

Southern Corridor Gas Regional Investment Plan 2014-2023

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WITHIN THE JURISDICTION OF THE MINISTRY OF ENVIRONMENT, ENERGY & CLIMATE CHANGE



Source of Development, Carrier of Energy

The Southern Corridor Region



- 10 countries (including Cyprus)

Italy

Austria

Slovakia

Hungary

Slovenia

Croatia

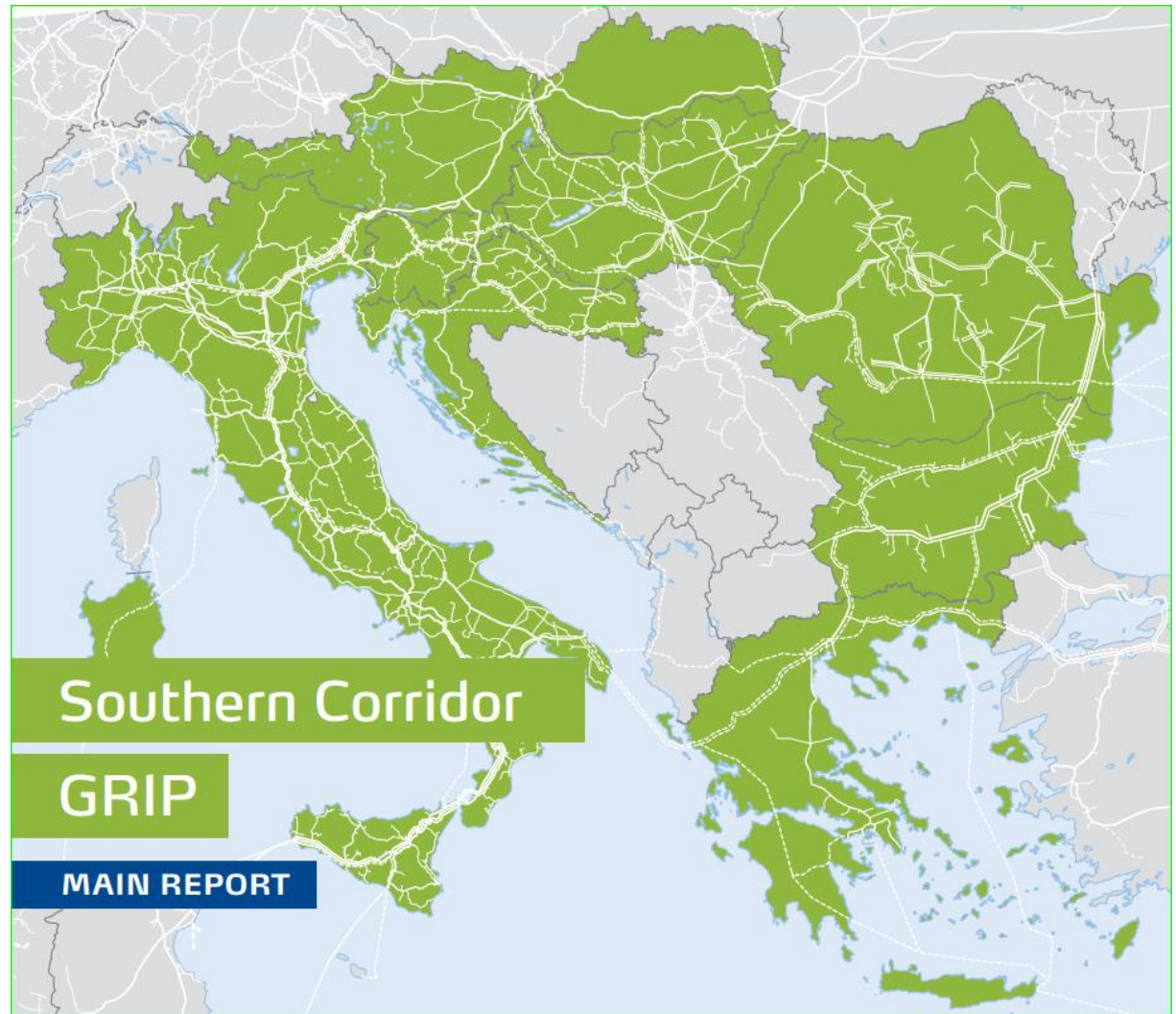
Romania

Bulgaria

Greece

Cyprus

- 12 TSOs





Contents

- **Region Overview**
 - **Number of Projects**
 - **Demand**
 - Forecasts
 - Modulation
 - **Supply**
 - National Production
 - Imports
 - **Prices**
- **Examination of capacities at Interconnecting Points**
- **Clustering of the Region's Projects**
- **Modelling and network assessments**
 - **Network resilience under Design Case (Reference Case)**
 - **Network resilience under Ukrainian disruption**
 - **Identification of zones with strong reliance on one source**
- **Conclusions**

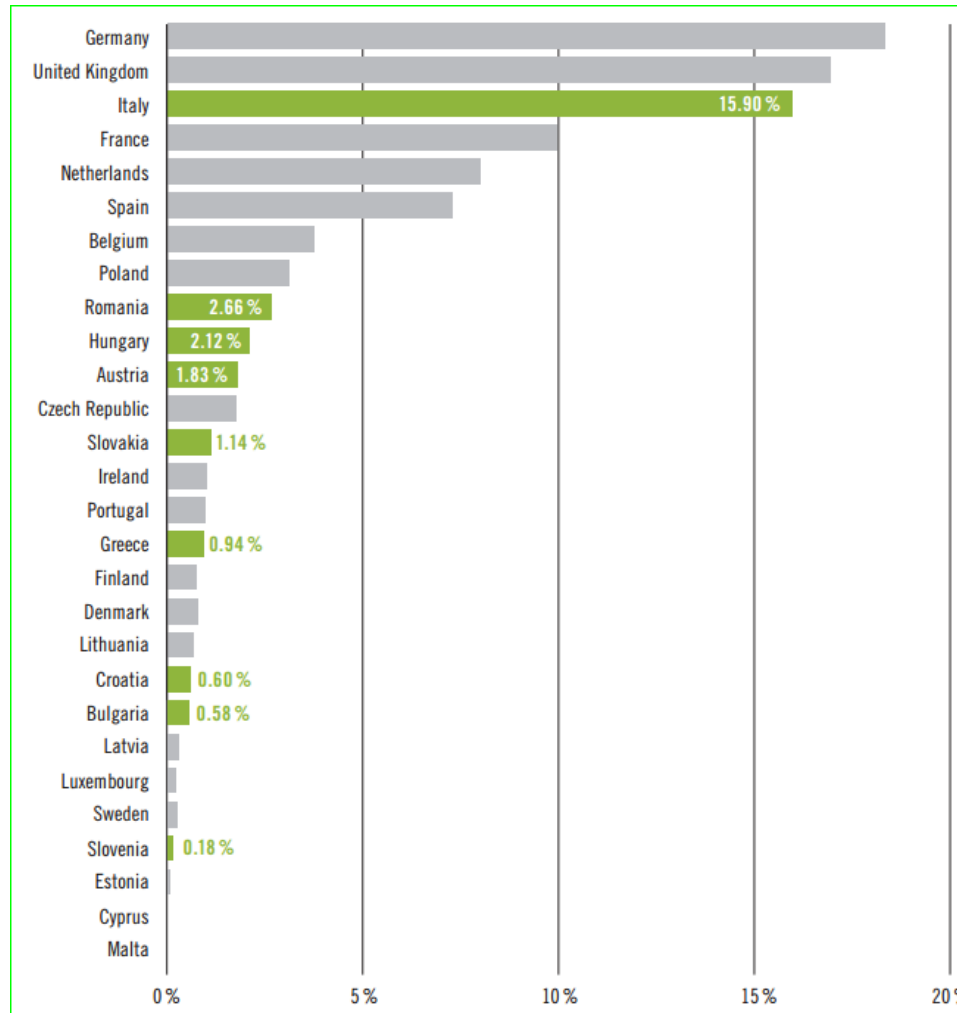


Region overview – Number of Projects

	FID	non-FID	TOTAL
LNG	1	8	9
PIPELINE	12	55	67
UGS	3	11	14

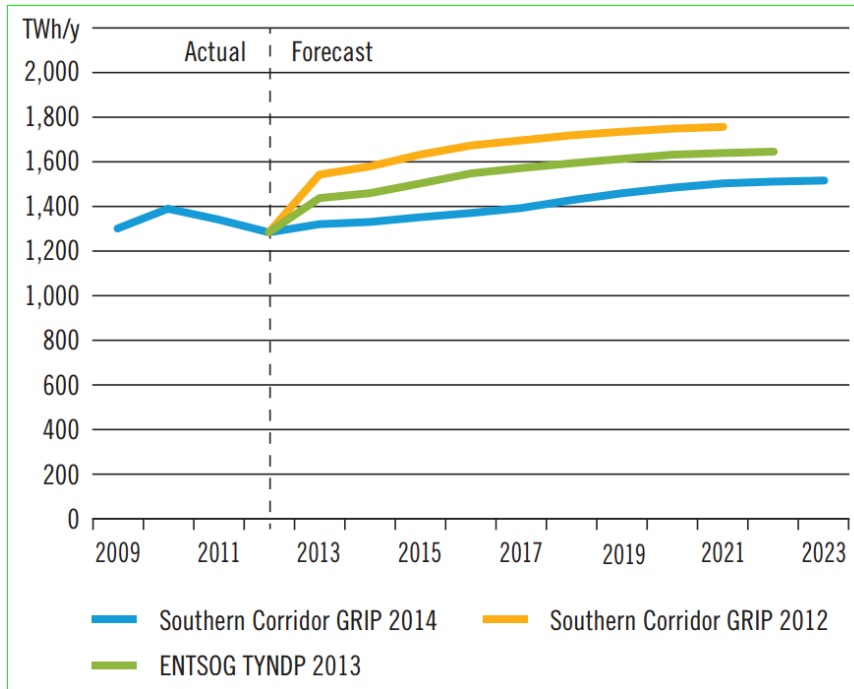
The Region is characterized by the existence of a few very large projects, mostly competing, aiming at the transportation of Caspian and Eastern Mediterranean gas to Europe.

Region overview – Annual Demand (2012)

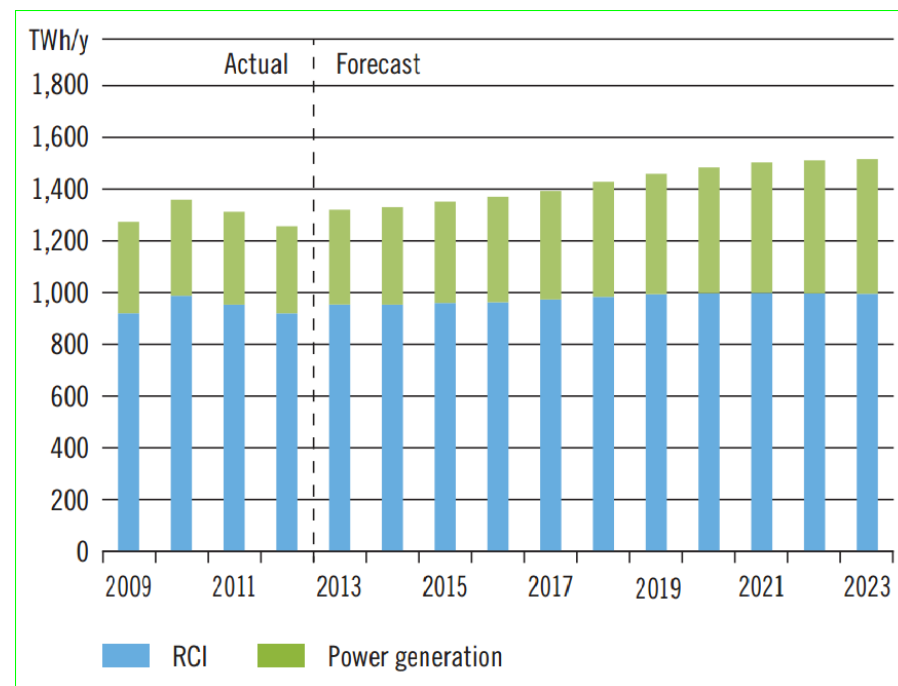




Region overview – Demand forecast



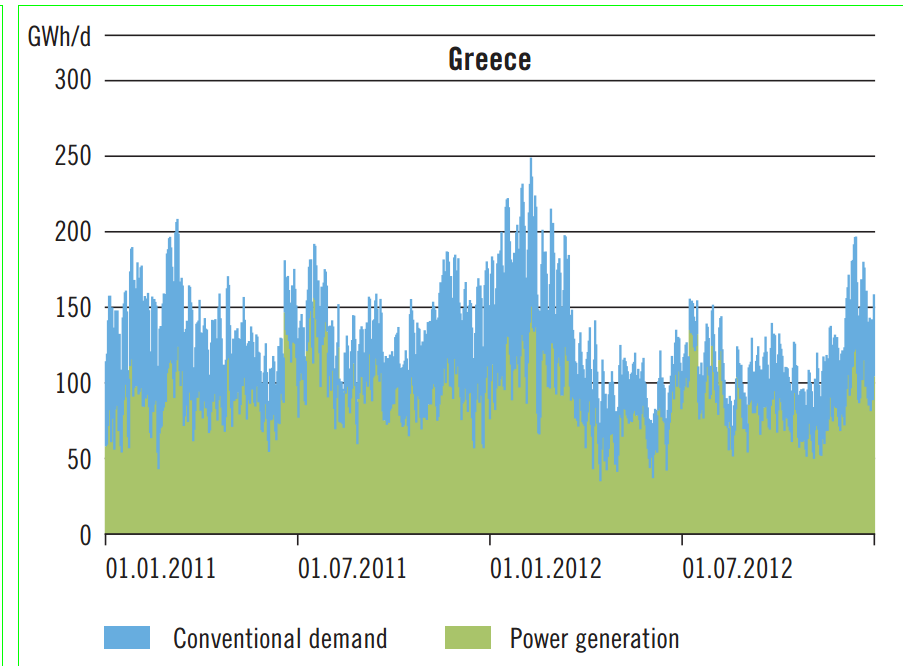
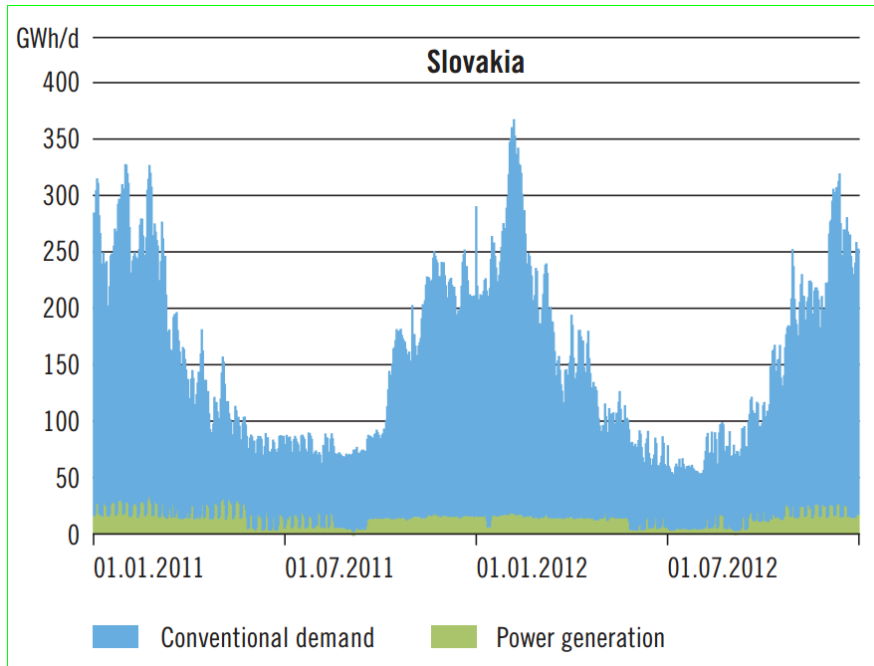
Demand is expected to increase but successive forecasts are decreasing



Demand for power generation is expected to increase despite increased competition from solid fuels and RES



Region overview – Demand modulation

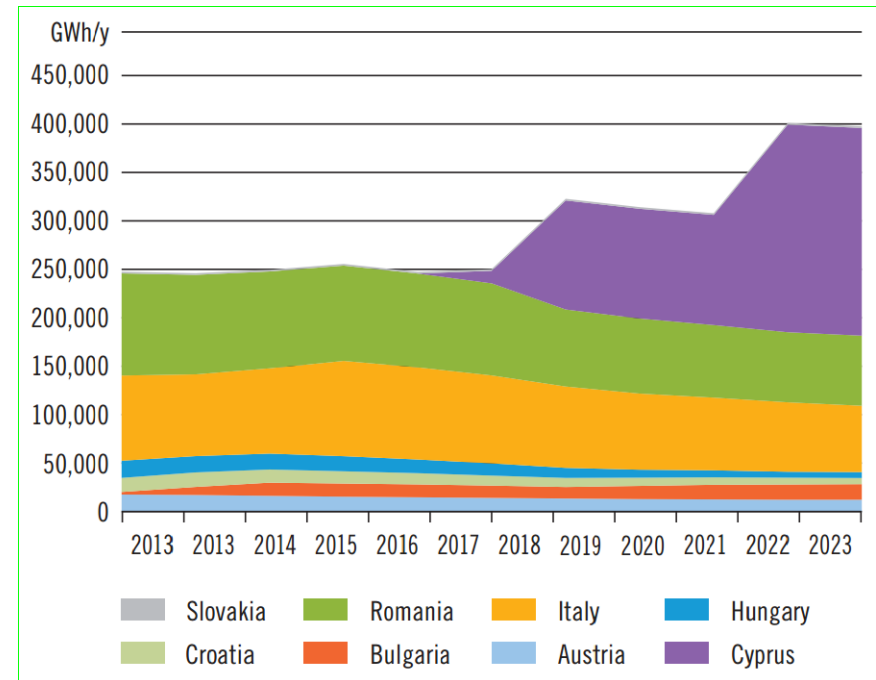
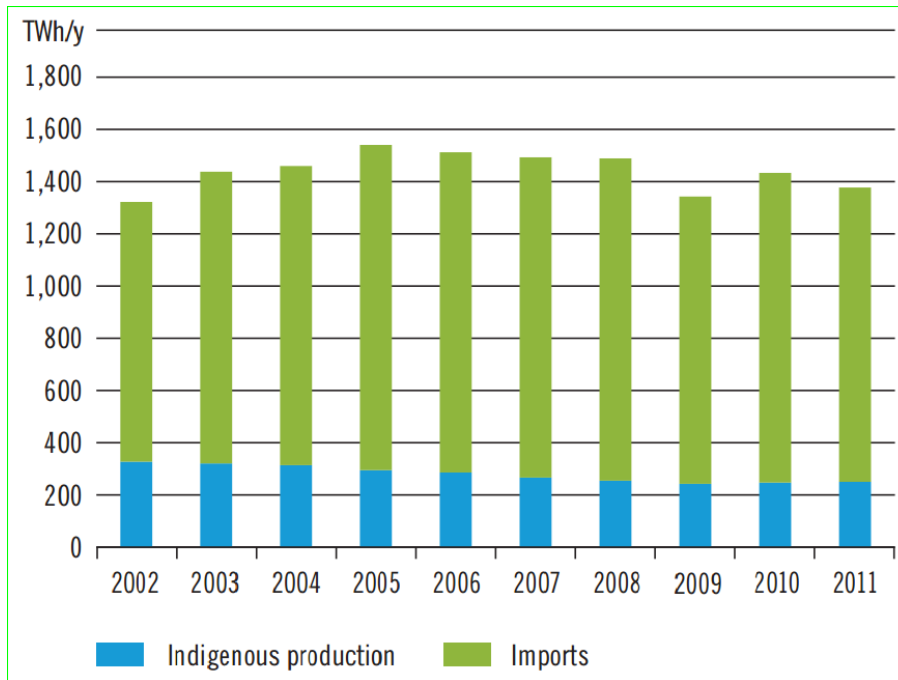


Different demand patterns are due to differences in:

climatic conditions,
market maturity and
demand mix



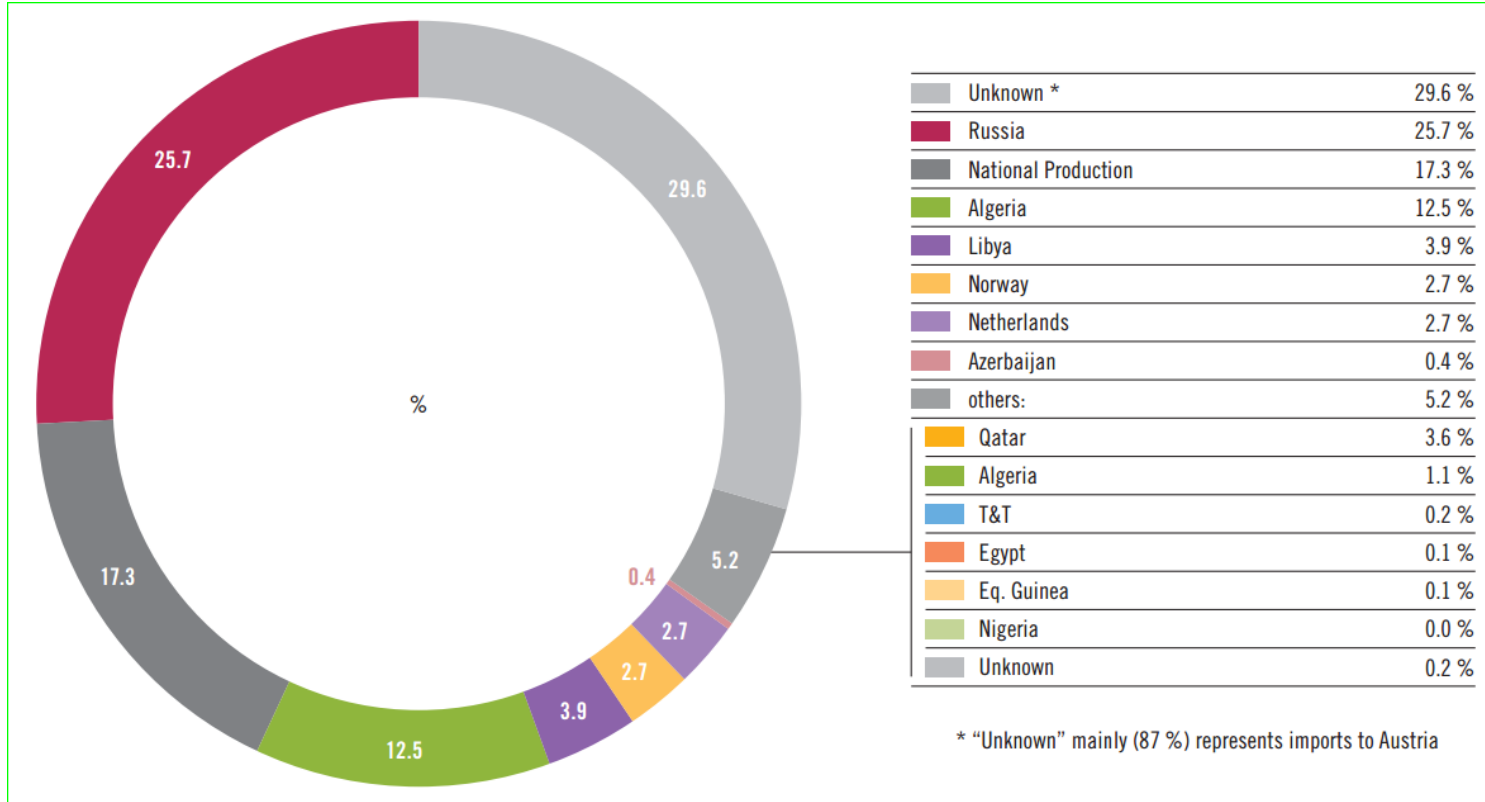
Region overview – National production



In 2012 NP covered 19% of the Region's demand (77% in Romania, 56% in Croatia, 19% in Hungary, 11% in Italy) but NP is expected to decrease, with the exception of Bulgaria and mainly of Cyprus.

However the destination of the gas from Cyprus is still unknown.

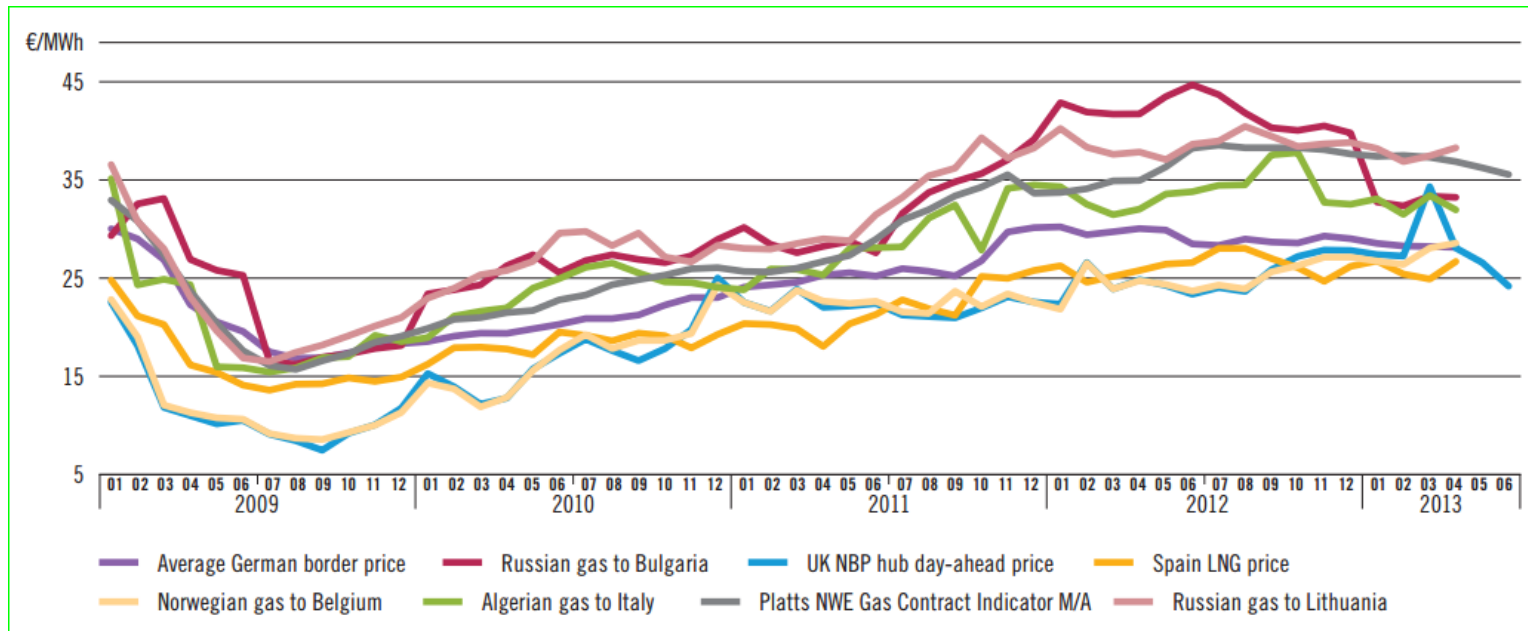
Region overview – Imports



- Although at Regional level there seem to exist many supply options, four countries (Bulgaria, Croatia, Hungary and Slovakia) depend on Russian gas for more than 80 % of their imports.
- In recent years (2010-12) we have seen an increase of Russian gas, a slight increase of Norwegian and Dutch gas and a decrease of Algerian gas (both pipe gas and LNG)

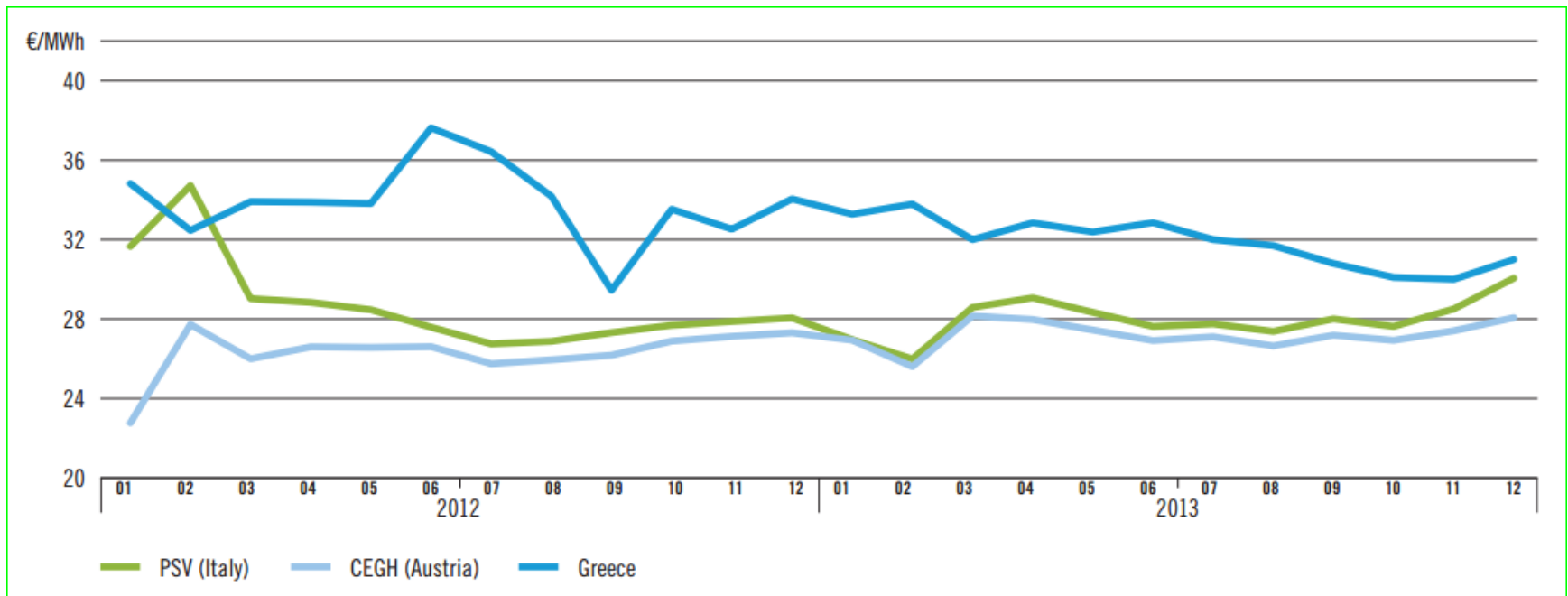


Region overview – Prices 1



- Import prices in the Region are, in general, higher than the ones of the liquid markets in Central and Western Europe due to the poor opportunities of the easternmost countries for the diversification of their supply.
- On the other hand prices are less volatile

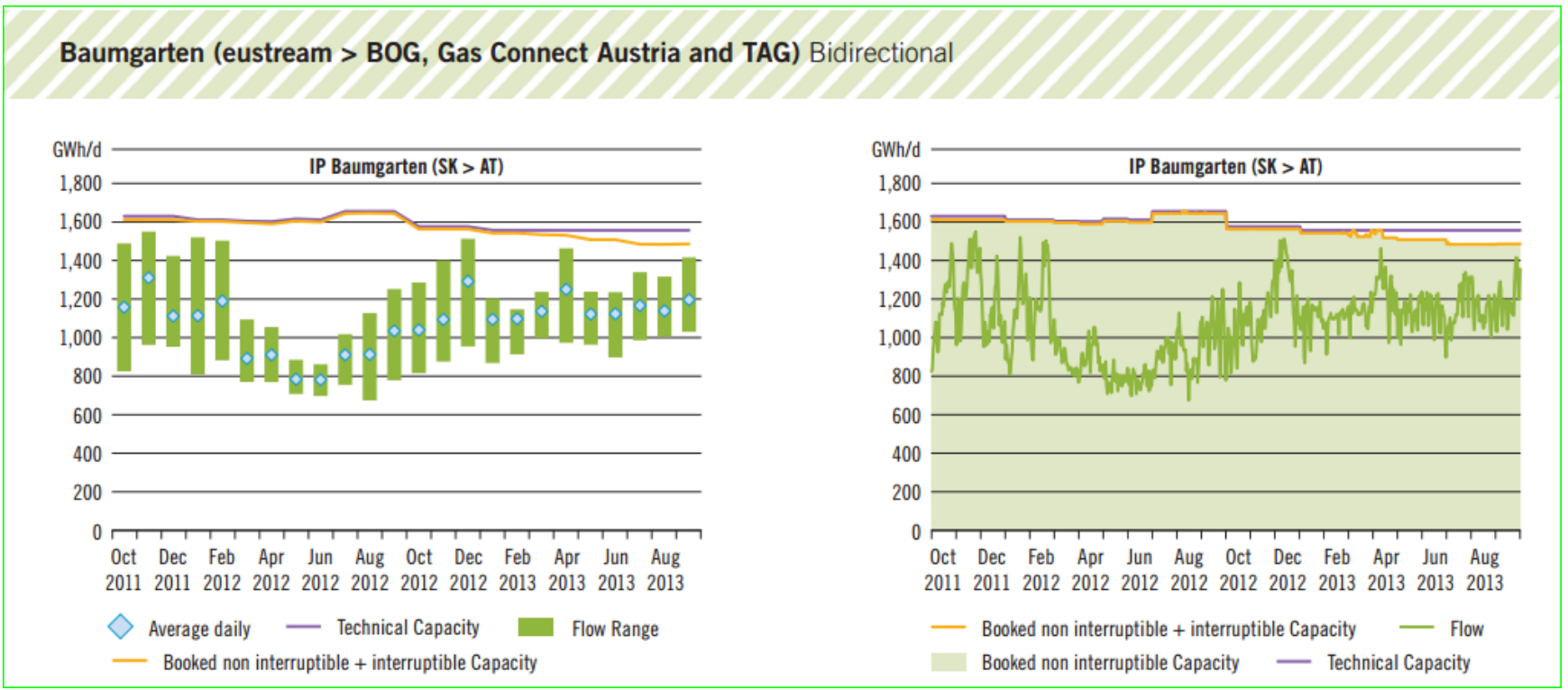
Region overview – Prices 2



- Progressive price alignment between Italian and Austrian hubs.
- Different pattern of the less liquid Greek market due to:
 - **Price mainly set by long term, oil indexed, import contracts**
 - **Lack of physical interconnections with liquid markets**



Examination of capacities at Interconnecting Points 1



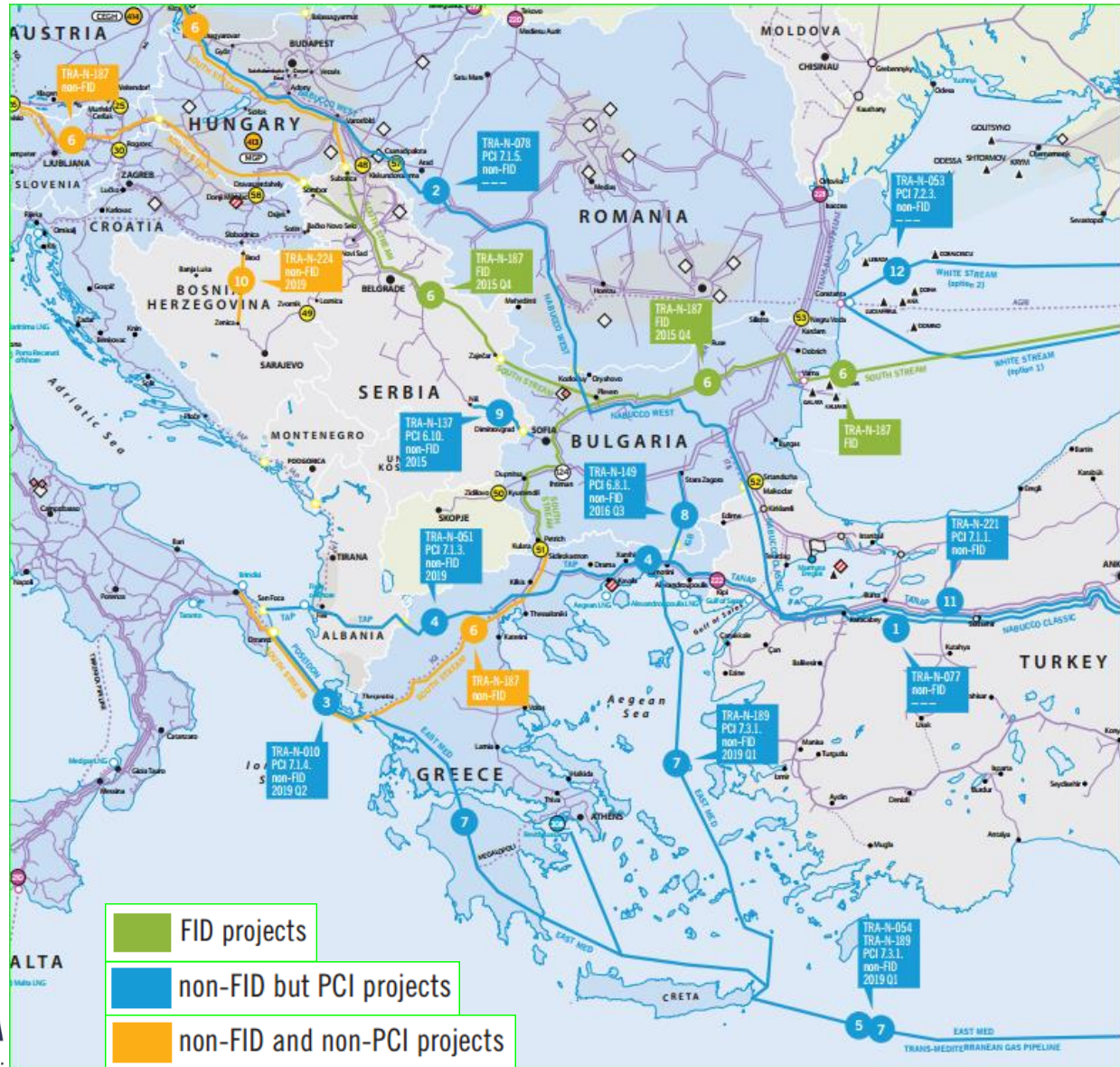
- 13 intra-EU IPs,
- 11 IPs with non-EU members,
- 3 LNG import terminals



Examination of capacities at Interconnecting Points 2

- Several IPs have a high percentage of spare capacity
- The majority of the IPs present intermediate average usage rates with the maximum usage rate reaching (or exceeding) the declared technical capacity
- Some IPs present high average usage rates with flows often exceeding the declared technical (and booked firm) capacity
- Some IPs present a high average booking rate. This may be due to several reasons:
 - Shippers having saturated the technical capacity with long-term bookings. (Mitigation with CMP provisions and CAM network code)
 - TSOs having reduced the technical capacity because of the reduction of capacity bookings by shippers
 - TSOs having sold capacity on an interruptible basis because of a reduction in actual flows. (Despite the apparent contractual congestion, capacity is available on a, physically, non-interruptible basis)

Clustering of Projects 1





Clustering of Projects 2

- **Key Transmission Projects**

- Trans Anatolian Pipeline (TANAP)
- Trans Adriatic Pipeline (TAP)
- Ionian Adriatic Pipeline (IAP)
- Interconnections Greece-Bulgaria (IGB) and Turkey-Bulgaria (ITB)
- South Stream
- East-Med pipeline (Cyprus to Greece) and further to Italy via the Poseidon pipeline

- **Other large Projects**

- Nabucco: Nabucco Pipeline Int. in liquidation procedure after SDII decision
- IGI – Poseidon: In quest of new gas volumes (non-SDII)
- White Stream: Practically on hold
- AGRI: Very unlikely



Clustering of Projects 3

- **Other Projects**

- **Projects linking the LNG terminals in Poland and Croatia**
- **Projects supplying gas from Croatian LNG terminal to neighbouring countries**
- **Projects allowing gas flows from Greece through Bulgaria, Romania and further to Hungary and Ukraine**
- **Projects allowing gas from the SC and/or LNG terminals in Italy to flow towards the north to Austria, Germany and the Czech Republic**
- **Underground storages in SE Europe**
- **Underground storages in Italy**
- **Romania-Hungary-Austria East-West Transmission Corridor**



Modelling and Network Assessments 1

- **Were examined:**
 - Demand and Supply balance
 - Resilience of transmission networks
 - Dependence of various countries on individual sources (Russian and LNG),
- **In 2014 - 2018 – 2023,**
- **Under conditions referring to:**
 - Projects having been implemented
 - Demand scenario (Level and duration of demand)
 - Existence of disruption of gas flow from Ukraine
- **With the ENTSOG linear programming Network Model (NeMo)**



Modelling and Network Assessments 2

- **Projects Implemented:** In addition to the distinction in the Ten Year Network Development Plan (TYNDP) 2013-2022, between:
 - FID (Final Investment Decision) and
 - Non-FID projects
 additional project clusters were used in order to better assess the impact of discrete projects:
 - FID
 - FID + TAP
 - FID + TAP + IGB
 - FID + TAP + IGB + IAP
 - FID + PCI
 - FID + non-FID

- **The South Stream project is considered FID in BG and RS and non-FID elsewhere**



Modelling and Network Assessments 3

- **Demand scenarios without regional diversification**
 - Design case: peak daily demand in weather conditions occurring, statistically, once every 20 years (or in whatever frequency is imposed by national legislation.)
 - Average Winter day, Average Winter week
 - 14 days Uniform Risk: in this Region same as the Design Case

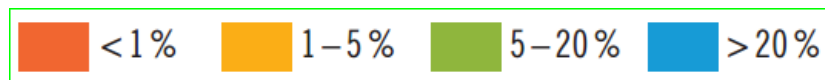
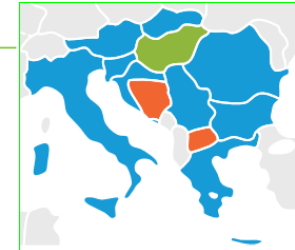
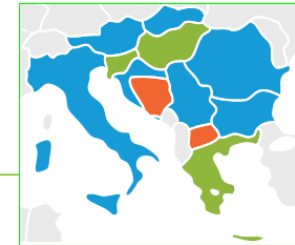
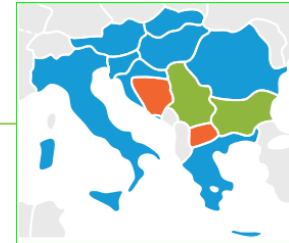
- **Demand scenarios with regional diversification**
 - EU was split in 3 regions:
 - Mediterranean (CY, ES, GR, IT, PT)
 - Central-Eastern (PL, CZ, SK, AT, SI, HU, RO, HR, BG)
 - Western Europe (remaining countries)
 - **Uniform Risk conditions were assumed:**
 - for 1 or 14 days,
 - in the Mediterranean or the CE region while the other two regions were assumed to experience Average Winter conditions



Network Assessments results 1

- **Resilience under Design Case:**

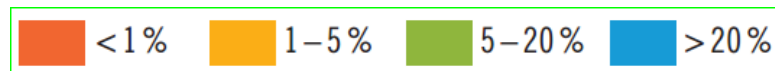
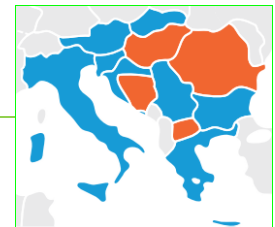
- 2014 FID only BG < 20%
- 2018 FID only HU < 20%
- 2018 FID+PCI all above 20%
- 2023 FID HU, SI (17,6%) and GR (19,2%) < 20%
- 2023 FID+TAP HU, SI < 20% GR > 20%
- 2023 FID+TAP+IGB+IAP only HU < 20%
- 2023 FID+PCI all above 20%





Network Assessments results 2

- Resilience under 1 day Ukraine disruption
 - CEE Uniform Risk – Other Average Week
 - 2014 FID BG, RO, HU face shortages
 - 2018 FID RO, HU face shortages
 - 2018 FID+non FID RO: small shortage, HU: very low resilience
 - 2023 FID RO, HU face shortages
 - 2023 FID+TAP+IGB+IAP low resilience in RO and HU
 - 2023 FID + non FID low resilience only in RO





Network Assessments results 3

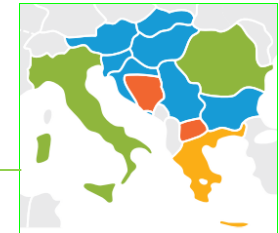
- Resilience under 1 day Ukraine disruption

- Mediterranean Uniform Risk – Other Average Week

- 2014 FID No supply shortages, Low resilience in GR, BG, Italy also affected



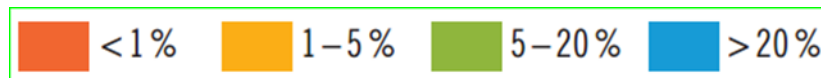
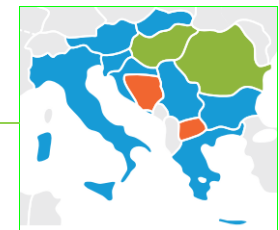
- 2018 FID BG OK (due to South Stream)
GR improved (due to Revythoussa extension)



- 2018 FID+PCI Situation redressed in GR (due to FSRUs)

- 2018 FID+non FID Situation redressed in Italy (due to LNG terminals)

- 2023 FID Worsening in HU which is redressed after IAP commissioning





Network Assessments results 4

- **Zones with strong reliance on one source**

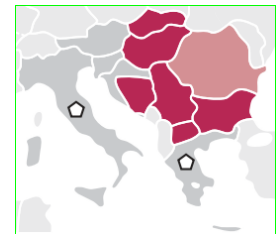
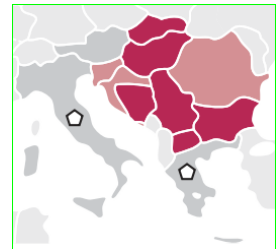
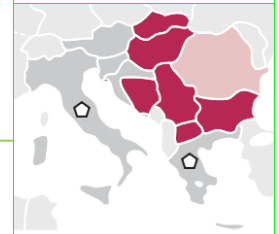
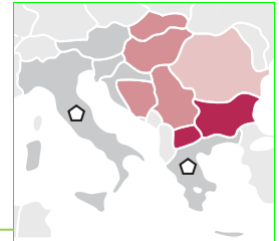
Sources are minimized one by one and the minimum supply needed by each zone, from the source being minimized, is recorded.

- Two sources were tested : Russian gas and LNG
- One day modelling reveals reliance on Russian gas
- 14 days modelling reveals reliance on LNG



Network Assessments results 5

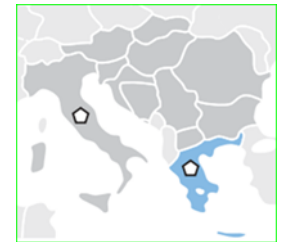
- **One day modelling**
 - **2014 FID** **BG** has the strongest reliance on RU gas
 - **2018 FID** Reliance of HU and SK on RU gas increases due to increasing demand, decreasing production and commissioning of the HU – SK interconnection
 - **2023 FID** Reliance of HR and SI increases due to reduction of NP (HR) and increase of demand (SI)
 - **2023 FID+TAP+IGB+IAP** Reliance on RU gas is decreased in SI, HR and BG remaining however high in BG.





Network Assessments results 6

- 14 days modelling
 - From the two countries that presently receive LNG, (IT and GR) Italy has the possibility to increase supplies from Algeria and Libya, so only Greece has a high reliance on LNG
 - This is reduced below 50% with the commissioning of TAP and to less than 20% with the commissioning of the East-Med pipeline





Conclusions

- **The Southern Corridor Region has several special attributes:**
 - It hosts some very large projects that can influence the supply pattern of an area larger than the Region itself.
 - Many of the Region's countries are (and more are expected to become) transit countries.
 - It presents a great variety of countries with respect to their national production and their gas demand structure.
- **The Region is vulnerable to the disruption of the Ukrainian route and has a high dependence on Russian gas, although this is expected to be reduced with the implementation of FID and PCI projects.**
- **The Region faces a general decrease in average load factor while the peak requirements remain important therefore it needs infrastructure increasing flexibility.**
- **No physical congestion appears in any IP (with one exception – AT > HU).**
- **Contractual congestion is very limited and is expected to improve with the implementation of projects and the new CMP and CAM rules**



Thank you for your attention

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