ENTSOG Summer Supply Outlook 2013

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 the grid is able to meet both demand and injection needs during Summer 2013 (April to September). 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**
- **Full injection into storage in preparation of the upcoming Winter**
- **Flexibility for network users**

The report also identifies the following particular situations:

- **The particularly low UGS stock level in Denmark and Sweden at the end of Winter 2013 (resulting from special climatic situation) would require the use of interruptible capacity to reach of very high stock level compared with previous Summers[1]**
- **The dependence of UGS stock level on Russian gas imports in Zones in the east of Europe**
- **The dependence of UGS stock level on LNG imports in Iberian Peninsula and Southern France**

It has to be noted that such findings are exacerbated by the 100% injection target used in the assessment when the aggregated stock level at the end of Summer 2011 were 93% and 88% at the end of Summer 2012 (AGSI scope).

As the Reference Case derived from market situation of last 2 years, a sensitivity analysis has been carried out to further illustrate the ability of the network to enable full injection under a wider range of supply patterns.

[1] The cross-border congestion identified for Denmark in 2013 is known to be related to the limited firm German-Danish border capacity. Two FID projects already exist to overcome the challenges in the Danish market in terms of border point capacity, diversification and security of supply that have been identified in previous reports.

Introduction

This Outlook builds on previous Summer Supply Outlooks as well as on the recently published TYNDP 2013-2022. It 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 additional flexibility for injection under different supply scenarios.

As last year's report, the Summer Supply Outlook 2013 has checked if the capacity of the European gas network is sufficient to face demand and to achieve a 100% stock level by 30 September 2013.

In order to encompass the range of possible supply patterns, an additional sensitivity study has been carried out around a Reference Case (see paragraph "Sensitivity analysis").

Differently from the previous edition, the Reference Case is defined by a profiled supply whose monthly level and mix are derived from the last 2 Summers. The sensitivity analysis aims to assess the impact on injection levels across Europe when decreasing the share of a given supply source compared to the Reference Case.

Assumptions and results of modelling

Taking into account the ACER's opinion advocating a better consideration of seasonal specificities and short term trends together with the improvements implemented in ENTSOG TYNDP 2013-2022, a new approach has been adopted for supply and injection.

> Reference Case

Injection and supply under this Reference Case have been defined essentially based on the situation of last 2 Summers. Actual injection and supply mix will in fact result from shippers' decision.

As in the previous edition overall Summer injection is defined as the quantity of gas necessary to reach full injection on 30 September 2013 starting from actual stock level on 31 March 2013. Monthly injections are derived using the weight of each month in the last 2 Summers.
Monthly supply levels are defined as the sum of:

- the monthly demand forecast by TSOs
- the monthly injection as defined above

First National Production is set according TSO forecast then the share of each import source for each month is derived from the supply mix of the last 2 Summers (analysis of these last 2 Summers is provided in the Summer Review).

Figure 1 shows the level and composition of supply for each month (refer to Annex B for the supply shares of import sources):

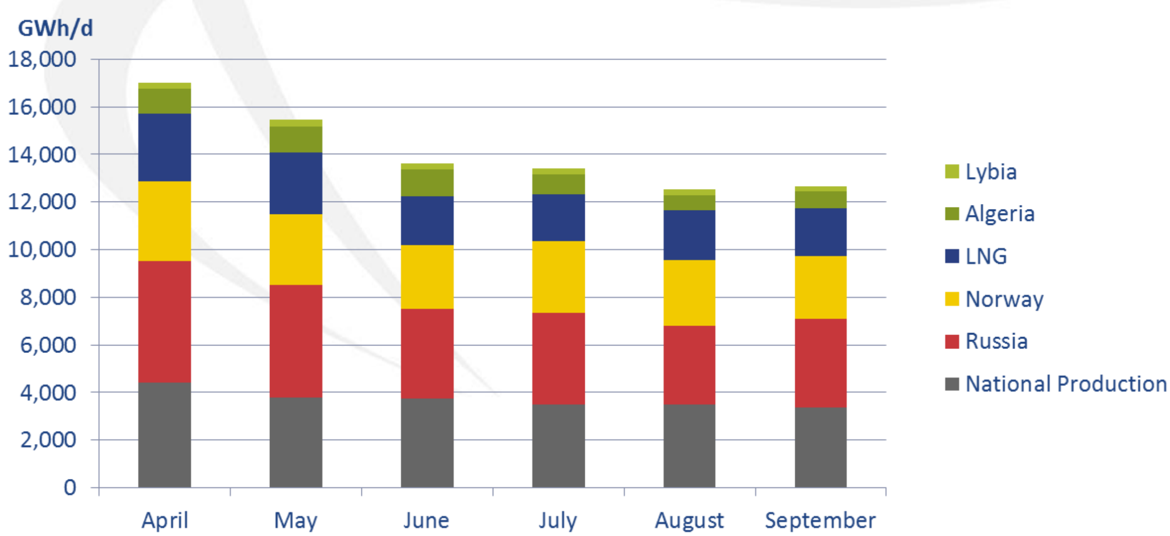

Figure 1 - Supply level and mix

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 183 daily simulations show that a 100% stock level may be achieved by 30 September 2013 in most of the Zones. Limitations have been identified for:

- Denmark and Sweden due to the limited of firm capacity from Germany (Danish and Swedish UGS can reach a maximum stock level of 65%). A higher maximum stock level would be reached using additionally interruptible capacity (as for example in March 2013). Capacity extension from Germany to Denmark would solve the issue (Two infrastructure projects will mitigate the issue for the subsequent Summers).
- Hungary and Serbia where the average weight of the import route coming from Ukraine over last 2 summers is too low (it results in a Hungarian stock level at the end of the Summer of 60% which is consistent with the level reached on 30 September 2012 which was a consequence of the suppliers' decisions). If suppliers decide to achieve higher injection import capacity from Ukraine is sufficient to reach a 100% stock level by 30 September 2013.

Figure 2 shows the breakdown of transported gas for each month (average daily values for each month including export to Kaliningrad and Turkey):

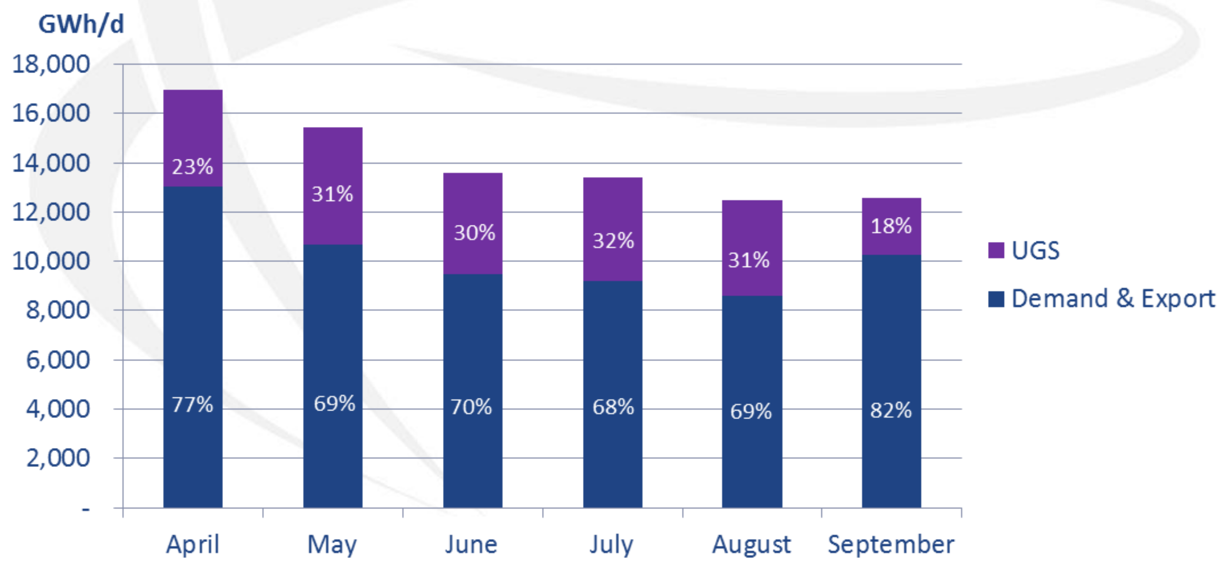

Figure 2 - Transported gas

Figure 3 provides the daily aggregated stock level evolution curve as resulting from the modelling of the Reference Case (actual injection curve will derive from shippers' behaviour):

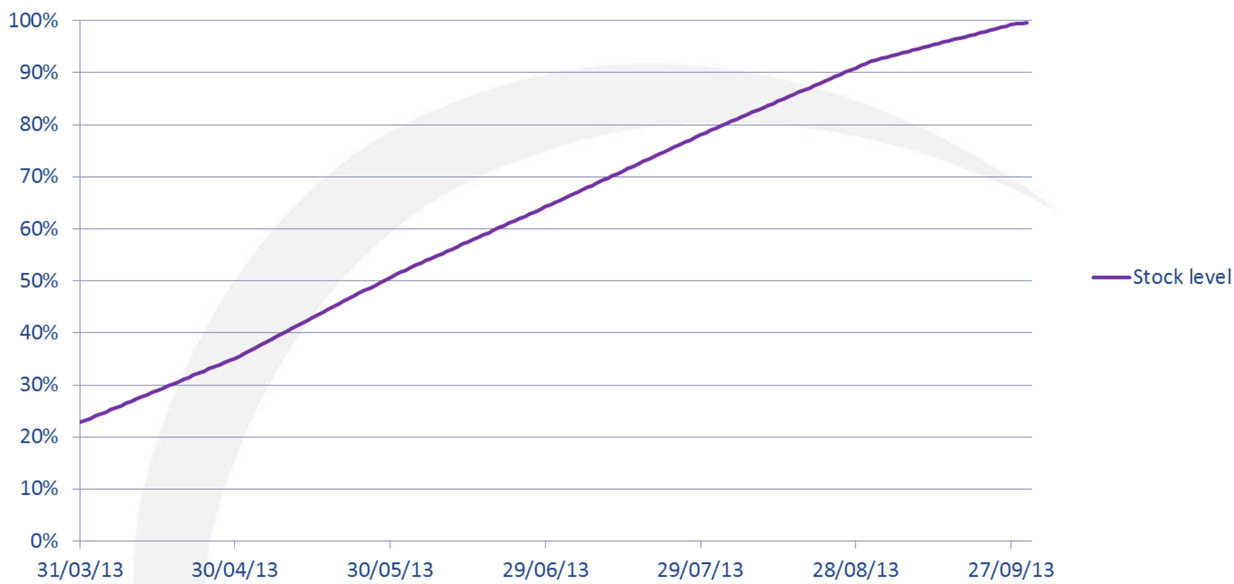

Figure 3 - Stock level development curve

Compared to Summer Supply Outlook 2012, injection at the beginning of the season is higher because of:

- Rather low stock level on 31 March 2013 compared to 31 March 2012
- The introduction of a profiled supply (closer to historic situation) instead of flat one

The table below provides the dates at which intermediate stock level are reached according the modelling of the Reference Case:

Cases	Date of x% filling achievement				Remarks
	85%	90%	95%	100%	
Reference case	15 Aug.	27 Aug.	13 Sep.	30 Sep.	Maximum level reached on 30 September (after correction of Russian export to Hungary) for Denmark & Sweden 65%

> Sensitivity analysis - Supply minimization

In order to capture the influence of supply sources on the ability to reach full injection on 30 September, each supply source share has been decreased by 10% and by 20%. The other supply sources have been increased based on their monthly share in the Reference Case. Subsequently, modelling has been used to identify the potential change in stock level on 30 September.

Generally, the flexibility of the European transmission system is high enough to allow for different supply patterns while keeping the same stock level at the end of the Summer. Some exceptions have been identified when investigating the influence of a decrease of LNG and Russian gas.

The following table identifies differences in stock level compared to Reference Case (identified stock levels of adjacent Zones are just one repartition among many possible) and the factors defining such levels:

Minimized supply source	10% reduction		20% reduction	
Algeria	No impact on stock levels compared to Reference Case			
Libya	No impact on stock levels compared to Reference Case			
LNG	PT 96% ES 96% FRs 96% FRt 96%	Maximum use of FRn>FRs Higher Algerian supply to Spain will mitigate the reduced injection in those Zones	PT 77% ES 77% FRs 77% FRt 77%	Maximum use of FRn>FRs Higher Algerian supply to Spain will mitigate the reduced injection in those Zones
Norway	No impact on stock levels compared to Reference Case			
Russia	BG 60% HU 96% RO 96% RS 96% LV 95%	Maximum use of AT>HU Higher LNG delivery to Greece will mitigate the reduced injection in BG	BG 26% HU 87% RO 87% RS 87% LV 84%	Maximum use of AT>HU Higher LNG delivery to Greece will mitigate the reduced injection in BG

These findings are consistent with those of TYNDP 2013-2022 under the Supply Source Dependence assessment. The impact of the LNG minimization is similar to the one observed under the simulation of the Russian predominance of Summer Supply Outlook 2012, where the increase of Russian gas imports led to a reduction of LNG imports.

These decreases in the maximum stock level represent only the influence of alternative supply patterns. In any case, the availability of transmission capacity to reach full injection is the same as under the Reference Case (being sufficient everywhere except from Germany to Denmark).

Summer Supply vs. TYNDP supply

This newly introduced section aims at building a bridge between Supply Outlooks and ENTSOG TYNDP 2013-2022 where 3 Potential Supply Scenarios have been introduced for each import source.

The Figure 4 compares for every import source the import level[2] in Reference Case of the Summer Supply Outlook with the 3 Potential Supply Scenarios defined in TYNDP for the year 2013.

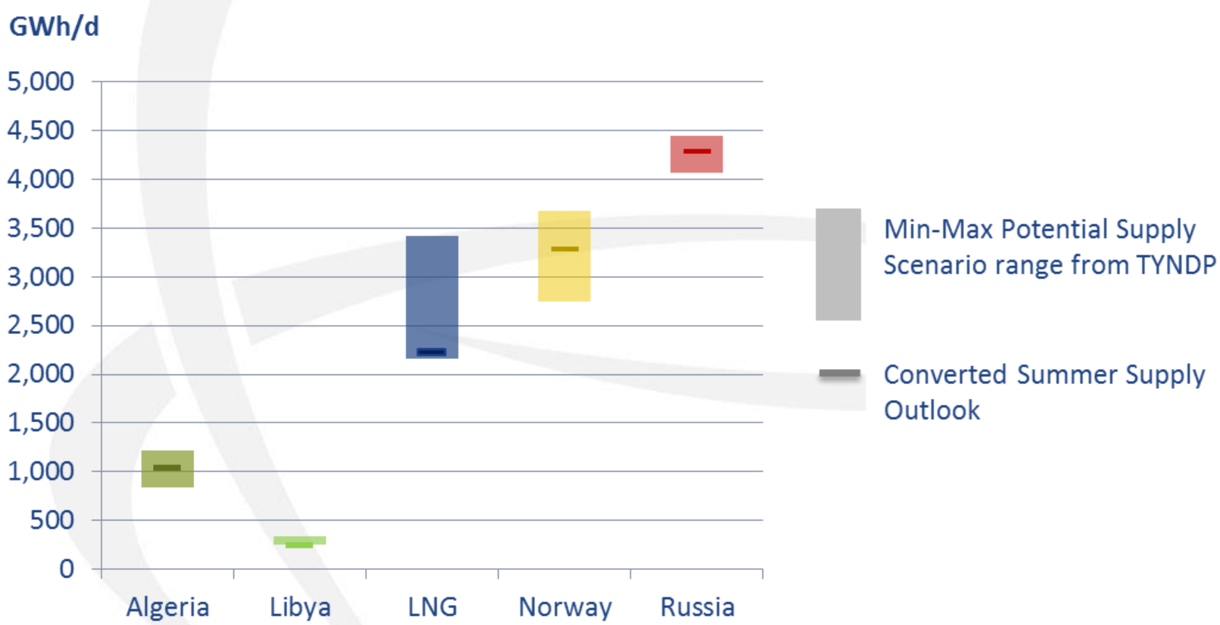

Figure 4 - Summer Supply Outlook vs. TYNDP for 2013

[2] A Summer/yearly ratio based on last 2 years has been used to convert imports used in this report into daily average for the whole year.

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 100% full gas storage by the end of the Summer while ensuring the proper maintenance of the system, except for Denmark and Sweden for infrastructure reason. The supply minimization has also enabled the identification of the strong influence of Russian and LNG supply on the UGS stock level respectively in East of Europe and Iberian Peninsula (plus South of France).

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 2013 dynamics in spring 2014 together with the next Summer Supply Outlook.

Legal Notice

ENTSOG has prepared this Summer 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 the similar to the one used in ENTSOG TYNDP 2013-2022 released in February of this year.
The considered level of transmission capacity is based on the annual firm capacity reduced according maintenance schedule where relevant.

In order to ensure maximum stock level in each Zone, priority has been given every day to the slowest storage facilities (bigger ratio between the volume still to be injected on the injection capacity).

Modelling enables the identification of potential capacity and supply limitation preventing the reach of a 100% stock level in each European storage by 30 September 2013. NeMo Tool also indicates on which date intermediate stock level may be reached.

Reference Case

Modelling is based on 183 daily simulations taking into account the decrease of injection capacity with storage filling. The different parameters are defined as below:

> Demand

Average monthly demand as the addition of TSO's forecast.
Within each month the demand is considered flat.

> Injection

First the total quantity of gas to be injected from 1 April to 30 September 2013, is defined as the difference between:

- the sum of the working volume of all European UGS
- the sum of the stock level of European UGS at the end of 31 March 2013 (source: GSE AGSI platform)

Then this quantity is split per month based on the weight of each month in the injection profile based of last 2 Summers (source: GSE AGSI platform). The overall injection within a month is considered flat and daily injection is limited by the below injectability curve.

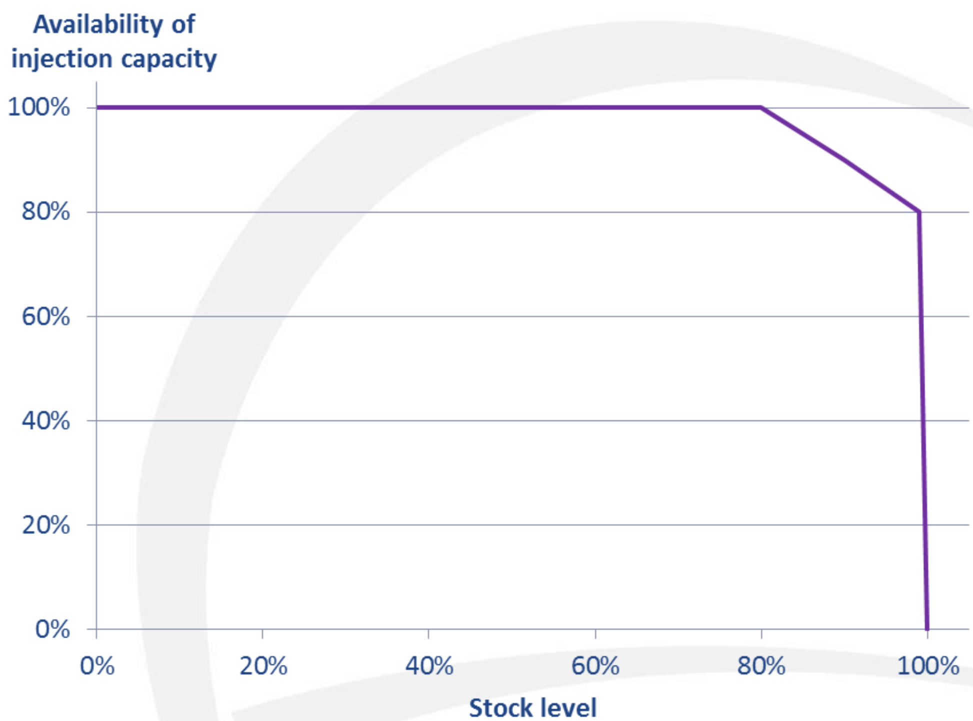

Figure 5 - Injectability curve

> Supply

For each month the level of supply results from the sum of demand and injection as defined above.

The share of National Production results from the TSOs' monthly forecast. For each month, the difference between the total supply needed and the national production is then split between import supply sources according to their share over the relevant month of last 2 summers (2011 data for Libya have been replaced by 2009 ones in order to cancel the effect of 2011 disruption).

For a given source and month, the weight of each import route is equal to the average weight of that route over last 2 summers with a ±10% freedom.

Sensitivity analysis - Supply minimization

Demand and injection parameters are the same as for the Reference Case. For supply, the monthly level is the same but each import source share is decreased one-by-one by 10% then 20% compared to Reference Case while increasing the other sources according to their share.
These changes in the level of supply sources are passed onto import routes, keeping them high enough to cover gas demand and exports to Turkey and Kaliningrad.

Modelling enables the identification of lower stock levels induced by the alternative supply mixes.

Summary of Summer Supply Outlook 2013 assumptions

	Reference Case	Supply minimization
Demand	Average monthly demand forecast provided by TSOs	
Monthly injection	> European aggregated injection over the Summer: quantity necessary to reach full injection on 30 September 2013 > Monthly injection based on the Summer one to which is applied the average monthly profile of last 2 Summers > Injection per Zone is a result of the modeling	
Overall supply	Sum of demand and injection for every month	
Supply shares	Average of summers 2011 & 2012**	-10% / -20% for the minimized source
Import routes	Average weight compared to previous 2 summers with a ±10% freedom	
Cross-border capacity	Firm technical capacity as provided by TSOs taking into account reduction due to maintenance	

(*): result of the modelling
(**): except for Libya where 2011 figures were replaced by those of 2009 to cancel the effect of 2011 disruption and for National Production which is based on TSO forecast

Annex B - Data for Summer Supply Outlook 2013

Supply share by source

Ref. Case	April	May	June	July	August	Sept.
National Prod.	26%	25%	27%	26%	28%	27%
Import	74%	75%	73%	74%	72%	73%

Ref. Case	April	May	June	July	August	Sept.	Summer/ yearly ratio
LNG	23%	22%	21%	20%	23%	22%	99%
Algeria	8%	10%	11%	9%	7%	8%	85%
Libya	2%	2%	3%	3%	3%	2%	99%
Norway	27%	25%	27%	30%	31%	28%	87%
Russia	41%	41%	39%	39%	37%	40%	93%

Import levels used in the Reference Case and Supply minimization (Summer average)

GWh/d	Reference Case	Algeria		LNG -10		Libya	
		-10%	-20%	-10%	-20%	-10%	-20%
Algeria	625	563	500	643	660	627	628
LNG	1,564	1,579	1,593	1,407	1,251	1,567	1,571
Libya	171	173	174	176	181	154	137
Norway	2,007	2,026	2,045	2,063	2,118	2,012	2,016
Russia	2,818	2,844	2,871	2,896	2,974	2,824	2,831

GWh/d	Reference Case	Norway		Russia	
		-10%	-20%	-10%	-20%
Algeria	625	650	674	666	706
LNG	1,564	1,624	1,685	1,665	1,765
Libya	171	178	184	182	193
Norway	2,007	1,806	1,605	2,136	2,266
Russia	2,818	2,927	3,036	2,536	2,254

Declared UGS storage Working Gas Volume capacity and level at the end of Winter 2012/2013

Country	DTMS* (GWh)	Stock level on 30 March 2013	Country	DTMS* (GWh)	Stock level on 30 March 2013
AT	39,886	13%	IE	2,398	1%
BE	7,755	20%	IT	174,801	37%
BG	4,950	17%	LV	25,520	11%
CZ	29,546	18%	NL	11,550	36%
DE	230,008	21%	PL	20,041	66%
DK	11,363	21%	PT	1,881	73%
ES	29,689	62%	RO	29,634	6%**
FRn	77,957	5%	RS	3,300	6%**
FRs	31,174	25%	SE	110	6%**
FRt	27,918	8%	SK	31,570	13%
HR	7,119	6%**	UK	52,316	6%
HU	67,870	23%	Total	918,356	23%

Source GSE AGSI Platform as seen from 4 April 2013 for reported countries
(*): Declared Total Maximum Technical Storage as defined on the GSE AGSI platform using a uniform GCV of 11 kWh/m^3 for conversion (Mm^3 into GWh)
(**): replacement values (see below)

When the information on stock level at the end of March was not accessible for a given country a level of 6% has been considered (lowest level of UGS as reported on AGSI platform at country level).

Average monthly demand and export forecast

GWh/d	April	May	June	July	August	September
AT	236	183	149	139	136	171
BE	481	423	358	340	340	377
BG	72	68	60	45	44	55
CH	63	48	40	37	37	43
CZ	218	130	106	64	96	129
DEg	1.157	919	737	676	624	781
DEn	1.241	949	752	707	656	885
DK	72	73	73	73	73	73
EE	16	12	10	10	10	12
ES	906	853	833	886	770	1.000
FI	100	82	73	66	73	91

FRn	719	556	463	426	383	509
FRs	281	218	181	167	150	199
FRt	71	44	34	29	24	36
GR	109	113	129	156	122	134
HR	74	77	73	71	71	77
HU	236	160	140	144	135	155
IE	150	126	130	119	116	135
IT	1.876	1.583	1.495	1.596	1.332	1.628
LT	78	60	50	48	49	52
LU	50	42	37	35	32	41
LV	37	20	16	16	16	20
MK	2	1	1	1	2	2
NL	1.016	827	753	691	707	783
PL	447	378	322	294	308	364
PT	149	147	141	141	131	143
RO	305	240	210	180	200	238
RS	46	41	36	32	33	41
RUk *	52	43	45	43	45	55
SE	44	20	17	17	17	21
SI	23	18	16	15	15	17
SK	136	81	67	57	61	80
TR *	280	230	310	328	258	251
UK	2.461	1.937	1.636	1.534	1.527	1.663
Total	**13.204**	**10.702**	**9.494**	**9.184**	**8.593**	**10.260**

(*): Exports to Kaliningrad and Turkey

ENTSOG Summer Review 2012

Executive Summary

ENTSOG has completed the review of the European gas supply and demand pictures for Summer 2012 (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 solid background for the assumptions considered in the Outlook. Such knowledge is also factored in the recurrent TYNDP process in order to ensure consistence and continuous improvement of ENTSOG reports.

Summer 2012 gas consumptions slightly decreased from the levels of the previous summer, induced by the use of gas for power generation.

The review highlights a considerable change in the supply mix, with a noticeable decrease of LNG and an important growth of Norwegian imports.

The review also includes a summary of the cross-border flows during the season.

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. This feedback would then be beneficial to the quality of further reports.

Introduction

This review, part of ENTSOG Annual Program 2013, is published on a voluntary basis and aims at providing an overview of demand and supply balance during Summer 2012. The report brings transparency on the internal analysis carried out by ENTSOG for the purpose of developing seasonal Supply Outlook and Union-wide TYNDP.

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 the 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 directly linked to physical rationales such as climate, demand breakdown or producing field flexibility for example.

Seasonal overlook

Some occurrences on the European gas market caused fluctuations in supply and demand during the period between April and October 2012. An excerpt of the major occurrences is mentioned here:

> Elgin Platform/North Sea - well blowout (April-May)
> Norway strike (mainly during June)
> General maintenance works all along the season

The following graph shows the evolution of the day-ahead monthly average prices for the main gas hubs in Europe (source Platts):

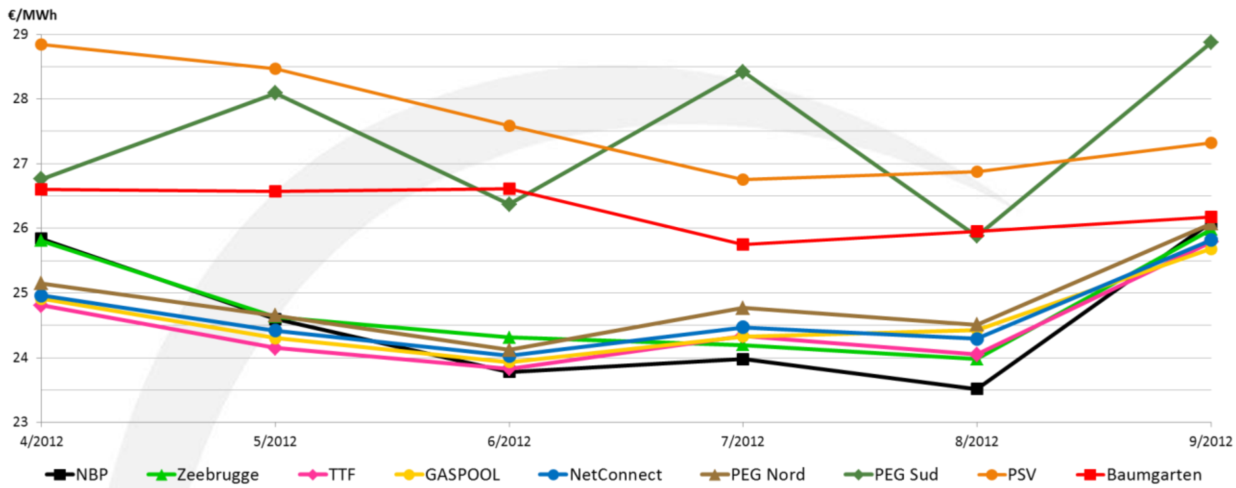

Figure 1 - Day-ahead gas prices- monthly average. Source Platts

As can be seen in the graph above, the gas prices during the summer months were mostly convergent between the main European hub, with exception of PSV, PEG Sud and Baumgarten where price levels were substantially higher.

Demand

> <u>European gas demand</u>

During Summer 2012 European gas demand was slightly lower (-2.1%) than the demand from previous summer, despite the significant increase experienced in the April consumption (+13%).

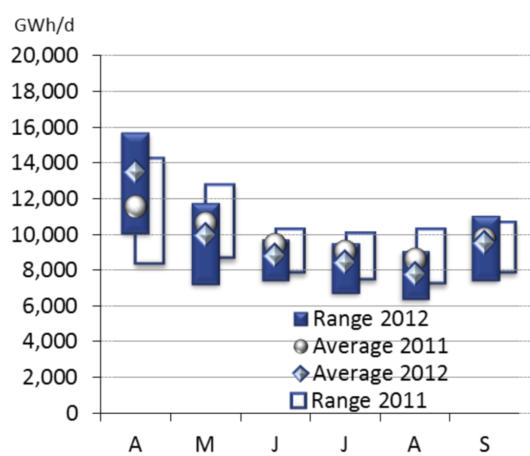

Figure 2 - Total gas demand

As shown in the graphs below, the contraction of gas consumption was caused by a sustained decrease in the power generation sector (-22%), while the levels of the Residential, commercial and industrial demand are above the ones of the previous year (+13%).

The increase in the Residential, commercial and industrial demand is partially motivated by their significant increase in April (+38%) following weather conditions, while an average increase of +7% is sustained during the remaining months of the season.

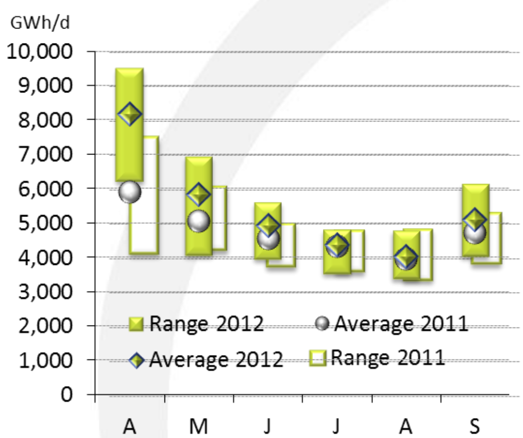

Figure 3 - Residential, commercial and industrial(*)

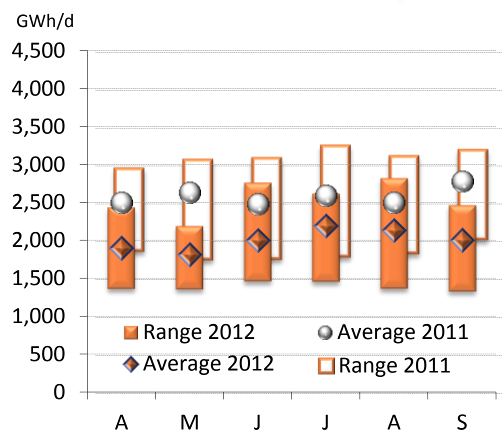

Figure 4 - Power generation (*)

(*) These graphs refer to the countries for which demand breakdown is available (Belgium, Croatia, Czech Republic, Denmark, Finland, France, Greece, Hungary, Italy, Ireland, Lithuania, Luxembourg, Netherlands, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden and United Kingdom). Although disaggregation figures for Germany are not available, German TSOs confirm the same consumption trends.

> Power generation from gas

The gas-fired power generation represented the 14% of the generation mix in Summer 2012. This is a significant decrease from the values of previous summer, when the total electricity produced was almost the same and gas represented 19%. In absolute terms, this implied a decrease of -22% in the total electricity produced from gas. This reduction was consequence of the increase in the RES production - reducing the segment of fossil fuels - and the slight increase of Coal (+1%).

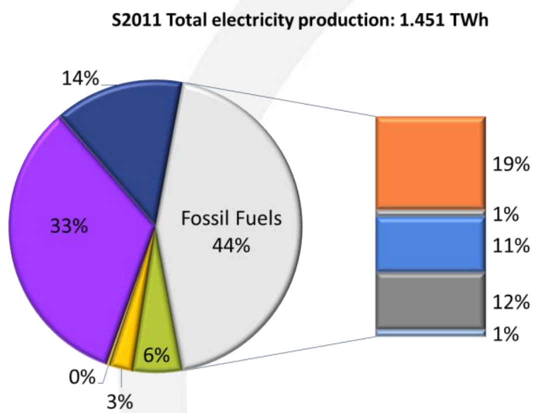

Figure 5 - Summer 2011 Electricity generation mix

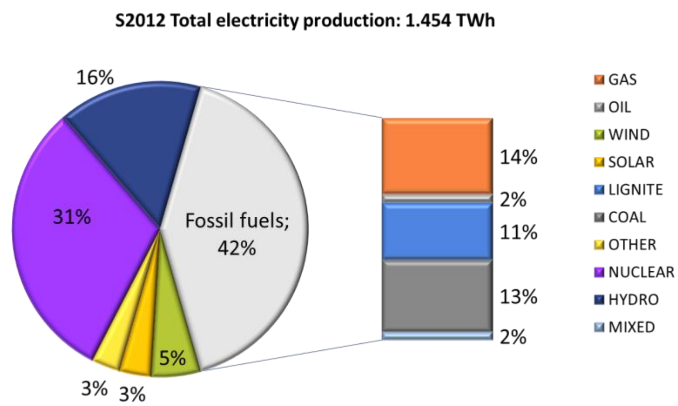

Figure 6 - Summer 2012 Electricity generation mix

Source: own elaboration on data provided by ENTSO-E

> ## Summer demand evolution 2009-2012

Having reached a maximum in 2010, gas demand has decreased during the last two summers.

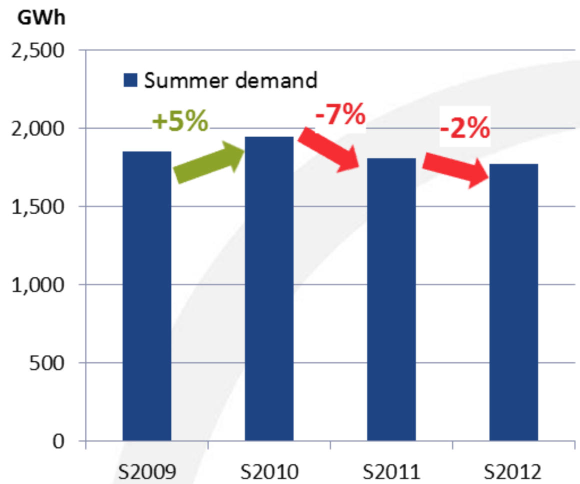

Figure 7 - Total consumption Summers 2009-2012

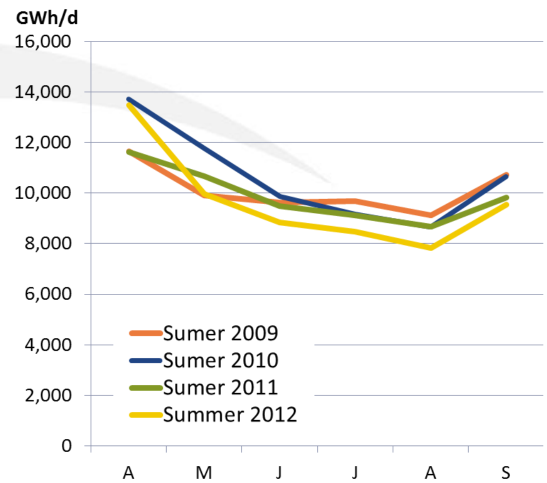

Figure 8 - Demand. Monthly average. Summers 2009-2012.

Even if the Residential, commercial and industrial sectors almost recovered in Summer 2012 to the level reached in 2010 (Figure 9), the sharp decrease experienced by the power generation (Figure 10) determined the sustained fall in the Summer gas consumption.

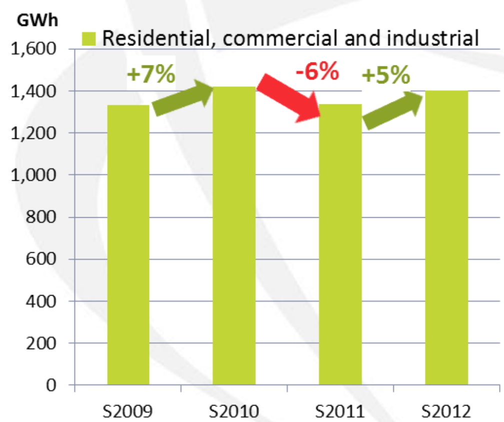

Figure 9 - Residential, commercial and industrial consumptions Summers 2009-2012 (*)

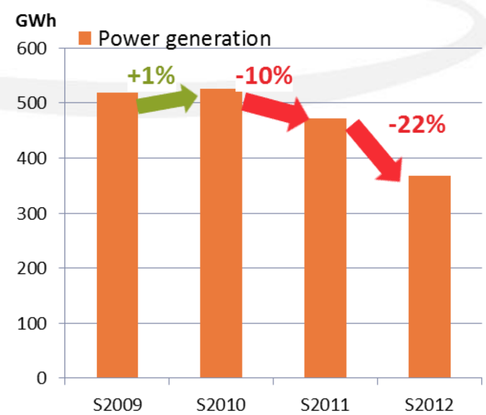

Figure 6 - Gas consumptions for power generation Summers 2009-2012 (*)

(*) These graphs refer to the countries for which demand breakdown is available (Belgium, Croatia, Czech Republic, Denmark, Finland, France, Greece, Hungary, Italy, Ireland, Lithuania, Luxembourg, Netherlands, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden and United Kingdom). Although disaggregation figures for Germany are not available, German TSOs confirm the same consumption trends.

> Country detail

Geographically, the increase or decrease of summer gas demand was heterogeneous, the demand breakdown of each country having a strong effect on the evolution of the respective demand: countries with high shares of power generation from gas experienced stronger decreases (FI, GR, HU, PT, SE, ES, UK), while those countries where demand is more weather sensitive, the high consumptions in April led to significant demand growths (FR, DE, DK).

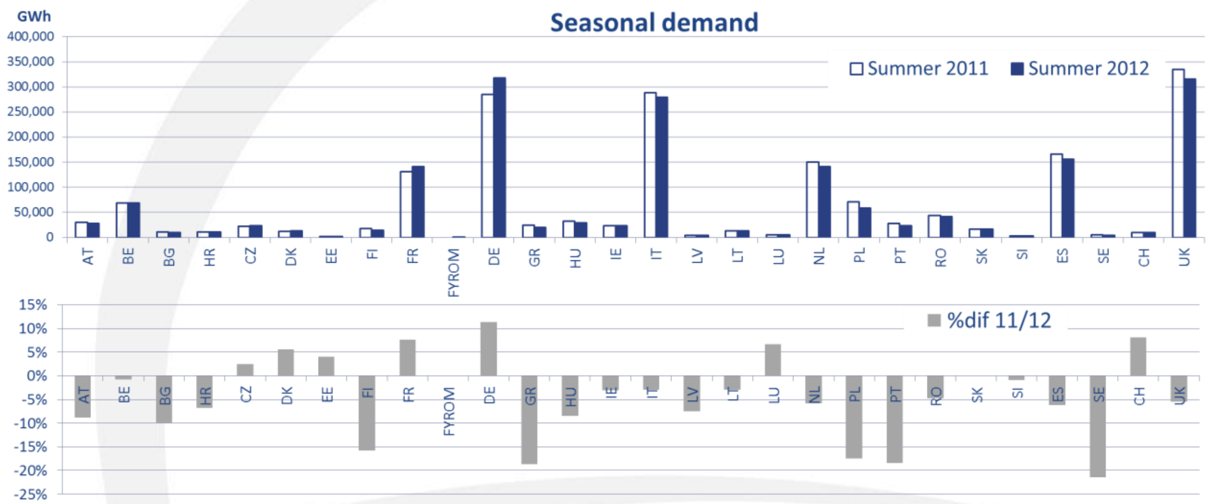

Figure 7 - Summer demand. Country detail

Storage

> UGS injection

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 considerations having an impact on gas demand.

Figure 12 provides the average injection and the daily range between the lowest and highest injection for the whole Europe for every month of the Summer 2012.

The average injection rate in April was significantly lower than the previous year, consequence of the higher consumptions experienced during this month.

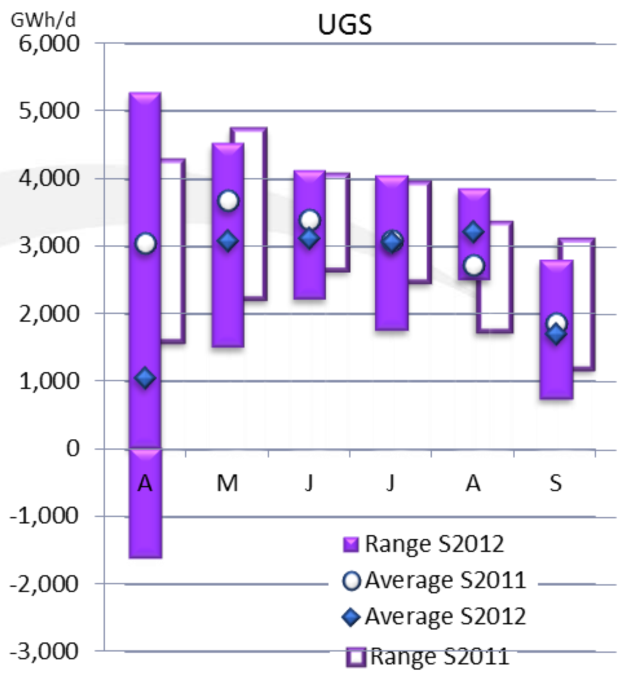

Figure 8 - UGS injection

> Stock levels

The following table provides the level of stock during summer 2012 for the GSE defined hub (source GSE AGSI platform):

Hub Area (*)	Countries	1 April	1 May	1 June	1 July	1 August	1 Sept.	30 Sept.
Baumgarten	AT,CZ,SK,HU	40%	43%	51%	59%	68%	77%	83%
France	FR	21%	22%	32%	43%	55%	72%	80%
Germany	DE	48%	51%	61%	68%	79%	89%	93%
Iberian	ES,PT	61%	67%	76%	84%	86%	90%	94%
NBP	UK	60%	52%	62%	77%	88%	98%	94%
PSV	IT	45%	54%	65%	74%	82%	87%	90%
TTF	NL,DK	63%	62%	71%	72%	77%	82%	86%
ZEE	BE	33%	34%	52%	71%	82%	94%	98%

(*) Hub definition according to AGSI platform

> <u>Stock evolution 2010-2012</u>

The following graph compares the stock level evolution curve of the last three summers (source AGSI).

Starting from an average stock level, summer 2012 is characterized by low injection volumes, reaching the lowest stock level at the end of the injection season.

It has to be noted that for many operators, injection continued in October 2012.

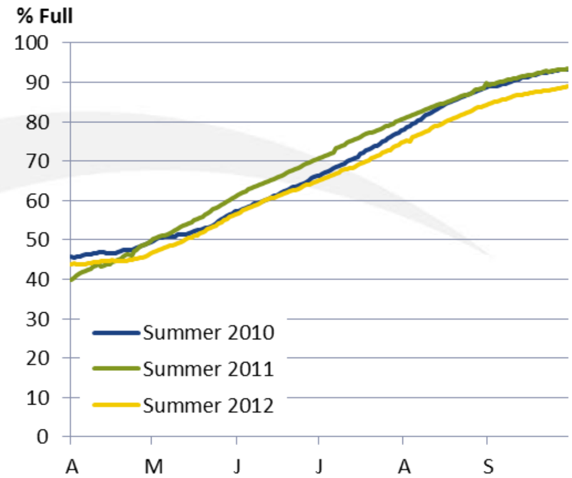

Figure 9 - Evolution of stock level. Summers 2010-2012

Final Stock level – Injection Season (%)	
30/09/2010	90.7%
30/09/2011	92.8%
30/09/2012	88.0%

Transported gas

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

Figure 14 shows the transported volumes during summer 2012 in comparison with those of the previous year.

The transported volumes in April were similar to those of the previous year, as the higher demand was compensated with lower injection.

In the following months the transported volumes were lower than those from summer 2011 following the decrease in gas consumption.

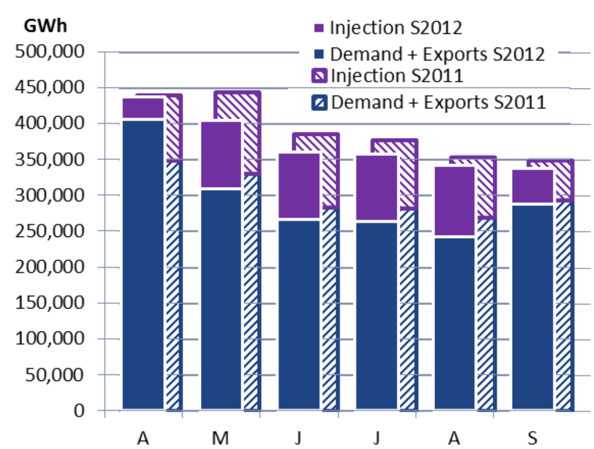

Figure 10 - Transported gas

Supply

> Summer supply

As can be seen in Figure 15, the injection in the UGS allows a relatively flat supply level during the season. No specific summer patterns can be extracted from the evolution of the different import sources.

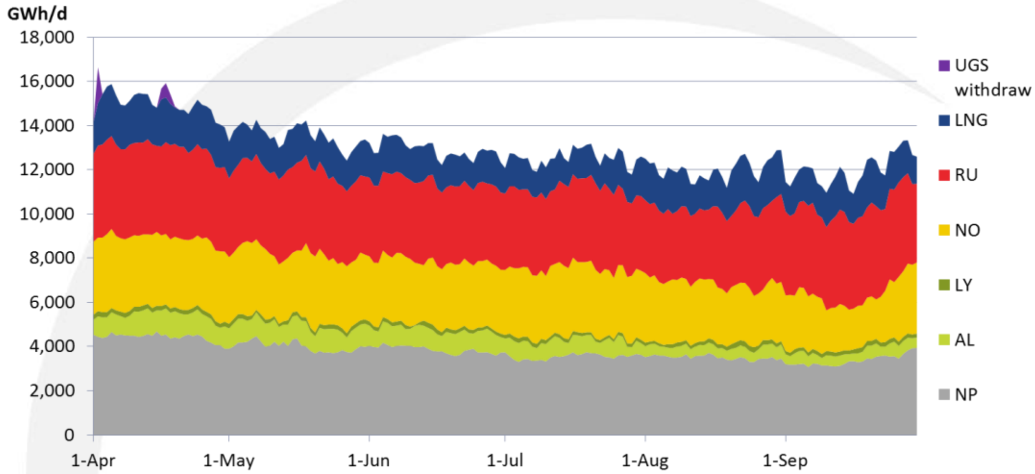

Figure 15 - Transported flows. Summer modulation

The next graphs give an overview of Import and National production supply shares during the summers 2012 and 2011 in absolute and relative terms

Total Summer Supply: 2.4x103 TWh

As can be seen in the accompanying graph, National Production, Russian, and Algerian supplies have suffered a small decrease in the supply levels, following the trend defined by gas demand.

The Libyan supplies reappeared in the supply mix, after the 2011 disruption.
On the other hand the evolution of LNG and Norwegian supplies deserves particular attention.

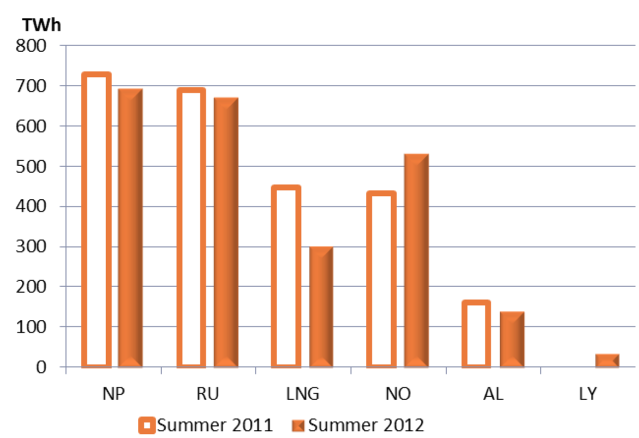

Figure 11 - Seasonal Supply

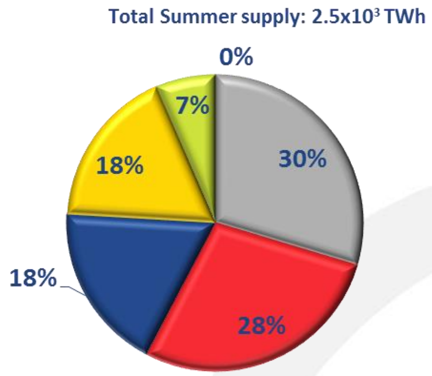

Figure 17 - Supply shares. Summer 2011

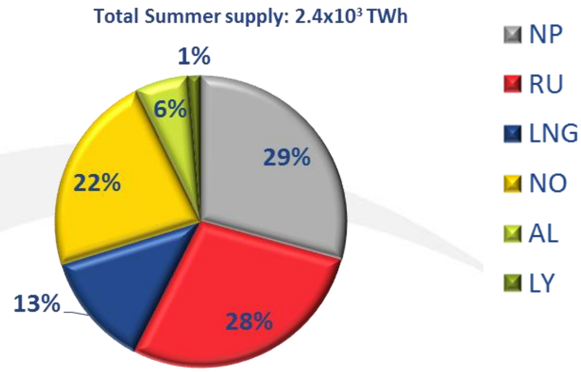

Figure 18 - Supply shares. Summer 2012

The gas prices in Europe, being significantly lower than those in the Pacific basin, combined with low demand in specific areas in Europe have prevented the arrival of spot LNG into Europe and promoted cargo redirection; as consequence the LNG supplies decreased significantly (-33%) in comparison with the previous year.

Norwegian flows were significantly higher in summer 2012 than in previous years, this was largely due to increased production from the flexible Troll field. The relatively high prices over the summer, in part because of the tight global LNG market, would have been a key driver in the decision to increase exports of Norwegian gas although other factors may also have influenced the decision.

> Supply modulation

The following graphs illustrate for national production and each import supply source and 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 2012):

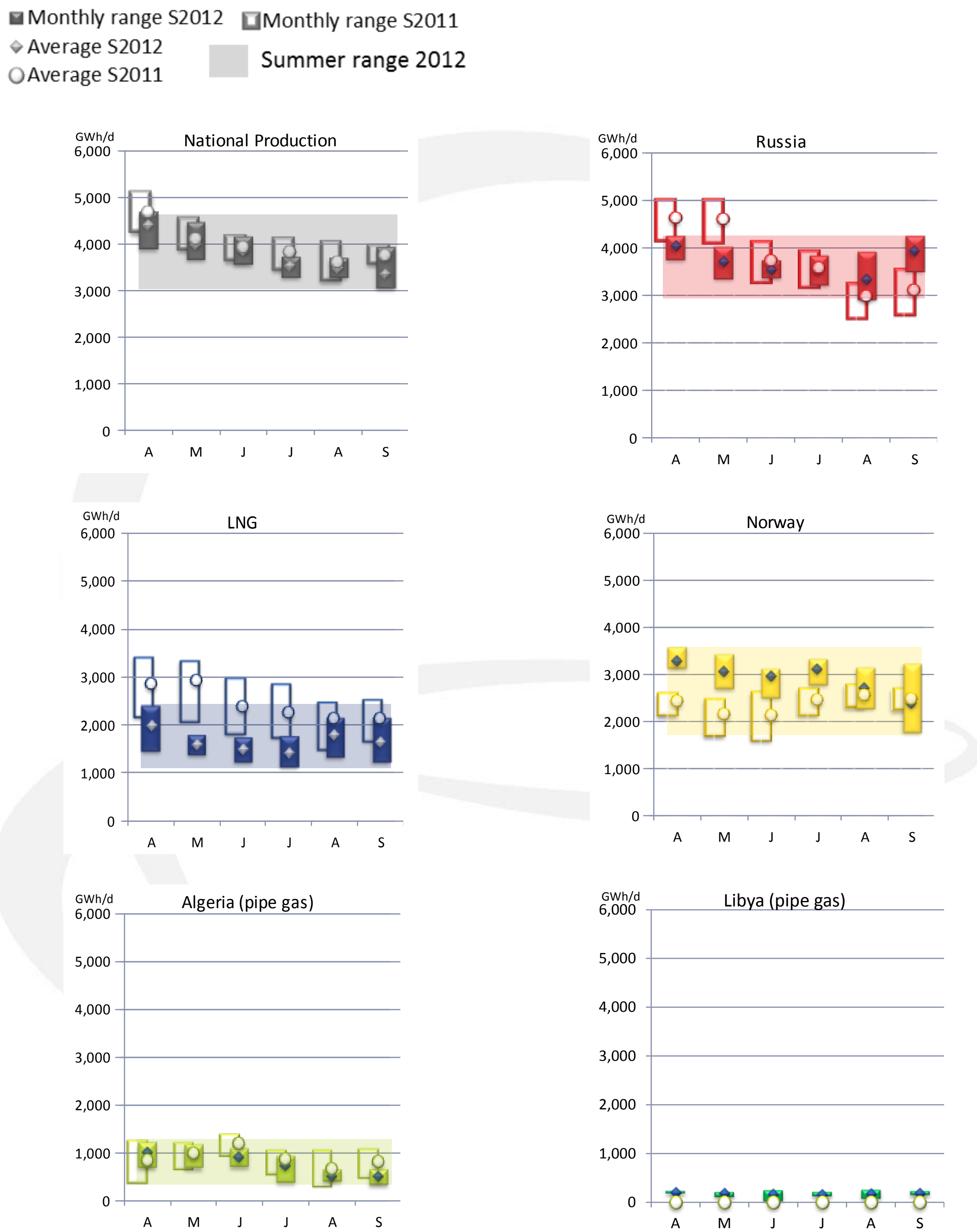

Figure 19 - Supply modulation

> Supply evolution 2009-2012

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

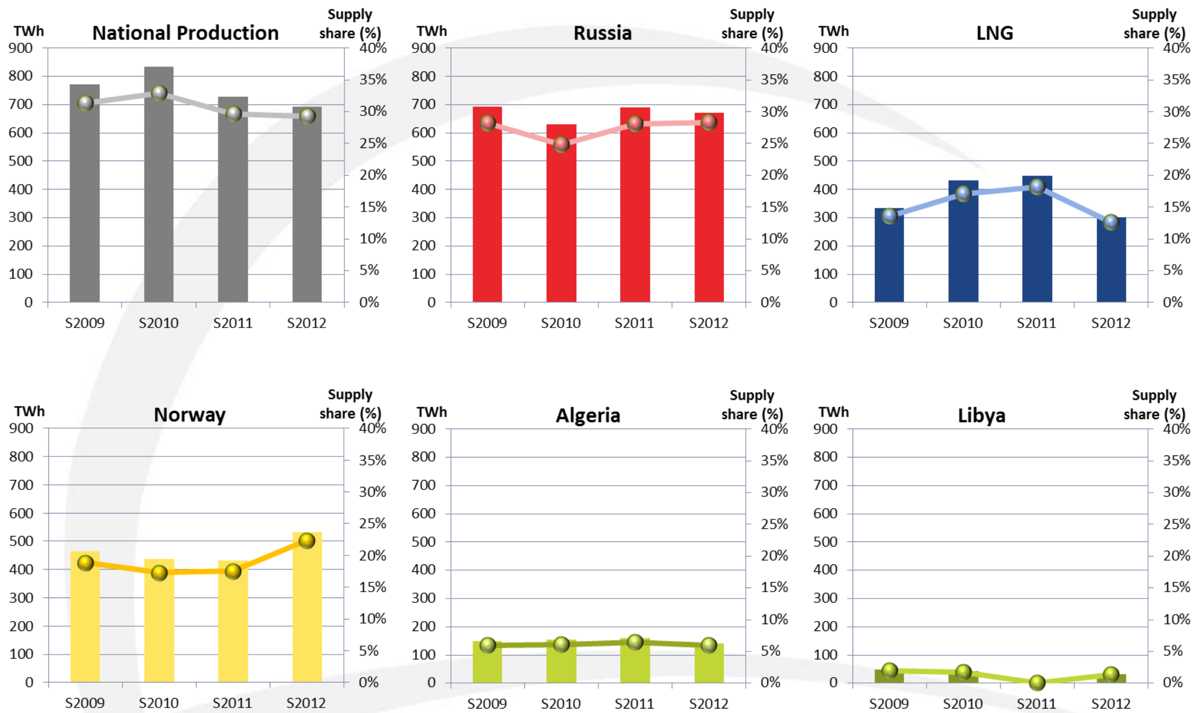

Figure 12 - Evolution of summer gas supplies 2009-2012

Flows

The following map summarizes the main net flows (summer daily average) entering Europe and through the European cross-borders during summer 2012. The tables below increase the detail, adding the monthly average and the maximum fluctuation within the summer. Commercial flows are not considered.

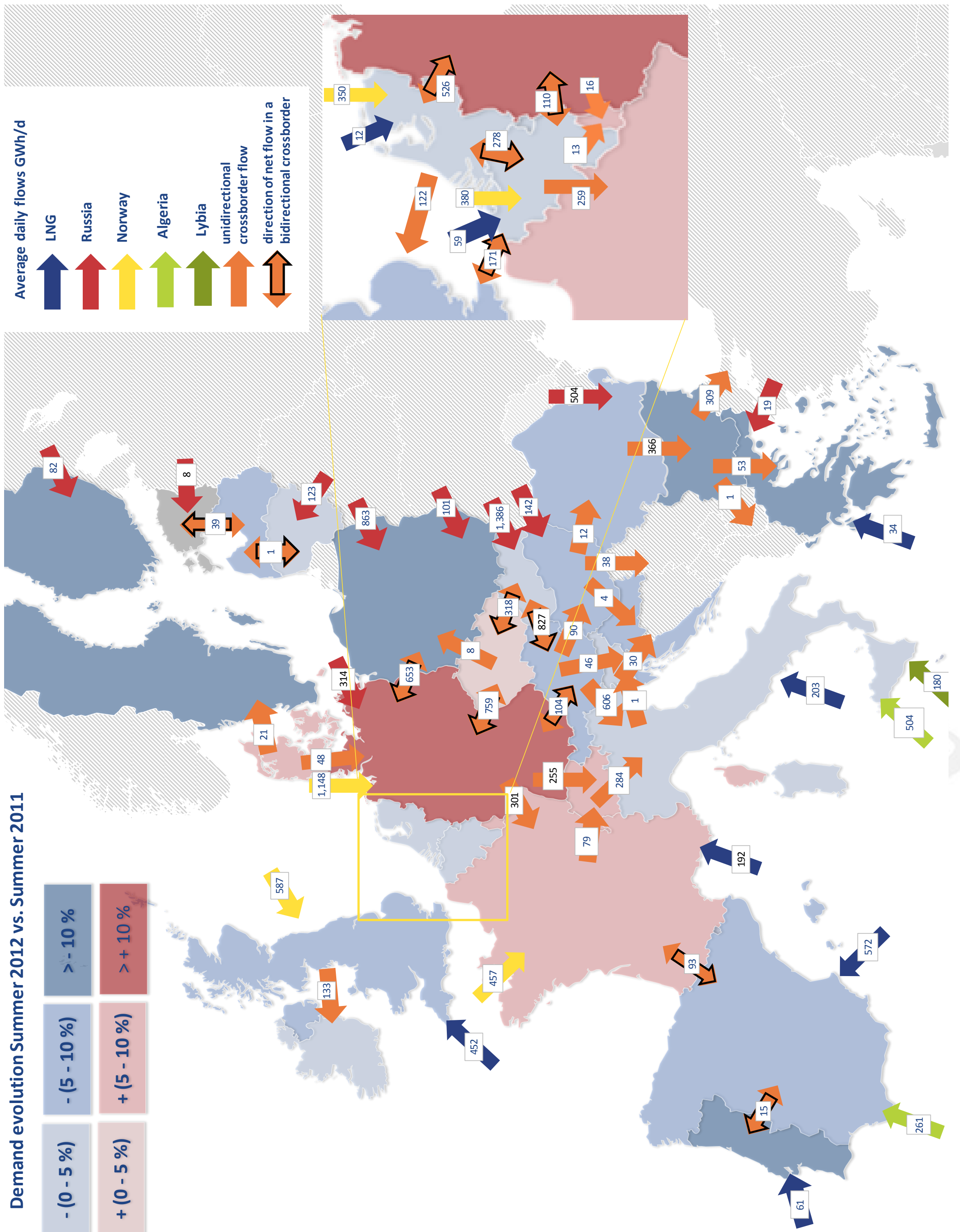

Figure 13 - Net flow pattern – summer average

Norwegian imports

GWh/d	April average	May average	June average	July average	August average	September average	Yearly average	Summer average	Summer max	Summer min
NO>UK	653	663	569	772	375	488	837	587	1,170	108
NO>FR	558	505	480	448	456	291	501	457	581	0
NO>BE	418	392	397	356	323	296	405	364	480	0
NO>NL	393	334	328	369	353	323	402	350	481	217
NO>DE	1,245	1,143	1,164	1,158	1,193	981	1,122	1,148	1,417	667

Russian imports

GWh/d	April average	May average	June average	July average	August average	September average	Yearly average	Summer average	Summer max	Summer min
RU>FI	98	79	73	64	79	97	110	82	131	48
RU>EE	8	10	7	6	7	9	8	8	16	0
RU>BY>LT	131	97	121	120	138	130	155	123	188	0
RU>BY>PL	1,077	945	780	822	718	838	903	863	1,122	143
RU>UA>PL	116	127	118	93	91	61	109	101	145	46
RU>UA>SK	1,787	1,325	1,062	1,336	1,257	1,554	1,470	1,386	2,112	933
RU>UA>HU	192	160	176	114	88	122	162	142	228	64
RU>UA>RO	520	508	643	480	385	492	584	504	759	156
Ru>DE	164	364	374	304	355	319	325	314	814	0
RU>TK>GR	22	21	18	21	16	19	18	19	26	1

(*) Greek imports from Turkey are composed of the supply sources available in Turkey, being it Russian between others.

LNG imports

GWh/d	April average	May average	June average	July average	August average	September average	Yearly average	Summer average	Summer max	Summer min
LNG>PT	34	31	34	89	88	86	61	61	161	0
LNG>ES	632	498	487	582	591	640	592	572	799	367
LNG>UK	653	510	410	264	614	261	408	452	862	105
LNG>FR	198	173	221	164	195	204	221	192	383	0
LNG>BE	51	40	38	35	76	117	67	59	293	21
LNG>NL	9	4	5	15	10	32	20	12	74	3
LNG>IT	267	249	198	167	117	222	210	203	362	69
LNG>GR	31	25	19	38	41	46	39	34	96	0

Algerian imports

GWh/d	April average	May average	June average	July average	August average	September average	Yearly average	Summer average	Summer max	Summer min
AL>ES	264	352	361	220	170	200	343	261	406	112
AL>IT	742	631	540	508	322	284	601	504	870	169

Libyan imports

GWh/d	April average	May average	June average	July average	August average	September average	Yearly average	Summer average	Summer max	Summer min
LY>IT	206	183	169	161	178	185	187	180	255	27

EU IP

GWh/d	April average	May average	June average	July average	August average	September average	Yearly average	Summer average	Summer max	Summer min
ES>PT	9	8	13	20	16	22	14	15	40	0
ES>PT	9	8	14	21	18	25	15	16	77	0
PT>ES	0	0	0	1	2	3	1	1	37	0
FR>ES	97	99	100	97	77	87	93	93	103	5
FR>ES	102	105	105	101	80	91	95	97	112	5
ES>FR	5	5	5	4	2	4	2	4	9	0
UK>IE	142	143	130	122	132	131	137	133	166	92
UK>IE	176	173	163	150	162	161	174	164	210	108
IE>UK	34	30	33	28	29	31	37	31	44	16
UK>BE	209	168	122	321	368	84	97	213	434	0
UK>BE	209	173	122	321	368	86	136	214	522	0
BE>UK	0	4	0	0	0	2	39	1	88	0
NL>UK	239	165	101	108	62	59	198	122	305	0
NL>UK	239	165	101	108	62	59	198	122	305	0
UK>NL	-	-	-	-	-	-	-	-	-	-
NL>BE	335	314	317	236	210	311	397	287	434	158
NL>BE	383	354	356	276	256	354	443	329	501	188
BE>NL	48	40	39	40	46	43	46	43	67	31
BE>FR	267	261	251	302	280	247	274	268	360	123
BE>FR	267	261	251	302	280	247	274	268	360	123
FR>BE	-	-	-	-	-	-	-	-	-	-
BE>LU	19	14	12	12	9	14	19	13	23	7
BE>LU	19	14	12	12	9	14	19	13	23	7
LU>BE	-	-	-	-	-	-	-	-	-	-
NL>DE	657	494	455	515	577	461	794	526	894	358
NL>DE	830	618	550	540	583	496	852	602	1,124	358
DE>NL	173	125	95	25	6	35	59	76	230	0
BE>DE	88	66	90	110	141	22	33	87	131	0
BE>DE	101	89	90	111	141	25	68	93	214	0
DE>BE	13	23	0	1	0	3	35	7	83	0
DE>LU	22	18	19	17	13	9	18	16	27	2
DE>LU	22	18	19	17	13	9	18	16	27	2
LU>DE	-	-	-	-	-	-	-	-	-	-
DE>FR	343	344	210	263	332	314	280	301	435	137
DE>FRn	343	344	210	263	332	314	280	301	435	137
FRn>DE	-	-	-	-	-	-	-	-	-	-
FR>CH	88	91	80	88	72	54	76	79	123	0
FR>CH	88	91	80	88	72	54	76	79	123	0
CH>FR	0	0	0	0	0	0	0	0	0	0

GWh/d	April average	May average	June average	July average	August average	September average	Yearly average	Summer average	Summer max	Summer min
DE>CH	231	233	240	273	269	286	266	255	320	191
DE>CH	231	233	240	273	269	286	266	255	320	191
CH>DE	-	-	-	-	-	-	-	-	-	-
CH>IT	244	273	280	308	311	289	261	284	356	222
CH>IT	244	273	280	308	311	289	261	284	356	222
IT>CH	-	-	-	-	-	-	-	-	-	-
DK>DE	29	61	60	68	34	37	25	48	81	0
DK>DE	29	61	60	68	34	37	25	48	83	0
DE>DK	0	0	0	0	0	0	0	0	2	0
DK>SE	28	20	20	17	18	21	27	21	41	12
DK>SE	28	20	20	17	18	21	27	21	41	12
SE>DK	-	-	-	-	-	-	-	-	-	-
DE>AT	104	113	115	105	105	83	69	104	71	56
DE>AT	191	179	187	164	132	157	133	168	201	56
AT>DE	87	66	72	59	27	74	63	64	130	0
AT>IT	642	509	549	641	621	674	688	606	875	325
AT>IT	642	509	549	641	621	674	688	606	875	325
IT>AT	-	-	-	-	-	-	-	-	-	-
IT>SI	1	1	1	1	0	2	2	1	3	0
IT>SI	1	1	1	1	0	2	2	1	3	0
SI>IT	-	-	-	-	-	-	-	-	-	-
CZ>DE	709	491	136	438	346	583	760	759	644	515
CZ>DE	942	818	468	746	674	917	1,084	1,069	994	515
DE>CZ	234	327	332	308	327	334	324	311	350	0
PL>DE	862	712	565	646	516	619	673	653	871	45
PL>DE	904	750	581	662	551	655	706	683	918	45
DE>PL	42	39	16	16	35	36	32	31	47	0
AT>SI	45	47	46	44	46	49	53	46	60	31
AT>SI	45	47	46	44	46	49	53	46	60	31
SI>AT	0	0	0	0	0	0	0	0	0	0
SI>HR	24	31	30	29	29	33	31	30	38	19
SI>HR	24	31	30	29	29	33	31	30	38	19
HR>SI	-	-	-	-	-	-	-	-	-	-
CZ>PL	26	4	4	4	4	5	17	8	27	3
CZ>PL	26	4	4	4	4	5	17	8	27	3
PL>CZ	0	0	0	0	0	0	0	0	0	0
SK>CZ	747	394	113	222	106	333	315	318	895	0
SK>CZ	747	394	113	222	113	333	321	319	938	0
CZ>SK	0	0	0	0	7	0	6	1	43	0
SK>AT	827	712	733	870	847	975	941	827	1,214	600
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AT>HU	83	82	82	102	102	91	92	90	117	36
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HU>HR	4	4	4	4	6	4	9	4	14	2
HU>HR	4	4	4	4	6	4	9	4	14	2
HR>HU	-	-	-	-	-	-	-	-	-	-
HU>RS	46	41	36	32	33	41	60	38	88	15
HU>RS	46	41	36	32	33	41	60	38	88	15
RS>HU	-	-	-	-	-	-	-	-	-	-

GWh/d	April average	May average	June average	July average	August average	September average	Yearly average	Summer average	Summer max	Summer min
HU>RO	18	11	9	11	13	8	14	12	18	7
HU>RO	18	11	9	11	13	8	14	12	18	7
RO>HU	-	-	-	-	-	-	-	-	-	-
RO>BG	344	286	421	433	298	417	429	366	522	124
RO>BG	344	286	421	433	298	417	429	366	522	124
BG>RO	-	-	-	-	-	-	-	-	-	-
BG>GR	46	57	58	67	45	47	71	53	103	7
BG>GR	46	57	58	67	45	47	71	53	103	7
GR>BG	-	-	-	-	-	-	-	-	-	-
BG>MK	1	1	0	1	1	1	3	1	4	0
BG>MK	1	1	0	1	1	1	3	1	4	0
MK>BG	-	-	-	-	-	-	-	-	-	-
BG>TK	292	227	360	362	251	365	350	309	427	123
BG>TK	292	227	360	362	251	365	350	309	427	123
TK>BG	-	-	-	-	-	-	-	-	-	-
LT>LV	0	-5	0	0	0	0	-1	-1	-74	0
LT>LV	0	0	0	0	0	0	0	0	0	0
LV>LT	0	5	0	0	0	0	1	1	74	0
LV>EE	0	0	0	0	0	0	0	0	0	0
LV>EE	0	0	0	0	0	0	0	0	0	0
EE>LV	-	-	-	-	-	-	-	-	-	-

Note: [-] - no physical flows due to no physical transmission capacity in that flow direction

Legal Notice

ENTSOG has prepared this Summer Review 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 – demand modulation

The demand composition and weather specificities determine the curve followed by the demand along the summer months. Defining the "Summer monthly load factor" (SMLF) as the relation between a summer month daily average demand and the summer daily average demand. The "Summer monthly load factor" shows the higher or lower modulation of gas consumption along the summer. Three different demand patterns had been distinguished:

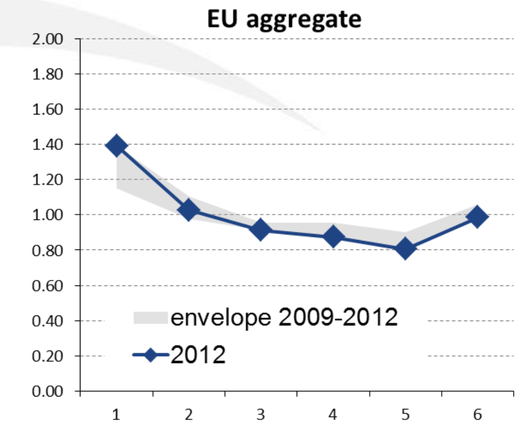
Type 1: Sharp "V" Summer: High share of residential demand in the demand composition combined with cold "summer-shoulder" months (April, May and September; particularly in April in 2012) may explain a well-defined "v" pattern.

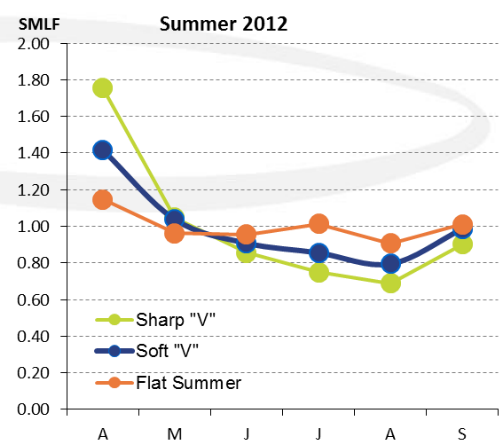
Type 2: Soft "V" Summer: Similar to type 1; moderately cold "summer-shoulder" months and a lower share of residential demand in the demand composition, may explain a softer "v" summer pattern.
The shifting between Soft and Sharp "V" is strongly dependent on weather conditions.

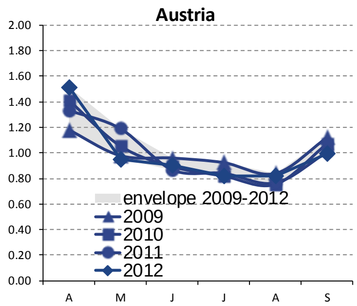
Type 3: Flat Summer: Warm "summer-shoulder" months with no heating requirements, combined with both a high share of gas demand for power generation in the demand composition and air conditioning during June, July and August, may explain a quite flat demand during the summer months.

This classification has been based on the qualitative analysis, and has changed from one year to the other. The following figure shows the evolution of the summer patterns followed by during the last four summers:

	2009	2010	2011	2012
AT	Soft"V"	Soft"V"	Soft"V"	Soft"V"
BE	Flat	Soft"V"	Flat	Soft"V"
BG	Soft"V"	Soft"V"	Flat	Soft"V"
HR	Soft"V"	Flat	Flat	Soft"V"
CZ	Soft"V"	Sharp"V"	Soft"V"	Soft"V"
DK	Soft"V"	Sharp"V"	Soft"V"	Soft"V"
EE	Soft"V"	Sharp"V"	Soft"V"	Sharp"V"
FI	Soft"V"	Flat	Soft"V"	Soft"V"
FR	Soft"V"	Sharp"V"	Soft"V"	Sharp"V"
DE	Flat	Soft"V"	Soft"V"	Soft"V"
GR	Flat	Flat	Flat	Flat
HU	Soft"V"	Soft"V"	Soft"V"	Soft"V"
IE	Flat	Flat	Flat	Flat
IT	Flat	Flat	Flat	Flat
LV	Flat	Soft"V"	Soft"V"	Flat
LT	Soft"V"	Sharp"V"	Flat	Flat
LU	Flat	Soft"V"	Flat	Flat
NL	Flat	Soft"V"	Flat	Soft"V"
PL	Flat	Soft"V"	Flat	Soft"V"
PT	Flat	Flat	Flat	Flat
RO	Flat	Soft"V"	Soft"V"	Soft"V"
SK	Soft"V"	Sharp"V"	Soft"V"	Sharp"V"
SI	Flat	Soft"V"	Soft"V"	Flat
ES	Flat	Flat	Flat	Flat
SE	Soft"V"	Soft"V"	Soft"V"	Soft"V"
CH	Soft"V"	Soft"V"	Soft"V"	Sharp"V"
UK	Soft"V"	Soft"V"	Flat	Soft"V"
EUROPEAN DEMAND				
1 - sharp "v"	0.0%	11.1%	0.0%	4.8%
2- soft "v"	34.1%	58.6%	34.4%	80.3%
3- Flat	65.9%	30.3%	65.6%	14.9%






Austria
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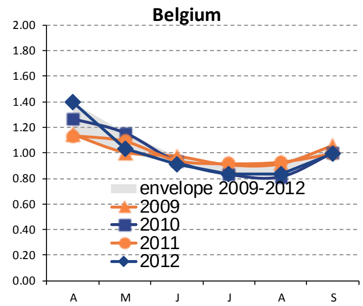
1.80
1.60
1.40
1.20
1.00
0.80
0.60
0.40
0.20
0.00
A M J J A S
envelope 2009-2012
2009
2010
2011
2012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envelope 2009-2012
2009
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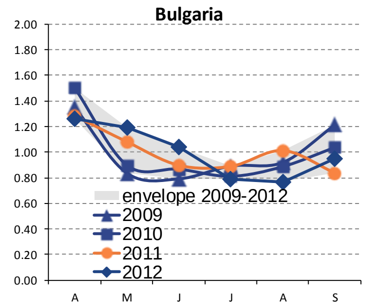
2012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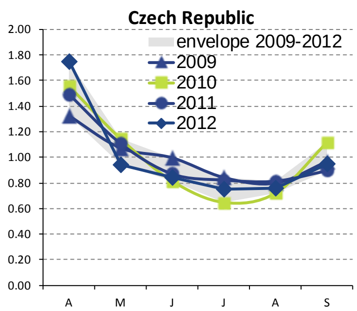
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2009
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2011
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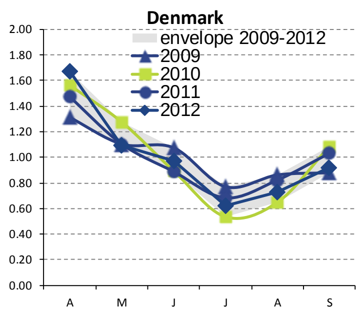
Denmark
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1.00
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A M J J A S
envelope 2009-2012
2009
2010
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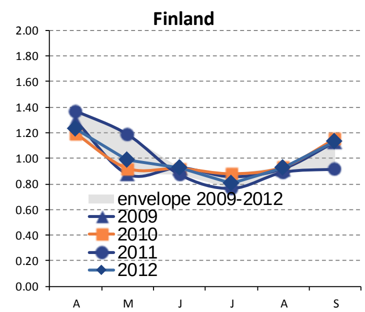
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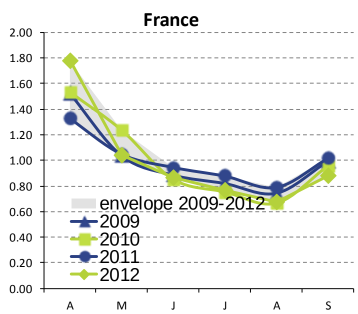
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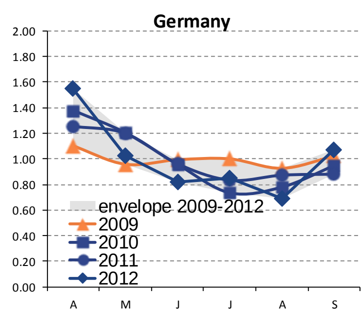
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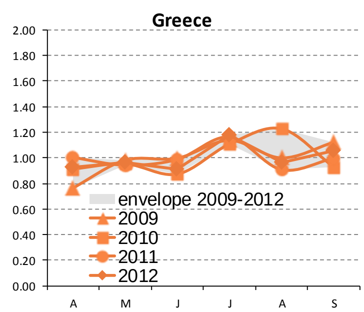
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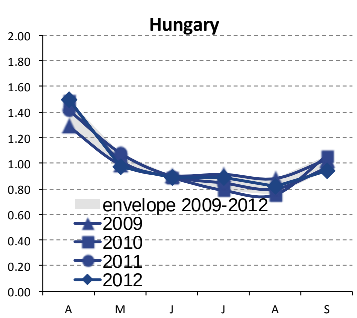
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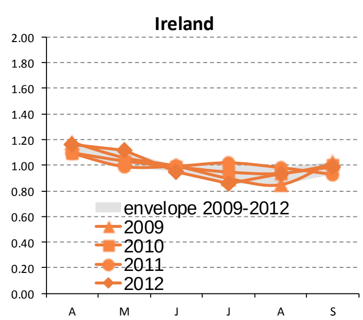
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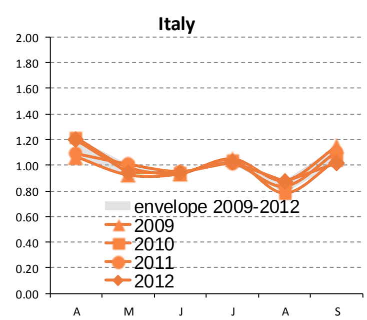
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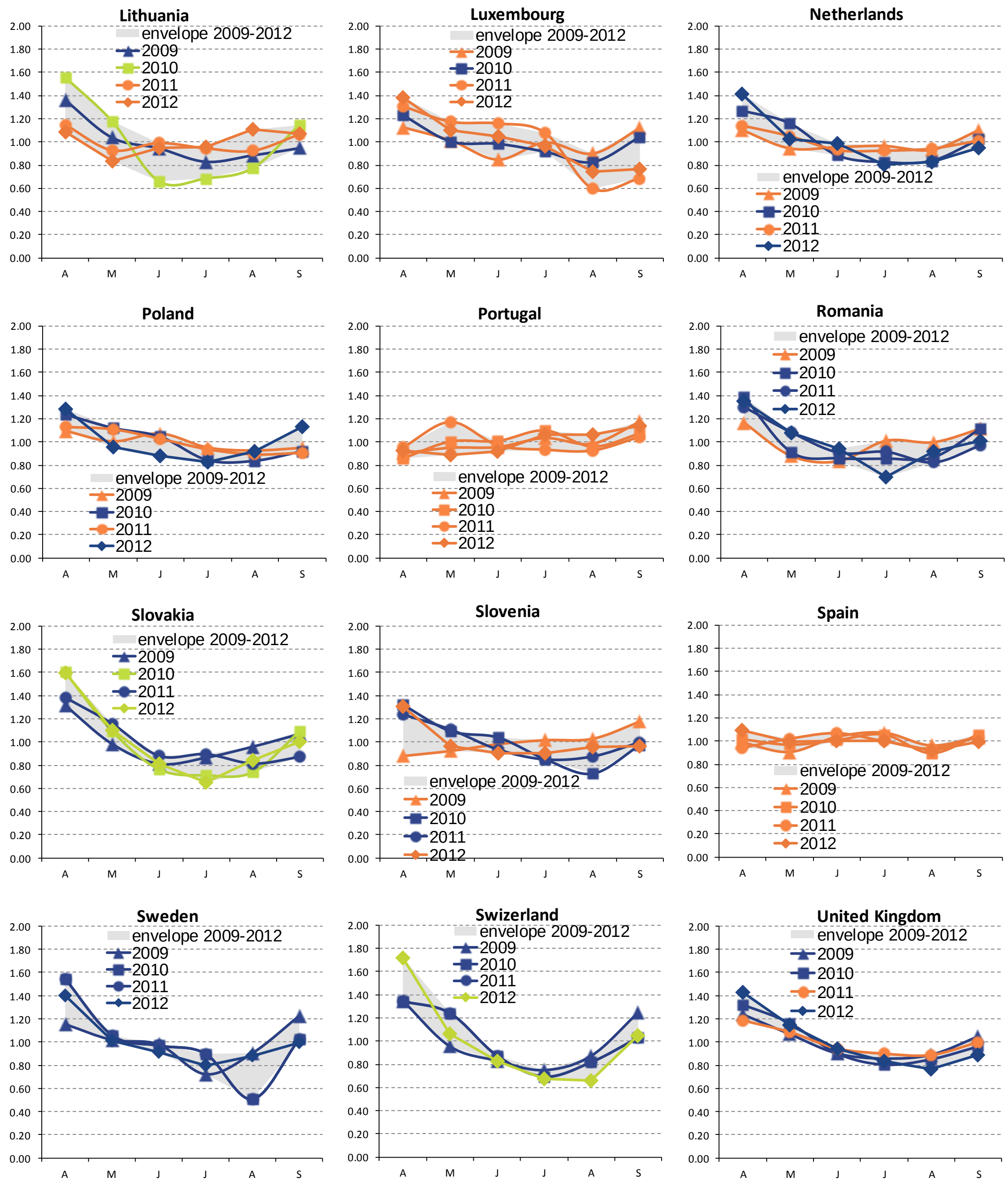
Lithuania
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Romania
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Spain
Sweden
Swizerland
United Kingdom
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