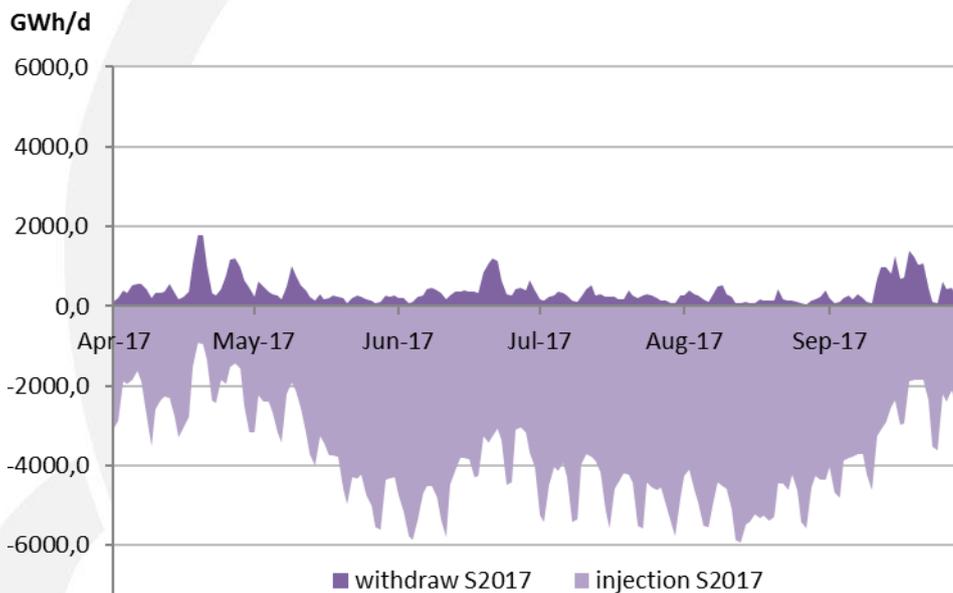


Figure 22 - UGS injection/withdraw profile EU-28 storages.

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 2017 and 2016.

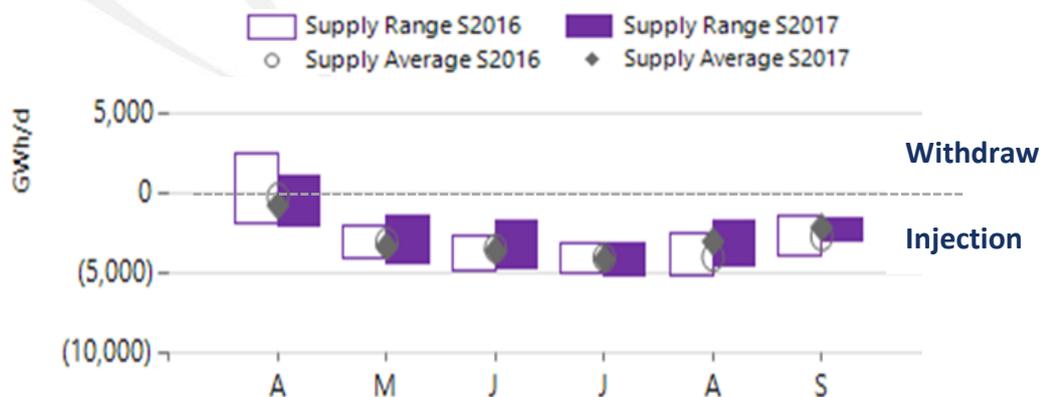


Figure 23 - UGS net injection (negative figures mean positive net injection)

The next table provides the evolution of the stock level as a percentage of the WGV during summer (source GSE AGSI platform). **Figure 24** shows how injection in UK ends in September while all the other countries still observe injection until October:

Country (%)	1-Apr-17	1-May-17	1-Jun-17	1-Jul-17	1-Aug-17	1-Sep-17	1-Oct-17
AT	15,5	18,6	27,2	35,7	50,8	69,5	82,9
BE	14,6	19,9	29,8	33,7	54,2	70,6	76,1
BG	28,0	30,7	39,9	51,8	67,3	74,1	75,7
CZ	27,6	33,8	43,7	64,8	77,1	87,3	94,9
DE	28,8	31,2	39,5	50,8	64,7	79,0	85,3
DK	21,9	23,3	29,5	40,6	60,0	78,0	91,0
FR	20,2	26,3	36,2	44,0	56,8	69,7	73,5
ES	55,2	59,7	64,5	68,2	70,9	72,7	74,9
HR	27,6	29,9	39,2	55,0	67,8	83,3	89,5
HU	19,6	21,7	28,2	35,7	45,3	60,6	71,7
IT	39,4	46,8	58,4	69,3	79,3	88,8	93,9
LV	20,0	15,0	15,0	15,0	20,0	30,0	49,0
NL	15,5	25,3	40,0	53,5	71,0	86,9	94,5
PL	31,1	29,5	43,0	57,5	70,5	87,0	98,1
PT	35,0	37,6	37,0	42,7	48,8	54,1	53,1
RO	16,5	18,4	27,4	38,6	49,1	58,3	67,0
SK	16,6	19,6	28,1	42,6	51,6	71,7	87,2
UK	46,3	20,2	21,3	45,0	63,2	75,1	53,2
<b>EU Total</b>	<b>26,2</b>	<b>30,8</b>	<b>40,6</b>	<b>51,6</b>	<b>64,4</b>	<b>77,9</b>	<b>84,9</b>

Figure 24 - Stock level (%WGV)

**Figure 25** compares the stock level evolution curve of the last five summers (source AGSI). Having started from an average level compared to the previous summers, 26% on the 1<sup>st</sup> April, the stock level increased enough to reach an average level, 85% by the end of September. For many operators, the injection season continued in October 2017.

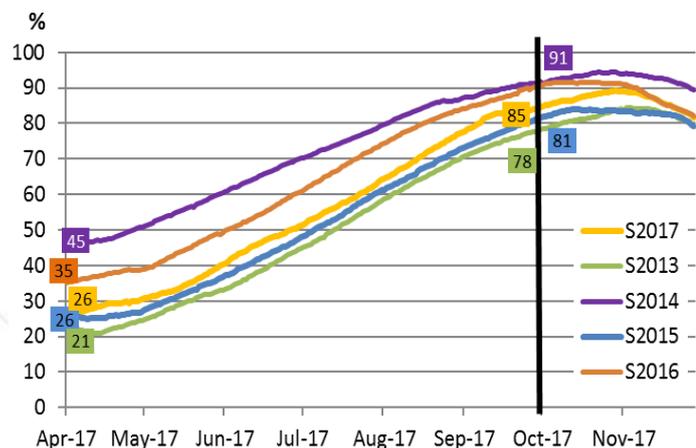


Figure 25 - Evolution of stock level. Summers 2012-2017 (AGSI)

Summer	30-sep	maximum stock level	
S2013	78%	85%	03/11/2013
S2014	92%	94%	23/10/2014
S2015	81%	84%	13/10/2015
S2016	91%	92%	09/10/2016
S2017	85%	89%	29/10/2017

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

**Figure 26** shows the stock level on the 30<sup>th</sup> September in comparison with the maximum stock level setting the end of the injection season. The maximum stock level reached in 2017 was 89%, a bit lower than the previous summer season and 5% 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.

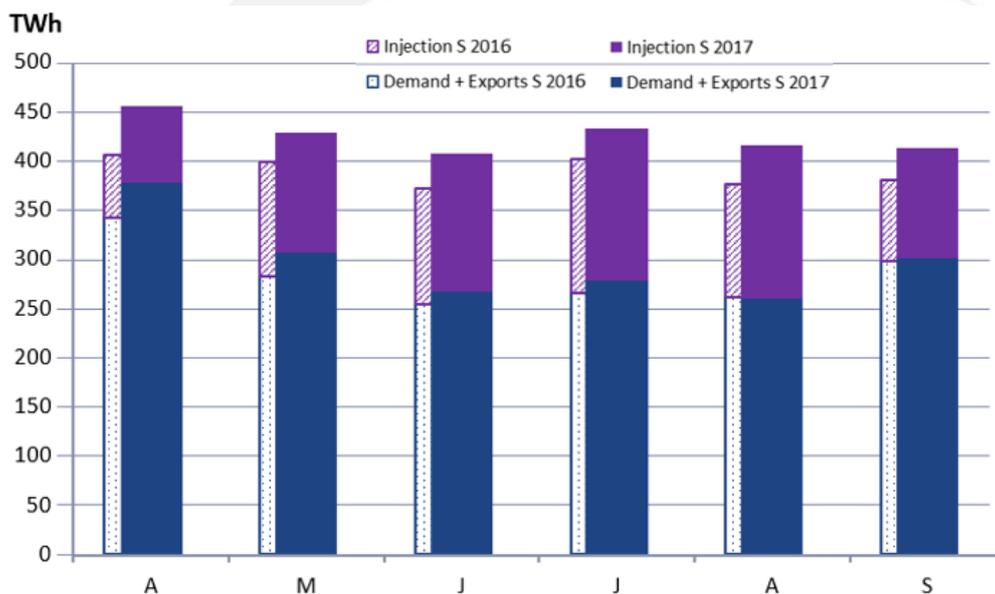


Figure 27 - Transported gas

**Figure 27** shows the transported volumes during Summer 2017 in comparison with those of the previous summer season. Total transported volumes from April to September in 2017 (2,552 TWh) were 9 % higher compared to 2016 (2,340 TWh).

The transported volumes during summer 2017 were higher than the ones from the previous summer, specially in April and May, plus the higher UGS injection during the rest of the season.



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