

3rd HAEE Energy Conference

IENE's Paper:

“Dominant Energy Security Issues in SE Europe and Proposed Accommodation Strategies”

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Presentation Outline

1. Raison d' Être - Why are we Interested in SE Europe?
2. The SE Europe Area Defined
3. Regional Energy Mix: Past, Current and Future Status
4. Defining Energy Security
5. Security of Energy Supply in SE Europe
6. Energy Security Issues in SE Europe
7. Disruption of the Largest Infrastructure to the Balkan Region
8. Legal and Institutional Framework for Energy Security
9. Strengthening Energy Security in SE Europe
10. An Expanded Southern Gas Corridor
11. Strengthening Security of Electricity Supply in SE Europe
12. Discussion and Conclusions

Raison d' Être – Why are we Interested in SE Europe?

- ❑ **For several reasons:** The prime being the geographical proximity to the main European landmass but also because of the substantial economic and trade connections of SEE to the rest of Europe.
- ❑ SE Europe (lately including the East Med), on the strength of its history, cultural background and current urban and industrial setting, constitutes a region both geographically and geopolitically important with a strong impact on the rest of Europe.
- ❑ SE Europe is fast emerging as a **unique energy bridge** between Eastern energy suppliers (Russia, Caspian region, Gulf area) and Western markets.
- ❑ An in-depth study of the energy prospects and perspectives of a particular geographic region, such as SE Europe, has an impressive cumulative effect, as the **sum often exceeds the value of its constituent parts**. Very much along the lines of Aristotle's logic when he proclaimed the *"The whole is greater than the parts"*.
 - The paper includes analyses from IENE's recently published reference study **"SE Europe Energy Outlook 2016/2017"**.

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South East Europe Energy Outlook **2016/17**



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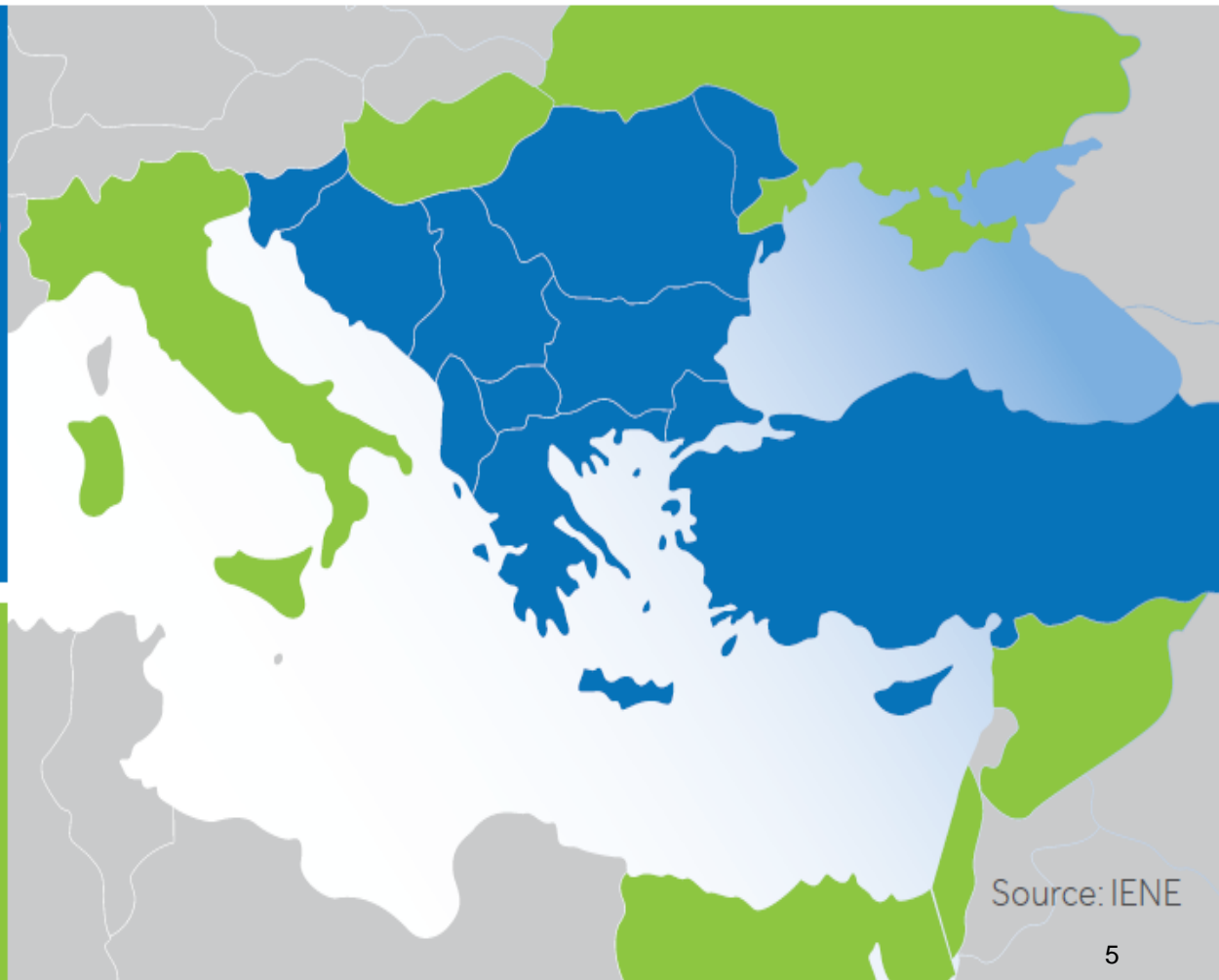
The SE European Region Defined

Core Countries

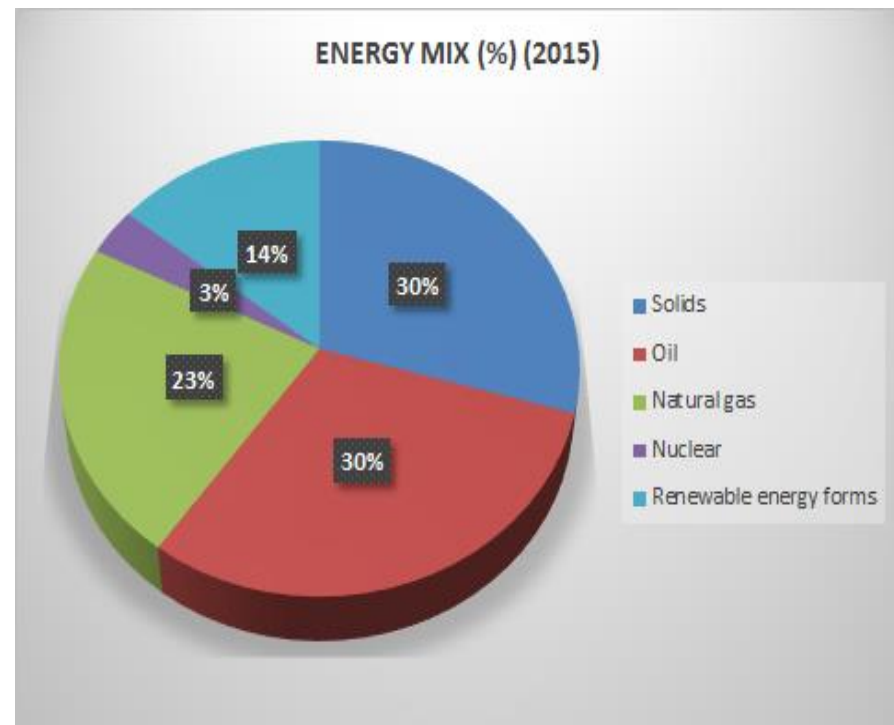
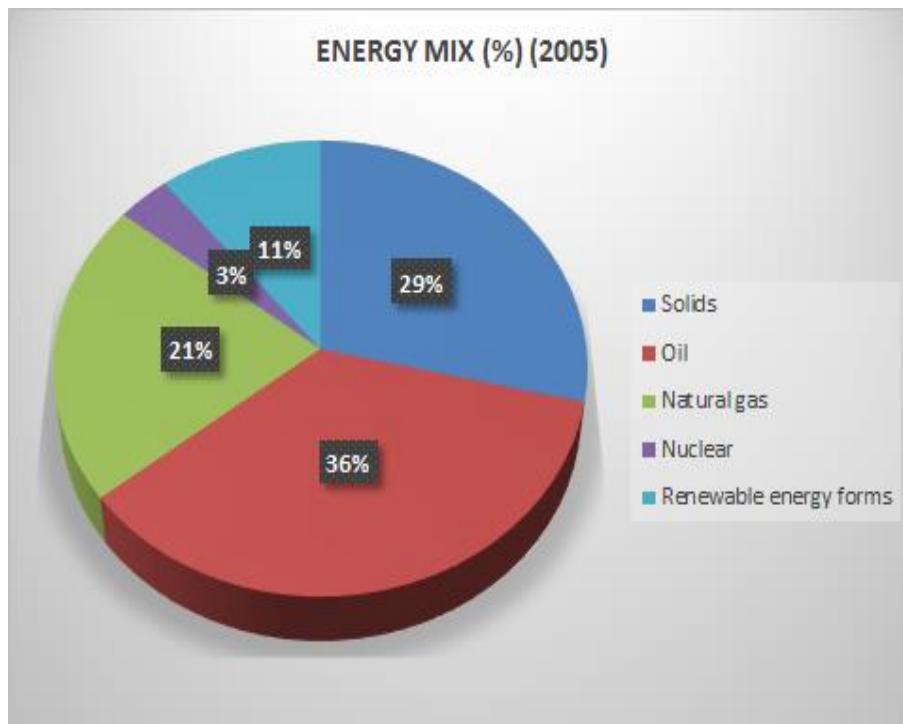
- Albania
- BiH
- Bulgaria
- Croatia
- Cyprus
- FYROM
- Greece
- Kosovo
- Montenegro
- Romania
- Serbia
- Slovenia
- Turkey

Peripheral Countries

- Egypt
- Hungary
- Israel
- Italy
- Lebanon
- Moldova
- Syria
- Ukraine

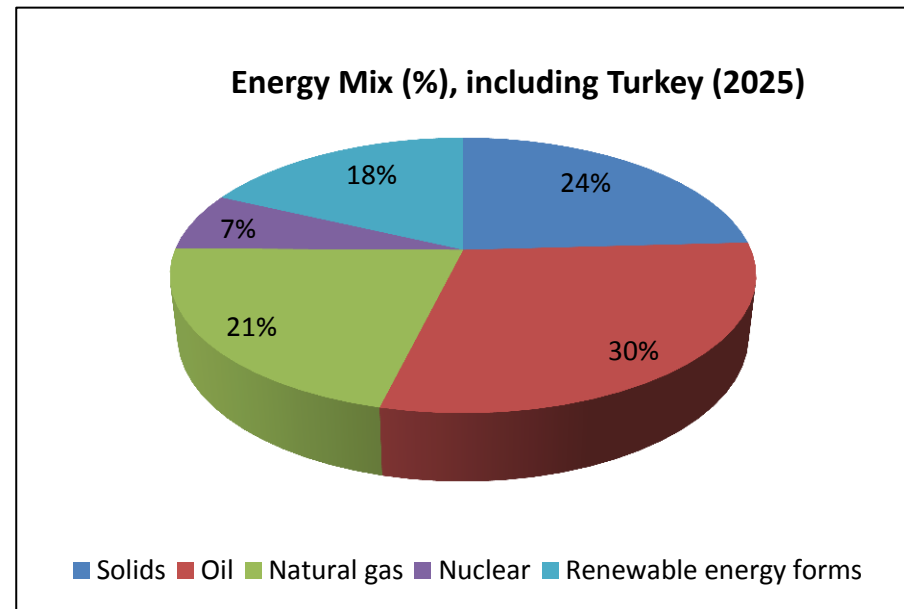
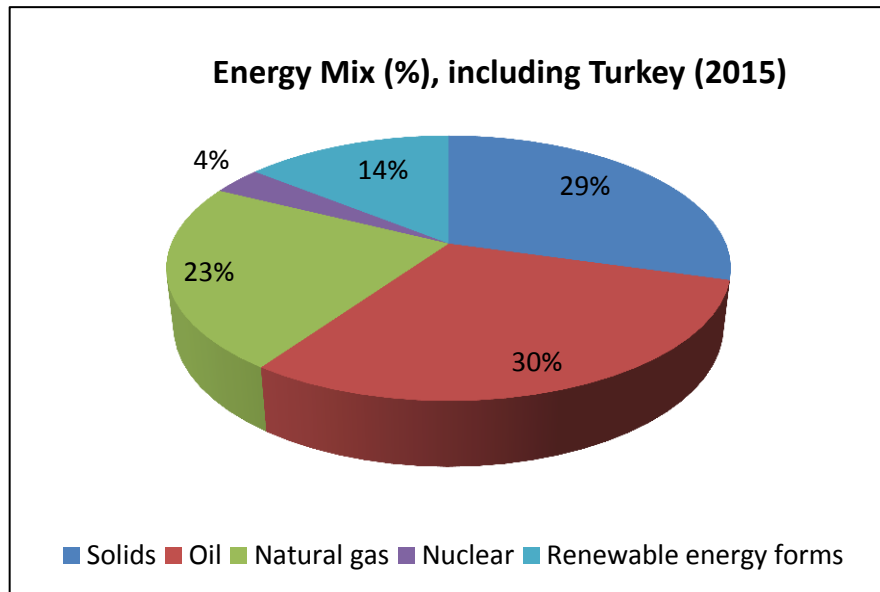


SE Europe: Gross Inland Consumption by Source, Including Turkey (2005 and 2015)



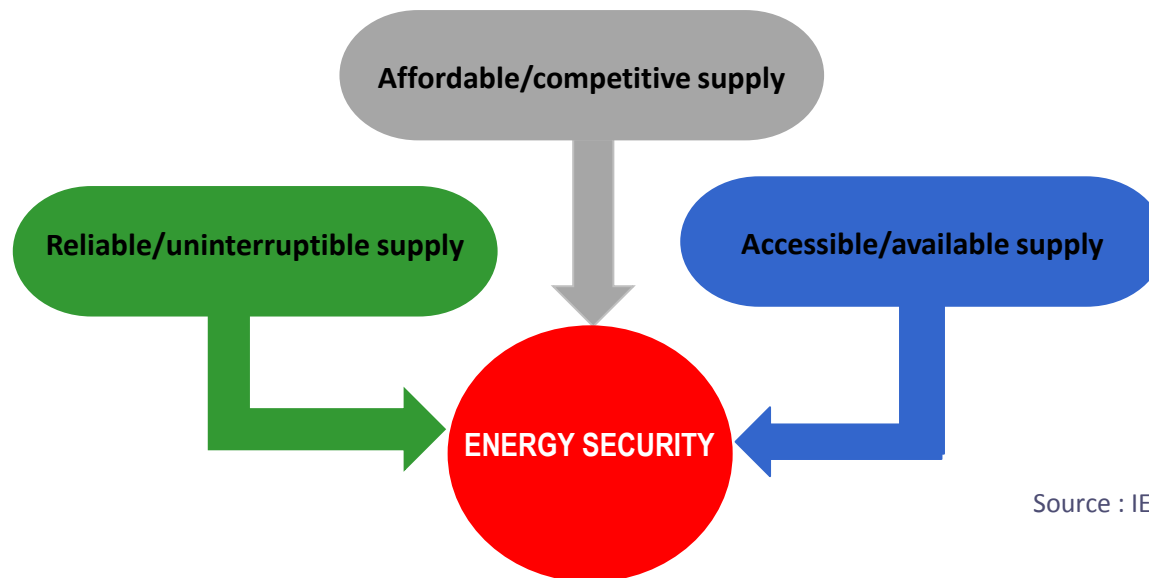
Regional Energy Mix: What Lies Ahead?

- The region's changing energy mix (Comparison between 2015 and 2025)
 - Substantial changes are foreseen over next 10 years with lower use of coal (lignite), stable contribution of oil, slight decrease of gas, more RES penetration and higher use of nuclear power.



Defining Energy Security

- The International Energy Agency (IEA; 2014) defines **energy security** as “the uninterrupted availability of energy sources at an affordable price”.
- A more modern definition augmenting it with “while addressing environmental concerns”.
- **Short-term energy security** focuses on the ability of the energy system to react promptly to sudden changes in the supply-demand balance, while **long-term energy security** is linked to timely investments in energy supply and infrastructure.



Source : IEA, 2014

Security of Energy Supply in SE Europe (I)

1. Energy supply disruptions (electricity, gas and oil) have a direct impact on maintaining utility services.
2. Physical hazards (usually extreme cold, flooding, earthquakes) also have a direct impact on utility services.
3. Terrorist or cyber-attacks aim to destroy or neutralize energy infrastructure and services.
4. Economic/financial disruption, normally undermine smooth operation of economy and by extension impact the functioning of the energy sector (e.g. bank run, failure to execute banking transactions, inadequate foreign exchange reserves, etc.)

Energy Security Issues in SE Europe (I)

- **Energy security is a complex issue** and as such cannot be considered in isolation.
 - SE Europe because of its geography, its proximity to high risk conflict zones (i.e. Syria, Iraq, Ukraine), a growing and uncontrolled refugee flow from the Middle East and North Africa and the location of some of its countries (i.e. Turkey, Greece, Romania) at vital energy supply entry points, faces **higher energy security threats** than the rest of Europe.
- There is a need to strengthen available mechanisms
 - The **strengthening of Emergency and Solidarity Mechanisms** and the **maintenance of adequate oil, coal and gas stocks**, constitute a short- to medium-term relief solution.
 - The achievement of a **balanced energy mix** provides the best long-term option in enhancing energy security both at country and regional level (e.g. Romania has a more balanced energy mix, compared to Greece or Albania or even Turkey. This means that it can withstand more efficiently any potential supply disruptions).
- Security of **supply/demand** and **differentiation of supply sources**
 - In the case of gas, it is becoming more important and pressing compared to other fuel sources, such as electricity, oil, coal and possibly uranium.
 - Gas is a primary area of concern largely because of its rather inflexible transmission method, mainly by means of pipelines.

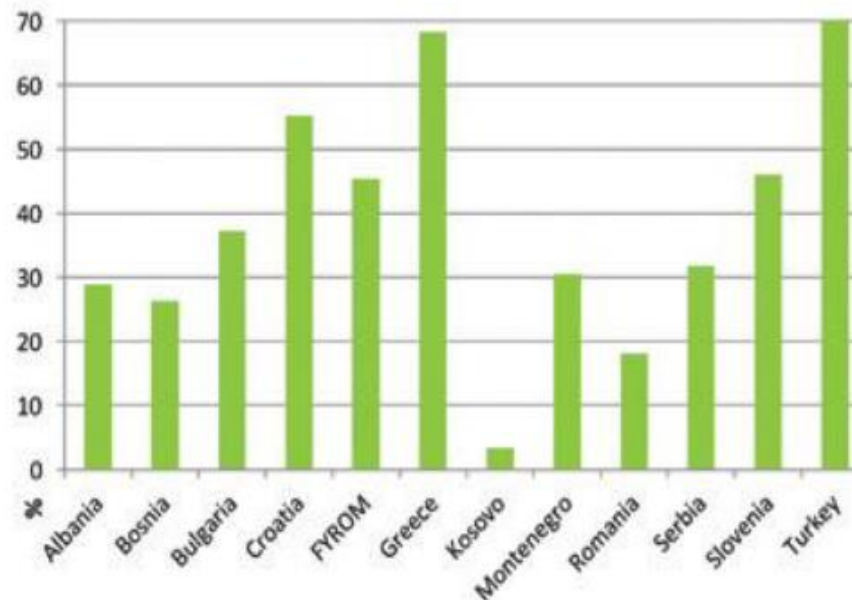
Energy Security Issues in SE Europe (II)

- Security of **transportation**, shipment of **oil and gas**
 - Gas deliveries were twice disrupted (i.e. 2006 and 2009) with the shipment of Russian gas, through Ukraine, to Europe but also from Turkey and Greece (i.e. 2011 and 2016). More recently (2014), Gazprom halted completely gas supplies to Ukraine for several months.
 - Since then, EU has strengthened its energy solidarity mechanism and created **CESEC** as yet another EU initiative, in order to speed up energy market integration.
- **Smooth supply of electricity** and urgent need to connect various island groups to the mainland grid
 - Mitigation of possible power supply failures and shortfalls and minimization of environmental impact through the retirement of fuel oil or diesel powered electricity generators on several islands.
- **Effective protection of energy infrastructure**
 - Mitigation of terrorist threats and advanced level of safety against of physical hazards (e.g. hurricanes, floods, earthquakes) and cyber threats.
- The various vulnerable key energy infrastructure locations in SE Europe constitute **potential energy security hot spots** and as such should be properly identified (*see following Map*), while also crisis management plans must be prepared in order to meet any emergencies (e.g. physical hazards, large scale industrial accidents or terrorist actions).

Security of Energy Supply in SE Europe (II)

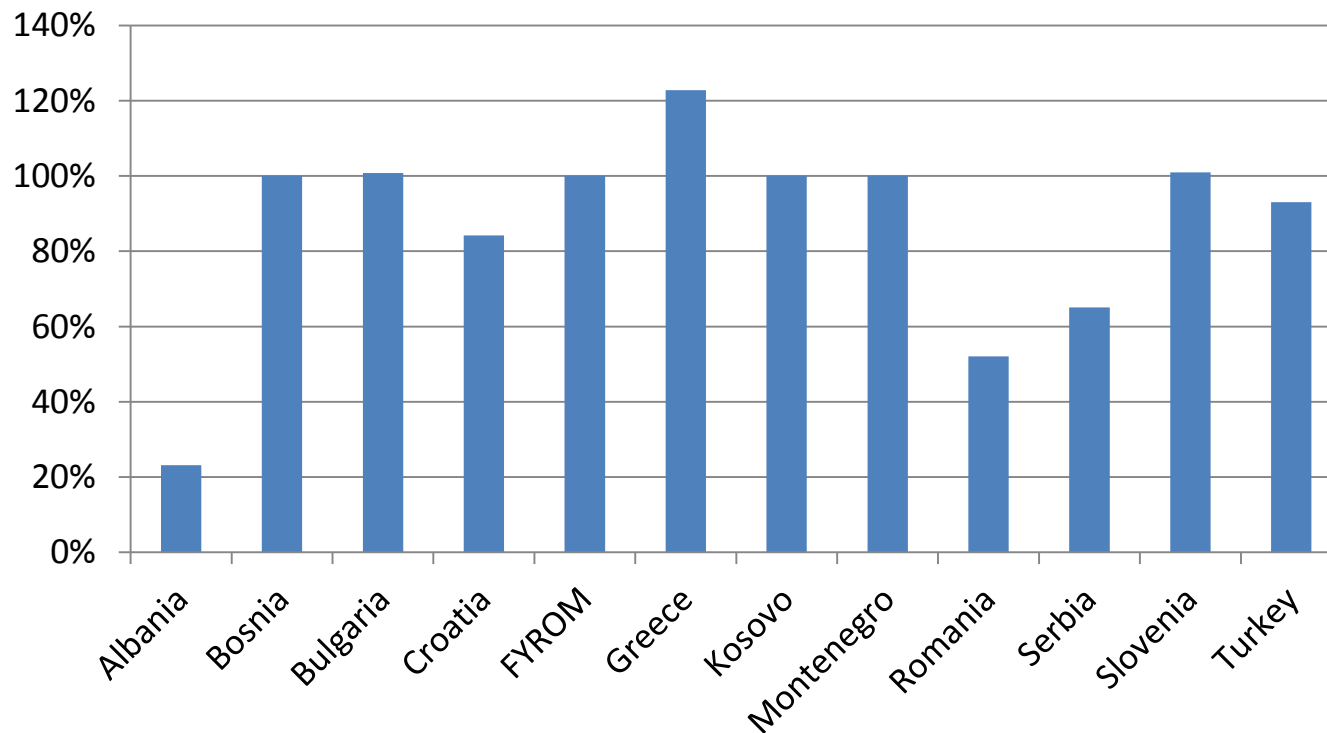
- **Energy import dependence** is the extent to which a country depends on imports to meet its energy needs.
 - All things being equal, the higher the share of imported energy, the more vulnerable a Member State is to price increases, supply disruptions or to foreign political decisions.

Energy Import Dependency (%) per country in SE Europe (2015)



Security of Energy Supply in SE Europe (III)

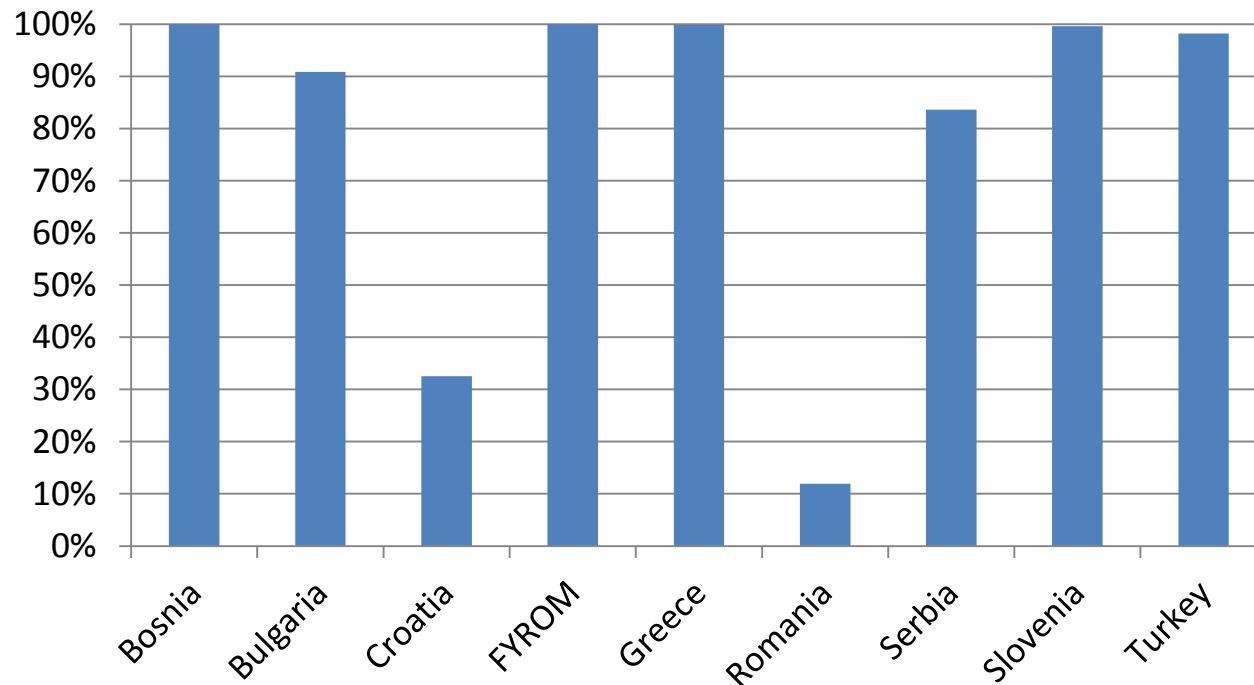
Oil Import Dependence (%) in SE Europe (2015)



Note: A dependency rate in excess of 100% relates to the build-up of stocks.

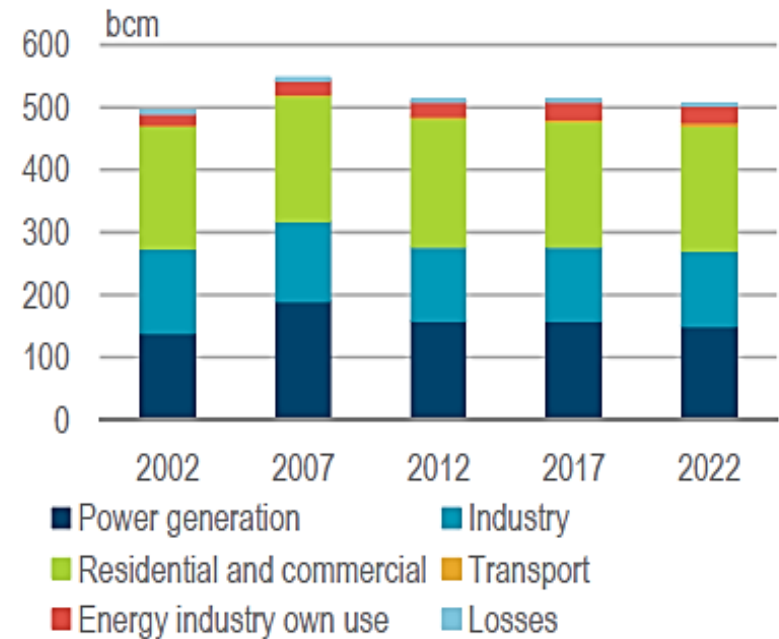
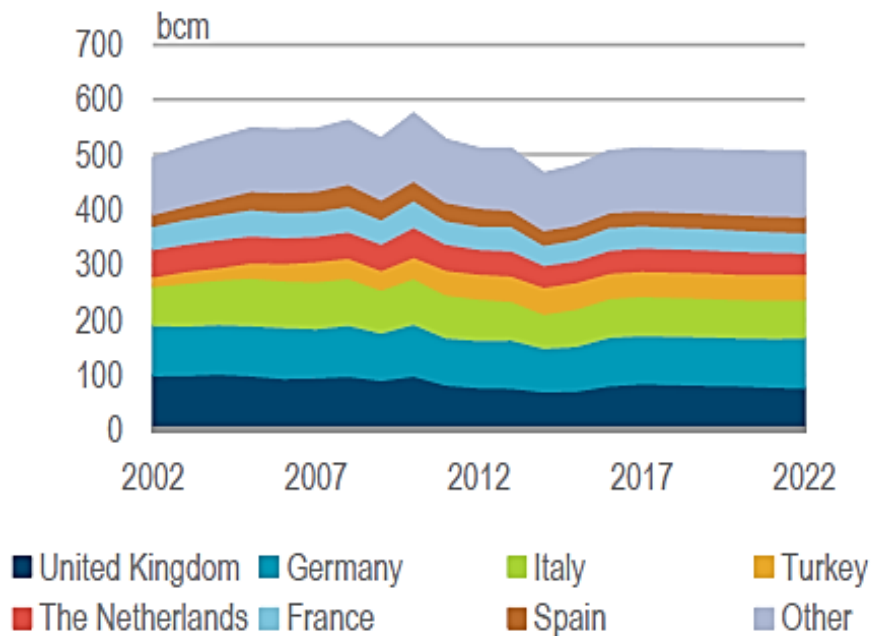
Security of Energy Supply in SE Europe (IV)

Gas Import Dependence (%) in SE Europe (2015)



Note: Albania, Cyprus, Montenegro and Kosovo do not produce, import or consume natural gas

OECD Europe's Gas Demand by Country and Sector, 2002-22



Source: IEA Gas Report 2017

Natural Gas Imports to EU

- In 2017, the **total gas imports to EU were 408.7 bcm** – a 21.45 bcm (5.5%) y-o-y growth. By providing over 40% of total gas imports, Russia continues to be the main EU supplier.

By country, % | bcm



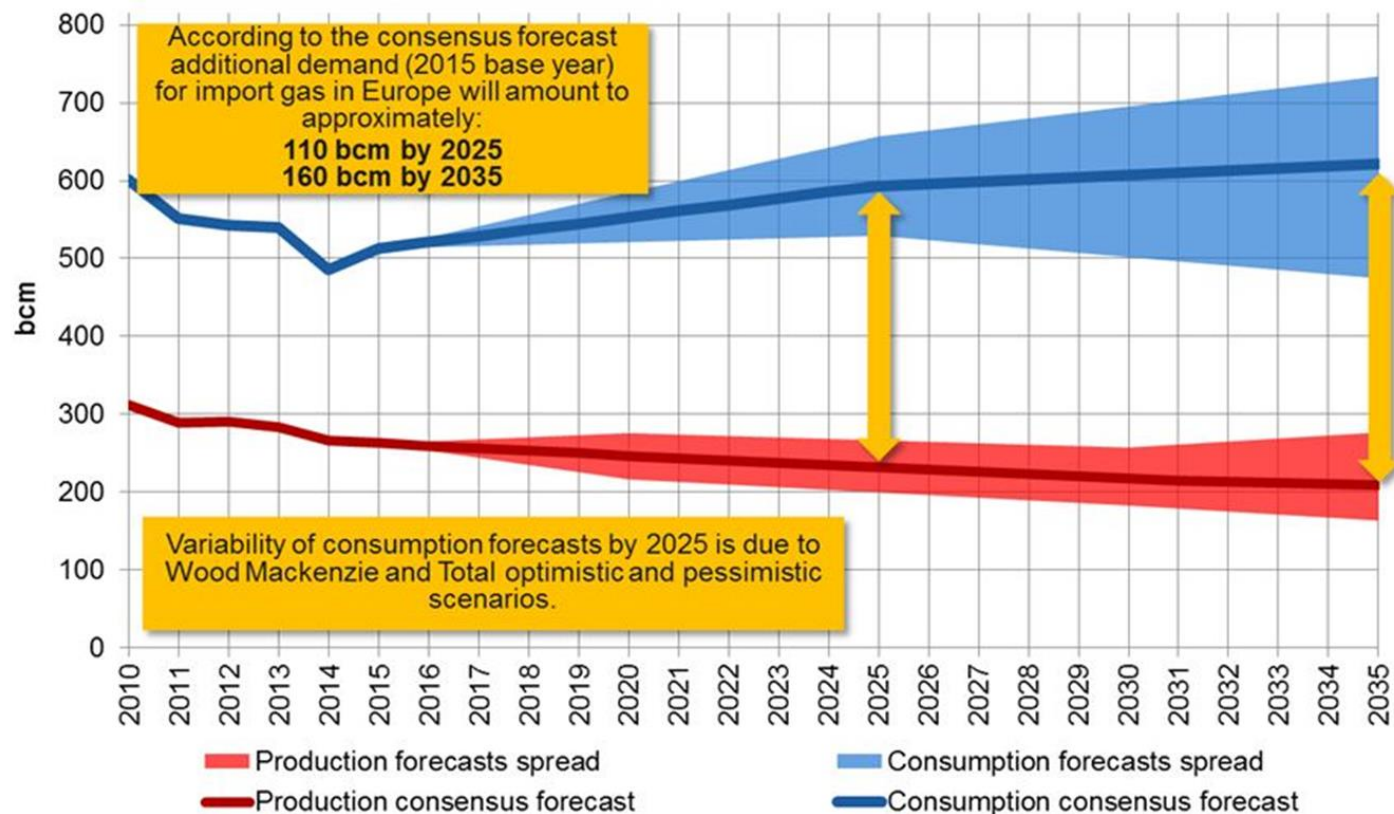
Turkey	0.14% 0.6bcm -0.05bcm YoY
Algeria	7.91% 32.3bcm -0.84bcm YoY
LNG	11.61% 47.4bcm 5.51bcm YoY
Libya	1.08% 4.4bcm -0.18bcm YoY
Netherlands	10.18% 41.6bcm -10.25bcm YoY
Norway	27.28% 111.5bcm 8.91bcm YoY
Other	1.49% 6.1bcm 3.56bcm YoY
Russia	40.32% 164.8bcm 14.81bcm YoY

	2017 bcm	2016 bcm
Russia	164.8	150.0
Norway	111.5	102.6
LNG	47.4	40.9
Netherlands	41.6	51.8
Algeria	32.3	33.2
Libya	4.4	4.6
Turkey	0.6	0.6
Other	6.1	2.5

Source: McKinsey Energy Insights

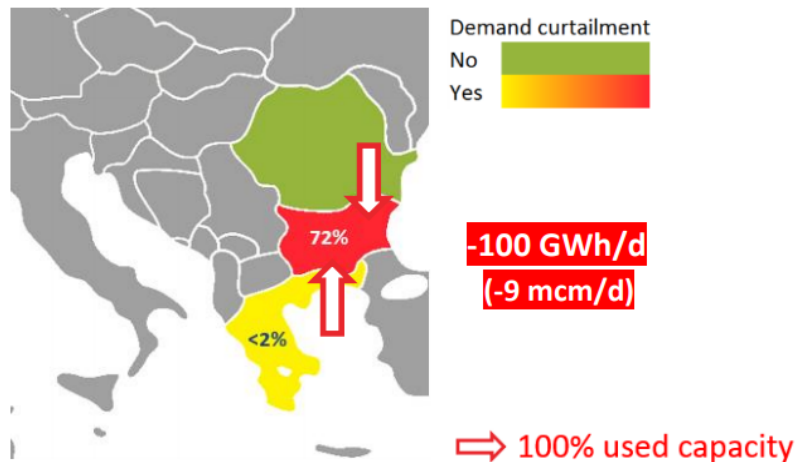
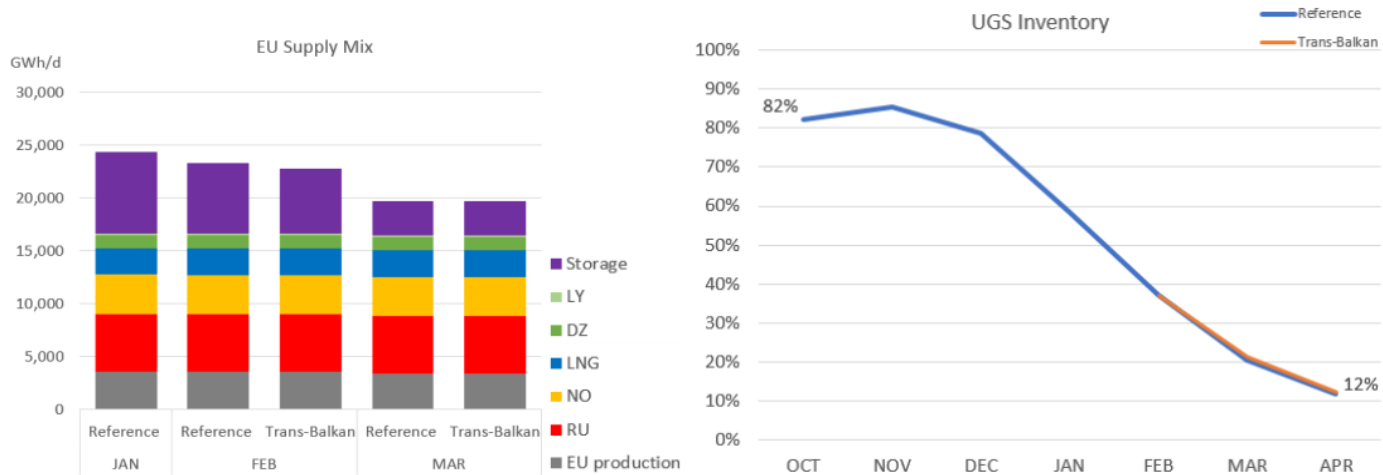
European Gas Demand and Production Gap

- Due to the falling indigenous production, European demand for additional gas imports may be **110 bcm by 2025** and **160 bcm by 2035**, according to Gazprom Export.



Disruption of the Largest Infrastructure to the Balkan Region (Romania-Bulgaria-Greece) (I)

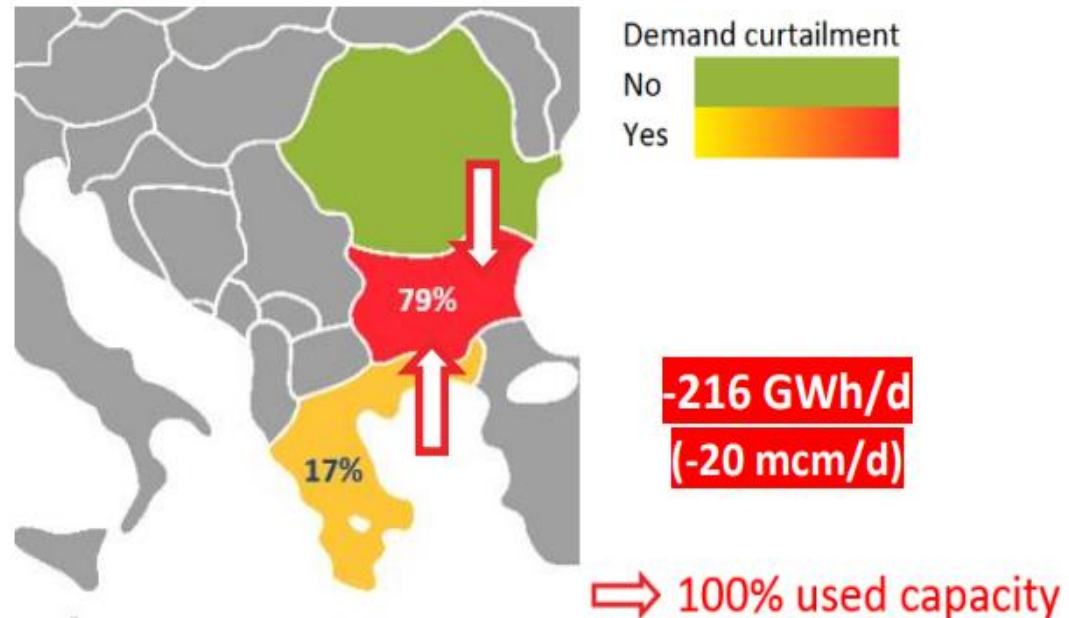
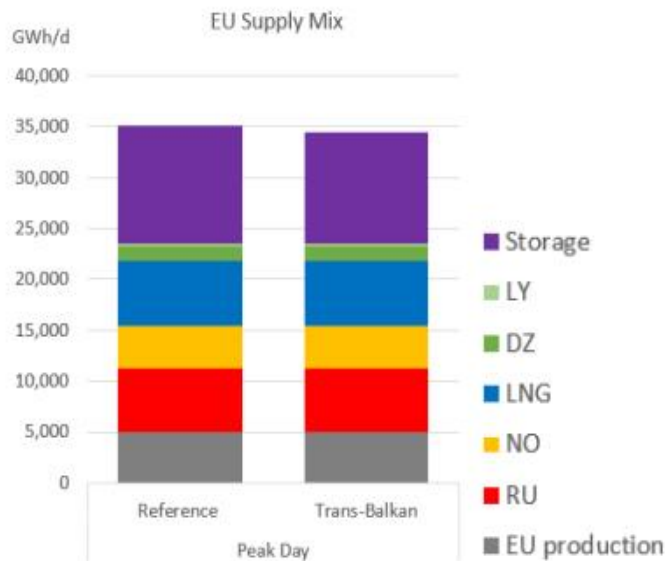
- ❑ ENTSOG's gas supply and infrastructure disruption **scenario #6 (February 15 – February 28)** out of 17 scenarios
- ❑ In case of a 2-month disruption of all gas imports to the EU via Ukraine, infrastructure limitations would result in the need to curtail gas demand in **Romania by 9%**, in **Greece by around 2%** and in **Bulgaria by 72%** of gas demand



Disruption of the Largest Infrastructure to the Balkan Region (Romania-Bulgaria-Greece) (II)

- ❑ These figures look **even worse** when modelled for a disruption via the same route during a **peak day** of exceptionally high gas demand, arising with a statistical probability of once in 20 years
- ❑ Figures for **Bulgaria** are looking **similarly bleak**

Peak day / 20 years – simulated on 15 February

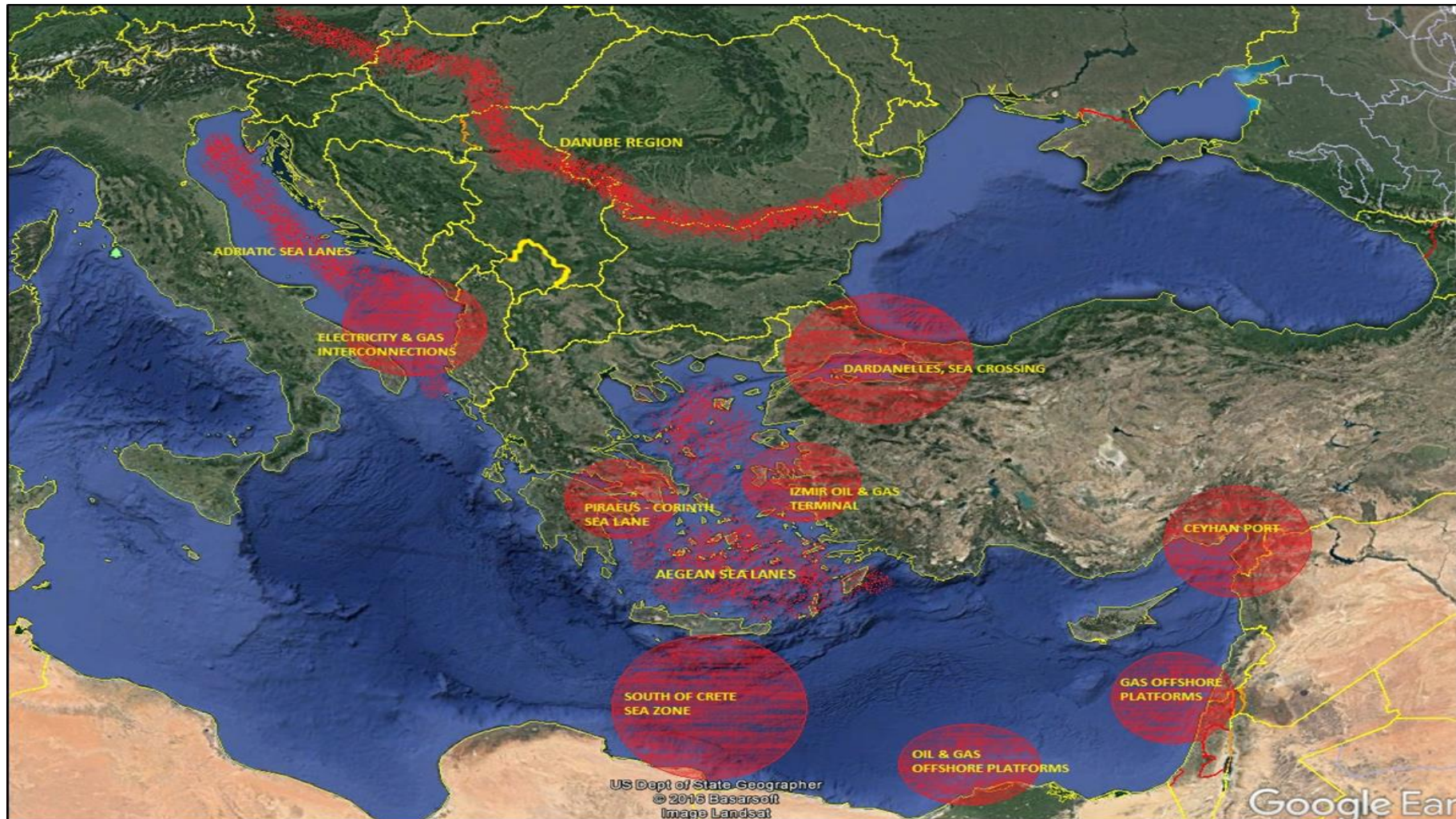


Strengthening Security of Electricity Supply in SE Europe

- Ensuring security of electricity supply requires conducting **regular assessments of whether the electricity system is adequate** (i.e. capable of meeting demand) and whether it is **secure** (i.e. physically resistant to shocks, etc.).
- It also requires **defining adequate responses**, once risks are identified. Transmission System Operators (TSOs) and Distribution System Operators (DSOs) have important responsibilities when it comes to guaranteeing operational security, in particular in the short term (e.g. TSOs carry out balancing activities).
- Beyond operational security, it falls on EU and non-EU Member States of SE European region:
 - to identify the types of risks relating to security of supply
 - to set standards of acceptable risks and
 - to take action (or ensure that relevant action is taken) to prevent the various risks from happening. In the absence of clear pan-European rules, it appears that approaches considerably vary across the region. The EU's Market Design Communication discusses the need for a joint approach to assess system adequacy, meaning the ability for supply to meet demand at all times.
- An increasing number of EU Member States and SEE countries (i.e. Contracting Parties) are taking action to secure their electricity supplies and prevent potential black-outs by **introducing capacity mechanisms**.
 - Capacity mechanisms are measures taken by individual states to ensure that electricity supply can meet demand in the medium- and long-term. Capacity mechanisms are designed to support investment to fill the expected capacity gap and ensure security of electricity supply.

Energy Security Issues in SE Europe (III) – The Role of Turkey and Greece as Transit Countries in Securing Energy Supplies to European Markets

Oil, Gas, Electricity and Security implications



Legal and Institutional Framework for Energy Security (I)

Legal and institutional Framework (IV)

- **Article 13 of Regulation (EU) No 1938/2017** introduces the principle of “SOLIDARITY” and a solidarity mechanism.
 - This Regulation introduces, for the first time, such **a solidarity mechanism** between Member States as an instrument to mitigate the effects of a severe emergency within the Union including a burden-sharing mechanism. The Commission should therefore review the burden-sharing mechanism and the solidarity mechanism in general in the light of future experience with their functioning, and propose, where appropriate, modifications thereto.
 - Member States should adopt the necessary measures for the implementation of the provisions concerning the solidarity mechanism, including by the Member States concerned agreeing on technical, legal and financial arrangements. Member States should describe the details of those arrangements in their emergency plans.
 - The **Commission issued its recommendation (EU) 2018/177 on February 2, 2018** on the elements to be included in the technical, legal and financial arrangements between the Member States for the application of the solidarity mechanism.
 - **By December 1st 2018, the Member States must adopt the necessary measures** in particular, the technical, legal and financial arrangements for the implementation of the solidarity mechanism.

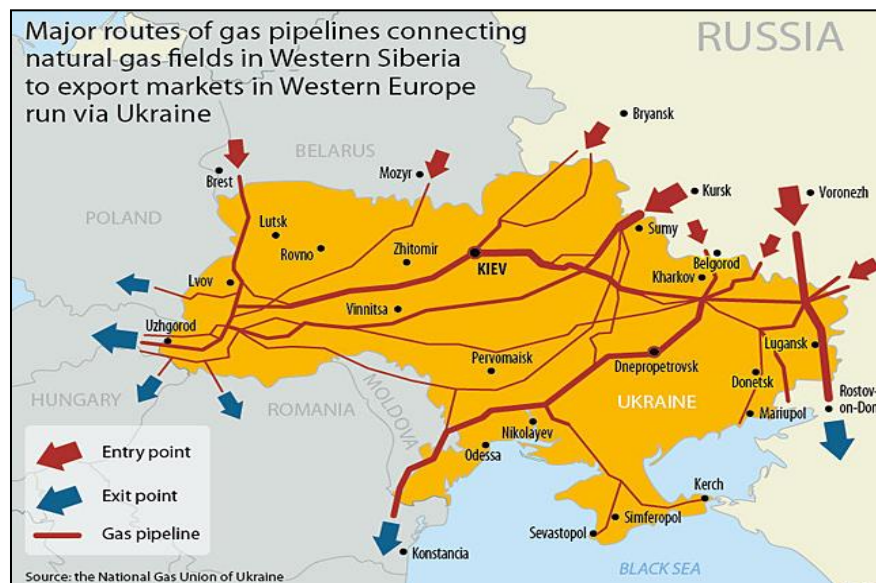
Legal and Institutional Framework for Energy Security (II)

Energy Security Strategy (May 2014)

- 38 European countries, including all EU countries, carried out energy security stress tests in 2014. They simulated two energy supply disruption scenarios for a period of one or six months:
 - a complete halt of Russian gas imports to the EU; and
 - a disruption of Russian gas imports through the Ukrainian transit route

Results:

- ❖ A prolonged supply disruption would have a **substantial impact on the EU**.
- ❖ Eastern EU and Energy Community countries would be particularly affected.
- ❖ If all countries cooperate each other, consumers would remain supplied even in the event of a six month gas disruption.



Strengthening Energy Security in SE Europe

Strengthening Emergency and Solidarity Mechanisms

- In view of the preceding information and analysis undertaken, it is obvious that **SEE countries need to strengthen their energy security by a combination of policy measures and the adoption of actual provisions.**
 - In line with EU thinking, **as exposed in EC's communication document on "European Energy Security Strategy"**, SE European countries (i.e. EU Member States, Contracting Parties and Turkey) could to a large extent adopt the specific actions proposed in the above communication in order to strengthen their energy security.
- These actions can be summarized as follows:
 - Intensify cooperation within the **Gas Coordination Group** and notably continue monitoring natural gas flows and the level of gas storage and coordinate at EU and/or regional level national risk assessments and contingency plans
 - Update the **risk assessments** and the **Preventive Action Plans and Emergency Plans**, as provided for by Regulation 994/2010
 - Organise and launch **energy security stress tests** in light of potential supply disruption risks, and develop back-up mechanisms, such as increasing gas stocks, developing emergency infrastructures and reverse flows and reducing energy demand or switching to alternative fuels in the very short term
 - Further cooperate with gas suppliers and transmission system operators to identify possible sources for short-term additional supplies, notably LNG.
- However, EU's current energy security strategy, as exemplified in the above document, appears focused on gas and does not take into consideration equally important and wider energy parameters such as oil, electricity, nuclear and coal.
- In considering an overall policy for strengthening SE Europe's energy security, IENE's view is that **a holistic approach is necessary to cover all forms of energy supply concerns.**

EU Initiated CESEC to Strengthen Energy Security

- The **Central and South Eastern Europe High Level Working Group** was set up by Austria, Bulgaria, Croatia, Greece, Hungary, Italy, Romania, Slovakia and Slovenia and the EU in February 2015.
 - ❑ They were joined later by eight Energy Community Contracting Parties: Ukraine, Moldova, Serbia, FYROM, Albania, Bosnia and Herzegovina, Kosovo and Montenegro.

- The **initial aim of the group** was to:
 - ❑ coordinate efforts to facilitate the swift completion of cross-border and trans-European projects that diversify gas supplies to the region
 - ❑ develop regional gas markets and implement harmonised EU rules to ensure the optimal functioning of infrastructure.

- At the **4th CESEC ministerial meeting** in Bucharest in September 2017, energy ministers signed a MoU extending the scope of CESEC cooperation. It now also includes:
 - ❑ a joint approach on electricity markets, energy efficiency and renewable development
 - ❑ a list of priority projects to build an interconnected regional electricity market
 - ❑ specific actions to boost renewables and investment in energy efficiency in a region with vast growth potential in these areas.

Members to the MoU of the CESEC High Level Group

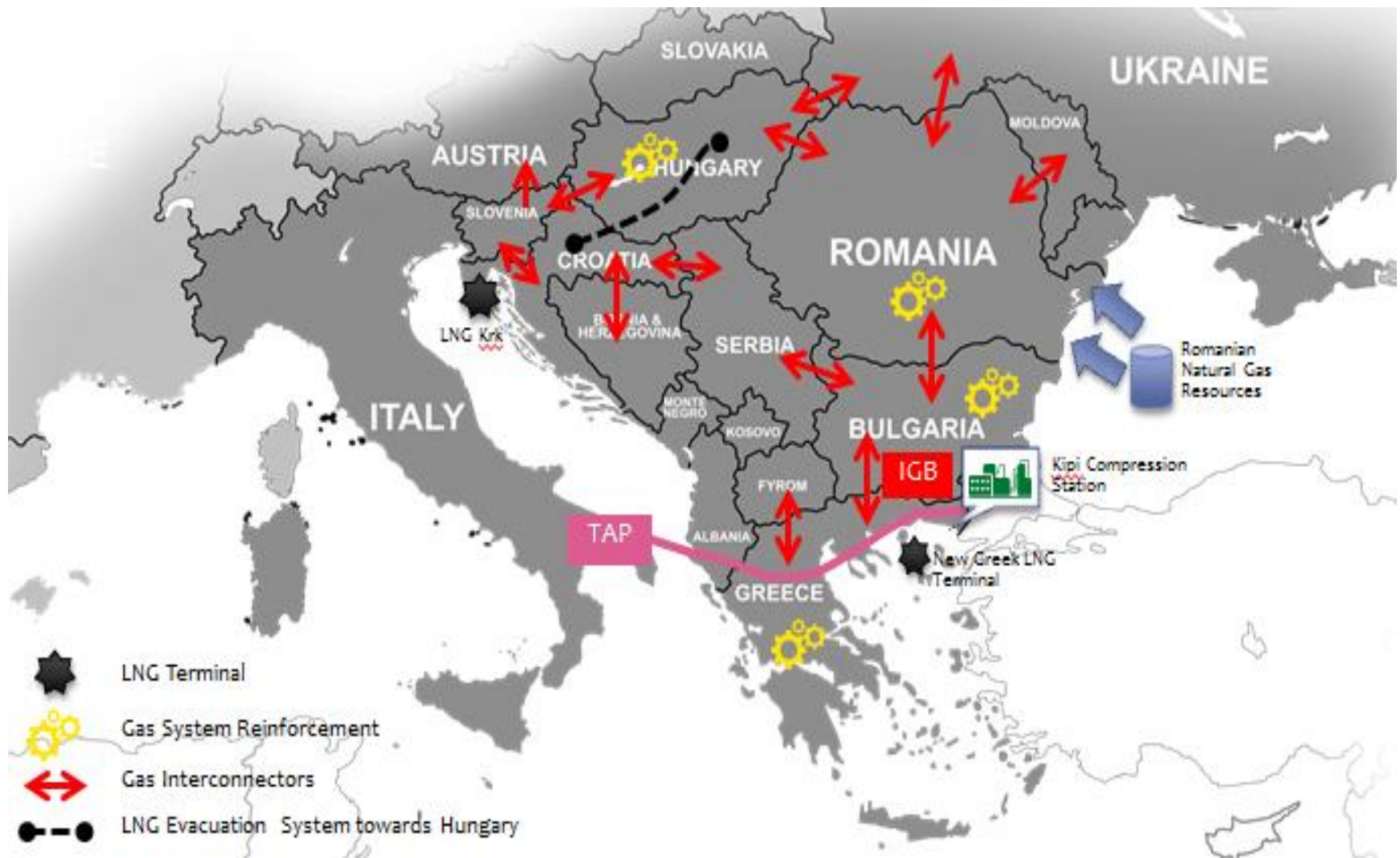
- Republic of Austria
- Republic of Bulgaria
- Republic of Croatia
- Hellenic Republic
- Hungary
- Italian Republic
- Romania
- Slovak Republic
- Republic of Slovenia
- Republic of Albania
- Bosnia and Herzegovina
- Former Yugoslav Republic of Macedonia
- Republic of Moldova
- Republic of Serbia
- Ukraine



Indicative List of CESEC Priority Projects in SE Europe

- ❑ Trans-Adriatic Pipeline (TAP)
- ❑ Interconnector Greece-Bulgaria (IGB)
- ❑ Interconnector Bulgaria-Serbia (IBS)
- ❑ Phased Bulgarian system reinforcement
- ❑ Phased Romanian system reinforcement
- ❑ Krk LNG Terminal
- ❑ Alexandroupolis FSRU Terminal

Energy Security - List of CESEC Priority Projects

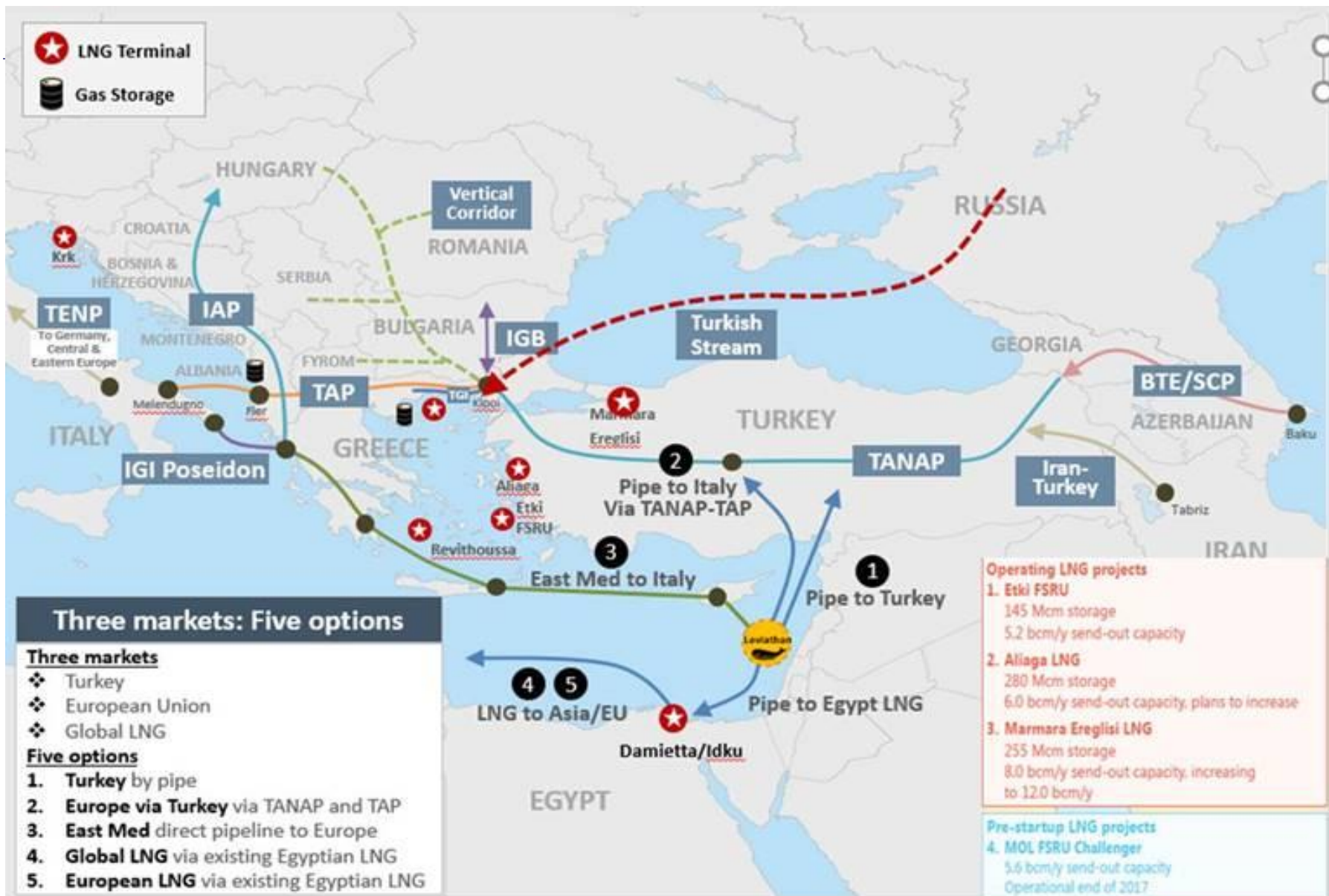


An Expanded Southern Gas Corridor



NB.: The TANAP and TAP gas pipelines as well as Turkish Stream are under construction, with IGB at an advanced planning stage with FID already taken. The IAP, the IGI Poseidon in connection with East Med pipeline and the Vertical Corridor and the IGF are still in the study phase. Blue Stream and Trans Balkan are existing pipelines.

Gas Routes in SEE and East Mediterranean



Discussion and Conclusions

- ❑ Energy security is a **complex issue** and as such cannot be considered in isolation.
- ❑ There are **no easy ways or readily available formulae** to mitigate potential threats or provide fail safe solutions in order to guarantee uninterrupted energy flows.
- ❑ **SE Europe**, because of its geography, its proximity to high risk conflict zones (i.e. Syria, Iraq, Ukraine), a growing and uncontrolled refugee flow from the Middle East and North Africa and the location of some of its countries (i.e. Turkey, Greece, Romania) at vital energy supply entry points, **faces higher energy security threats than the rest of Europe.**
- ❑ A corollary of the paper indicates that the **strengthening of Emergency and Solidarity Mechanisms and the maintenance of adequate oil, coal and gas stocks, constitute a short- to medium- term relief solution, whereas the achievement of a balanced energy mix provides the best long-term option in enhancing energy security both at country and regional level.**
- ❑ **The next important energy security challenge to face SE Europe will be the transition, in terms of gas supply, of Greece and Bulgaria from Russian gas, which from 1/1/2020 will be channeled entirely via Turkish Stream.**
- ❑ The SE European region needs a **well-defined and pragmatic strategy for energy security**, which promotes resilience to shocks and disruptions to energy supplies in the short-term and reduced dependency on particular fuels, energy suppliers and specific routes in the long-term.
- ❑ **Consequently, policy makers at national and regional level are faced with an important challenge as they must be prepared to inform the citizens of the available hard choices that reducing this dependency requires.**



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**Thank you for
your attention**

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