ENTSOG Summer Supply Outlook 2015

Executive Summary

As part of its obligation under Art.8(3)(f) of Regulation (EC) 715/2009, ENTSOG has undertaken an assessment of the European gas network to analyse whether gas infrastructures enable to meet both demand and injection needs during Summer 2015. The conclusions are:

The European gas network is sufficiently robust in most parts of Europe to enable:

- **Planned maintenance in order to ensure infrastructure reliability on the long term**
- **At least 90% stock level in preparation of the upcoming Winter**
- **Some flexibility in network users' supply strategy**

The report also highlights some particular situations:

- **Due to the low storage level at the end of the winter and expected exports to Ukraine during the summer, supply flexibility will be inversely proportional to targeted storage level**
- **the commissioning of new infrastructure projects over last 12 months has improved the situation in Scandinavia**

Based on ACER recommendation to consider the latest supply and flow pattern trends, physical exports to Ukraine have been taken into account on the basis of latest historical data.

The actual supply mix and storage level on 30 September 2015 will depend on market behaviour and global factors.

Introduction

This edition builds on previous Summer Supply Outlooks as well as on the recently published TYNDP 2015. The report aims to assess the ability of the European gas network to provide sufficient flexibility to shippers during their storage injection season.

The summer months provide shippers the opportunity to refill storage in anticipation of the winter months ahead. The level of injection targeted by shippers varies from one country to the other and from time to time due to climatic, price and legal parameters.

Modelling has been used to confirm the ability of the European gas network to provide flexibility of injection under different scenarios around a Reference Case targeting 90 percent storage level by 30 September 2015.

These additional scenarios cover alternative injection targets

Differently from the previous editions and in order to take into account the latest development since the beginning of the Summer, the modelling takes as a starting point the actual storage level on 10 May 2015.

This report also integrates new features of ENTSOG Network Model developed for TYDNP 2015 and Winter Supply Outlook 2014/15. The temporal optimization and the introduction of a market layer allow a new approach in the definition of supply along the season.

Finally additional linearization curves have been provided by GSE Members. Their use in the model enables a better consideration of the reduction of injection capacity when storage reaches higher stock level.

Assumptions and results of the modelling

Taking into account the ACER's opinion advocating a better consideration of seasonal specificities and short term trends together with latest TYNDP 2015 development, a new approach has been adopted for supply and injection. In any case actual injection and supply mix will result from shippers' decision.

> Reference Case

Injection and supply under the Reference Case have been defined essentially based on the actual data of the last 2 Summers.

The overall "Summer injection" is defined as the quantity of gas necessary to reach an aggregated 90% stock level on 30 September 2015 starting from actual stock level on 10 May 2015.

The repartition of injection and supply along the summer months result from the modelling and the following assumptions:

- The monthly demand forecast by TSOs
- Monthly exports towards Ukraine, Kaliningrad and Turkey

- The monthly national production forecast by TSOs
- The overall Summer injection as defined above
- The temporal optimization of import based on a supply curves set according to forward prices

The flexibility given to the model for the definition of the supply patterns derives from the supply mix of the last 2 Summers (See Annex A-Methodology).

Based on these assumptions (further detailed in Annex A and B), modelling has been used in order to check if any physical congestion or over dependence on an import source may limit the injection.

The simulations show that a 90% stock level may be achieved by 30 September 2015 in all the zones. Whereas in previous editions, limitations were identified for Denmark and Sweden, these limitations have disappeared with the commissioning of new project increasing the interconnection capacity between Germany and Denmark.

Figure 1 shows the breakdown of transported gas for each month (average daily values for each month including exports to Kaliningrad, Turkey and Ukraine) for the Reference Case:

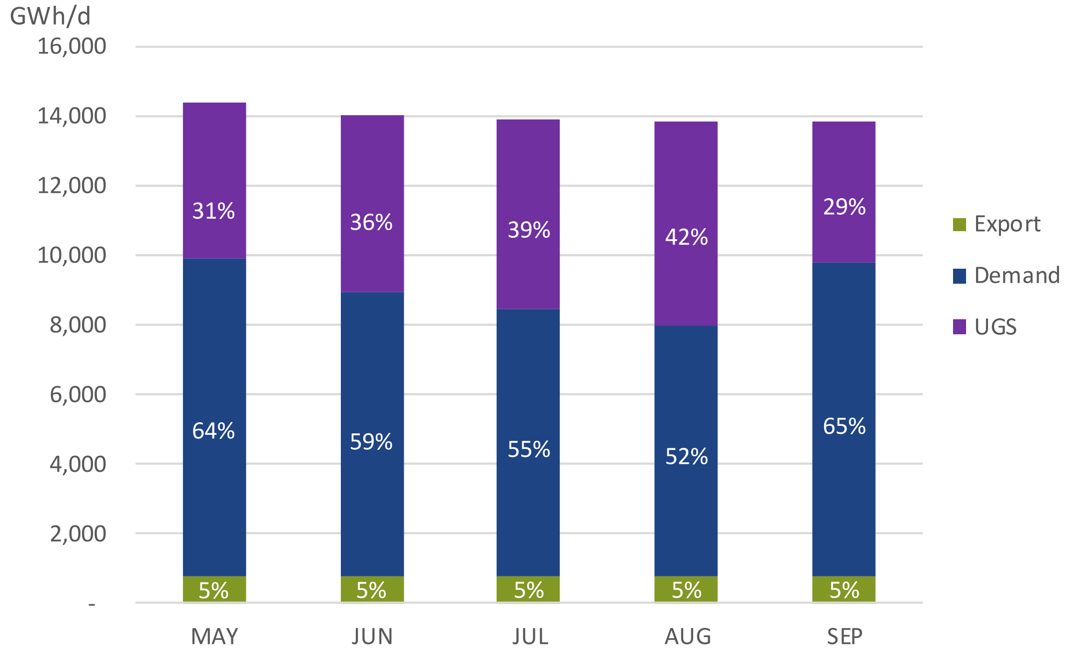

Figure 1 - Transported gas

Figure 2 shows the level and composition of supply for each month for the Reference case:

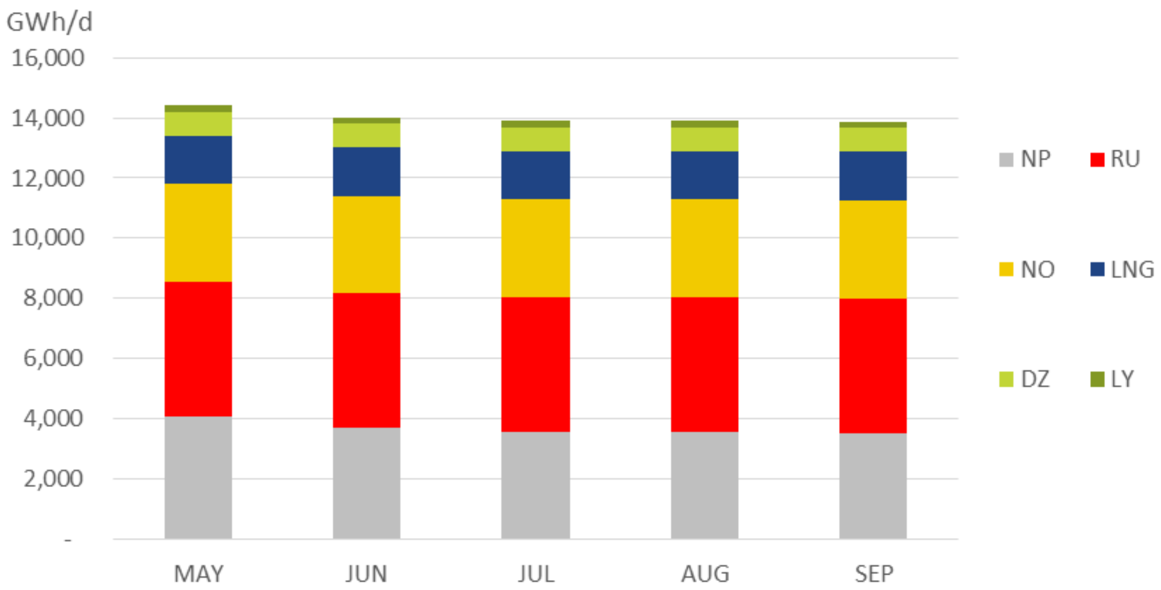

Figure 2 - Supply level

> Sensitivity-analysis – Alternative injection targets

Given the uncertainty on the level of stock at the end of the season resulting from the behaviour of market participants, two alternative targeted levels of storage have been considered: 80 and 100% on 30 September 2015.

The definition of the monthly injection and supply is following the same rules than for the Reference Case.

Figure 3 provides the daily aggregated stock level evolution curve as resulting from the modelling of Summer Supply Outlook 2015 (actual injection curve will derive from shippers' behaviour) and actual aggregated curves of last two summers:

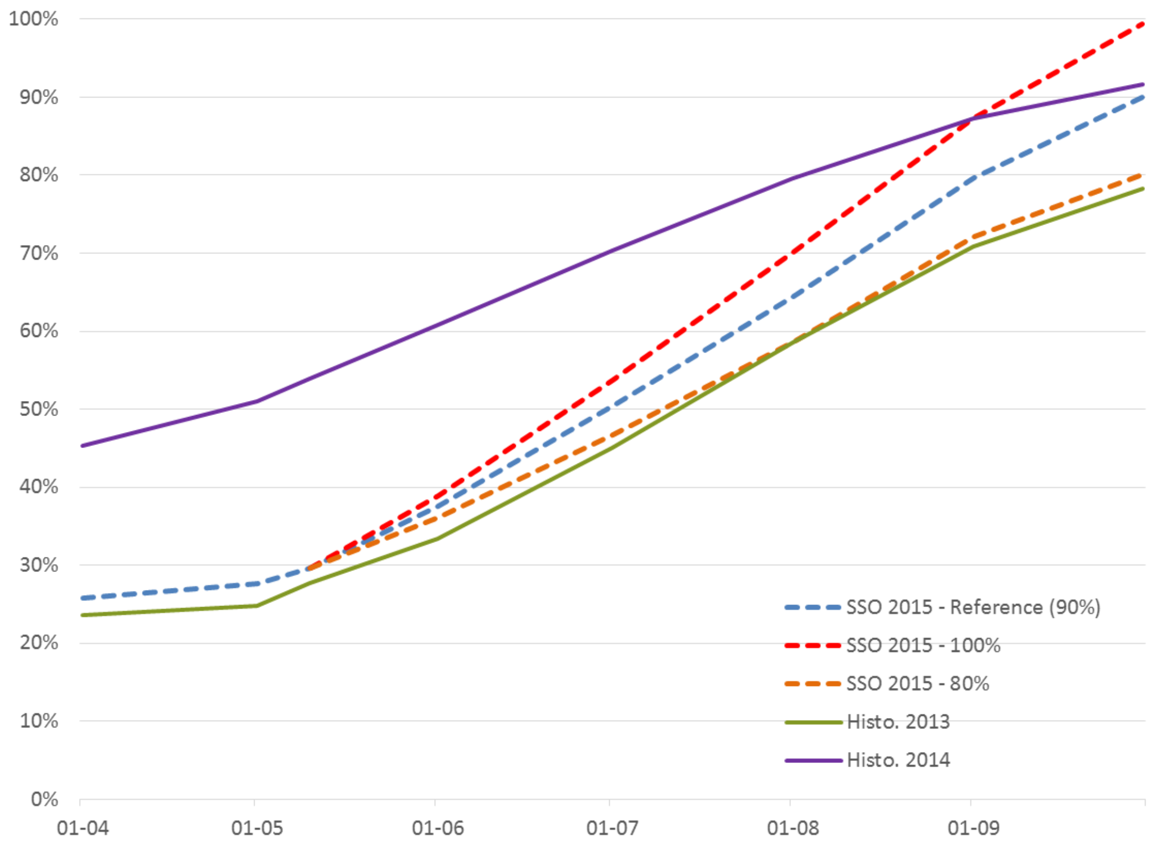

Figure 3 - Stock level development curve

The simulation shows that a 100% stock level is achievable by 30 September 2015 in most of the Zones. Residual limitations have been identified for Spain (96% reached), UK (97%) and Serbia (97%) as a consequence of the reduced injection capacity at high stock levels. Nevertheless, for many operators the injection season continues in October enabling a full injection if decided so by market players.

The injection profile targeting 80% is very similar to the actual aggregated profile of Summer 2013.

Given the supply constraints detailed in Annex A, the different injection targets are reached though fluctuation of the supply levels, having a particular influence the LNG imports.

As shown in figure 5, the flexibility of the European transmission system is high enough to allow for different supply patterns while reaching 80% stock level at the end of September 2015. On the contrary, due to the low stock levels at the end of the Winter 2014/15 reaching a 100% storage level would imply a significant increase in the LNG imports while the other supply sources would reach the maximum deliverability set in the Reference Case.

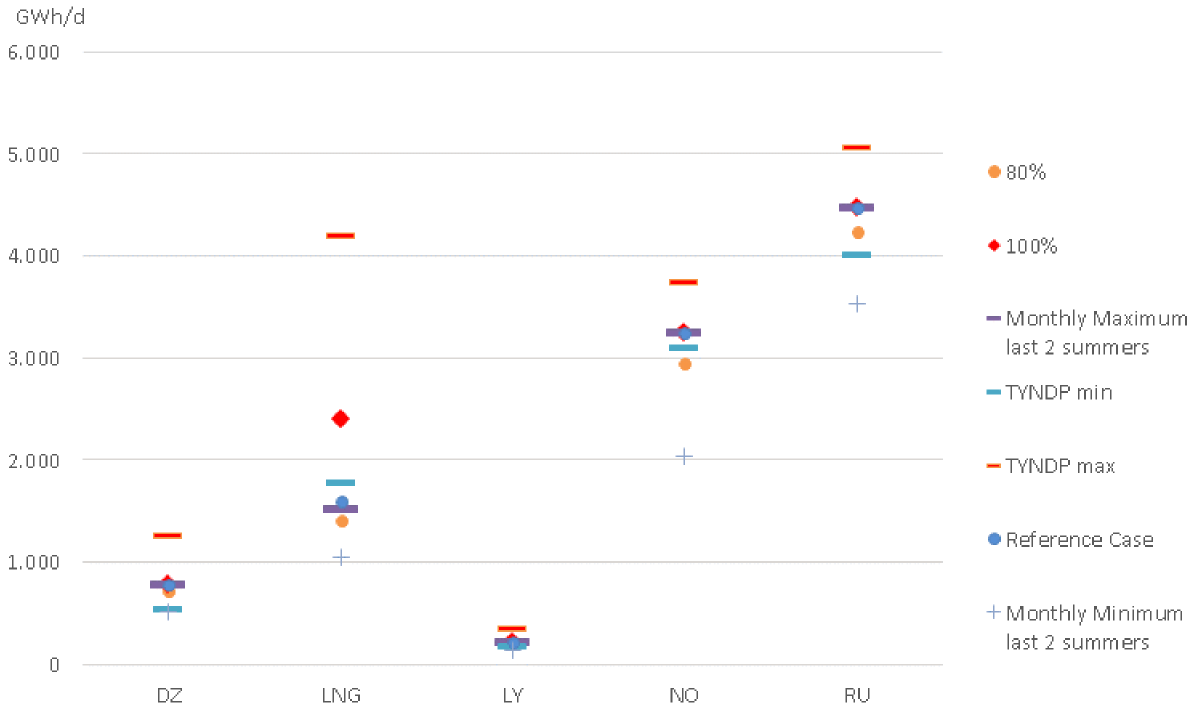

Figure 4 - Fluctuation of the supply patterns in the sensitivity analysis on the stock level

Figure 5 shows the difference between the supply shares in the Reference and the two alternative stock level targets.

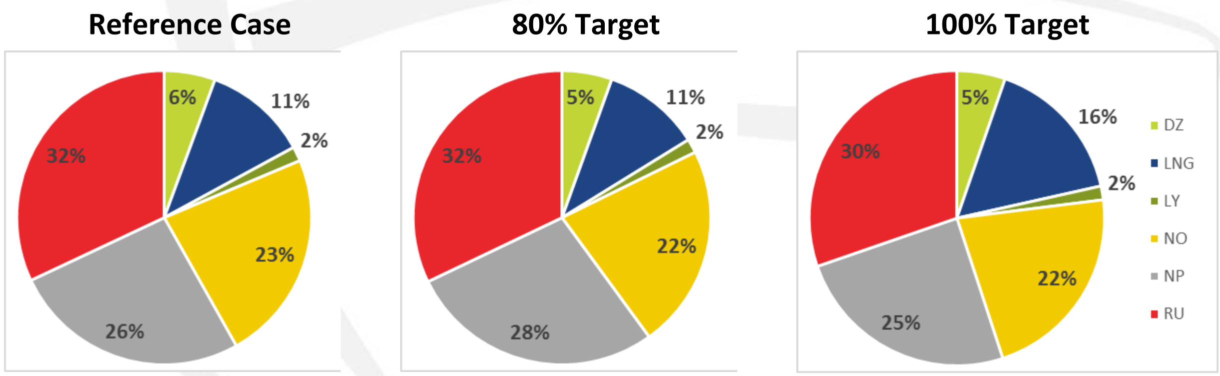

Figure 5 - Summer supply

Regarding transport of gas to non-EU countries it is important to consider that:

- A physical reverse flow from Slovakia to Ukraine of 402 GWh/d (consistent with the actual exporting flows in April 2015 and implying the use of interruptible transmission capacity) and from Poland to Ukraine of 12 GWh/d.
- From an infrastructure point of view such reverse flows have no impact on the UGS storage level at the end of the season but they require a high availability of supply sources.

Conclusion

According to the ENTSOG modelling and supply assumptions, this Summer Supply Outlook confirms the ability of the European gas network to enable shippers to reach at least a 90% stock level in underground gas storage by the end of the Summer 2015 while ensuring the proper maintenance of the system and potential export to Ukraine. Actual storage level will depend on shippers' decision and the deliverability of supply sources.

It has to be noted that the low level of storage at the end of the winter will require a high deliverability of supply sources in order to reach ninety percent storage level on 30 September 2015.

Please note that the integrated flow patterns used in this report are hypothetical and have been designed for the purposes of this Summer Supply Outlook.

ENTSOG plans to provide a review of Summer 2015 dynamics in spring 2016 together with the next Summer Supply Outlook.

Legal Notice

ENTSOG has prepared this Summer Supply Outlook in good faith and has endeavoured to prepare this document in a manner which is, as far as reasonably possible, objective, using information collected and compiled by ENTSOG from its members and from stakeholders together with its own assumptions on the usage of the gas transmission system. While ENTSOG has not sought to mislead any person as to the contents of this document, readers should rely on their own information (and not on the information contained in this document) when determining their respective commercial positions. ENTSOG accepts no liability for any loss or damage incurred as a result of relying upon or using the information contained in this document.

Annex A – Methodology

Modelling tool

Modelling has been carried out using ENTSOG NeMo Tool based on linear programming of flows. The network/market topology used in this report is similar to the one used in ENTSOG TYNDP 2015 released in March of this year. Main features of this model, compared to the one used in previous editions of the Summer Outlook is the introduction of temporal optimization and a market layer, allowing a new approach in the definition of supply along the season.

The adaptation of the topology to fit the purposes of the Summer Outlook included:

> Definition of 5 temporal periods, each of one representing one of the months from May to September
> Temporal optimization means the optimization of the summer as a whole period. This implies that the model anticipates an event, adapting the flows in the previous months and mitigating its impact.
> Introduction of linearization curves, as provided by GSE Members, to consider the reduction of injection capacity when the stock level increases.

Modelling enables the identification of potential capacity and supply limitation preventing the reach of the targeted stock level in each European storage by 30 September 2015.

Modelling is based on a single simulation including 5 time periods, each of them representing one month from May to September. The different parameters are defined as below:

> Demand

Average monthly demand as the addition of TSO's forecast

> Injection

First the total quantity of gas to be injected from 11th May to 30 September 2015, is defined as the difference between:

- the sum of the working volume of all European UGS multiplied times the targeted stock level
- the sum of the stock level of European UGS on 10th May 2015 (source: GSE AGSI platform)

This quantity will be split per month by the model on the basis of the temporal optimization, considering the limits set by the linearization of the injection curves.

Figure 6 shows the average injectability curve. The detail of the curves defined at country level is included in Annex B.

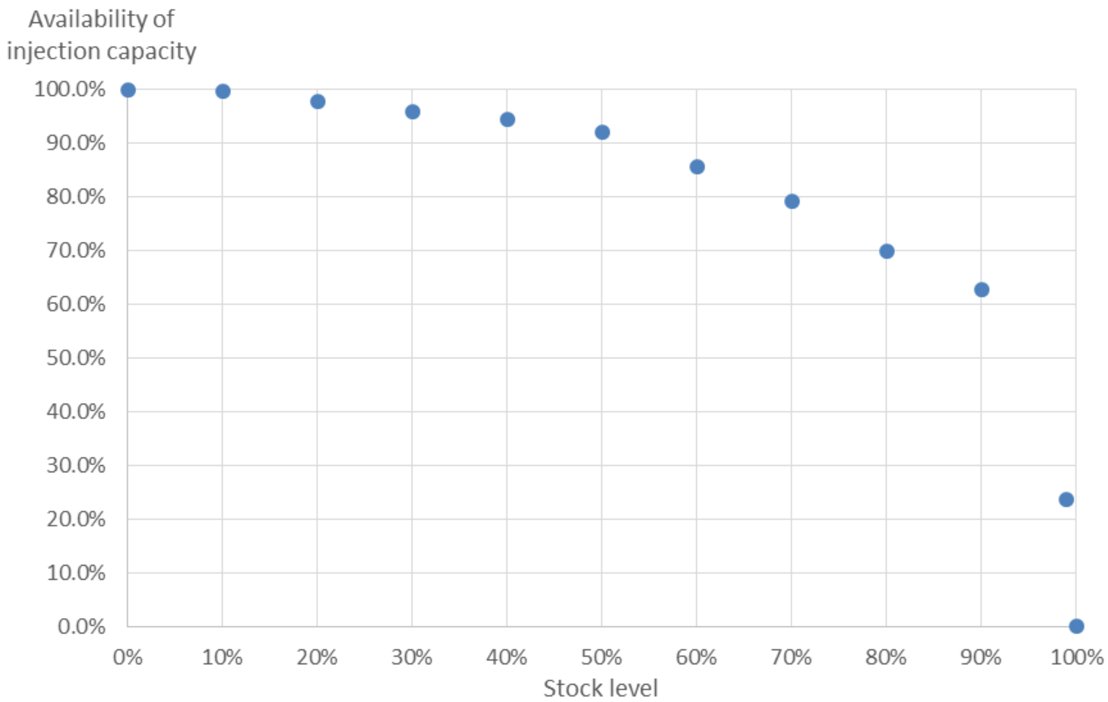

Figure 6 – Injectability. Average curve.

> Supply constraints

Within the modelling tool, each supply source is described as a supply curve, representing the increasing supply cost on the long run when demand is increasing.

The model will select therefore, the supply combination that minimizes the costs for the system for the whole period, within the limits set for the different supply sources.

- Minimum supply per source

The minimum supply per source, on daily average, is set as the minimum monthly average supply of the last 12 summer months (April to September 2013 and April to September 2014) for each supply source. The detailed figures are included in Annex B.

- Maximum supply per source

The maximum supply per source, on daily average, is set as the maximum monthly average supply of the last 12 summer months (April to September 2013 and April to September 2014).

This applies to each supply source with the exception of LNG, where the maximum is set at a high level, meaning no practical constraint. Despite of the lack of maximum for LNG, its import levels are kept on reasonable levels through the price curves.

- Price curves

The price curves have been defined on the basis of forwards markets.

Maximum price: highest NBP monthly price for the summer period

Minimum price: lowest NBP monthly price for the summer period

In order to avoid the distortion caused by the different levels set for the maximum supply level per source, the maximum step (defined as combination of final price and maximum supply) has been calculated in order to preserve the slope defined by the original maximum price and the maximum monthly supply of the last 12 summer months.

This way, the access to higher levels than this maximum for LNG will imply higher costs, and will only be used by the model when it is necessary to avoid demand disruptions.

The detailed figures are included in Annex B.

Summary of Summer Supply Outlook 2015 assumptions

Demand	Average monthly demand forecast provided by TSOs
Monthly injection	> European aggregated injection over the Summer: quantity necessary to reach injection target (80%, 90% or 100%) on 30 September 2015 > Monthly injection (aggregated and per Zone) is a result of the modeling
Overall supply	Sum of demand and injection for the whole summer
Supply shares	Supply shares is a result of the modeling
Import routes	Split between import routes is a result of the modeling
Cross-border capacity	Firm technical capacity as provided by TSOs taking into account reduction due to maintenance
Reverse-flow towards Ukraine	414 GWh/d
Exports towards Turkey	280 GWh/d
Exports towards Kaliningrad	52 GWh/d

Annex B – Data for Summer Supply Outlook 2015

Minimum and Maximum supply per source

GWh/d	Minimum	Maximum
Algeria	507	704
LNG	1,043	5,000
Libya	140	223
Norway	2,039	3,246
Russia	3,530	4,478

Average monthly demand and export forecast

	April	May	June	July	August	September
AT	220	169	137	124	124	167
BA	4	2	2	2	2	3
BE	459	397	330	294	304	360
BG	78	65	53	46	48	54
CH	80	70	45	45	45	60
CZ	224	145	112	81	98	135
DEg	1,069	825	764	727	715	907
DEn	1,112	859	795	756	744	944
DK	95	63	49	31	39	61
EE	15	10	7	6	7	8
ES	890	820	800	755	695	825
FI	122	93	84	76	82	100
FRn	753	540	422	378	339	455
FRs	293	210	164	147	132	177
FRt	70	50	35	30	25	36
GR	77	76	79	98	79	90
HR	62	52	42	42	44	54
HU	216	138	122	123	111	148
IE	135	109	119	98	90	110
IT	1,545	1,251	1,264	1,308	1,020	1,423
LT	65	66	64	42	43	45
LU	35	19	15	14	12	23
LV	68	37	29	29	29	37
MK	2	1	1	1	1	1
NL	1,003	808	726	621	644	741
PL	423	338	289	290	310	361
PT	119	121	117	119	111	120
RO	292	204	189	181	161	186

RS	45	45	45	45	45	45
SE	30	20	18	17	17	21
SI	21	18	16	15	15	17
SK	145	72	72	69	62	74
UK	2,056	1,492	1,213	1,082	1,071	1,274
Total	**11,821**	**9,184**	**8,217**	**7,692**	**7,263**	**9,059**

Average monthly production forecast

	April	May	June	July	August	September
AT	41.6	37.6	43.0	35.8	37.1	33.3
BG	2.6	2.6	2.6	0.2	0.2	0.2
CH	0.0	0.0	0.0	0.0	0.0	0.0
CZ	5.0	5.0	5.0	5.0	5.0	5.0
DEg	216	209	194	204	203	192
DEn	29.5	28.5	26.5	27.8	27.6	26.2
ES	0.0	0.0	0.0	0.0	0.0	0.0
FI	0.2	0.2	0.2	0.2	0.2	0.2
FRn	0.0	0.0	0.0	0.0	0.0	0.0
FRs	0.0	0.0	0.0	0.0	0.0	0.0
FRt	0.0	0.0	0.0	0.0	0.0	0.0
HR	38.8	38.8	38.8	38.8	38.8	38.8
HU	44.5	44.5	44.5	44.5	44.5	44.5
DK	143.5	143.5	143.5	143.5	143.5	143.5
IE	4.8	44.0	44.0	44.0	44.0	44.0
IT	213.8	210.0	210.3	210.0	210.0	214.6
LU	0.0	0.0	0.0	0.0	0.0	0.0
NL	2,137	1,894	1,620	1,497	1,555	1,556
PL	99	100	101	99	99	100
RO	308	308	308	308	308	308
RS	5.1	5.1	5.1	5.1	5.1	5.1
SE	0.0	0.0	0.0	0.0	0.0	0.0
SI	0.0	0.0	0.0	0.0	0.0	0.0
SK	2.3	2.3	2.3	2.3	2.3	2.3
UK	1,050	1,026	906	907	836	815
Total	**4,342**	**4,099**	**3,695**	**3,573**	**3,559**	**3,528**

Linearization curves

	Injection availability when working gas volume is at xx% level											
	100%	99%	90%	80%	70%	60%	50%	40%	30%	20%	10%	0%
STcAT	0%	16%	71%	79%	85%	90%	94%	96%	97%	98%	100%	100%
STcBE	0%	24%	63%	70%	79%	86%	92%	94%	96%	98%	100%	100%
STcBG	0%	6%	56%	56%	100%	100%	100%	100%	100%	100%	100%	100%
STcHR	0%	24%	63%	70%	79%	86%	92%	94%	96%	98%	100%	100%
STcCZ	0%	3%	30%	35%	70%	75%	99%	100%	100%	100%	98%	96%
STcCZd	0%	24%	63%	70%	79%	86%	92%	94%	96%	98%	100%	100%
STcDK	0%	24%	63%	70%	79%	86%	92%	94%	96%	98%	100%	100%
STcFRn	0%	60%	63%	71%	85%	86%	87%	88%	92%	97%	100%	100%
STcFRs	0%	53%	56%	59%	61%	64%	67%	70%	78%	91%	98%	100%
STcFRt	0%	24%	63%	70%	79%	86%	92%	94%	96%	98%	100%	100%
STcDE	0%	15%	58%	68%	79%	88%	97%	98%	98%	99%	100%	100%
STcHU	0%	64%	67%	70%	73%	73%	88%	100%	100%	100%	100%	100%
STcIE	0%	24%	63%	70%	79%	86%	92%	94%	96%	98%	100%	100%
STcIT	0%	6%	62%	69%	77%	89%	91%	93%	94%	96%	100%	100%
STcLV	0%	24%	63%	70%	79%	86%	92%	94%	96%	98%	100%	100%
STcNL	0%	41%	68%	73%	80%	85%	91%	93%	95%	97%	99%	100%
STcPL	0%	24%	63%	70%	79%	86%	92%	94%	96%	98%	100%	100%
STcPT	0%	10%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
STcRO	0%	24%	63%	70%	79%	86%	92%	94%	96%	98%	100%	100%
STcRS	0%	24%	63%	70%	79%	86%	92%	94%	96%	98%	100%	100%
STcSK	0%	24%	63%	70%	79%	86%	92%	94%	96%	98%	100%	100%
STcES	0%	9%	85%	90%	90%	90%	95%	100%	100%	100%	100%	100%
STcSE	0%	24%	63%	70%	79%	86%	92%	94%	96%	98%	100%	100%
STcUK	0%	24%	63%	70%	79%	86%	92%	94%	96%	98%	100%	100%

ENTSOG Summer Review 2014

Executive Summary

ENTSOG has completed the review of the European gas supply and demand picture for Summer 2014 (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. They also 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 consistence and continuous improvement of ENTSOG reports, and will be factored in the ongoing R&D plan.

The key findings of this review are:

- **Seasonal Gas demand in Europe was 10.5% lower than the one from previous summer.**
- **The decrease in gas demand was probably concentrated on the residential sector following warm weather conditions.**
- **The high stock levels in the UGS at the beginning of the summer were compensated with lower injections along the season.**
- **There has been a significant decrease in European indigenous production.**

Stakeholders' comments on this seasonal analysis are welcomed 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.

Introduction

This review, as part of the ENTSOG Annual Work Program 2015, is published on a voluntary basis and aims at providing an overview of the demand and supply balance during Summer 2014. The report brings transparency on the internal analysis carried out by ENTSOG for the purpose of developing the seasonal Supply Outlooks and the Union-wide TYDNP, as well as for the ongoing R&D plan.

The report aims to provide an overview of European trends that could not be captured at national 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 for example.

Seasonal Overview

Some occurrences on the European gas market caused fluctuations in the supply and demand balance during the period between April and September 2014, the major ones being:

- Summer maintenances season on Norway's pipeline system, the Interconnector and the Nord Stream Pipeline (June - July 2014)
- Production cut at the Norwegian Åsgard field for two days (July 2014)
- Unspecified production field maintenance in Norway for several days (August and September 2014)

Demand

> European seasonal gas demand

Gas demand was 1,547 TWh in Summer 2014, significantly lower (-10.5%) than in previous summer.

The average demand levels in July and August were very close to those from the previous summer while significant differences were experienced in the maximum levels reached in April due to the long lasting winter the year before. The maximum daily demand was 40% higher in April 2013 than in April 2014.

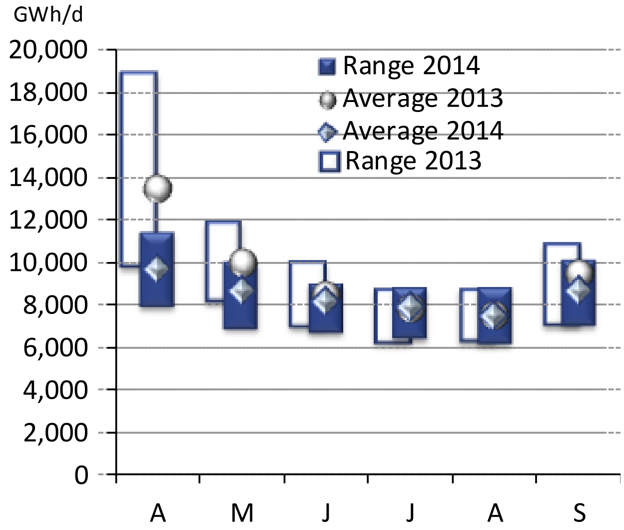

Figure 7 – Total gas demand

The following two graphs show the evolution of gas prices in Europe during Summer 2014:

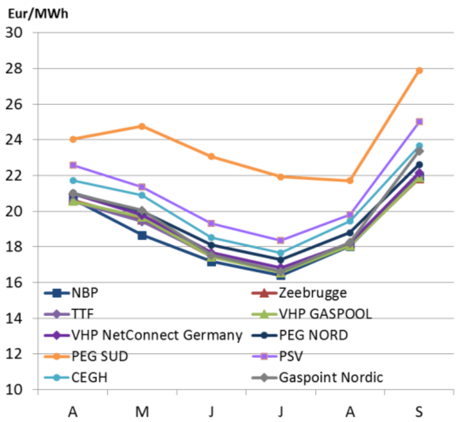

Figure 8 - Month-ahead average price by hub

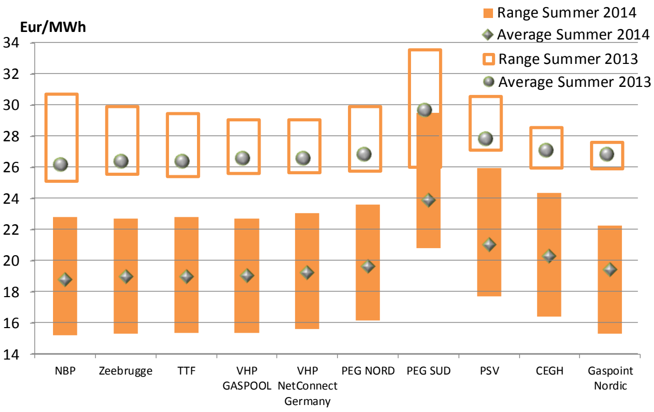

Figure 9 - Month-ahead average price (*)

(*) Average price calculated as non-prorated average of the hubs detailed in figure 8

Figure 8 compares the month-ahead Summer average prices of the main European gas hubs and figure 9 shows the price range described by the month-ahead average price for each of the considered gas hubs (source Platts and Gaspoint Nordic) in comparison to the last summer. Summer 2014 shows a significantly lower price range throughout all hubs. This evolution reflects the lower summer demand along with a higher availability of LNG in some European countries due to a decrease in the competition for spot cargoes in Asia. While a good level of price convergence is achieved between most of the hubs, this is not the case for PEG SUD where higher prices were driven by the congestion between GRTgaz Nord and GRTgaz Sud.

> Power generation from gas

The generation of electricity from gas has followed a significant (-28%) fall since Summer 2011.

This decrease follows both the increasing generation from RES source and the continuing preference for coal generation against gas.

The data shows a continuous decline in the thermal gap (the volume of power generation coming from fossil fuels).

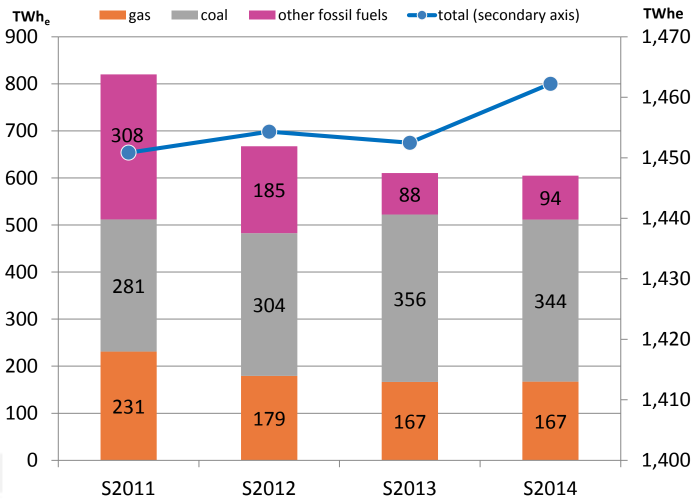

Figure 10 - Gas and coal in the electricity mix Summers 2011 - 2014

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

The power generation from gas in Summer 2014 remained at the Summer 2013 level.

On monthly basis, the power generation from gas was lower than the previous year in April and May, keeping after June a higher level than in the respective month of 2013

This does not represent a significant change in the shares of electricity produced by gas as shown in the following graphs.

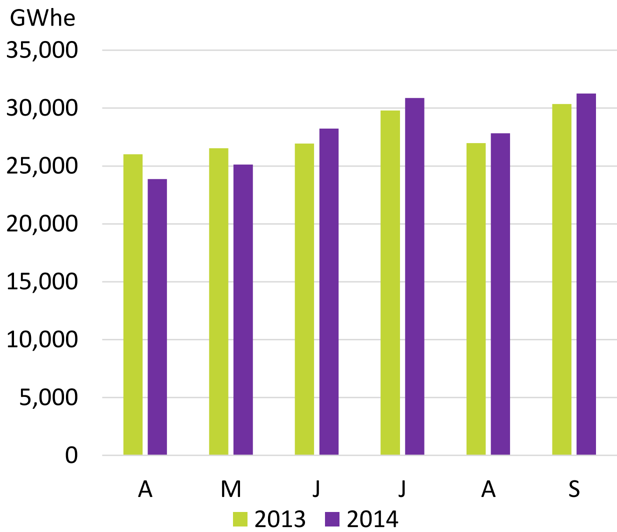

Figure 11 - Power generation from gas

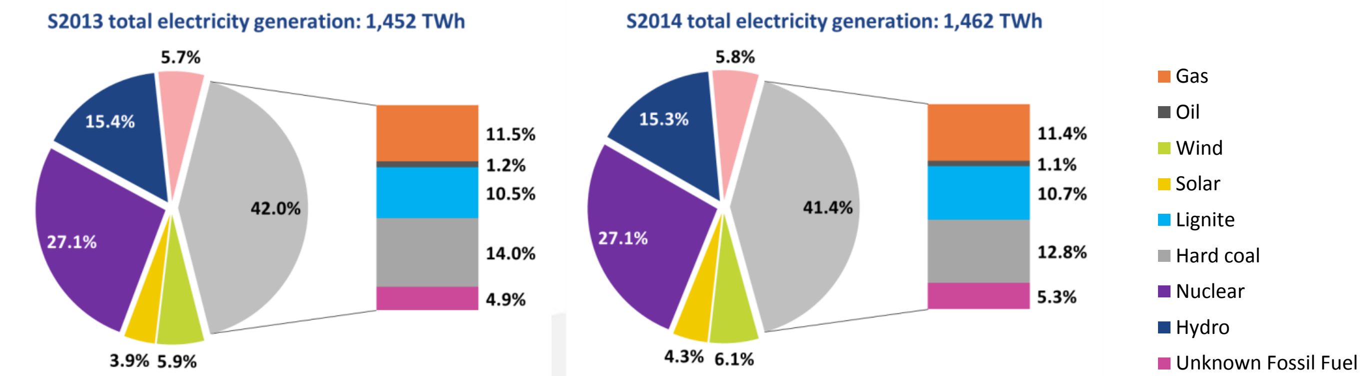

Figure 12 - Summer 2013 Electricity generation mix **Figure 13 - Summer 2014 Electricity generation mix**

As shown in the graphs above, the increase in RES (Hydro, Solar and Wind) sources resulted in a small decrease of the segment of fossil fuels from 42.0% to 41.4%.

Despite of the apparent stability in the figures of power generation from gas at European level, the evolution was quite heterogeneous between countries.
Important increases occurred in United Kingdom is explained by the introduction of a carbon tax.
Such increase was compensated by significant decrease in the electricity generated from gas in Italy, Greece, and in Spain, as can be seen in the following graph.
The decrease in the power generation in Greece is explained by a change in the provisions that used to guarantee the absorption of electricity corresponding to about 30% of the technical capacity of the CCGTs. In Spain it is consequence of a combination of low electricity demand and increase in the RES generation and coal. The decrease in Italy can be explained by an increase in renewables together with the reduction of the overall electricity consumption.

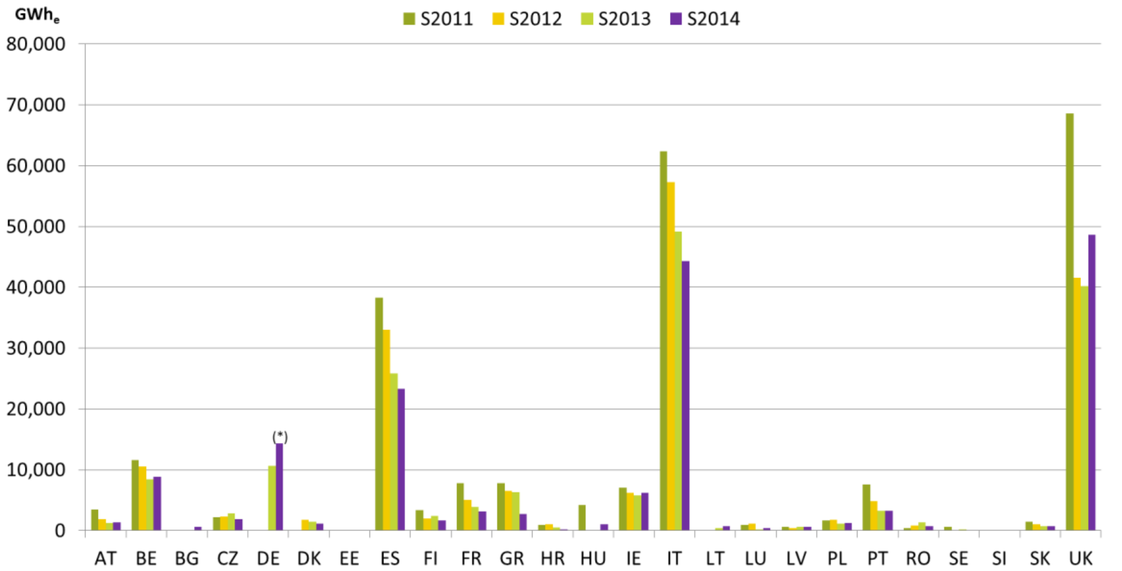

Figure 14 - Electricity generation from gas. Country detail. Summers 2011-2014 (Source ENTSO-E)

AT	BE	BG	CZ	DE	DK	EE	ES	FI	FR	GR	HR	HU
7%	5%	n.a.	-32%	(*)	-21%	n.a.	-10%	-31%	-19%	-57%	-56%	n.a.
IE	IT	LT	LU	LV	NL	PL	PT	RO	SE	SI	SK	UK
7%	-10%	56%	64%	-5%	n.a.	4%	0%	-44%	-83%	n.a.	4%	56%

Figure 15 - Electricity generation from gas. Differential S2013 vs. S2014. Country detail

(*) The increase in the figure for electricity generation from gas in Germany results from a change in data processing while a significant decrease is reported by national statistics.

As can be seen the electricity production from gas during Summer 2014 was on the same level as in summer 2013. Assuming that the gas consumption from power generation was stable, the main decrease in the total gas demand would come from the residential sector, due to the mild climatic conditions in April. It should be noted that 2014 has been identified by the NASA[1] as the warmest year in modern record.

> Summer demand evolution 2009-2014

Summer demand has decreased for the fourth year in a row. The accumulative decrease since the maximum reached in summer 2010 is 20.5%.

[1] http://www.nasa.gov/press/2015/january/nasa-determines-2014-warmest-year-in-modern-record

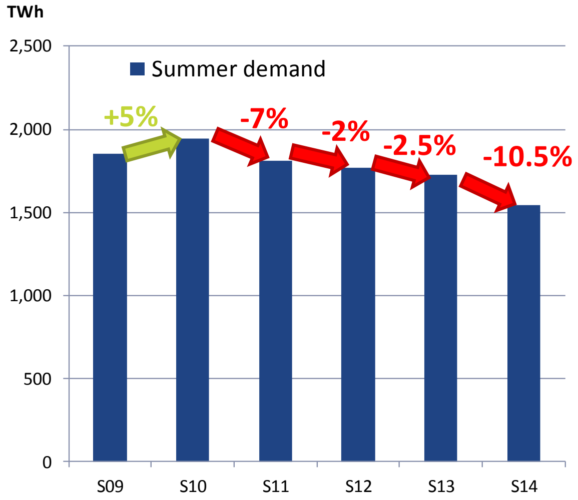

Figure 16 - Total consumption Summer 2009-2014

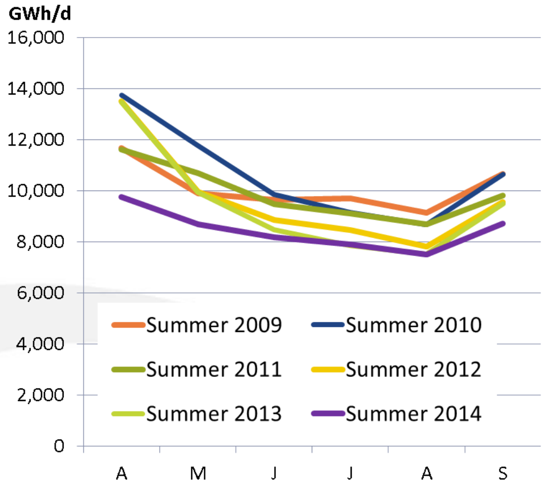

Figure 17 - Demand. Monthly average. Summer 2009-2014

> Country detail

The evolution of gas demand compared to previous summer was geographically heterogeneous with significant variations in both directions, with Bulgaria, Luxembourg and Austria being the only countries where gas demand increased. The countries where the demand decrease was more significant are Croatia, Denmark, Estonia, Finland, France, Germany, Greece and the United Kingdom. Their demand decrease follows different explanations. While it is mostly linked with the warmer climatic conditions in April for countries where gas is mostly used in the residential sector, the decrease follows a change in the use of gas for power generation in other countries like Greece.

Variation (+/-%)	Total
AT	0.4%
BE	-5.9%
BG	7.3%
HR	-21.6%
CZ	-5.4%
DK	-12.2%
EE	-33.9%
FI	-12.9%
FR	-13.1%
FYROM	n.a.
DE	-14.2%
GR	-31.5%
HU	-4.3%
IE	0.0%
IT	-5.6%

Variation (+/-%)	Total
LV	n.a.
LT	-9.3%
LU	4.5%
NL	-5.9%
PL	-1.2%
PT	-3.9%
RO	-1.1%
SK	-9.6%
SI	-3.8%
ES	-7.5%
SE	-2.8%
CH	-9.9%
UK	-17.4%
Total	**-10.5%**

Figure 18 - Variation of total gas demand (Summer 2014 ref. Summer 2013)

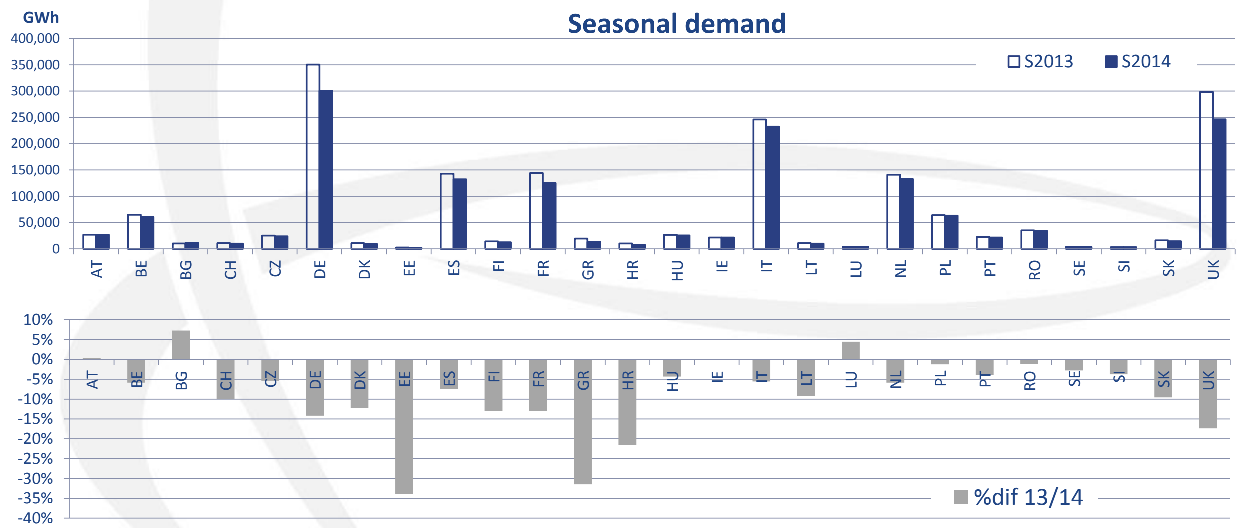

Figure 19 – Summer total gas demand. Country detail

> Seasonal modulation

The pattern followed by summer demand is linked to the climatic conditions in April and September.

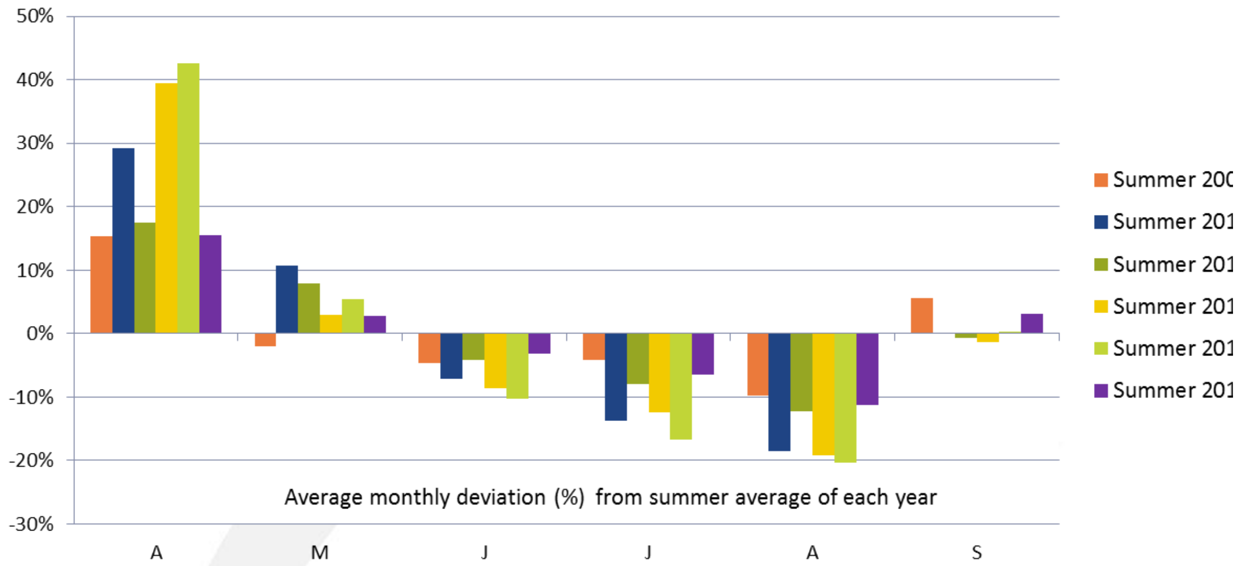

Figure 20 - Summer modulation 2009-2014

The graph above shows the deviation of the monthly average demand from the summer average for each of the last five summers:

- April has been regularly the month with the highest demand
- The gas demand in June, July and August has been systematically lower than the average
- September gas demand has been very close to the summer average for the last four years.

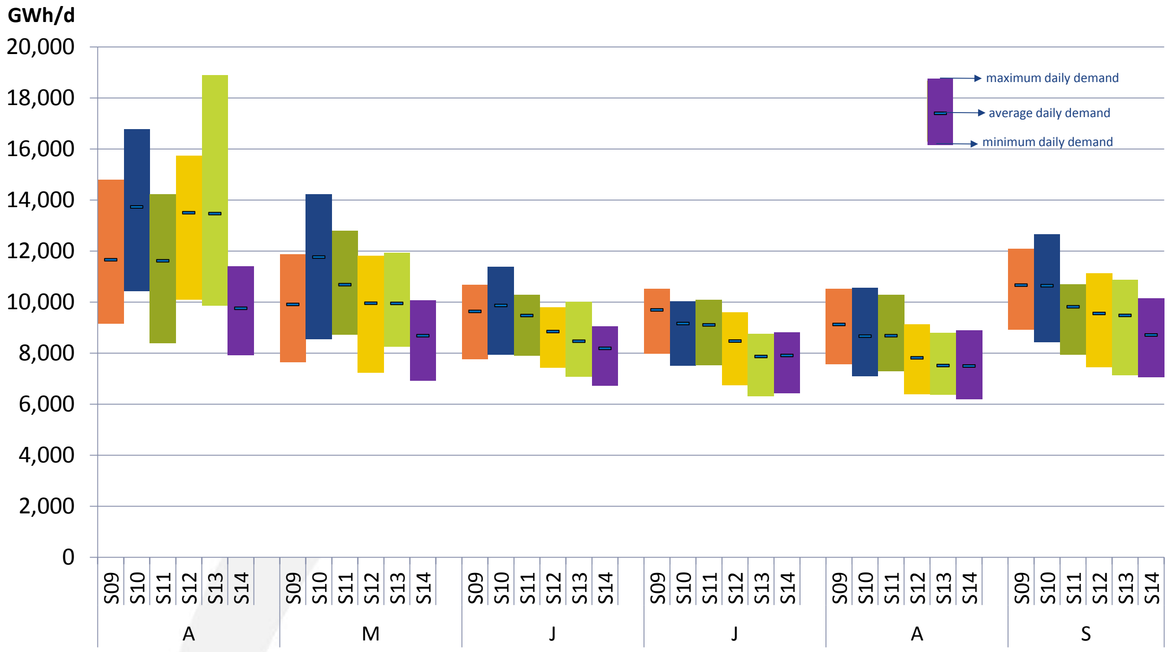

Figure 21 - Monthly demand: average and ranges

The figure above shows the monthly variation between the maximum and the minimum daily demand.

Comparing the evolution of the daily average per month since 2009, there has been a gradual decrease in the summer gas demand. The soft decrease followed in the last years was significantly accentuated between 2013 and 2014 due to the difference in the weather conditions in the months of April.

European seasonal gas supply

Figure 22 shows the evolution of the aggregated gas supply in Europe during the Summer 2014.

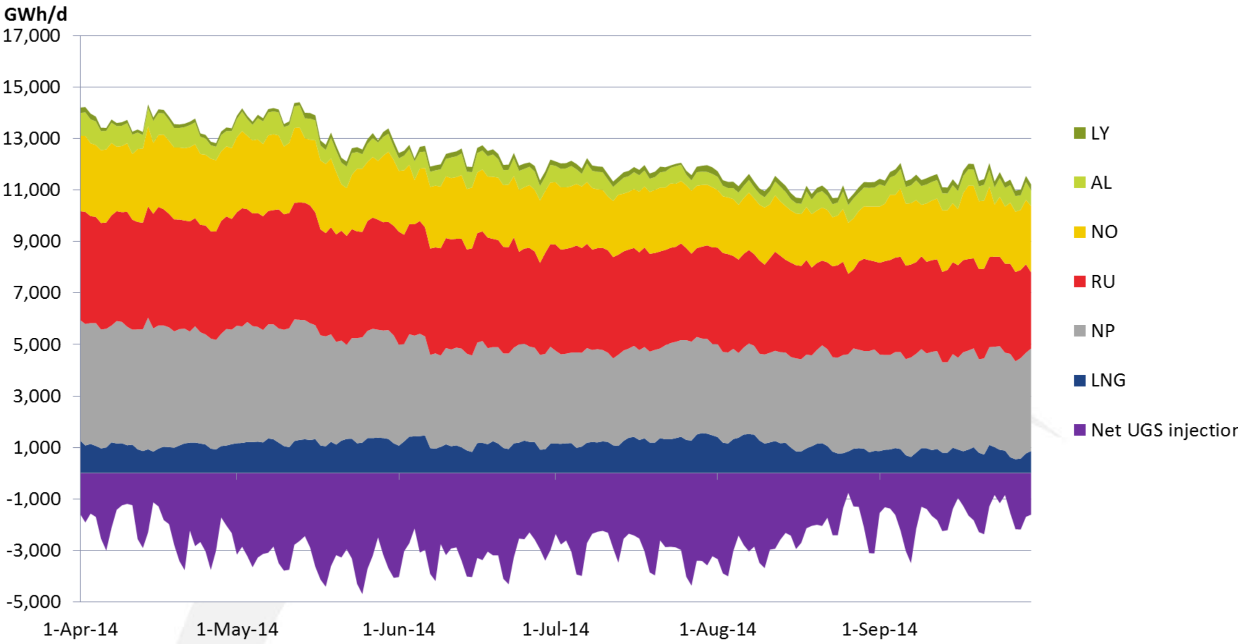

Figure 22 - Summer 2014 supply profile

The next graphs give an overview of Imports and National production supply shares during the summers 2014 and 2013 in both absolute and relative terms.

Total Summer Supply 2,165 TWh

Figure 23 shows the seasonal supplies by source for the last two summers in absolute figures.

While there was no variation in the Libyan imports and there was a slight increase in Algerian imports (+5.3%), Imports from Russia (-8.4%), LNG (-12.9%) and Norway (-13.8%) followed the decrease set by the European gas demand.

The decrease seen in the indigenous production (-13.7%) can be explained by the combination of several factors, the depletion of gas fields and the low gas demand among others.

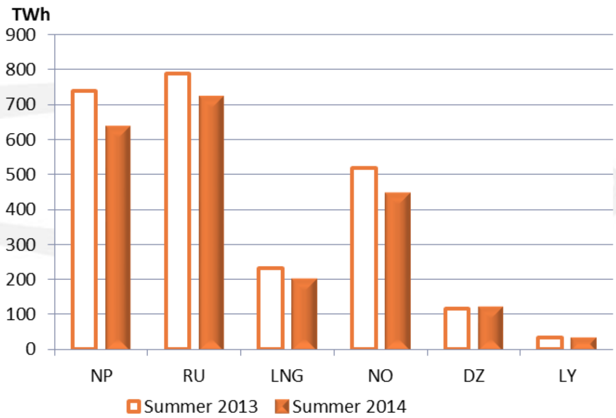

Figure 23 - Seasonal supply

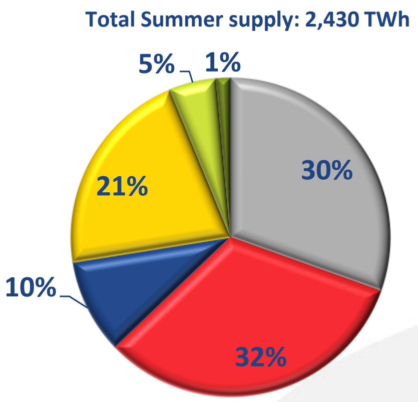

Figure 24 - Supply shares. Summer 2013

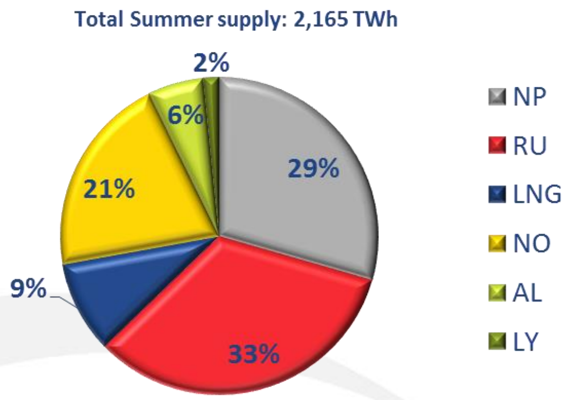

Figure 25 - Supply shares. Summer 2014

Despite of the significant decrease in the Norwegian imports, the share of Norwegian gas in the European supply mix remained at the same level. The decrease in the indigenous production was mostly compensated by Russian and North African gas each of them increasing their share by one percent.

> Supply modulation

The following graphs illustrate for national production and each import supply source per month, the average flow and the monthly and seasonal range (between the lowest and highest daily flow of each month and for the whole summer).

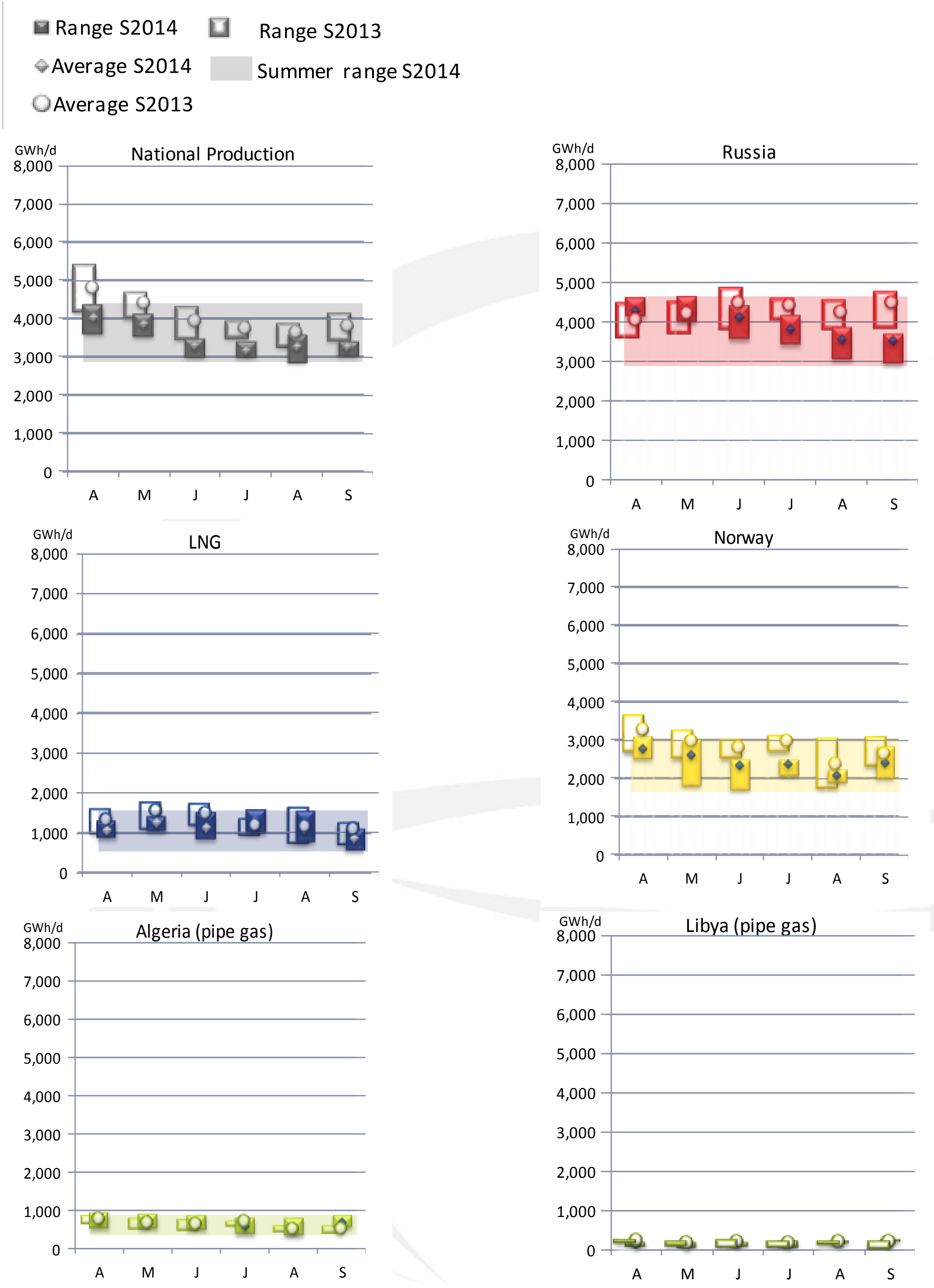

Figure 26 - Supply modulation

> Summer supply evolution 2009-2014

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

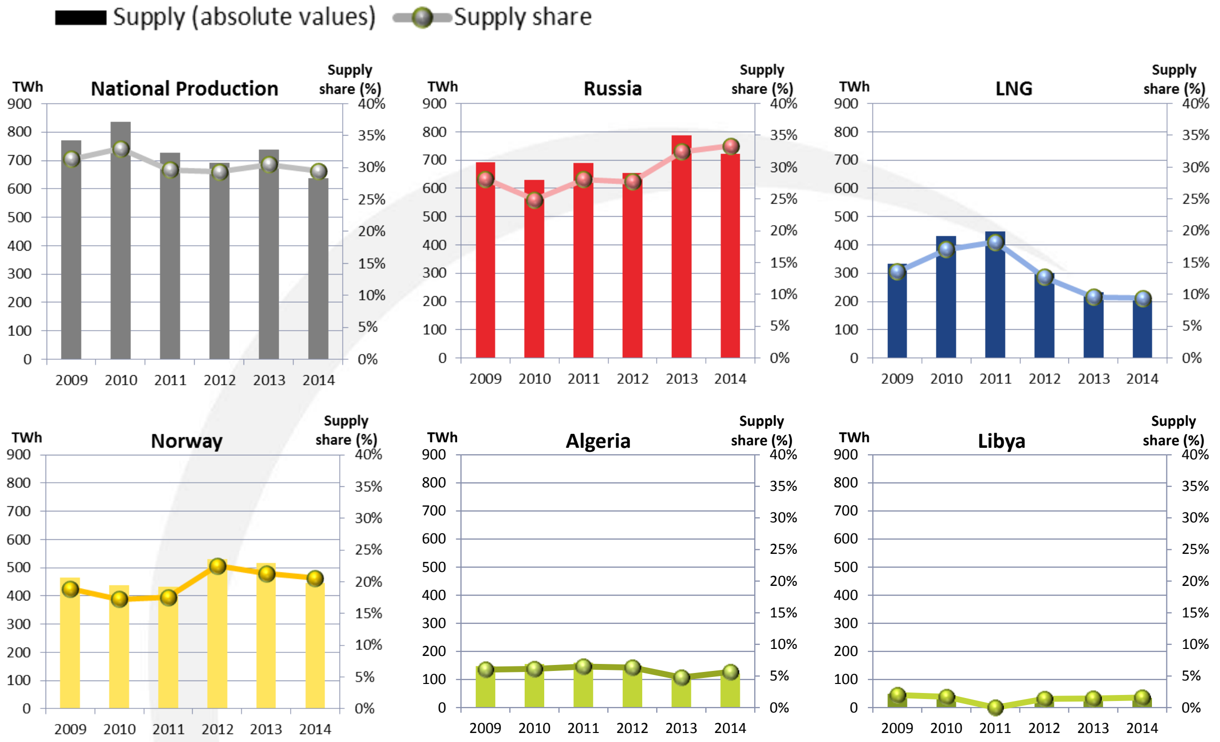

Figure 27 - Evolution of summer gas supplies 2009-2014

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 when considering gas demand. The first factor may be linked to price signals such as summer/winter spread unless the national regulatory framework implies some mandatory injection. The second one is linked to climatic and economic consideration having an impact on gas demand.

Figure 29 provides the average injection and the daily range between the lowest and highest injection for the whole Europe for every month of the Summers 2014 and 2013.

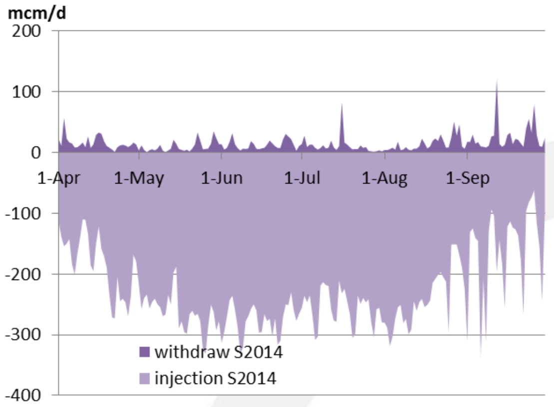

Figure 28 - UGS injection/withdraw profile. Source AGSI

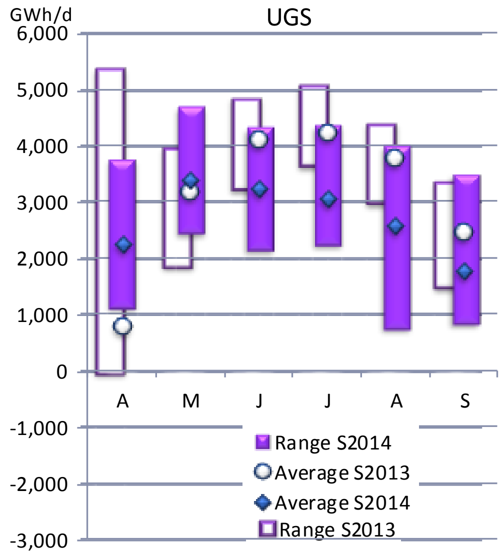

Figure 29 - UGS net injection

The high injection rate in April allowed by the low level of demand, along with the high stock level remaining by the end of the previous mild winter derived in low injection rates after June.

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

Country	1-Apr-14	1-May-14	1-Jun-14	1-Jul-14	1-Aug-14	1-Sep-14	30-Sep-14
AT	35.89	44.83	54.19	68.97	80.38	92.47	95.49
BE	58.52	63.21	68.89	77.72	89.31	92.6	95.73
BG	39.76	48.19	57.75	71.11	75.67	73.21	82.29
CZ	39.88	48.6	64.83	76.52	88.93	97.29	99.18
DE	58.01	62.77	71.26	76.8	82.65	90.22	94.2
DK	58.37	57.2	70.51	72.43	78.61	89.35	95.98
ES	82.12	84.28	89.55	88	94.18	97.49	99.64
HR	n.a.	41.88	44.74	58.51	68.89	79.67	86.47
HU	19.07	23.18	29.85	34.78	44.34	53.67	61.79
IT	45.98	52.98	65.17	76.26	85.51	91.96	95.93
LV	n.a.	n.a.	n.a.	n.a.	n.a.	68.07	86.43
NL	79.33	79.33	79.33	97.6	98.05	98.05	98.05
PL	69.24	73.63	62.41	75.11	87.17	93.21	99.83
PT	59.9	73.27	78.41	72.07	70.83	82.4	76.4
SK	38.17	44.66	58.95	72.63	85.9	97.24	94.68
UK	53.57	62.76	68.17	85.2	92.34	95.3	96.21

Figure 30 - Stock level (%WGV)

Figure 32 compares the stock level evolution curve of the last five summers (source AGSI).

Having started form a higher level than the previous four summers (45% on the 1st April), the stock level increased smoothly reaching 91% by the end of September.

For many operators, the injection season continued in October 2014.

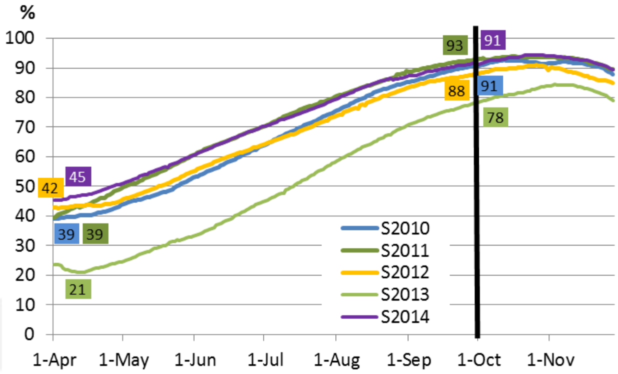

Figure 32 - Evolution of stock level. Summers 2010-2014 (Source AGSI)

	30-Sep	maximum stock level	
S2010	90.70%	92.60%	12/10/2010
S2011	92.80%	93.80%	16/10/2011
S2012	88.00%	90.90%	26/10/2012
S2013	78.30%	84.50%	03/11/2013
S2014	91.69%	94.36%	23/10/2014

Figure 31 - Stock level: 30 Sept vs. max Stock level

Figure 31 shows the stock level on the 30th September in comparison with the maximum stock level setting the end of the injection season.

Transported volumes

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

Figure 33 shows the transported volumes during Summer 2014 in comparison with those of the previous year.

The transported volumes were continuously lower than these from the previous summer, due to the lower level of demand, along with the high stock level in the UGS at the beginning of the injection season.

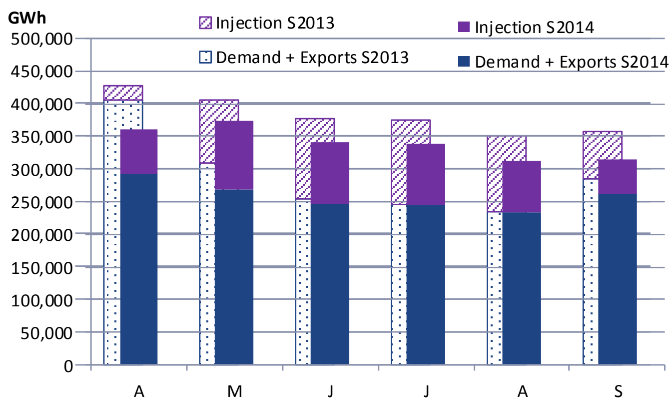

Figure 33 - Transported gas