



Background Paper

“The Geopolitics of Energy Transition with Special Reference to SE Europe”



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THE GEOPOLITICS OF ENERGY TRANSITION



BACKGROUND PAPER

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Introduction

Fundamental changes are currently taking place in the global energy system which over the coming decades are bound to affect almost all countries and are expected to have wide-ranging geopolitical consequences. Renewables (RES) and energy efficient technologies have moved to the epicenter of the global energy landscape. Technological developments and falling costs have made RES grow faster than any other energy source. Many RES technologies are now cost-competitive with fossil fuels in the power sector, even before taking into account their contribution in the battle against air pollution and climate change.

These trends are creating an irreversible momentum for a global energy transformation. While the surge in wind, solar and other RES has taken place mostly in the electricity sector, new technologies are enabling transformation in other sectors, including oil and gas. Electric vehicles and heat pumps are extending the deployment of RES and energy efficiency in transport, industry and buildings. Innovations in digitalization and energy storage are expanding the potential for RES to flourish in ways that were unimaginable just a decade ago.

The accelerating deployment of RES and the introduction of advanced efficient technologies have set in motion a global energy transformation that will have profound geopolitical consequences. Just as fossil fuels have shaped the geopolitical map over the last two centuries, the current energy transformation will alter the global distribution of power, relations between states, the risk of conflict, and the social, economic and environmental drivers of geopolitical instability.

In 2017, Europe generated more electricity from RES than from coal, reaching 30% of annual consumption. This is a clear sign that a transformation in Europe is underway with positive influence in the countries beyond the continent, but we need to go further and faster if we are to achieve large-scale clean and affordable electricity. If we take into account that the new EU regulatory framework includes an energy efficiency target for 2030 of 32.5% with an upwards revision clause by 2023, the new objective shows EU's high level of ambition and demonstrates the remarkable pace of change of new technologies and reduced costs through economies of scale. Together with the agreed 32% EU RES target for 2030, Europe will be well equipped to complete the clean energy transition and meet the goals set by the Paris Agreement.

While market integration and transition to cleaner fuels is progressing well at European level, this is not the case for SE Europe. In most SE European countries, regional energy cooperation has been perceived as a necessary part of the European integration process. At the beginning of the present decade, the main targets of EU energy policy were incorporated in the long-term strategies of SEE countries. Lately, the focus has been redirected towards modernisation of energy infrastructure, the construction of new facilities, including electricity and gas interconnections, improvement of energy efficiency and increased use of RES.

SE Europe, in contrast to the rest of Europe, remains committed to continuing coal use. Based on IENE's estimates, the share of solid fuels for power generation is anticipated to hold its present position if not increase in several countries of the region (most notably in Serbia, Kosovo, Croatia, Bosnia and Herzegovina, Montenegro, Greece and Turkey) over the next 10-15 years, as they will struggle to meet increased energy demand. Hence, the road towards decarbonization and the transition to a "greener" future in SE Europe, with higher use of natural gas and RES, appears difficult, if not uncertain, in comparison with the rest of Europe. Paris agreement is proven to be an important reference point and an accelerator to global energy transformation.

1. The Global and SEE Energy Transition

(a) The Global Energy Transition

RES, particularly wind and solar, have grown at an unprecedented rate in the last decade and have consistently surpassed expectations. The growth of their deployment in the power sector has already outpaced that of any other energy source, including fossil fuels, which include oil, coal and natural gas. RES, in combination with energy efficiency, now form the leading edge of a far-reaching global energy transition¹.

This ongoing transition to RES is not just a shift from one set of fuels to another. It involves a much deeper transformation of the world's energy systems that will have major social, economic and political implications which go well beyond the energy sector. The term "energy transformation" captures these broader implications².

This ongoing global energy transformation will have a particularly pronounced impact on geopolitics. As the IRENA says, it is one of the undercurrents of change that will help to redraw the geopolitical map of the 21st century. The new geopolitical reality that is being shaped will be fundamentally different from the conventional map of energy geopolitics that has been dominant for more than one hundred years.

Fossil fuels have been the foundation of the global energy system, economic growth and modern lifestyles. The exploitation of fossil fuels lifted global energy use fifty-fold in the last two centuries, shaping the geopolitical environment of the modern world. The geographic concentration of fossil fuels has had a significant impact on the wealth and security of nations. An energy transformation driven by RES could bring changes just as radical in their scope and impact.

As a result, the majority of countries can hope to increase their energy independence significantly, and fewer economies will be at risk from vulnerable energy supply lines and volatile prices. Some countries that are heavily dependent on exports of oil, gas or coal will need to adapt to avoid serious economic consequences. At the same time, many developing economies will have the possibility to leapfrog fossil fuel-based systems and centralized grids. RES will also be a powerful vehicle of democratization because they make it possible to decentralize the energy supply, empowering citizens, local communities, and cities.

The Global Energy Transformation

Although rapidly growing RES have unquestionably started to transform the global energy landscape in an irreversible way, at the same time, considerable uncertainty still surrounds the energy transition that is taking place. As the rapid uptake in RES shows, we live in an age of exponential change and disruption. Which technological innovations will accelerate the transformation cannot yet be foreseen. Political choices will affect the course and pace of the energy transformation, which is likely to progress at different speeds in each country and in each sector. However, three primary aspects characterize and underpin the transition: (a)

¹ IRENA, OECD/IEA and REN21 (2018), "Renewable Energy Policies in a Time of Transition", https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2018/Apr/IRENA_IEA_REN21_Policies_2018.pdf

² We use the term "energy transition" to refer to the shift from fossil fuels to renewable energy sources. We use the term "energy transformation" to refer to the broader implications of this shift.

energy efficiency, (b) the growth of RES, (c) the growth of natural gas and (d) electrification, according to IRENA's latest related report³.

Energy efficiency enables economic growth with lower energy inputs. In the 20th century, the average growth rate of energy demand was 3%, about the same as the growth rate of global GDP, based on IRENA's data. In recent decades, improvements in energy efficiency have broken this link. Primary energy demand is now forecast to grow at 1% a year in the period to 2040⁴.

Growth of RES: RES have emerged as the fastest growing energy source⁵. The main RES are bioenergy, geothermal, hydropower, ocean, solar and wind. Among these, solar energy and wind power are undergoing very rapid growth, while the others are growing more gradually. Solar and wind share a characteristic that is largely unique to them: the amount of power they generate varies with the weather and the time of day. This is why they are called variable RES.

Natural gas has environmentally friendly credentials for power generation and transport and can be characterized as a bridging fuel to a low-carbon future. Its price competitiveness and abundance make it the fuel of choice for energy-intensive industries such as chemicals, plastics, steel and textiles. Countries looking to rapidly increase electricity generation see gas as a cheaper and faster option than building coal, oil or diesel powered stations.

Electrification: Electricity accounts for 19% of total final energy consumption, but its share is expected to grow considerably as increased electrification of end-use sectors takes place, based on IEA's latest data. The deployment of heat pumps and electric vehicles, for example, permits electricity to be used for heating, cooling, and transport. Electricity has been the fastest growing segment of final energy demand, growing two-thirds faster than energy consumption as a whole since 2000. This trend is set to continue. Since 2016, the power sector has attracted more investment than the upstream oil and gas sectors that have traditionally dominated energy investment, another reflection of the ongoing electrification of the world's economy⁶.

However, the speed of energy transformation remains uncertain. Because of the complexity of energy systems, there are as many scenarios on the future of energy as there are forecasters. Nevertheless, scenarios that model an energy future compatible with the goals of the Paris Agreement have a similar structure: a near-term peak in fossil fuel demand, a rapid uptake of RES, and a long decline in fossil fuel demand, according to latest British-Dutch company Royal Dutch Shell's report⁷. Figure 1 illustrates these dynamics. It is not a prediction, but shows a possible pathway which assumes that the world is able to achieve the goal of the Paris Agreement to limit temperature increase to 'well below 2°C'.

³ IRENA (2019), "A New World: The Geopolitics of the Energy Transformation", http://geopoliticsofrenewables.org/assets/geopolitics/Reports/wp-content/uploads/2019/01/Global_commission_renewable_energy_2019.pdf

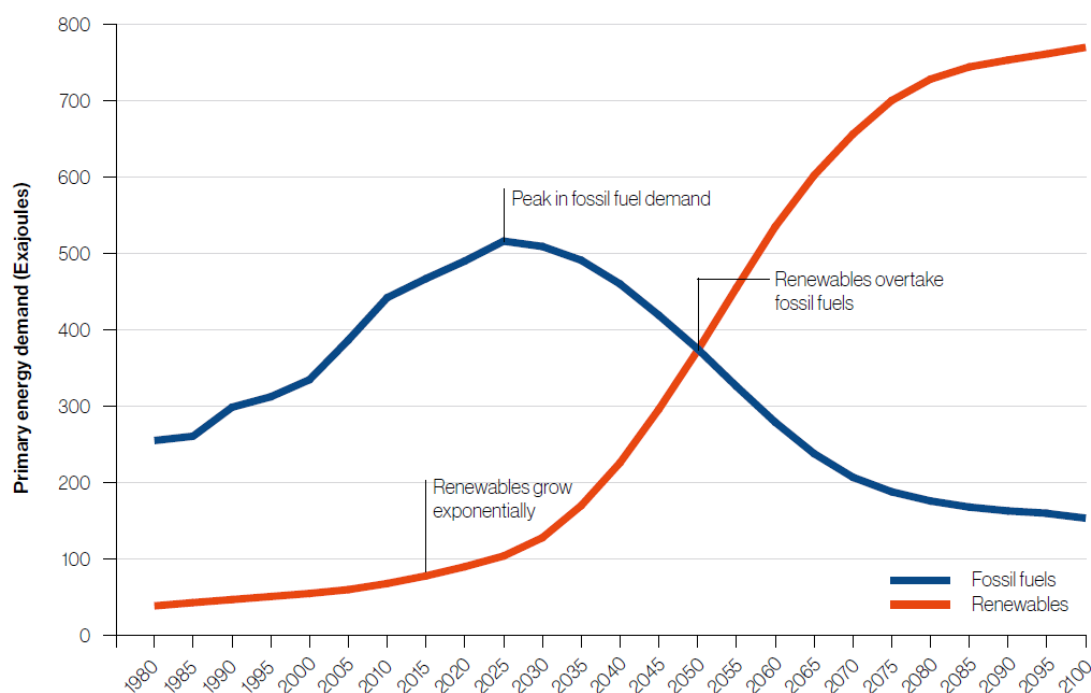
⁴ IEA (2018a), "World Energy Outlook 2018", <https://www.iea.org/weo2018/>

⁵ IEA (2018b), "Global Energy and CO₂ Status Report 2017", <https://www.iea.org/publications/freepublications/publication/GECO2017.pdf>

⁶ IEA (2018c), "World Energy Investment 2018", <https://www.iea.org/wei2018/>

⁷ Shell Global (2018), "Shell Scenarios: Sky - Meeting the goals of the Paris Agreement", <https://www.waterborne.eu/media/35584/shell-scenarios-sky.pdf>

Figure 1: The Global Energy Transition Framework



Source: Shell Sky Scenario

Even though nuclear energy is a low-carbon technology, the growth prospects for nuclear energy appear limited. After rapid expansion in the 1970s and 1980s, the growth of nuclear power has slowed in the last three decades. The share of nuclear in electricity generation declined from 17% in 2000 to 10% in 2017, based on IEA's WEO 2018 data. Around two thirds of today's nuclear power plants in advanced economies are more than 30 years old and will be shut down in the foreseeable future unless their lifetimes are extended, notes the IEA. Some countries are building new nuclear power plants, notably China, India, Russia, and the UAE. In others, governments are planning to phase out nuclear power, as in Germany, Switzerland, Spain and South Korea.

Overall, the global energy transformation is characterized primarily by a rapid growth of RES, and in particular solar and wind and increased use of natural gas. Oil, gas and coal will be affected differently by the energy transition because they have distinct characteristics and are used in a variety of sectors.

Why RES Will Transform Geopolitics

The main story of the energy transition is the rise of RES, particularly solar and wind, and the future decline of fossil fuels. RES differ in many respects from fossil fuels, and these differences will have geopolitical consequences.

First, RES are available in one form or another in most countries, unlike fossil fuels which are concentrated in specific geographic locations. This reduces the importance of current energy choke points, such as the narrow channels on widely used sea routes that are critical to the global supply of oil. Second, most RES take the form of flows, whilst fossil fuels are stocks. Energy stocks can be stored, which is useful; but they can be used only once. In contrast, energy flows do not exhaust themselves and are harder to disrupt. Third, RES can be deployed

at almost any scale and lend themselves better to decentralized forms of energy production and consumption. This adds to the democratizing effects of RES. Fourth, RES have nearly zero marginal costs, and some of them, like solar and wind, enjoy cost reductions of nearly 20% for every doubling of capacity, based on data of DNV GL's Energy Transition Outlook 2018⁸. This enhances their ability to drive change but requires regulatory solutions to ensure stability and profitability in the power sector. The energy transformation will be one of the major elements that reshape geopolitics in the 21st century, alongside trends in demography, inequality, urbanization, technology, environmental sustainability, military capability and domestic politics in major states.

(b) Energy Transition in SE Europe

As the economies of SEE countries are developing with the view of catching up with those of the rest of Europe, energy plays an important role both from financial/investment perspective, but also in terms of market development (i.e. liberalization, competition, etc.). The region of SE Europe, as defined and covered by IENE, includes 13 countries from Slovenia in the North-West to Cyprus in the South-East, 11 countries of the Balkan Peninsula, plus Turkey and Cyprus (see Map 1). From these countries, 6 are EU member states, 7 are NATO members, 3 are OECD members and only 2 are members of the Paris-based International Energy Agency (IEA).

Map 1: The SE Europe Area Defined



Source: IENE

Although politically, culturally and economically diverse, these countries are related and bound in different degrees each to EU energy strategies, policies and objectives. Their economies appear widely divergent in terms of structure and level of development, but they share several challenges, which appear to be common to all. Among them, it is the priority they all give to the development of the energy sector, both in terms of infrastructure, energy mix and market operation. Six countries in the Western Balkans are contracting parties of the Energy Community and hence in the process of fully adapting their energy legislation to EU Directives, while Turkey has made a significant progress in adapting its legislation and market operation to EU requirements.

⁸ DNV GL (2018), "Energy Transition Outlook 2018", https://sun-connect-ea.org/wp-content/uploads/2018/11/DNV-GL-ETO-2018-Main-Report_sept_18.pdf

Large amounts of indigenous coal and lignite deposits, which provide relatively cheap and easily accessible energy supplies for most countries in the region, are preventing a determined move towards decarbonization. As can be seen in Table 1, most countries in SEE have well defined plans and running projects for new coal/lignite fired power plants which over the next 8-10 years will add some 10 GW of new electricity capacity. Hence, the region's dependence on solid fuels is likely to increase, notwithstanding commitments for increased RES use.

Table 1: Under Construction and Planned Coal Plants in SEE Countries (MW)*, as of January 2019

Country	Announced New Plants	Pre-permit	Permitted	Announced + Pre-permit + Permitted	Under Construction	Shelved	Operating	Cancelled (2010-2018)
Turkey	12,8	17,311	6,555	36,666	800	24,554	18,826	41,031
Bosnia & Herzegovina	2,38	0	1,7	4,08	0	0	2,073	1,02
Serbia	1	0	350	1,35	0	0	4,405	1,82
Romania	0	600	0	600	0	0	5,305	5,105
Kosovo	0	450	0	450	0	0	1,29	330
Greece	0	450	0	450	660	0	4,375	800
North Macedonia	300	129	0	429	0	0	800	300
Montenegro	0	0	0	0	0	0	225	1,41
Bulgaria	0	0	0	0	0	0	4,889	2,66
Slovenia	0	0	0	0	0	0	1,069	0
Croatia	0	0	0	0	0	0	210	1,3
Albania	0	0	0	0	0	0	0	800

*Note: Includes units 30 MW and larger

Sources: EndCoal, IENE

Also, the high dependence on oil and gas imports of the region should be emphasized, which is driving many countries' exploration efforts to new finds. Natural gas is becoming increasingly important in the countries of the region for their energy mix, including power generation. However, the poor energy infrastructure and the lack of adequate cross-border interconnections, especially in the West Balkan countries, are obstacles for further penetration in the energy mix and market development. Moreover, the gas supply in SE Europe is characterized mostly by the lack of domestic production with one dominant supplier, Russia.

The liberalization of the electricity market has recorded impressive progress in most SEE countries, especially in its EU member states and Turkey. However, in terms of security of energy supply, the region appears more vulnerable than the rest of Europe and it can be strengthened by improving the interconnectivity for both gas and electricity across the region. There is high RES potential in the region, but its exploitation for power generation and non-electrical uses remains at widely different levels among the SEE countries, while good records in hydropower should be mentioned. Most of the EU member states and Turkey have made impressive progress with increased RES penetration, while other countries, as in the West Balkans, are at the beginning of solar and wind applications.

In addition, it should be underlined that attention on the deployment of energy efficiency solutions has been poor, to say the least, over the past years. Although the lack of energy efficiency has been recognized in recent years, clearly more work is required at state and local authority level for the successful introduction of energy efficiency schemes. The energy landscape in SE Europe is changing and there are exciting opportunities for clean energy and

the digitalization of energy services in the region, as well as a need for qualified professionals in all areas of the energy sector.

As already mentioned, considerable progress has been achieved in recent years in European energy market integration, but the SEE region still faces serious challenges when it comes to adapting its energy systems and energy markets to meet EU basic targets (i.e. decarbonization, RES penetration and energy efficiency).

Today, we observe great divergence in the degree of adaptation between the different country groups of the region. EU member states have already achieved, to a large extent, energy market integration, while West Balkan countries lag behind due to lack of electricity and gas interconnections, despite the assistance over the last 12 years by the Energy Community.

Electricity Markets

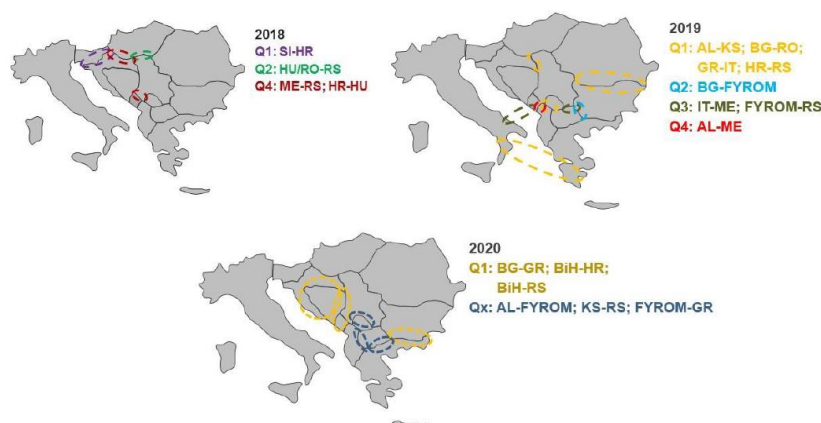
In the electricity sector, it is highly important to understand the current status of the market liberalization process in the SE European region, which has faced several difficulties and numerous non-technical obstacles in the past as the incumbent companies in almost all SEE countries solidly resisted any change on the grounds of losing control of the market and hence weakening of their bureaucratic hold. Currently, the situation in six SEE EU member countries, including Bulgaria, Croatia, Cyprus, Greece, Romania and Slovenia, looks varied with certain countries having managed to complete what appeared to be an anomalous transition period and other countries still trying to adapt to EU competition rules.

In the six SEE Energy Community Member States, including Albania, Bosnia and Herzegovina, Kosovo, North Macedonia, Serbia and Montenegro, we have the intervention of the Energy Community through the contracting parties, which has facilitated the overall transition process to European Acquis. In the case of Turkey, a much larger country compared to any of the other SEE states that affects to a large extent financial, trade and energy flows to the rest of SE Europe, the progress achieved in electricity market operation unbundling and competition in the retail area has been impressive and has now entered a critical stage with the market opening up much faster than anticipated.

Hence, some solid steps have been made towards electricity market competition. However, progress is not very satisfactory in most contracting parties, largely because of the inflexible market structure and the stiff hold of the state over market mechanisms. The electricity markets in SE Europe are still fragmented. National markets are small and in different stages of maturity. In most countries, markets are not very developed in EU standards and still rely much on bilateral contracts. Markets also lack reliable price signals.

From the ongoing and potential market coupling initiatives, a tentative roadmap has been drawn to illustrate how the current fragmented SEE electricity market could possibly integrate regionally and with the rest of Europe. Even if such a roadmap is highly uncertain and subject to constant planning changes, some observations can be made. As shown in Map 2, the first wave of SEE electricity market couplings could take place in 2018 in the northern part of the region bordering the Day-Ahead electricity markets of the Czech Republic, Slovakia, Hungary and Romania and/or northwest and southwest Europe plus Italian borders.

Map 2: Tentative Roadmap Towards the SEE Electricity Market Integration



Source: ENTSO-E⁹

With rising preparedness in all countries, the year 2019 will be busy and can see some 6-8 borders coupled. This would reach, even if one year late, the Western Balkan 6 target to get every country coupled with at least one of its neighbors. It is reasonable to expect that coupling of the remaining borders will follow by the end of 2020.

Gas Markets

Over the past five years, important steps regarding the long-term development of the SE European gas market have taken place. However, a highly fragmented landscape for the gas market development in the region still exists. According to IENE, the only way forward for the development of a regional gas market is the consistent and rapid implementation of the provisions of the Third Energy Package, at least to the extent that the 6 SEE EU Member States and the 6 SEE Energy Community Contracting Parties have committed to adopt it in a legally binding way.

The Central and South-Eastern European Gas Connectivity (CESEC) initiative is highly relevant in this process as it brings together Energy Community Contracting Parties and their EU neighbours in Central and South-Eastern Europe and has helped to generate political support and boost regional cooperation on common challenges faced most notably in the gas sector.

According to a report by the Energy Community¹⁰, the progress with respect to the transposition and implementation of the EU's flagship energy market legislation, known as the Third Energy Package, is varied in the Western Balkans. Four of the six Western Balkan countries, which include Albania, Kosovo, Montenegro and Serbia, have transposed the Third Energy Package to a sufficient degree.

However, progress in Bosnia and Herzegovina is not in sight due to the ongoing political deadlock over the division of state and sub-state competences. The country's lack of progress continues to hinder gas and electricity infrastructure and market development and security of gas supply at the expense of energy consumers.

⁹ ENTSO-E (2017), "Enhancing market coupling of SEE Region", https://docstore.entsoe.eu/Documents/MC%20documents/170504_ENTSOE_ReportonDAMC_SEE_region.pdf

¹⁰ Energy Community (2018), "Knocking on the EU's Door through the Energy Community: Integration of Western Balkans into the Pan-European Energy Market", https://www.energy-community.org/dam/jcr:f28990a7-1d9e-44a5-9e1d-db1d57187403/EnC_WB6Report_012018.pdf

2. Redrawing the Global and SEE Geopolitical Map

(a) The Global Geopolitical Map

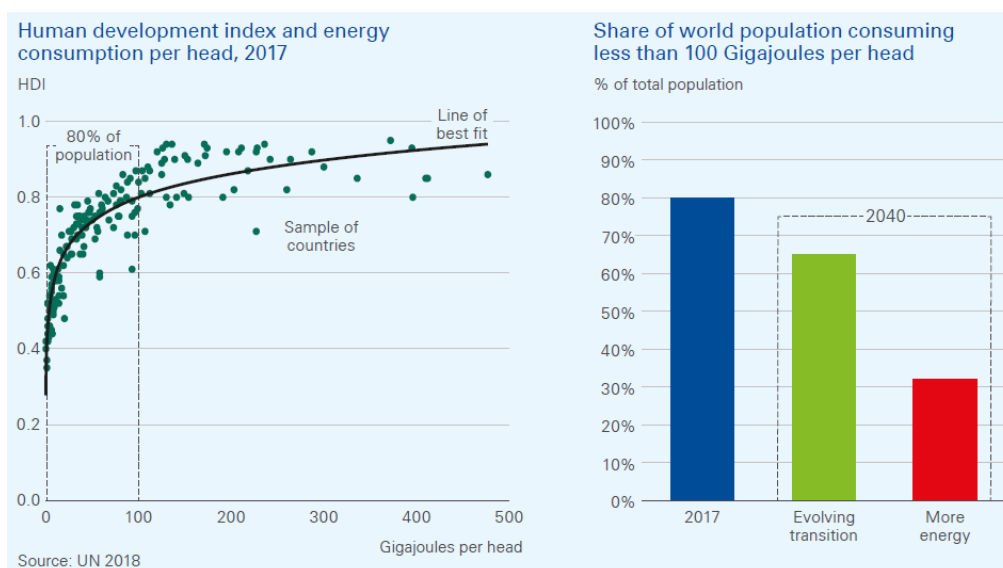
For two centuries, the geographic concentration of oil, gas and coal reserves has helped configure the international geopolitical landscape. Coal and steam power drove the Industrial Revolution which, in turn, shaped geopolitics in the 19th century. Since then, control over the production and trade in oil has been a key feature of 20th century power politics. A transition from fossil fuels to RES could transform global power relations no less than the historical shifts from wood to coal and from coal to oil.

Repositioning of States

A state's relative position in the international system is influenced by a range of attributes, including its GDP, population, land size, natural resources, geostrategic location, military resources, and 'soft power'. Having control over and access to significant energy resources and markets is an important asset because it enables states to protect vital national interests at home and leverage economic and political influence abroad. States without such assets, by comparison, have less leverage and are more vulnerable. The rapid growth of RES is therefore likely to alter the power and influence of some states and regions relative to others, and to redraw the geopolitical map in the 21st century.

There is a strong link between human progress and energy consumption. The United Nation's Human Development Index (HDI) suggests that increases in energy consumption up to around 100 Gigajoules (GJ) per head are associated with substantial increases in human development and well-being, after which the relationship flattens out. Around 80% of the world's population today live in countries where average energy consumption is less than 100 GJ per head. In BP's "Evolving Transition" scenario, this proportion is still around two-thirds even by 2040. In its alternative "More energy" scenario, this share is reduced to one-third by 2040. This requires around 25% more energy by 2040, roughly equivalent to China's energy consumption in 2017.

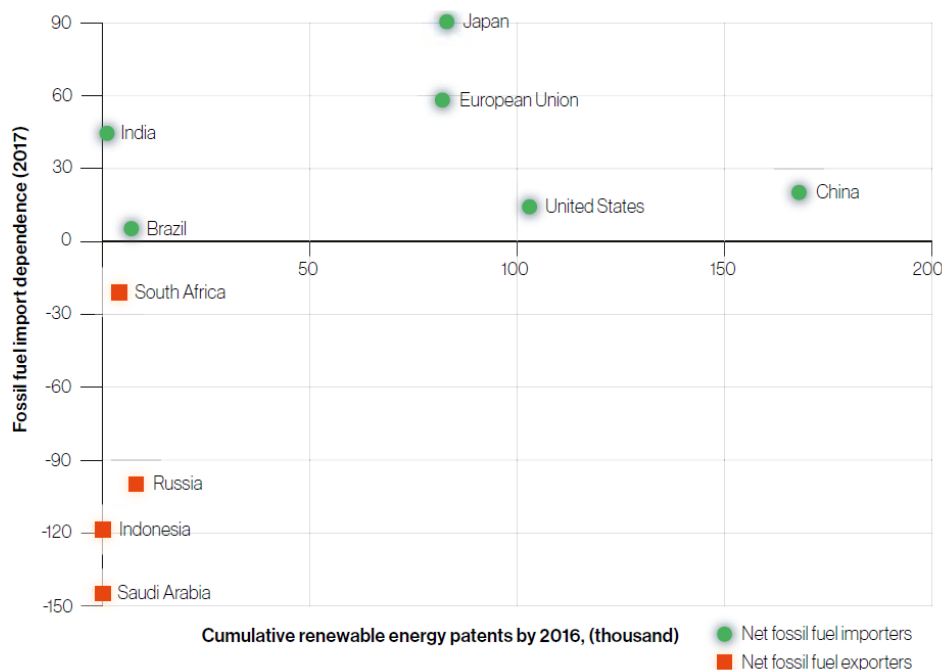
Figure 2: The World Needs 'More Energy' to Allow Global Living Standards to Continue to Improve



Source: BP Energy Outlook 2019

How different countries fare in the context of the energy transition depends in no small part on how exposed they are to changes in fossil fuel trade flows. Equally important is their position in the clean energy race, the commercial race to become a leader in RES technology. Although the issue is highly complex, innovation will be a key determinant of the pace of change and its effect can be illustrated in Figure 3.

Figure 3: Impact of the Energy Transition on Selected Countries and Groupings



Sources: BP, IRENA

The **Y-axis** depicts the share of oil, gas, and coal imports in total primary energy consumption in 2017. It situates selected countries, as well as the European Union, in the energy economy of today, which is dominated by fossil fuels. The higher the share, the more dependent a country is on fossil fuel imports. Net fossil fuel exporting countries have negative shares. The **X-axis** shows the cumulative number of patents for RES technologies that had been registered by the end of 2016. This indicator provides a way to assess the position of selected countries, and the European Union, in the clean energy race.

Countries and groupings in the upper right quadrant of Figure 3 stand to gain the most from the energy transition: they are highly dependent on imported fossil fuels but have positioned themselves at the forefront of the clean energy race. Figure 3 gives rise to a number of observations:

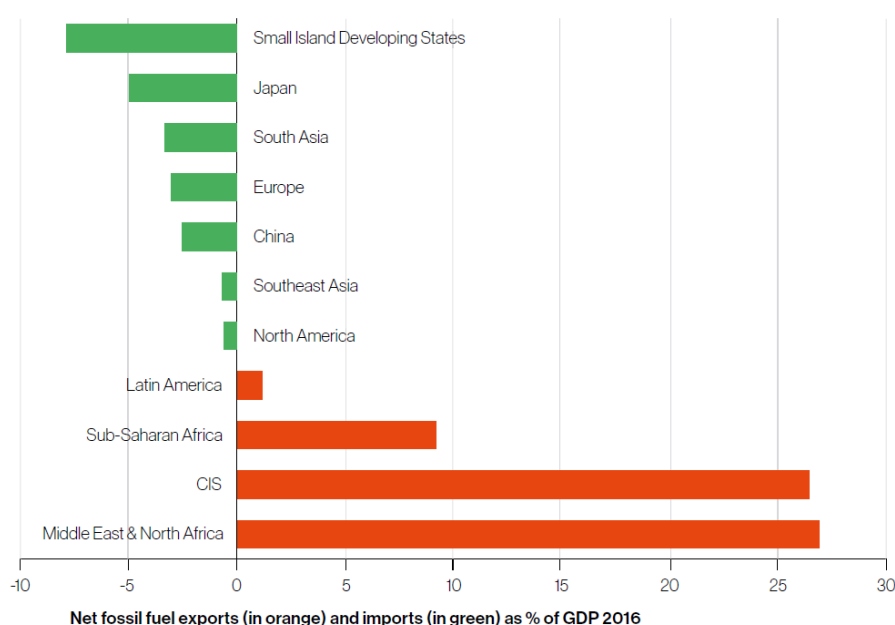
- The **United States** is close to energy self-sufficiency, largely due to the shale revolution. It became a net exporter of natural gas in 2017 and is projected to become a net oil exporter early in the 2020s. The US is well positioned in the clean energy race: US companies hold strong positions in new technologies, including robotics, artificial intelligence, and electric vehicles.
- **China** will gain from the energy transformation in terms of energy security. It has a leading position in manufacturing, but also in innovation and deployment of RES technologies. It is the biggest location for RES investment, accounting for more than

45% of the global total in 2017¹¹. Currently, it remains highly dependent on oil imports which have been growing steadily.

- **Europe and Japan** are major economies which are very dependent on fossil fuel imports. They also hold strong positions in RES technologies. In Europe, Germany leads the way with almost 31,000 RES patents. Germany’s domestic Energiewende, or “energy transition”, has made the country a frontrunner in RES deployment.
- **India** has been among the fastest-growing economies in the world in the last few years, lifting millions out of poverty. It is projected to have the world’s largest population by 2024¹² and is poised to overtake China as the world’s largest energy growth market by the end of the 2020s. India has set itself an ambitious target of 175 GW of RES by 2022, based on IEA/IRENA joint policies and measures database. This represents a massive increase, considering that India’s total installed power generation capacity in October 2018 was only 346 GW.
- **Russia**, the world’s largest gas exporter and second largest oil exporter, may face challenges in adapting to a world increasingly powered by RES. Russia’s economy is larger and more diversified than any of the Middle Eastern oil producers, but oil and gas rents are a vital component of the state budget, accounting for around 40% of fiscal revenues, according to IEA’s WEO 2018. Even though Russia is stepping up RES deployment and is investing in research and development, it still lags far behind China and the US in terms of patents for RES technologies.

To assess the impact of the energy transition on different regions, Figure 4 shows each region’s net fossil fuel exports and imports as a share of GDP.

Figure 4: Regional Impact of the Energy Transition



Sources: World Bank, IMF

¹¹ Frankfurt School-UNEP Centre and BNEF (2018), “Global Trends in Renewable Energy Investment 2018”, http://www.iberglobal.com/files/2018/renewable_trends.pdf

¹² UN DESA (2017), “World Population Prospects”, <https://population.un.org/wpp/>

While the graph above masks differences within regional groupings, it has the advantage of uncovering major differences between regions and country groupings.

- The **Middle East and North Africa**, together with **Russia and other countries in the Commonwealth of Independent States (CIS)**¹³, are the regions most exposed to a reduction in fossil fuel revenues. On average, these regions have net fossil fuel exports of more than a quarter of their GDP. Declining export revenues will adversely affect their economic growth prospects and national budgets. To prevent economic disruption, they will need to adapt their economies and reduce their dependence on fossil fuels.
- The majority of countries in **Sub-Saharan Africa (SSA)** will benefit from reducing fossil fuel imports and generating RES domestically, because this will boost job creation and economic growth. The exceptions to this are the two biggest oil producers in the region, Nigeria and Angola, which are at risk because they depend heavily on fossil fuel rents. Because of their size and large fossil fuel exports, they skew the data for SSA as a region. In the long-term, however, African countries have a unique opportunity to leapfrog the fossil fuel-centred development model despite recent discoveries of oil and gas.
- **Small Island Developing States (SIDS)** will benefit most of all if they adopt RES rather than fossil fuels. The import of fossil fuels now amounts to 8% of their GDP. Many SIDS are also extremely vulnerable to the effects of climate change. SIDS possess ample RES and RES technologies can meet most of their domestic energy needs. The shift would cut import bills, promote sustainable development, and increase their resilience. International cooperation to support SIDS' RES ambitions is growing substantially, and 13 SIDS have established 60-100% RES electricity targets.
- **South Asia** spends more than 3% of its GDP on imports of fossil fuels, and demand for fossil fuels is rising rapidly from a low base. These countries will benefit from the energy transformation primarily by reducing their fossil fuel import bills, which would otherwise grow dramatically and weigh on their economies.
- **Europe, China and Japan** are currently heavily reliant on fossil fuel imports but would increase their energy independence as RES shares grow. Japan is the most dependent; its net fossil fuel imports amount to 5% of GDP.
- **North and Latin America** are net neutral when combined. On a continental scale, in light of both their domestic resources and international trade in energy, their economies are largely energy independent.

Energy and Conflict

The pivot to RES and energy efficiency could reduce the incidence of certain kinds of conflict, and alleviate competition for important natural resources, notably oil and gas, as currently holds for the SE European and the East Mediterranean region. As major energy consuming countries become gradually less dependent on oil and gas imports, the geopolitical role of hydrocarbon exporting countries diminishes. Hence, geostrategic goals need to be reassessed and redefined, while new alliances emerge.

Fossil fuels, especially oil and gas, have made a considerable imprint on patterns of conflict over the last hundred years. As the world shifts to RES, and the relative importance of fossil fuels declines, a geopolitical shift in the incidence and geographic location of conflict may occur. Global and local confrontations over contested hydrocarbon reserves, for instance in

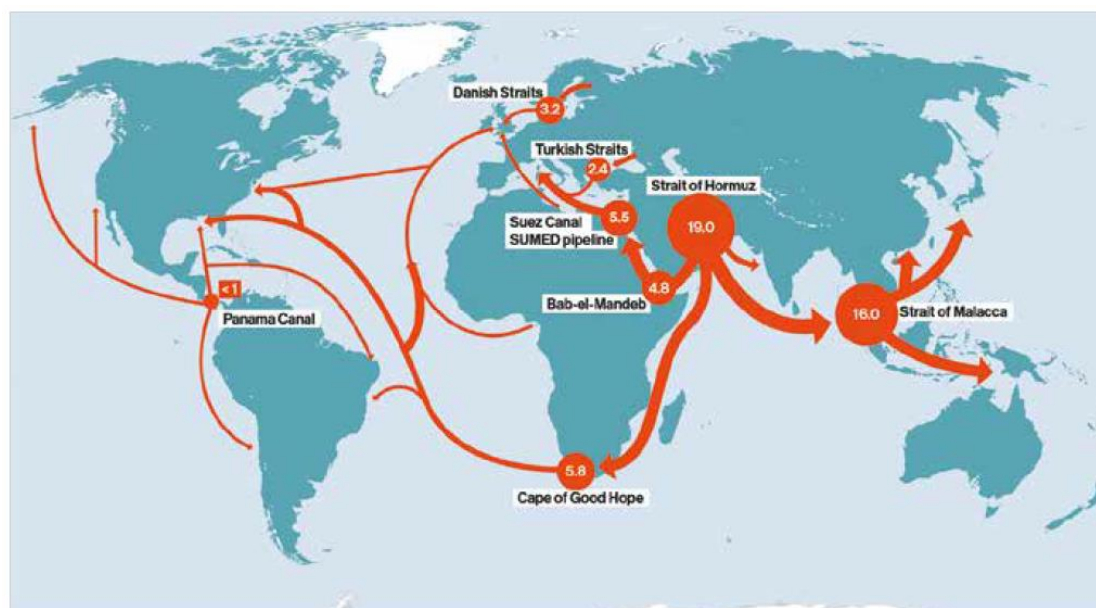
¹³ Under the World Bank's classification system, the CIS includes Armenia, Azerbaijan, Belarus, Kazakhstan, Kyrgyzstan, Moldova, Russia and Tajikistan.

the South China Sea or the Eastern Mediterranean, may diminish or result in fewer conflicts. To this extent, the global energy transformation may generate a peace dividend.

Fossil fuels are rarely a direct cause of conflict between states, but they are often an aggravating factor in armed conflicts within states. Some African countries that produce oil have experienced serious internal turmoil and conflict in recent decades. Oil can reinforce existing inequalities and create opportunities for external actors to further exacerbate grievances in oil-producing regions, particularly when central governments redistribute wealth away from them. Armed groups can also capture natural resources and related supply chains to finance their activities. Other natural resources (diamonds and tropical timber, for instance) may also drive local conflict; however, the evidence links conflicts to oil more robustly than to any other natural resource.

If oil and LNG become less strategic for security, maritime chokepoint, narrow shipping lanes such as the straits of Hormuz, may become less critical as a consequence (see Map 3). The Strait of Hormuz is the world's most important oil artery, which links Middle East crude producers to key global markets. At its narrowest point, it is only 21 miles wide and the shipping lane is only 2 miles wide in either direction. Each day, around 30% of all seaborne traded crude oil passes through it, as well as a significant volume of LNG, according to IRENA.

Map 3: Daily Transit Volumes Through World Maritime Oil Chokepoints



Note: All estimates in million barrels per day. Includes crude oil and petroleum liquids. Based on 2016 data.

Source: US EIA

Interestingly, energy doesn't play much of a role in **Syria** because the country is not an important energy player. It is commonplace to think of the Iraqi invasion of Kuwait in 1990 and the subsequent US-led coalition to liberate Kuwait as being predicated on 'freeing up the oil'. Similarly, the war in Iraq in 2003 has been widely characterized as a 'grab for oil'. But

Kuwait and Iraq sit on significant energy resource bases, while Syria simply does not, according to the Royal Institute of International Affairs, commonly known as Chatham House¹⁴.

What we are seeing in Syria is a geopolitical competition between the regional players, Saudi Arabia, Turkey, Iran and Qatar, and then more widely Russia, the US and China. Syria really has become a battleground for regional and international players, but the game is more about influence on the ground rather than energy.

Interestingly, China is slowly coming into this situation because it is more about the strategic location of Syria sitting atop the Arab world and being situated alongside the Mediterranean Sea, which gives it access to Europe. So, it is more about Syria's strategic importance rather than its energy supplies for China as well.

Libya is different. It does sit on considerable oil reserves and can produce 1.8 million barrels per day during peace time. In fact, it has the capacity to increase production somewhere in the region of 2.5 mbd. But the country is far from reaching those levels and has not done so since the early 1970s. However, there is direct competition for Libya's resources between Russia, Turkey and China, though all are engaged in differing ways in Libya's energy scene.

The real competition is between competing local militias on the ground, which seek control over oil resources as a means of securing political power. Militias, such as those aligned with Khalifa Haftar's self-styled Libya National Army, which controls access over many oil assets in the east of the country, are backed by external powers such as the United Arab Emirates. European powers, such as Italy and France, are also intimately involved in the political process and both countries have national energy champions with stakes in the success of Libya's oil sector.

The ongoing blockade of **Qatar** by Saudi Arabia, the United Arab Emirates, Bahrain and Egypt has seen the oil and gas-rich nation withdraw from the OPEC¹⁵. How significant of a role has energy played in the regional crisis? The roots of the crisis have been more based on how Saudi Arabia and the United Arab Emirates, on the one hand, and Qatar, on the other hand, have two competing visions for how the region should be.

One is focused on the anti-Muslim Brotherhood axis, which sees an alignment of countries which are secular in their outward policies, autocratic, authoritarian and see a strong role for the military in their political development. This alignment of states includes Saudi Arabia, the United Arab Emirates, Egypt, arguably Haftar in Libya as well as Russia – a string of strongmen.

Qatar, on the other hand, sees political Islam, through the Muslim Brotherhood, as playing an important role in the development of the region, which is more closely aligned with Turkey. Its relations with Iran tend to be complex but the two countries successfully share the management of a major gas field (South Pars) and have extensive commercial and trade relations.

In terms of energy, while Saudi Arabia is one of the world's leading oil exporters, Qatar is one of the world's leading LNG exporters, which has allowed the country to develop an autonomous role regionally and globally – much to the frustration of the Saudis. In a way, the division between oil and gas in the Middle East over the past couple of decades has really

¹⁴ Chatham House (2019), "The Middle East's Shifting Energy Politics", <https://www.chathamhouse.org/expert/comment/middle-east-s-shifting-energy-politics>

¹⁵ Reuters (2018), "Gas-focused Qatar to exit OPEC in swipe at Saudi influence", <https://www.reuters.com/article/us-qatar-opec-idUSKBN1O20DT>

enhanced Qatar's ability to pursue an independent foreign policy and play an active role in the region and beyond.

Following Donald Trump's plans to withdraw American troops from Syria and Afghanistan, and USA's apparent retreat from the region¹⁶, what is the geopolitical importance of the Middle East, particularly in terms of the region's energy resources, to Russia and China and to what extent are Gulf states dependent on exporting to Russian and Chinese energy markets?

China imports 49% of its crude from the Middle East and 37% of Middle Eastern oil exports are destined for China. In terms of capital, Chinese exports to the region amounted to nearly \$123 billion in 2016 while imports from the region were valued at \$87.5 billion. This is because China has made a number of significant upstream investments in Iraq and Iran, while Qatari and Saudi investors have invested in downstream operations in China, as a means of developing a value chain that ties the long-term economic interests of the countries together.

Despite China's efforts to diversify the provenance of its natural resources, the Middle East, especially the Gulf region including regional competitors Iran and Saudi Arabia, will grow in importance as the country's domestic demand grows.

Commensurately, increasing US production of shale oil and gas will continue to displace Middle Eastern oil and gas in the North American and European energy markets; therefore, creating a virtuous cycle between China and the Middle East.

Russia's energy interests in the Middle East have developed significantly since Western governments-imposed sanctions on the country following the outbreak of the Ukraine crisis in 2014. Russia has thus been motivated by the need to secure new markets for its oil and gas, attract investments from Gulf states, work with major oil producers, such as Saudi Arabia, to stabilize international oil prices, undermine Europe's endeavours to diversify its natural gas supplies and support delivery of Russian oil and gas to Asia as well.

As the world attempts to reduce its dependence on fossil fuels under the global Paris agreement, how is the transition towards clean energy affecting the status quo among the Middle East's oil and gas-rich nations, especially given Saudi Arabia's state-owned company announcing that it is planning to expand into fossil fuel extraction projects for the first time overseas?

The agreement reached by the five **Caspian** Sea states in August 2018¹⁷ helped overcome the geopolitical deadlock which existed over the last 30 or so years. The breakthrough agreement on sovereign rights to the sea has paved the way for new oil and gas plans after more than two decades of disputes. The treaty ends a spat over whether the Caspian is a sea or a lake, granting it special legal status and clarifying the maritime boundaries of each surrounding country. It also allows each to lay pipelines offshore with consent only from the neighboring states affected, rather than from all Caspian Sea nations, Bloomberg reported.

Azerbaijan, Iran, Kazakhstan, Russia and Turkmenistan have tried to define the Caspian Sea's legal status since the collapse of the Soviet Union, in order to divide up the waters and its natural resources for new drilling and pipelines. The territorial disputes have prevented the

¹⁶ Chatham House (2018), "America's Mideast retreat", <https://www.chathamhouse.org/publications/twt/americas-mideast-retreat>

¹⁷ Financial Tribune (2018), "Caspian Sea Agreement to Help Boost Energy Plans", <https://financialtribune.com/articles/energy/91724/caspian-sea-agreement-to-help-boost-energy-plans>

exploration of at least 20 billion barrels of oil and more than 6.8 trillion cubic meters of gas, the US Energy Information Administration estimated in 2013.

While the treaty “will take us one step forward”, there remain “important issues” to be resolved, Iranian President Hassan Rouhani said on Sunday before the summit. According to Eurasia Group analyst Zachary Witlin, one issue is the distribution of rights to seabed oil and gas deposits. “Further talks will be needed to provide full legal clarity on the boundaries of the division and future rights to either contested or undiscovered fields,” Witlin said in a research note.

The new agreement states that the development of seabed reserves will be regulated by separate deals between Caspian nations, in line with international law. This essentially cements the current situation, since countries such as Kazakhstan and Russia already have bilateral accords on joint projects.

The five Caspian Sea nations already develop offshore oil and gas reserves that are located near enough to the coast not to be disputed. Projects in the northernmost waters - Kazakhstan’s giant Kashagan field and Russia’s Filanovsky and Korchagin deposits - are seen as sources of future oil-output growth for the countries. The treaty will also remove a legal barrier to building a trans-Caspian gas pipeline from Turkmenistan to Europe, the Oxford Institute for Energy Studies said in July, adding that “political and strategic obstacles would remain”.

The **Black Sea** is also crucial in the development of a cooperative energy security framework, with significant geopolitical importance and heavy leverage as a transit corridor for major infrastructure projects to supply EU member states. In 2017, respected analysts of Wood Mackenzie reported an estimate of 1.35 billion barrels of oil equivalent of yet-to-find reserves for the Black Sea¹⁸. This may be a modest estimate, given the presence of widespread source rocks, seepage and large potential traps. By contrast, in 2000, the USGS World Petroleum Assessment estimated in excess of 7 billion barrels of oil equivalent. However, the current contribution of the Black Sea to global petroleum production is minor, especially when compared to the neighbouring Caspian Sea region.

It is worth noting that Bulgaria’s government gave its approval on February 20, 2019, for Spanish energy company Repsol to acquire a 20% stake in the oil and gas exploration and production (E&P) rights for the Khan Koubrat 1-14 block on the Bulgarian Black Sea shelf. The Cabinet awarded a five-year exploration license for the block, renamed in 2017 and known prior to that as the 1-14 Silistar block, to a Dutch-registered subsidiary of Royal Dutch Shell in February 2016. The name change in April 2017 was accompanied by the transfer of the license to another Shell subsidiary, based in Italy. In December 2018, the Cabinet also approved the transfer of a 30% stake in the E&P rights for Khan Koubrat 1-14 to Australia’s largest oil and gas company, Woodside Energy. The contract with Shell is the second major offshore exploration contract signed by Bulgaria in recent years. In 2012, it awarded an exploration permit for the Khan Asparoukh 1-21 block on the Bulgarian Black Sea shelf to a consortium led by France’s Total, which also included Repsol and Austria’s OMV.

In addition, Romanian-based Black Sea Oil & Gas, controlled by private equity firm Carlyle Group LP, announced on February 7, 2019, that it has decided to go ahead with its \$400 million offshore gas project in Romania, the first such project to be developed in 30 years. Black Sea

¹⁸ Wood Mackenzie (2017), “Black Sea: Unlocking its Full Potential”, <https://www.woodmac.com/news/editorial/black-sea-potential/>

Oil & Gas will extract the gas in a joint venture with Italian producer Gas Plus International B.V. and investment group Petro Ventures Resources, which hold 15% and 20% of the project, respectively. The infrastructure works should be completed in the first quarter of 2021, the company said¹⁹.

Cybersecurity

The energy transition is occurring alongside another revolutionary trend: digitalization. New digital technologies are transforming the energy sector by making it more connected, intelligent, efficient, reliable and sustainable. The electricity sector is at the heart of this process. As the contribution of variable and distributed energy sources grows, digitalization plays a key role in keeping grids balanced. It enables smart responses to electricity demand and blurs the distinction between generation and consumption.

However, the growth of digitalization in the energy sector can raise security and privacy risks in the absence of an international rules-based framework. Criminal groups, terrorists, or the security services of hostile countries may hack into the digitalized systems that control utilities and grids, either for criminal purposes such as fraud and theft, or to commit military or industrial espionage. In the most extreme case, cyber attackers may attempt to interrupt, sabotage, or destroy industrial infrastructure, including the power supply.

(b) The Geopolitical Map in SE Europe

SE Europe's geopolitical position is unique as it lies between major energy producers in the East and energy consumers in the West and hence can be seen to act as an energy corridor for the EU, both for gas and electricity. The Expanded South Corridor, the Vertical Corridor, the EuroAsia Interconnector, the East Med pipeline and others should be mentioned as the new and ascending energy routes. The energy sector offers a great challenge for closer cooperation between the SEE countries and therefore, facilitating the European integration process. In addition, SEE countries have established strong links with major oil and gas suppliers and consequently they can play a key role in enhancing East-West and North-South energy cooperation.

An important regional issue is to be found in the energy security risks which the SEE is currently facing, covering oil and gas supply disruption, energy price swings, physical hazards and terrorist threats. Looking at the broad energy security picture of SE Europe, we must by necessity confine our examination along two main axes. The first axis involves the security of energy supply for each individual SEE country, while the second axis addresses our concern for the whole SE European area, treated as a single regional entity from an energy security perspective, and its crucial role as an East-West energy bridge.

The consideration of the SE European region as an East-West energy bridge should not be confined alone to the transit route concept (e.g. the South Corridor or even the Expanded South Corridor that is explained and analysed further on), but should also consider the various vulnerable key energy infrastructure locations. These locations constitute potential energy security hot spots, and should be analysed in detail, and as such must be properly identified, while crisis management plans must also be prepared in order to meet any emergencies whether these include physical hazards, large-scale industrial accidents or terrorist actions.

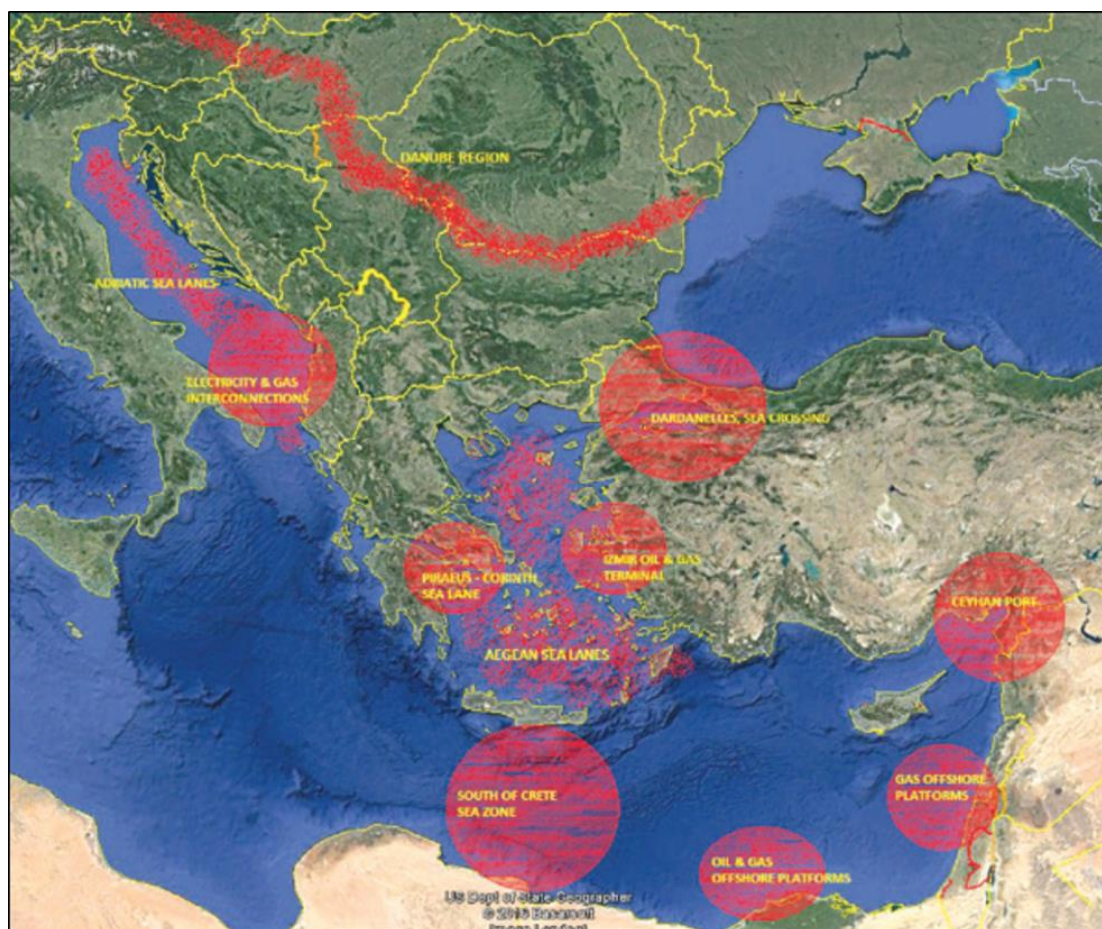
¹⁹ Reuters (2019), "Black Sea Oil & Gas to go ahead with \$400 million Romanian offshore project", <https://www.reuters.com/article/us-romania-energy-gas/black-sea-oil-gas-to-go-ahead-with-400-million-romanian-offshore-project-idUSKCN1PW0M1>

Over the last few years, energy security has emerged as a key issue for policy makers in Europe. In view of SE Europe's critical role as an East-West energy bridge through which vital oil and gas supplies flow to Europe, its "security" dimension has acquired a new importance. A stable and abundant energy supply to EU countries is now accepted as a key policy objective especially since the EU imports 53% of all the energy it consumes at a cost more than €1 billion per day. In this sense, we should also concern ourselves with the ability of the region to secure the safe and continuous flow of oil and gas from the Eastern suppliers (i.e. from the Caspian region, from the Persian Gulf but also from Russia) through its land and sea areas to the Western markets.

In this context, the appearance of war conflict zones or hot spots (e.g. Eastern Ukraine, Crimea, Syria, Northern Kurdistan, Iraq) or the presence of energy choke points, such as the Bosphorus, or vulnerable locations, such as the Ceyhan oil hub, the Piraeus-Corinth oil-gas sea corridor and parallel land strip, are areas of security concerns where emergency plans must be in place in order to meet physical hazards or terrorist threats. Therefore, the consideration of the SE European region as an East-West bridge should not be confined alone to the actual transit routes (e.g. the South Corridor), but should also consider a wider circle of vulnerable key energy infrastructure locations.

These locations constitute potential energy security hot spots and as such should be properly identified (see Map 4), while also crisis management plans must be prepared in order to meet any emergencies whether these include physical hazards, large scale industrial accidents or terrorist actions. A cursory examination of such energy security hot spots across the region reveals potential vulnerabilities, involving disruptions of likely energy flows and in this sense a proper risk assessment analysis must be undertaken at both national and regional level by the competent national authorities and related international and regional organizations. Table 2 presents an initial and tentative list of such energy security hot spots to be found in various locations in SE Europe.

Map 4: Energy Security Hot Spots in SE Europe



Source: IENE

Table 1: Selected Energy Security Hot Spots in SE Europe

Location	Importance
Dardanelles, sea crossing	More than 3.6 mb of oil per day cross the Dardanelles and the Marmara Straits. The crossing presents high vulnerability in terms of potential accident and terrorist threats due to increased traffic.
Izmir oil and gas terminal and Ceyhan port and loading facilities areas.	Sizable maritime traffic of inbound and outgoing and loading facilities areas. Vessels over a restricted sea zone present high-risk area and constitute a potential threat zone.
Piraeus-Corinth sea corridor and associated land strip	High concentration of port facilities, oil and LNG terminals and refineries combined with high volume of maritime traffic presents high risk area and constitute a potential threat zone.
Danube region across Moldova, Romania, Serbia	Location of series of thermal power plants and coal yards across the Danube region in combination with high river traffic constitute a high-risk area and potential threat zone.
Adriatic and Aegean sea lanes	Congested maritime traffic carrying oil and LNG cargoes could under certain circumstances present physical hazard threats and terrorist targets.
South of Crete sea zone	The presence of high migratory flows from North Africa to Europe combined with increased oil and gas sea traffic through the specific zone present potential terrorist threats.

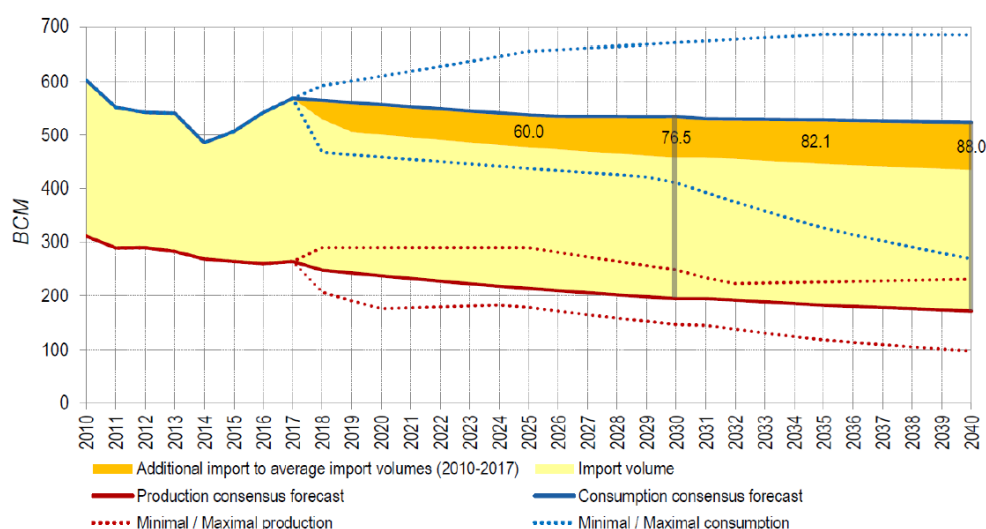
Source: IENE

Who Will Fill the Widening Demand-Production Gap in Europe?

Energy is also one of the main elements of EU-Norway collaboration. Norway’s gas exports cover 25% of the European gas use, a record high in the last years. EU-Norway energy talks focus on the efforts needed to modernise the power sector to contribute to the ambition of a climate neutral European economy by 2050. Norway, a member of the European Economic Area (EEA), is a strategic energy partner for the EU, taking part as a full member in the internal energy market. “We have been through a strong growth period since the mid-1990s and are now at a stable level. Around one-third of our estimated gas resources have been produced. This means that we have a lot of gas left to produce. We expect a high and stable level of gas exports to the EU in the years to come”, the Norwegian Energy Minister said in the context of the 4th EU-Norway Energy Conference took place on February 5, 2019 in Brussels²⁰.

As European energy demand is set to grow over the next few years, there will be a need for increased imports as indigenous oil and gas production has reached its limits and is already declining (see Figure 5). Today, EU-28 is more than 53% energy import dependent, with this figure likely to increase in the years ahead; in addition to oil and gas, there is going to be a further decrease in locally produced coal and lignite in view of stringent environmental considerations. The South Corridor will play a pivotal role as an alternative entry gate for gas which will help Europe diversify both its energy supplies and its energy routes. Hence, South Corridor is expected to strengthen the security of energy routes.

Figure 5: European Gas Demand and Production Gap



Source: Gazprom

The Expanded South Gas Corridor

The TANAP-TAP gas pipeline system, which is now under construction, is the foundation of the South Corridor. A number of alternative plans for channeling this gas to Turkey are now being implemented with gas to be used for domestic consumption, but also for transiting to European main gas markets. These plans now include additional gas pipelines, liquefaction plants for LNG export and FSRU terminals to be tied up into the TANAP-TAP system.

²⁰ European Commission (2019), “4th EU-Norway Energy Conference”, https://ec.europa.eu/info/events/4th-eu-norway-energy-conference-2019-feb-05_en

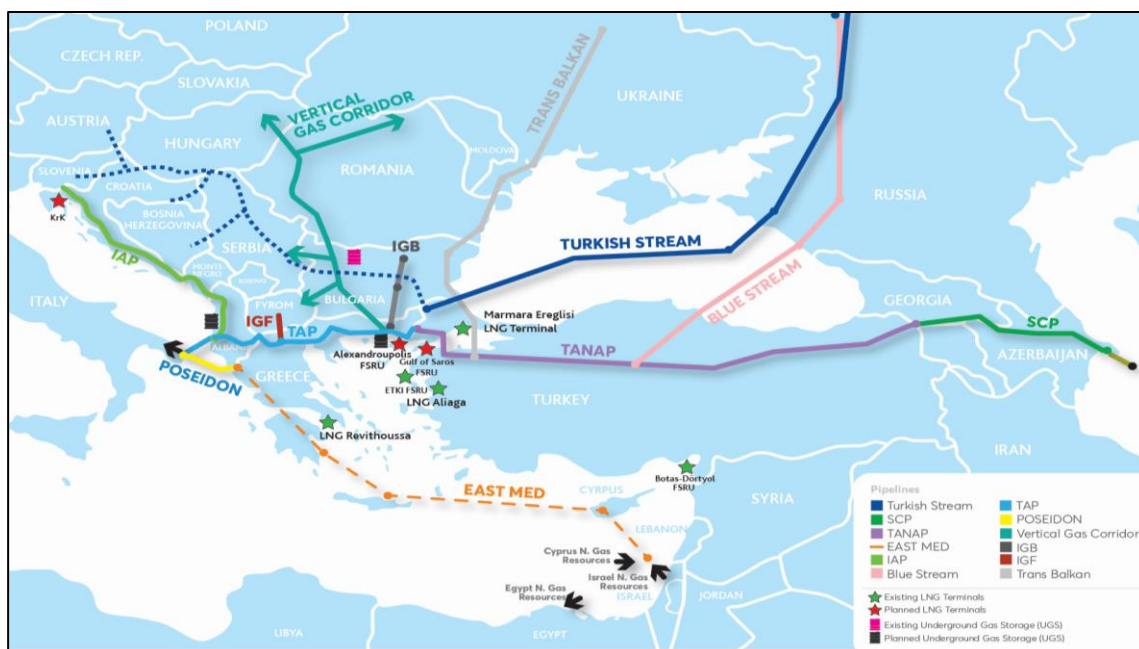
Another option, apart from the TANAP-TAP system, is the East Med pipeline which again, due to the significant technical challenges, could only accommodate limited gas quantities in the region of 8 to 12 bcm per year. Meanwhile, EC is actively exploring the possibility of massively increasing the member countries' LNG capabilities as part of Energy Union priorities.

The now defunct South Stream and its possible successor, the Turkish Stream, should also be considered as a potentially vital gas supply route. Furthermore, South Stream or the Turkish Stream raises the prospect for the stalled ITGI (Interconnector Turkey-Greece-Italy) resurfacing and actually being developed. ITGI has also been included in the European Commission's latest PCI list although it is not linked as yet to any particular gas supplier. Russia's latest proposal for natural gas supply to Europe via the Greek-Turkish border could incorporate ITGI into its plan.

Alongside of the East-West route, the Vertical Corridor is a gas system that will facilitate the connection between existing national gas grids and other gas infrastructure in the East Balkans in order to secure easy gas transiting, thus contributing to energy security and market liquidity. Such a gas system (which will bring together national grids, underground gas storage facilities, interconnectors, LNG terminals) will form an important new corridor from South to North whose operation will be fully aligned with EU Directives and European energy policy.

In view of several new projects under development in the region, it is time to redefine the South Corridor by including these new potential gas supply sources and routes. Therefore, an Expanded South Corridor should be considered and defined as such, to include all major gas trunk pipelines and terminals which will feed gas into the system that will then be directed towards the main European markets (see Map 5). Finally, an Expanded South Corridor with its multiple of gas entry points and linked underground gas storage and LNG facilities will provide the necessary background for the operation of regional gas trading hubs.

Map 5: An Expanded South Gas Corridor

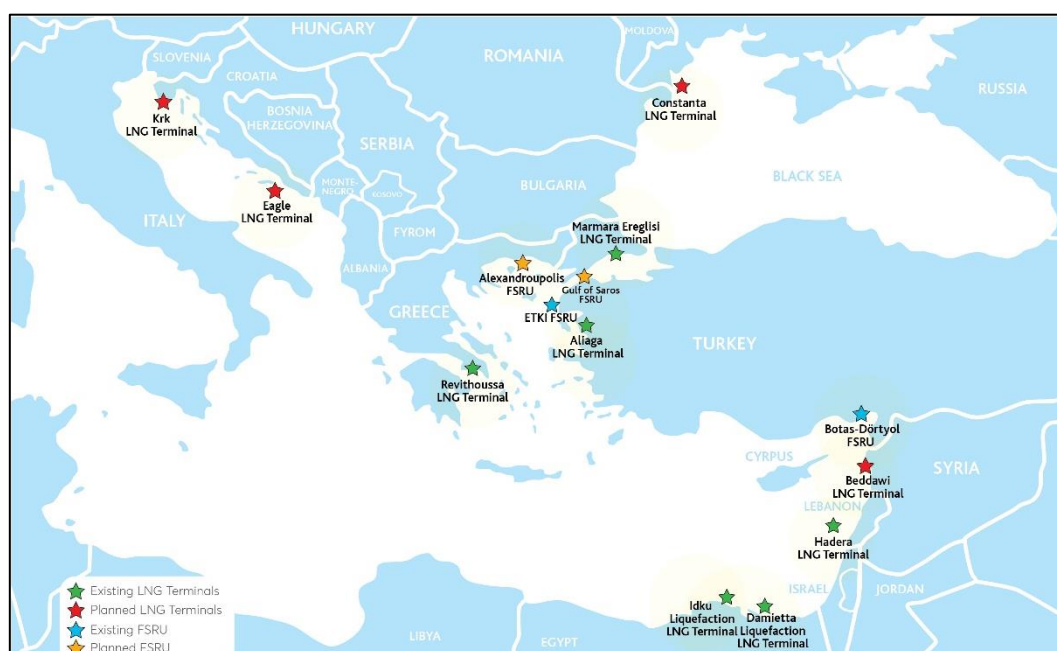


NB.: The TANAP has been completed, while TAP and Turkish Stream are under construction, with IGB at an advanced planning stage with FID already taken. The IAP, the IGI Poseidon in connection with East Med pipeline and the Vertical Corridor and the IGF are still in the study phase. Blue Stream and Trans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

Source: IENE

It is anticipated that the SE European region will play a significant role in expanding LNG trade in Europe by 2020 through the construction and operation of several new LNG regasification projects, such as the FSRU unit that is planned to be located offshore in Alexandroupolis, in Northern Greece (see Map 6), with the prospect of feeding gas quantities into the Greek, Bulgarian, Serbian and Turkish gas systems, among others. Greece and Turkey are the only countries in the broader Black Sea-SE European region which at present possess LNG gasification terminals that are well linked and integrated into their national gas systems.

Map 6: LNG Terminals in SE Europe



Source: IENE

Security of Energy Supply in SE Europe

Given the importance of security of energy supply in discussing and analyzing the energy security situation in SE Europe, it is important to present some basic information in terms of the prevailing regime in the SEE countries.

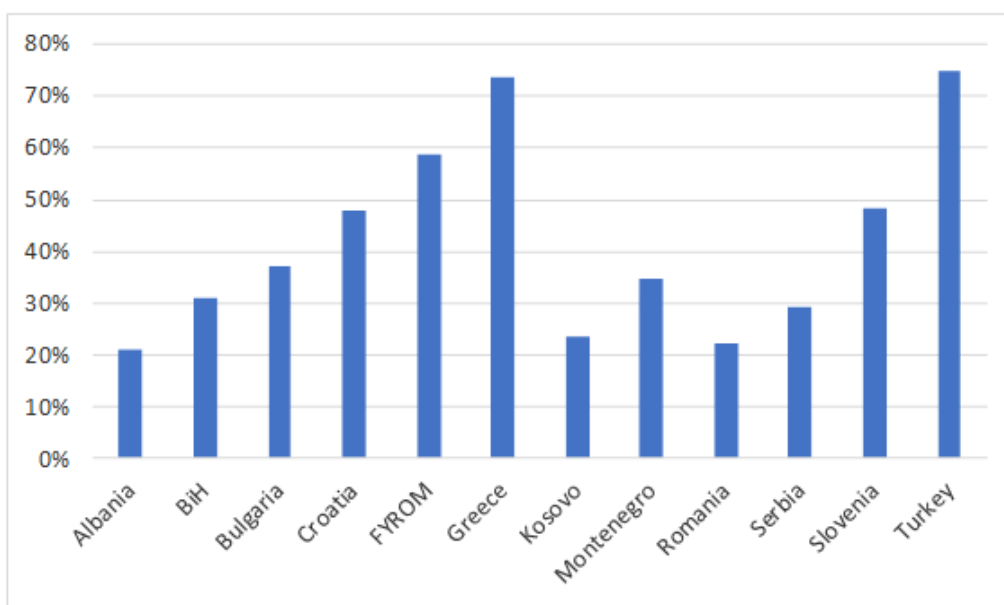
Energy import dependence is the extent to which a country depends on imports to meet its energy needs. All things being equal, the higher the share of imported energy, the more vulnerable a state is to price increases, supply disruptions or to foreign political decisions. In the case of SE Europe, some 41.9% of energy consumed in 2016 came from imports (see Figure 6), according to Eurostat data²¹, clearly showing that SE Europe is also energy import dependent and hence vulnerable to security and conflicts episodes. This is only to be expected given SE Europe's high dependence on imported oil and gas (see Figures 7 and 8).

More specifically, SE Europe's oil import dependency stood at 82.9% in 2016, with Romania and Albania being 57% and 28% oil import dependent respectively, because of their indigenous oil production. In addition, the SEE countries imported about 77% of the gas they

²¹ Eurostat (2019), "Energy dependence", http://ec.europa.eu/eurostat/tgm/table.do?tab=table&init=1&language=en&pcode=t2020_rd320&plugin=1

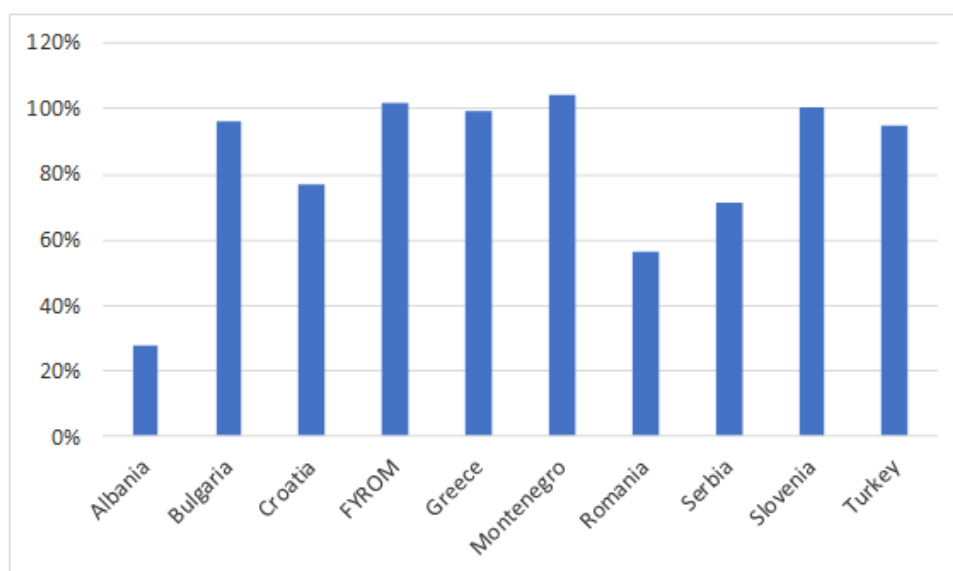
consumed. Natural gas imports reach the EU and SEE countries either via pipelines or LNG carriers. Many SEE countries import all or almost all of their gas needs. Romania and Croatia cover a substantial part of their consumption from indigenous production, while Bulgaria, Serbia and Turkey cover a tiny part, whereas Greece relies 99.2% on gas imports. At the same time, there are countries such as Albania, Montenegro, Kosovo and Cyprus which have not yet introduced gas into their energy mix.

Figure 6: Energy Import Dependence (%) in SE Europe (2016)



Source: Eurostat

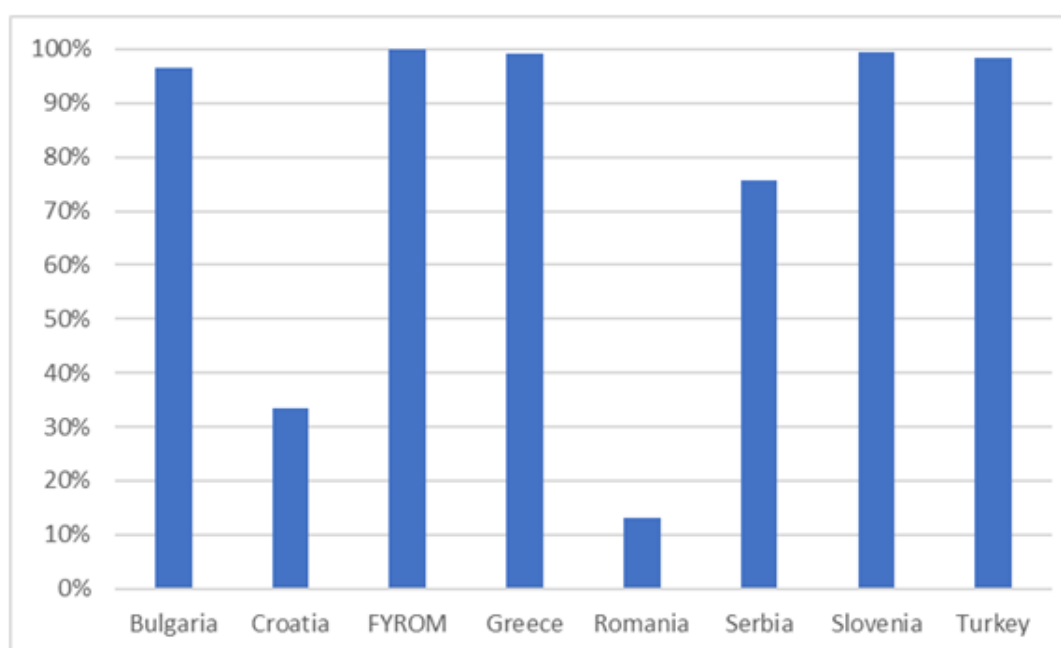
Figure 7: Total Petroleum Products Import Dependence (%) in SE Europe (2016)



Note: A dependency rate in excess of 100% relates to the build-up of stocks. Eurostat provides no data for Bosnia and Herzegovina and Kosovo.

Source: Eurostat

Figure 8: Total Gas Import Dependence (%) in SE Europe (2016)



Note: Albania, Cyprus, Montenegro and Kosovo do not import natural gas.

Source: Eurostat

Latest Geopolitical Developments in the SE European and East Mediterranean Region

It is worth noting that both **Serbia** and **Kosovo** aspire to EU membership – Serbia as a candidate country and Kosovo as a potential candidate. The EU insists that Serbia must normalise its relations with Kosovo before joining. Since 2011, with the help of EU mediation, the two neighbours have resolved some of the technical issues, but disagreements prevent normal day-to-day interaction between them in areas such as trade, energy supplies and cross-border travel. In terms of energy, European grid operators are obliged to help neighbouring countries cover their needs in the event of a shortfall. Despite signing an energy agreement with Kosovo in 2015, Serbia refused to meet its supply obligations to Pristina in March 2018, disrupting the grid not only in Kosovo but also throughout Europe. Serbia also does not pay Kosovo for the use of its interconnection lines; Pristina claims this has cost it €52 million in lost revenue since 2008, according to the European Parliament²².

In January 2019, Egypt, Israel, Cyprus, Greece, Italy, Jordan, and the Palestinian Authority established the **East Mediterranean Gas Forum (EMGF)** in an effort to coordinate energy policies and establish a regional gas market. The group will attempt to develop and organize the region's rising gas market, allowing its members to tap their vast natural gas resources, and potentially become an exporting hub for Europe. Although the formation of the EMGF may be a step in the right direction, **Turkey's** exclusion remains a major stumbling block to the future of energy cooperation in the region. Incorporating Turkey into the Forum will improve EMGF's prospects of success, although Turkey is unlikely to be invited to join as long as Cyprus remains in the Forum, or without a resolution between the two countries.

²² European Parliament (2019), "Serbia-Kosovo relations: Confrontation or normalisation?", [http://www.europarl.europa.eu/RegData/etudes/BRIE/2019/635512/EPRS_BRI\(2019\)635512_EN.pdf](http://www.europarl.europa.eu/RegData/etudes/BRIE/2019/635512/EPRS_BRI(2019)635512_EN.pdf)

The establishment of the EMGF reflects the growing interest of a large number of parties in the hydrocarbons of the Eastern Mediterranean. Massive gas discoveries over the past decade off the shores of Egypt, Israel, and Cyprus in the Eastern Mediterranean, estimated by the US Geological Survey at somewhere between 3.5 and 6.3 tcm as well as 1.7 billion barrels of oil, indicated that the region has a chance of becoming one of the world's most significant sources of natural gas over the next few decades.

In response to these important discoveries, Israel is planning to export large quantities of its natural gas to Arab countries, Egypt is striving to become a regional energy hub in the Euro-Mediterranean region, and Cyprus is seeking additional offshore explorations in its economic zone. Lebanon is a latecomer to the gas game, but in 2018 it awarded two of its blocks for exploration (expected to begin operations in late 2019). The EMGF is also good news for major oil corporations operating in the region, including Texas-based Noble Energy (working with Israel); Italian corporation Eni (working with Egypt, Greece, Turkey, and Cyprus); and French company Total, the United States' ExxonMobil, and Qatar Petroleum (all working with Cyprus). ExxonMobil also signed a deal last October with the Cypriot government to carry out explorations off southern Cyprus. On February 28, 2019, Cyprus and ExxonMobil jointly announced a natural gas discovery estimated between 5 and 8 trillion cubic feet or 142 to 227 billion cubic metres at the Glaucus 1-well in Block 10 of Cyprus's Exclusive Economic Zone (EEZ), approximately 180 kilometers southwest from Limassol port, offshore Cyprus. In the same vein, the British-Dutch company Royal Dutch Shell, Total, and a consortium of South Korean Kogas and Eni have won exploration rights in Cypriot waters. Meanwhile, Eni secured a new exploration license in the East Nile Delta Basin of the Mediterranean.

Regarding **Egypt**, Shell, Eni, BP and Exxon Mobil were among winners of the country's international tender for oil and gas exploration on February 12, 2019, with 12 concessions awarded in total. It marks Exxon Mobil's entry into gas exploration in Egypt, while Shell was awarded the most concessions in the tender (i.e. three for oil and two for gas). Neptune Energy, Merlon, Shell, Eni and state-controlled Egyptian General Petroleum Corp. (EGPC) were awarded seven oil exploration concessions in total in which 39 wells will be drilled, Egypt's petroleum ministry said in a statement. Egypt has in recent years reached maritime demarcation agreements with several countries in the region in a push toward increased oil and gas exploration. Egypt expects investments of at least \$750 million to \$800 million in the first stage of exploration in the 12 concessions, Petroleum Minister Tarek El Molla said during a press conference. EGPC's tender included areas in the Western Desert, Nile Valley, Gulf of Suez and Eastern Desert. Five gas exploration concessions were awarded - in which 20 wells will be drilled - to Shell, Exxon, Petronas, BP, DEA and Eni, the head of Egypt's state gas board said. Eni's discovery of the giant gas field Zohr in 2015, the largest in the Mediterranean and estimated to hold about 30 trillion cubic feet of gas, has raised interest in gas exploration in Egypt.

However, high levels of cooperation around gas in the Eastern Mediterranean highlight the countries that have been left out of the EMGF (Turkey, as well as Syria and Lebanon), and recent moves by the Turkish government are the latest signs of instability in the Eastern Mediterranean. In response to its exclusion from the group, Turkey conducted live-fire navy exercises in January in an area designated by Cyprus as part of its EEZ and plans to conduct "the largest naval exercise of the past 20 years" in the Aegean, Eastern Mediterranean, and Black Seas in early March. Turkish media say these exercises are intended to "send a message" to the members of the EMGF, according to the Atlantic Council²³.

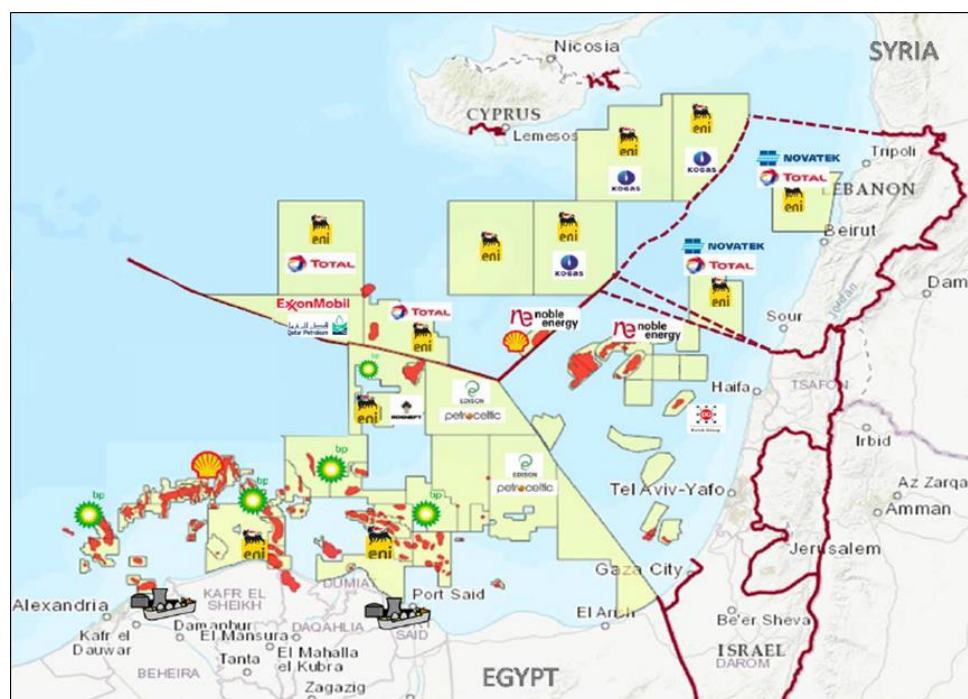
²³ Atlantic Council (2019), "Gas and Conflict in the Eastern Mediterranean", <https://www.atlanticcouncil.org/blogs/energysource/gas-and-conflict-in-the-eastern-mediterranean>

Even prior to its exclusion from the EMGF, tensions were high between Turkey and its neighbors over Eastern Mediterranean resources. Speaking at a military ceremony in Istanbul in November, Turkish President Recep Tayyip Erdogan said that his country would not allow gas extraction plans in the Eastern Mediterranean to materialize if it excluded Turkey and its allies in the Republic of Northern Cyprus. Erdogan expanded on this position, saying, “We do not have an eye on other countries’ rights, laws and territories. We only protect the rights of our country and of our brothers...We will not allow bandits in the seas to roam free just like we made the terrorists in Syria pay.” Erdogan’s rhetoric shows how adamant Turkey is to both obstruct Greece and Cyprus’s hydrocarbon research plans in the region and militarize the dispute, if deemed necessary, to stop them. In December, Turkey issued three navigational telexes designating a sea area for military drills and seismic surveys, apparently designed to dispute the EEZs of Cyprus and Greece. Additionally, local Turkish reports indicated that Ankara is planning to construct a naval base in northern Cyprus in 2019, the Atlantic Council notes.

Tensions rose in October when the Turkish navy announced that it had stopped a Greek frigate from “harassing” a Turkish ship conducting seismic surveys west of Cyprus. In response, the US State Department urged Turkey “to refrain from statements and actions that could increase tension” in the area. In December, a Cypriot-Greek-Israeli summit discussed plans for economic cooperation against the backdrop of the three countries’ tensions with Ankara, indicating that they plan to intensify their cooperation over energy security even in the absence of Turkey.

The US has strategic interests in the Eastern Mediterranean and a stake in both the safety of Europe and the uninterrupted flow of energy supplies to its states. And due to the rise of the EMGF as an institutional framework through which regional cooperation can be enhanced and differences can be bridged, US efforts to promote economic cooperation in the region now have a higher chance of success. Optimism should be tempered, however, by caution.

Map 7: The East Mediterranean Exploration Blocks



Source: Charles Ellinas

Conclusions

As already analysed, the **global** energy transformation driven by RES will have significant geopolitical implications. It will reshape relations between states and lead to fundamental structural changes in economies and society. The world that will emerge from the RES transition will be very different from the one that was built on a foundation of fossil fuels. Global power structures and arrangements will change in many ways and the dynamics of relationships within states will also be transformed. Power will become more decentralized and diffused. The influence of some states, such as China, will grow because they have invested heavily in RES technologies and built up their capacity to take advantage of the opportunities they create. By contrast, states that rely heavily on fossil fuel exports and do not adapt to the energy transition will face risks and lose influence. The supply of energy will no longer be the domain of a small number of states, since the majority of countries will have the potential to achieve energy independence, enhancing their development and security as a result. While the precise scope and pace of the energy transformation cannot be predicted, its impact on countries, communities and companies will be profound.

In addition to market integration and market liberalization requirements, COP 21 targets and commitments are now complicating further the energy issues in **SE Europe**. EU member countries in the region (i.e. Bulgaria, Croatia, Cyprus, Greece, Romania and Slovenia) have no great difficulty in abiding to EU Directives and targets, in comparison with the Western Balkans. Although it should be stressed that the transition process for most of the EU countries was fraught with difficulties.

The transition to decarbonized power generation is not an easy regional issue, as in most of the SEE countries electricity generation, which is mainly based on coal and lignite, supports thousands of jobs while it forms the basis of an extensive industrial base. Although all countries in the region to a larger or to a smaller extent are committed to RES and energy efficiency programmes and specific targets, at the same time, they are pursuing a parallel carbonization agenda as we have several coal-fired power plants under construction or at an advanced planning stage. In short, carbon-based power generation is also moving ahead, adding substantial capacity from now until 2025 (1.5 GW per year for SEE and 2.5 GW for Turkey, i.e. total 4 GW per year over the next 7-8 years). While new RES capacity over the last three-year period is less than 500 MW per year of installed capacity and approximately 1.5 GW, including Turkey. As a result, there is a substantial gap between new coal-fired power plants and anticipated RES installations.

In addition to this supply gap, between coal and RES, the likelihood of power generation shortfall, as early as 2027, must be considered. In such an eventuality the region's electricity balance will be seriously disrupted as it will transform the region from an exporter of electricity to a net importer. This will drive up electricity prices and make low economic growth forecasts, predicted by various bodies, self-fulfilling. Underinvestment today and higher electricity prices in the near future will act as a brake to economic growth.

The arduous and rather complex decarbonization process, which SEE countries have to go through, is further burdened on account of their strong coal/lignite legacy, while they also have to deal with serious energy security issues.

From the analysis undertaken, energy security emerges as a key issue for SEE. 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.

In general, large-scale RES development can contribute towards improving the energy security situation of SEE countries. However, the degree to which RES can bolster energy security depends greatly on the type RES used, their connectivity to the national grid, their synchronicity to consumption patterns and their storage capability, according to IENE's Working Paper No.19²⁴. If RES development is to be pursued from an energy security perspective, then emphasis will have to be placed on dispersed and pumped storage schemes so as to overcome the drawback from the intermittent nature of RES, notably wind and solar. Energy efficiency applications can also help lessen a country's dependence on fossil fuels and/or imported fuels. However, considerable work is still required if one is to assess with any precision their potential impact in terms of improving energy security.

It is, therefore, obvious that the SE European region needs a well-defined and pragmatic strategy for energy security in tandem with decarbonization policies, which promote 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 huge and complex challenges as they must be prepared to inform the citizens of the available hard choices that reducing this dependency means while making the move to cleaner fuels.

²⁴ Stambolis, C. (2014), "Renewable Energy Sources and Energy Efficiency and Their Role in SEE Energy Security", *Working Paper No.19*, https://www.iene.gr/articlefiles/wp%2019_final.pdf