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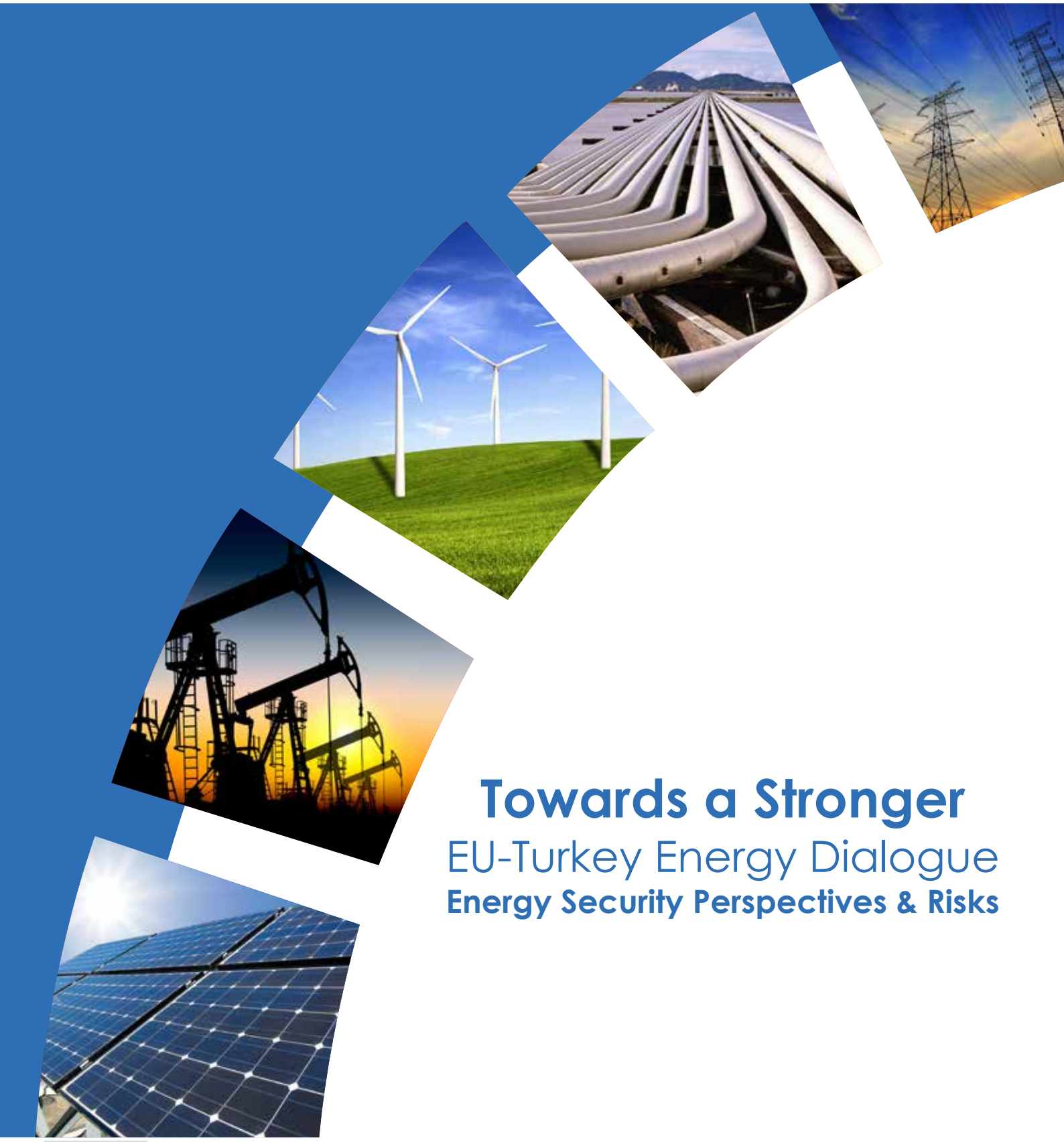

Towards a Stronger
EU-Turkey Energy Dialogue
Energy Security Perspectives & Risks

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Towards a Stronger
EU-Turkey Energy Dialogue
Energy Security Perspectives & Risks

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Abbreviations

CSD	Center for the Study of Democracy
bcm	billion cubic metres
BOTAS	Turkish Petroleum Pipeline Corporation
BTC	Baku-Tbilisi-Ceyhan
CAB	Capital Market Board
DSOs	Distribution System Operators
EC	European Commission
EEA	European Environment Agency
EED	Energy Efficiency Directive
EIA	Energy Information Administration
EMRA	Energy Market Regulatory Authority
ENTSO-E	European Network of Transmissions System Operators for Electricity
EPİAŞ	Energy Exchange Istanbul
FSRU	Floating Storage and Regasification Unit
IEA	International Energy Agency
IIESR	International Index of Energy Security Risks
ISPAT	Investment Support and Promotion Agency of Turkey
ITB	Interconnector Turkey-Bulgaria
ITG	Interconnector Turkey-Greece
mcm/d	million cubic metres per day
mcm/y	million cubic metres per year
MENR	Ministry of Energy and Natural Resources
MSs	Member States
NBP	British National Balancing Point
NGML	Natural Gas Market Law
NREAP	National Renewable Energy Action Plan
OME	Mediterranean Energy Observatory
PMUs	Particular Matter Units
R&D	Research and Development
REAP	Renewable Energy Action Plan
SEECAO	SEE capacity auction platform
SOEs	State-Owned Enterprises
SWF	Sovereign Wealth Fund
TANAP	Trans-Anatolian Pipeline
TCA	Turkish Court of Accounts
TEAS	Turkish Electricity Generation and Transmission
TEDAS	Turkish Electricity Distribution Company
TEIAS	Turkish Electricity Transmission Company
TEPAV	Economic Policy Research Foundation of Turkey
TETAS	Turkish Electricity Trading and Contracting Company
TFEC	Total Final Energy Consumption
TPES	Total Primary Energy Supply
TSOs	Transmission System Operators
UNFCCC	United Nations Framework Convention on Climate Change

Executive Summary

The energy policies of the EU and Turkey are bound to be closely intertwined due to their common energy security positions and challenges. Securing affordable, reliable and environmentally sustainable energy supply to fuel their competitive, growing economies would benefit immensely from policy synergy and deeper integration. Turkey has assumed the ambitious and responsible role of becoming a bridge country, a hub for alternative gas and oil supplies from the Caspian and Middle Eastern regions. The country has become a crucial factor for the completion of the EU Southern Gas Corridor, which for Europe is a priority project to diversify imports and make Europe less energy dependent. In the context of the shaping EU Energy Union, Turkey is placed strategically to assist in its goals of bringing about energy market integration and diversification in Southeast Europe. The countries in the region are yet to synchronise their energy market rules with those of the EU and are still mostly pursuing a bilateral approach to energy security, which is insufficient for the development of a strategic regional energy security partnership to counter common risks. This perpetuates their energy security risks and makes them vulnerable to natural or induced external shocks.

The energy domain is particularly suitable for building cooperation between the EU and Turkey as it is central for the competitiveness of their economies. It brings together the issues of environmental protection and security (with the notion of energy security and energy dependence on external factors); education (awareness of citizens to basic energy factors influencing their everyday decisions and budgets); and social policy (by introducing the notion of energy poverty among vulnerable groups). Amid the recent stalemate on accession negotiations and the worsening political ties, the EU and Turkey should make extra efforts to carry forward their plans in the energy sector, which meet well both sides' interests. Improved dialogue in the energy domain can then be used as a stepping stone to improving relations and re-building trust in other areas. As the EU and Turkish energy markets are very much strategically aligned, seeking an economically and technically efficient way to facilitate energy flows would benefit both partners.

A new EU-Turkey energy initiative is necessary, which matches the two sides' energy security demands. Such an initiative would require common diplomacy in order to unlock new energy supply sources in the Caspian Sea, the Mediterranean and the Middle East. It would also require a common political will to work for regional market integration by investing in cross-border energy infrastructure and the synchronization of the regulatory framework. Turkish policy-makers need to follow-up with their commitment to fully liberalize the energy sector, improve transparency in decision-making and corporate governance of tate-owned enterprises, and increase the investment in regional energy links. The EU can provide both financial and political support using its dedicated infrastructure funds and drive forward a common energy strategy that focuses on diversification of resources and the narrowing of energy imbalances.

Turkey and the EU Energy Union

The new geopolitical uncertainties in the Black Sea region have pushed the EU and Turkey to seek ways to improve the security of their energy supply by diversifying their imports and developing indigenous sources. The outcome of the EU efforts to form a common energy security policy has been the publication of the *European Energy Union Roadmap*, which focuses on completing the internal energy market, increasing the security of supply through diversification of sources, boosting the EU energy infrastructure capacity, and accelerating the transition to a low-carbon energy future through renewables, energy efficiency and technological innovation. The successful completion of a European energy union will not be possible without the active involvement of Turkey. The latter is going to play a vital role as the major trading centre of future alternative natural gas supply from the Caspian region and the Middle East. Similarly, Turkey will benefit from the development of the Energy Union because it can transform itself into a major energy-trading hub, Turkey's long-term energy policy objective.

Turkey's energy security can only be ensured through a meaningful restructuring of its energy market system, which lacks efficiency and competition. Investment in energy infrastructure needs to be urgently scaled up to improve power and gas connectivity, storage capacity and reliability of power and gas delivery amid booming demand. If the country wants to decrease its dependence on foreign energy imports, Turkey needs to further develop its renewable energy market and boost energy efficiency,

By working together on diversification projects, the EU and Turkey will increase their bargaining position vis-à-vis third-party suppliers and could more easily overcome commercial and political barriers on difficult geopolitical projects. The efficient cooperation on the Southern Gas Corridor is an example that joint efforts pay off. Furthering the strategic cooperation between EU and Turkey could potentially scale up the capacity of this key energy route and reinvigorate Turkey's potential to become an energy hub.

EU and Turkey energy cooperation should be based on the goal of coupling power and gas market along a mutually compatible regulatory framework. In the electricity sector, Turkey has successfully synchronised its energy law with that of the EU implementing a number of structural reforms. Most generation units have been privatized and the generation, transmission and distribution entities have been legally unbundled along the EU liberalization packages. Turkey has also

launched a power exchange based on the example of trading platforms in the EU, and has become an observer member of the organization of European transmission systems operator, boosting power markets coordination.

The Turkish government has embraced the EU approach towards the development of a comprehensive renewable energy support scheme increasing the share of renewables in the final energy consumption to close to 14% with a plan to expand it to over 20% by 2023. To achieve this target, Turkey would need to reduce unnecessary administrative burdens and improve the horizontal coordination of different bodies granting permits for installing RES capacity. The 2016 changes to the Renewable Energy Regulation that would mandate renewable producers to sell to the free market will improve the competition on the electricity power market and make support schemes more affordable.

In terms of energy efficiency, the country has advanced modestly. The government has developed a very ambitious energy efficiency strategy and has followed up with significant revamping of the existing legislation of building codes, energy labelling, and demand response mechanisms but has so far moved slowly on implementing the new framework in practice. The funding schemes for energy efficiency available by the government and international financial institutions are relatively small to cope with the task of renovating the present stock of 19 million building units. Demand-side incentive schemes could be more successful in diminishing skyrocketing energy consumption but they would require a careful balancing act between sustainability and economic competitiveness.

Where Turkey's advance towards fulfilling the EU energy acquis has fallen short is the restructuring of the natural gas sector. The largest importer and wholesale gas supplier, has remained state-owned, and has not been unbundled. Its virtual monopoly on imports, storage, distribution and the sale of natural gas has stifled competition. Meanwhile, subsidization of household and industrial prices has contributed to the company's unstable financial situation. Without robust secondary legislation to meet the goals of the full liberalization, development of a competitive gas market in Turkey would be difficult. This could compromise Turkey's ambition to become a natural gas hub, which would also hurt EU's plans for delivering the promise of the Energy Union for Southeast Europe.

Turkey's Energy Security Risk Assessment

Turkey's energy cooperation with the EU should be viewed through the prism of its energy security risk framework. Turkey's energy security is around 20% worse than it was in 1980 largely due to the rise in consumption and the increasing energy dependence on oil, gas and coal imports, the slow progress in diminishing energy intensity, and the growth of CO2 emissions. Like many other European countries, Turkey has almost no indigenous production of fossil fuels other than low-grade, polluting coal. Its oil, gas and electricity import expenditures have remained high making up between 15 and 20% of overall imports and most of the country's current account deficit.

On the positive side, Turkey has quite a diverse electricity sector with hydro-power, coal and natural gas each making up around a third of the power generation capacity. However, the country faces significant reliability of supply risks associated with an inadequate gas storage and transmission capacity that leads to power and gas outages during peak demand in winter. To reduce its dependence on imported natural gas for power generation, the government has embarked on an ambitious investment program that includes the building of two nuclear power plants, the expansion of the coal generation capacity, and the better utilization of the country's hydro and RES potential. Turkey has improved the reliability of its energy supply by expanding existing underground gas storage facilities and commissioning an LNG floating storage and regasification unit (FSRU). A key pillar of Turkey's security of supply policy has been the drive towards turning the country into a regional gas hub. Turkey has significant advantages in this respect, as it has a variety of supply options and import points (approximately six at the moment) due to its beneficial geographical position.

The future security of gas supply will largely depend on the country's demand trends and the government's ability to reduce energy intensity. Turkey's electricity consumption has been growing by 6-7% annually for the last 15 years. The Turkish government has struggled to increase the generation capacity at a pace fast enough to cover the country's demand. The deficit has been most acute in the natural gas-based generation. In a conservative (high-demand) scenario, gas demand would more than double to over 96 bcm by 2040. A proactive scenario, which assumes demand moderation, improvement of energy efficiency and increase of domestic production, gas consumption remains almost flat in the same period[1]. Gas demand in Turkey would depend on how the economy develops in the next decade. But the country would continue importing almost all of its gas leaving it vulnerable to external shocks and geopolitical instability.

Reducing the security of supply risks cannot come at the expense of energy affordability. Skyrocketing energy consumption coupled with lack of efficiency and adequate demand-side responses have exacerbated the pressure on the Turkish currency and on the overall macroeconomic stability of the country. At the same time, energy poverty remains a wide-spread phenomenon despite the substantial improvement of living standards since the early 2000s. Over 40% of the population are energy poor, while more than 50% still rely on wood and solid fuels to heat their homes making Turkey one of the OECD countries with the worst air pollution levels.

1 The Mediterranean Energy Perspectives (MEP 2015), Mediterranean Energy Observatory.

The new energy plan announced by the Turkish energy minister, Berat Albayrak, in early April would try to tackle the main energy security risks facing the country. The plan includes 10 main strategies including 1) the diversification of the oil and gas supply routes, 2) the expansion of the capacity of the existing underground gas storage facilities to a total of 9.7 bcm by the end of 2020, 3) the acceleration of oil and gas exploration drilling to improve the potential for domestic production, 4) the enhancement of the capacity of the gas transmission system to 400 million cubic metres per day (mcm/d), 5) the better utilisation of the domestic coal reserves in the economy, 6) the increase of the share of renewable energy sources in the energy mix, 7) the introduction of nuclear energy into the system, 8) the rehabilitation of the existing power distribution and transmission infrastructure through large-scale public investment, 9) the full application of the policy measures developed in the National Energy Efficiency Plan to decrease energy intensity and boost energy savings, and finally 10) the fostering of the research & development (R&D) potential of Turkey in the renewable energy sector and by taking advantage of the technology transfer in the nuclear sector.

The ambitious objectives aim to resolve the nexus between the security of supply and the availability of resources by concurrently boosting the domestic energy potential of the country and investing in improving the supply capacity of the energy system. The energy plan, which is yet to be fully unveiled, would based on the long-term assumption that the country's economic growth and national security would depend on an efficient and reliable energy system.

Improving the Governance Framework

In a bid to overcome energy sector inefficiencies, Turkey has begun a comprehensive overhaul of its governance framework. It has strengthened the independence of the energy regulator and the competition authority although full separation and independence from the executive has not been achieved yet. The energy regulator, for example, has not been able to push through the liberalisation of the gas market and to remove costly subsidy schemes burdening the finances of state-owned companies (SOEs). While state aid rules have been properly integrated in the Turkish national legislation, enforcement by the competition authority remains weak.

Turkey should aim to implement the OECD guidelines on corporate governance of SOEs, which would strengthen the standing of SOEs. The lack of transparency and consistency of decision-making in SOEs often leads to suboptimal outcomes that distort the market and prevent critical investments to be implemented timely and efficiently.

Turkey's energy sector transformation towards becoming part of the planned European internal energy market should be intensified. Although the planned changes will have an effect on both industries and individual consumers, it is of strategic importance both for Turkey and for the EU politicians to embrace them and to sign on the dotted line to initiate the final stages of liberalization.

Policy Recommendations

In conclusion, it should be underlined that there is a need for strengthening the EU-Turkey energy cooperation to solve common energy security risks. Improving the energy security and the governance of the energy sector in Turkey in the context of better integration in the EU Energy Union entails, at a minimum, the implementation of the following actions:

- Enhancement of EU efforts to form a common energy security policy based on close cooperation with its extra-EU key energy partners.
- Expansion of the regional natural gas and power interconnectors to facilitate the physical integration of Turkey in the European internal energy market leading to an increase in liquidity and competitiveness.
- Natural gas diversification away from pipeline trade, and development of LNG capacity on the Mediterranean coast to tap world markets and assist the development of a virtual natural gas hub.
- Improving the governance of the Turkish energy sector through the introduction of transparent regulation and management of the state-owned companies, as well as a consistent regulatory framework.
- Introduce prioritization and selection of large investments projects in the Turkish decision-making process, based on clear and transparent procedures and fact-based analyses, synchronized with EU priorities.
- The private sector must understand that there are no risk-free energy investments. A guaranteed profit mentality should be buried in the pages of history.
- Turkey should pursue a more balanced and diverse energy mix and electricity generation mix. In this sense, the diversity of its supply sources and routes need to be improved as well.
- Turkey needs a strong push for renewable energy sources and aggressive implementation of energy efficiency and energy conservation policies. The effect of energy efficiency improvements would help the Turkish government achieve three energy policy objectives at the same time, namely to reduce the macroeconomic effect of energy imports on the current account balance, improve the security of supply and raise the competitiveness of Turkish businesses.
- Turkey must pay more attention to R&D and innovation in the energy sector, especially when it comes to making use of its domestic lignite reserves.

- The EU needs to pay particular attention to strengthening its engagement with Turkey on other Southern Gas Corridor and on other issues of common energy security concern.
- Member-states and Energy Community members from SEE should intensify their dialogue with Turkey and seek to leverage EU funding for improving energy integration and liberalisation in the region.

1 Introduction

In the context of the EU Energy Union, Turkey is placed strategically to assist in its goals of bringing about natural gas and power market integration and diversification in the European Union, and more particularly in Southeast Europe and the Black Sea region. The Crimean crisis and the continuing instability in Eastern Ukraine have turned into a rude wake up call for Europe's energy security vulnerabilities. In response, the EU leaders have increased their focus on the development of a viable European Energy Security strategy. As Turkey is a strategic centre for new energy sources for the European Union, it will play an increasingly important role in helping the EU in completing the energy security pillar of the Energy Union initiative.

For Turkey to become an integral part of the EU energy system, the country would need to overcome its own energy security risks, which come on top of recently strained relations to the EU and some member states (MSs). The extraordinary uninterrupted economic growth that Turkey went through from 2001 and 2017 with only a short pause during the 2009 economic crisis have brought on not only wealth and prosperity but also acute energy policy challenges. Turkey is highly vulnerable from possible energy supply cuts, especially during the seasonal peak demand period. Most of its oil and gas, and half of coal supply come from imports leading to macroeconomic imbalances including large current account deficits contributing to significant pressure on the Turkish Lira. The depreciation of the Turkish Lira by close to 20% against the US dollar in 2016 further exacerbated the economy's vulnerability to energy imports. Turkey's energy imports and electricity generation capacity investments are largely paid for in dollars. This means that a weaker currency boosts import costs in Lira terms as well as effectively increasing the debt burden on energy firms which revenues are in Lira and credit repayments in dollars.

Apart from the financial risks associated with Turkey's excessive dependence on energy imports, consumers often face acute power and gas shortages during peak demand periods usually in the winter. This is the result, on the one hand, from skyrocketing energy demand boosted by GDP growth, and, on the other, from the structure of power generation, which is largely based on natural gas and coal burning in the winter. Gas storage and LNG import capacity are currently inadequate to bridge the periods of imbalances. Meanwhile, the push towards increasing renewable energy generation capacity has contributed to intermittency problems in the transmission system. Finding the right balance in the security of supply/environmental sustainability is one of the long-term energy policy challenges before the Turkish government. In this respect the EU's Energy Union provides a useful framework for coordinating Turkey's energy position and establishing the country as an important transit and integration partner.

Despite EU's activism for developing universal rules for Europe for liberalization and security in gas and electricity, Turkey and the countries in the Black Sea region still pursue mostly a bilateral approach to energy security, which is insufficient for the development of a strategic regional energy security partnership between EU and Turkey. Turkey's energy sector transformation towards becoming part of the planned European internal energy market is happening very slowly, particularly on gas. Given that the inevitable changes will have an effect on both industries and individual consumers, there has been reluctance to sign off on the final stages of liberalization. This has been further caught in the recent high-level political drifting apart between the EU and Turkey, and the stalling of the country's EU integration process.

The delay in the implementation of critical energy reforms consistent with the EU energy market rules has been most visible in the natural gas sector where privatization, unbundling and market liberalisation are at an early stage yet. The Turkish government, however, seems to have realised the benefits of a more efficient liberalized gas market and is taking the first crucial steps towards creating a gas market exchange on the already existing day-ahead power market exchange (EPIAS). The introduction of competitive balancing mechanisms would diminish the effects of external supply shocks or domestic demand overshoots. It will also reduce the financial burden of the many gas-fired power plants that have been suffering from their rigid contracts with the Turkish Petroleum Pipeline Corporation (BOTAS) and the limited options for covering their supply/demand imbalances.

The EU could play a pivotal role in supporting the energy market reform in Turkey. Both the EU and Turkey are likely to share a similar energy future based on shrinking domestic oil and gas production and increased dependence on imports. The EU and Turkey are also sharing the common goal of diversifying energy mix, supply sources and routes. Russia, Azerbaijan, and the Middle East are likely to remain the large energy partners for both Turkey and the EU, with the latter two sharing the position of energy consumers. By investing in Turkey's strategic energy infrastructure, the EU will both support its own energy supply diversification and would help its South Eastern neighbour integrate more profoundly in the European internal market and improve its own energy security. The EU has preconditioned such financial involvement on Turkey accepting to join the EU energy market rules along the governance framework of the European Energy Community. Despite holding an observer status in the organization, the Turkish authorities have been very successful in transposing the EU energy acquis at least on paper[2].

2 Energy Community Secretariat. ENERGY GOVERNANCE IN TURKEY Report on Compliance with the Energy Community Acquis. 1 October, 2015.

This was confirmed by the Energy Chapter of Turkey's 2016 EU Accession Progress Report, which acknowledged the successful alignment of Turkey's energy legal framework with that of the EU. The report noted Turkey was moderately prepared in this chapter and made good progress in the area of security of supply, electricity, and the renewable energy sector[3]. The EU noted significant progress in the liberalization of the power market, adopting key legislations part of the Third Energy Package and the launching of a liquid intra-day and day-ahead market. The progress on the gas market had been evaluated as uneven, as a change to the Natural Gas Market Law pushing for the unbundling of BOTAS and the gas tariffs liberalization remained trapped in a parliamentary limbo since 2014[4]. In addition, the EU has noted continuing lack of progress on energy efficiency despite ambitious goals and the urgent need for the reduction of energy intensity. A further note of concern is that the development of the nuclear energy programme of Turkey remains largely the product and potential hostage of volatile Russian-Turkish geopolitical relationship. The recent announcement by the Turkish energy minister that the construction of the Russian-led 4,800 MW Akkuyu plant would begin in 2017, and would be finished in 2023[5], should be taken very seriously, as the project would commit and shape Turkish nuclear policy for decades to come.

The EU and Turkey seem to be speaking the same language when it comes to the development of renewable energy. The Turkish authorities have synchronized their Renewable Energy Strategy with Directive 2009/28/EC, based on which Turkey's National Renewable Energy Action Plan (REAP), published by the Ministry on December 2014. The target for the share of renewable energy sources in the gross final consumption of energy in 2023 is set at 20.3% or around seven percentage points away from 2015 levels and in line with the EU RES targets.

Overall, there has been significant progress in the implementation of the most important points in the energy synergy strategies of the EU and Turkey including Turkey's full integration with the EU internal energy market, the joint implementation of energy security projects, and the merging of the energy regulatory framework of the two energy partners. However, the change in the overall pace of political dialogue and integration of Turkey with the EU, on the back of internal political constraints on both sides, has led to inadequate communication, which could turn into an acute risk to the future of the energy relationship between the two partners. While political emotions look likely to stay high for the foreseeable future, both sides should be well aware that they share common energy security risks, and finding a way to continue technical cooperation, would improve their standing vis-à-vis suppliers.

This communication deficit should be overcome with intensified cooperation at technical level in areas where both sides face critical vulnerabilities such as security of supply, liberalization and climate change. Institutional communication and alignment practices between Turkey and the EU should be implemented in a more decisive way. First, there is a need for developing strategic understanding for the challenges and opportunities presented by the integration of Turkey in the Energy Union, and to acknowledge the commonalities and the differences between the two sides on an annual basis. Ideally, this could be done by leading think-tanks in Brussels and Ankara, to ensure a non-political read. Second, broader geopolitical contention points between the two partners should not be mixed up with technical and economic issues related to the more efficient operation of the energy market. Cooperation, not competition should be the driving force of the EU-Turkey energy dialogue as the deepening of economic integration will produce benefits to all European and Turkish consumers but would also have spillover effects into the political discourse. Last but not least, the EU should show more political will in pushing through energy reforms in Turkey providing financial incentives in the form of increased spending on critical energy infrastructure that does not only alleviate reliability of supply risks in Turkey but helps also contribute to the diversification policies in Europe.

This report aims to draw an overall picture of the state of the EU-Turkey energy dialogue through the prism of civil society understanding of EU and Turkey's energy security risks and perspectives, and the role of the Energy Union in helping to overcome them. In addition, the report will build a Business-As-Usual and a Cooperation scenario for the future role of Turkey in the regional and European energy market. The report builds upon a background policy brief to develop an in-depth overview of the Turkish energy sector that also incorporates the statements, opinions and recommendations provided by EU and Turkish policy-makers, energy experts and business representatives during a series of capacity-building workshops and study visits in Brussels and Ankara. Additional meetings with European and Turkish energy business associations, as well as influential energy watchers have enriched the final analysis.

The chapter on energy security risks will, on the other hand, draw a detailed picture of the energy security risks facing Turkey using an international standard tool for comparing the energy security risk index of countries across the world. After reviewing the overall picture, the Report will analyse in detail the different energy security dimensions including: availability of resources, reliability of supply, affordability of energy and environmental sustainability. The different policies undertaken by the Turkish government in managing the different subfactors of the Turkish energy security picture would be described using the latest available data, as well as the two scenarios for the development of the Turkish energy sector, developed by the Mediterranean Energy Observatory (OME).

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3 European Commission, Turkey 2016 Progress Report SWD(2016), 9 November, 2016, Brussels.

4 Ibid

5 Daily Sabah (February 3, 2017). Turkey's first nuclear power plant Akkuyu to be operational by 2023, accessed at http://www.dailysabah.com/energy/2017/02/04/turkeys-first-nuclear-power-plant-akkuyu-to-be-operational-by-2023

The section on the governance structure of the energy sector will discuss the role of the energy and competition regulators and of the decision-making structure of SOEs to understand how the improvement of the regulatory and policy process in Turkey could solve some of the most pressing energy security risks. Specific focus will be placed on the independence of the energy regulator and the financial management of SOEs.

2 The EU Energy Union and Turkey

Building on a 2010 proposal by Jacques Delors, the European Union is now shaping its Energy Union that aims at fostering a cost-efficient energy transition able to deliver secure, sustainable and affordable energy to all European consumers. The Energy Union Framework Strategy laid out on 25 February 2015, has defined its main objective as the finding of a common policy platform to be embraced by the member states, which have differing energy policy agenda and interests. Resting on five pillars[6], it aims at enabling the delivery of the EU energy-climate objectives[7].

The new EU project is primarily driven by the need to coordinate energy policy-making to ensure the implementation of the 2020 and 2030 renewable energy and energy efficiency targets. The second and somewhat related reason for the emergence of the Energy Union initiative is the urgency to strengthen the EU energy security framework by driving through diversification projects and strengthening the cohesion of the internal energy market. On this point, Turkey's role is crucial as the country is a natural energy bridge between the resource-rich Caspian and Middle East regions and the consumption centers in the EU. This role has been enhanced and complicated by Russia, which has sought to establish a competitive foothold in Turkey to transfer its current gas transit through Ukraine, but which clearly sees alternative transit projects as a threat. To improve EU's common position on energy, the goals of the Energy Union include the strengthening of energy diplomacy, the expansion of low carbon technologies abroad, and the boosting of industrial competitiveness[8]. The third reason is to establish a well-functioning European energy market to facilitate trade, enable competition and drive costs down for consumers. The latter is a sensitive issue as the push towards low-carbon transition had been associated with rising energy costs for some countries that might not be sustainable in the future. Turkey has embraced the EU transition agenda without external pressure as increasing air pollution and the strategy to reduce import dependence have pushed the government to adopt aggressive measures in boosting the share of renewable energy sources in power generation.

In 2016 the Energy Union initiative has taken a more specific shape in the form of a comprehensive document (running at around 1,000 pages), colloquially known as the Winter Package. It aims to streamline governance frameworks on national level and to deliver the transition to a low-carbon energy sector. While with the Winter Package, the Energy Union has developed a coherent plan for a sustainable energy transition, there are large differences between countries regarding their ability to sustain the costs of energy reforms and the investments needed.

A low carbon energy transition requires disrupting the current energy system based on fossil-fuels, centralized generation, supply-side orientation, and all the practices, policies, technologies, norms and attitudes linked to this system, while at the same time developing and introducing sustainable alternatives. If Turkey, which has implemented a large share of the earlier EU energy package directives, is to adopt the new set of reforms, the country would face challenges in reforming governance and policy-making that is open and based on a long-term strategy that cannot be easily overturned. Such strategy would also require very tough political decisions, such as gradually phasing out coal power plants, reducing carbon emissions without hurting the economy, and boosting energy efficiency.

The achievement of the EU energy transition objectives rests on the assumption that EU member-states would sustain their current rate of investment in renewable energy technologies and energy efficiency improvements despite a popular backlash, especially in Central and Eastern Europe. However, renewable energy investments are slowing down, while base-load power producers needed to balance the intermittency problems associated with renewables face growing financial difficulties amid slumping electricity prices. Meanwhile, consumers in Europe are facing ever higher retail prices that compensate for the renewable energy subsidies placing a significant strain on the affordability of energy supply, in particular in the poorer member-states in the East and Southeast. According to the European Commission (EC), poorer parts of the population are faced with energy expenditures of 22 % of total expenditure in some MSs.[9] Household expenditure on energy, taxation and levies included, is expected to rise further even if all possible gains from completing the internal energy market are taken into account.[10] To alleviate the energy affordability concerns, the Energy Union aims to empower consumers by easing access to financing for decentralized power supply (rooftop solar panels and renewable cooperatives), reduce administrative burdens on switching the energy supplier and provide additional measures to reduce energy poverty including through the promotion of energy efficiency and social benefits for vulnerable groups. As Turkey is at a similar level of economic development as the aforementioned member states it would face the same policy dilemmas and potential solutions.

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6 Energy security, solidarity and trust; A fully integrated European energy market; Energy efficiency contributing to moderation of demand; Decarbonising the economy, and Research, Innovation and Competitiveness

7 Reduce EU territorial greenhouse gas emissions (by 20% by 2020, and by 40% by 2030), increase the share of energy coming from renewable sources (to 20% by 2020 and to 27% by 2030) and improve energy efficiency (by 20% by 2020, by 27% by 2030).

8 COM (2017) 53. Second Report on the State of the Energy Union. 1 February, 2017

9 European Commission (2013). Energy challenges and policy: Commission contribution to the European Council, Brussels, 22 May 2013.

10 Ibid

Reducing energy consumption through efficiency gains and boosting domestic production have somewhat reduced the energy supply risks associated with the imports of energy resources. However, energy import dependence that would increase as domestic resources are depleted remains a risk for the overall security of the European energy system. Not surprisingly, similar to Turkey, at least 13 EU members are considering the development of nuclear energy either by building new reactors or extending the life of old ones. The benefits of reducing energy dependence on a limited number of energy suppliers have clashed with the environmental and safety risks that have grown more visible following the Fukushima incident in 2011. While the latter seem to have prevailed in Europe, at least with the on-set of the economic crisis, this attitude might change sharply once more buoyant growth resumes. Turkey is facing a similar trade-off in nuclear, pressured by fast-paced but uncertain economic growth, and the risks of very high investment costs, lead times, and potential incidents fears.

Improving the security of supply of the EU and Turkey does not depend only on increasing the availability of domestic resources, but also on the reliability of the energy infrastructure connecting the internal energy market, on the one hand, and bringing alternative energy supplies, on the other. Increasing gas and power interconnection capacity means that countries become less vulnerable to external supply shocks and enhances their bargaining power vis-à-vis third-party suppliers. The Gas Stress Tests prepared by the European Commission in 2014 showed that the Southeastern Europe region remained the most vulnerable to sudden gas supply cuts, and countries including Turkey have done little to enhance their storage capacities, regional interconnections, and access to the LNG market.

On the external dimension of the Energy Union, completing the Southern Gas Corridor to connect the EU with new natural gas from the Caspian basin is crucial for the Energy Union's diversification strategy. This is also where the Energy Union strategy needs to be most in sync with the Turkish future energy policy. The Trans-Anatolian Pipeline (TANAP) will ship 10 billion cubic metres (bcm) of natural gas from the second phase of the Shah Deniz natural gas field in the Caspian Sea to European markets, especially in SEE and Italy. The Southern Gas Corridor could potentially serve as a stepping stone to delivering additional sources of gas from Turkmenistan, Iran, Iraqi Kurdish Regional Government, and Israel to the EU consumers.

2.1 How Does Turkey Fit In?

Despite the ambitious plan to create an Energy Union, the attitudes and interests of Member States differ when it comes to supply, use and transformation of energy sources. The discrepancies in the energy policies of EU members have already hampered the adoption of a long-term approach to energy policy to ensure security, affordability and sustainability of the energy supply for Europe's citizens and businesses. Turkey is no exception to this paradigm. The country is at a pivotal point in its economic development. As with other industrializing economies, Turkey is experiencing rising energy consumption wedded to supply challenges. Like EU member-states, it faces a similar energy policy trilemma between security of supply, affordability and sustainability, with each of the three options bearing different weights in the different countries. In such a situation, policy-makers will find it hard to achieve all three objectives at once. So far for Turkey, the main thrust has been in securing the country's continued economic growth and industrial competitiveness, which depends on securing cheap and reliable energy for domestic businesses. This has been interpreted by energy policy-makers to mean an increase in the domestic coal power capacity fuelled by cheap coal imports, the building of nuclear power plants, and the striking of a multitude of long-term gas deals with geopolitical consequences. The focus on the security of supply and business competitiveness seems to place environmental sustainability and efficiency on second place, which might compromise Turkey's climate change commitments and make the country's integration in the EU energy market difficult.

The EU-Turkey shared concern about the security of supply opens the way for potential future cooperation that is crucial if they are to increase their bargaining power and access to the future suppliers in the Middle East, Eastern Mediterranean, and the Caspian, despite existing considerable tensions in the regions at present:

- Sitting on over 300 bcm of natural gas reserves, Erbil could become a viable exporter of around 4 bcm per year of natural gas to Turkey by 2019, ramping up to 10 bcm later, and thus diminishing the country's dependence on other suppliers. .
- Eastern Mediterranean could become yet another new source contributing to the diversification of gas supply in Turkey and the EU, provided that gas from the region is competitively priced and a gas transport infrastructure is built Although a pipeline from İsrael to Turkey seems commercially most viable option amongst the planned projects from the region, geopolitical issues mostly related to the Cyprus problem constitute a major challenge for its realisation.

The chances for a more successful cooperation between Turkey and the EU in the energy sector look more promising considering the persistent worries of a number of EU member-states about the role Russia has played on European gas markets. Since supplies from Russia have become a geopolitical matter there is little appetite in most of Europe for further engagement with Gazprom. The Southern Gas Corridor will open both a new supply source and route for European markets. In addition, both the EU and Turkey stand to benefit immensely from the expected LNG glut on world market. Although LNG spot prices are currently not competitive to those of Russian pipeline gas, a massive oversupply on the market caused by stagnating demand in Europe and moderating growth in Asia could drive LNG prices much lower. To

optimize LNG investment costs in Southeast Europe and the Mediterranean, EU and Turkish companies have a strong incentive to work together to make these projects happen.

To ease the transit of gas from producing to consuming regions, the EU and Turkey have a strong incentive to work on coordinating the completion of new and the expansion of existing gas interconnectors with Greece and Bulgaria that would ship new gas volumes into the EU. Turkey currently exports around 600/700 million cubic metres per year (mcm/y) of gas to Greece via the Interconnector Turkey-Greece (ITG), which follows a regulated entry/exit model consistent with the EU regulations. The amount shipped from Azerbaijan to Europe through Turkey will increase significantly as the TANAP/TAP pipeline system comes on line in early 2021. However, the launching of the Bulgaria-Turkey link in reverse mode had been facing repeated delays due to the lack of political will and limited administrative capacity to accelerate the process of EU funding for the project, deemed as very significant for the completion of the internal energy market and the diversification of supply for the SEE region.

After 2019, the Interconnector Turkey-Bulgaria (ITB) could become a 'must' for the most Russia-dependent countries in SEE including Bulgaria, Romania, Macedonia and Greece, if Gazprom reverts the gas supply from the existing Transbalkan pipeline to the planned Turkish Stream. The full version of the latter (i.e. two pipelines, one to feed the Turkish market and the other to supply gas to the markets in SEE), projected to cost around USD 11 billion (for the all four lines) and built by Gazprom, is still a question mark despite the signing of an intergovernmental agreement between Russia and Turkey in October 2016, and pipeline procurement activity in early 2017. The failed South Stream pipeline showed that even if an investment decision is struck, there is no certainty that actual construction will commence. The Turkish Stream with a capacity of around 15.75 bcm is the Southern pillar of a largely geopolitical strategy aiming to fully circumvent Ukraine as a transit country for Russian gas to Turkey and Southeast Europe. However, Russia would need the agreement of its European consumers to change the points of receiving the gas before the projects can actually be set in motion.

2.2 Transposition and Implementation of the EU Energy Acquis in Turkey

Turkey and the EU share a common interest to cooperate on more than just strategic gas pipeline issues. Institutional communication and alignment practices between Turkey and the EU should be implemented in a more decisive way. In particular, there is a need for developing strategic understanding for the challenges and opportunities the Energy Union create for Turkey and for the Black Sea and South East Europe. Turkey's energy sector transformation towards coupling with the planned European internal energy market, as planned in the EU-Turkey accession negotiations, is taking place at a slow pace. The implementation gap in terms of the introduction of the EU energy acquis will depend not only on the full independence of Turkey energy regulator's decision-making but also on the improvement of the corporate governance of some of the most important energy state-owned companies (SOEs) such as BOTAS, currently a virtual monopoly in the gas sector.

A key prerequisite for the better functioning and security of supply of the energy markets in SEE and CEE is the integration of the Turkish energy system into the EU internal market. Turkey is already an active gas and power market participant. However, it is insufficiently interconnected with neighboring EU member states and market coupling based on common capacity allocation mechanisms and price convergence are still works in progress. Regulatory barriers prevent a deepening of the regional energy markets and its integration into the wider European energy system.

To better understand the obstacles before the full integration of the Turkish energy market in the EU, we can try to draw a comparison with the process of implementing the energy liberalization packages in the new members of the EU from Central and Eastern Europe. In principle, most of the countries in the region have adopted the necessary laws transposing the Third Energy Package of reforms aiming to liberalise the domestic power and gas markets, implement renewable energy support schemes, and the integration of the EU internal market. A brief overview of the progress of the EU member-states in implementing the liberalisation packages shows that energy markets have been successfully reformed only in several CEE countries.[11]

11 COM(2014) 634 COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS: Progress towards completing the Internal Energy Market, 13.10.2014.

Table 1 Progress of the CEE EU Member States and Turkey on the EU Energy Liberalization Reforms

	Bulgaria	Croatia	Czech Republic	Estonia	Greece	Hungary	Latvia	Lithuania	Poland	Romania	Slovakia	Turkey
Third Energy Package	Compliance Review	Transposed	Transposed	Transposed	Transposed	Transposed	Granted derogation from the Third Energy Package	Transposed	Compliance Review	Not transposed completely	Transposed	Transposed
Organised Day-ahead Market	Further efforts required	Further efforts required	Coupling with Slovakia and Hungary	Member of the Nord Pool Exchange	Further efforts required	Coupling with the Czech and Slovak markets should be extended to other countries	Activ participation of Latvenergo to Nord Pool Spot market is necessary	Baltpool operation is based on the Nord Pool Spot model	In progress	In progress	Coupling with the Czech and Hungarian Markets	Further efforts required on coupling with Bulgaria nad Greece. Most contracts are still bilateral.
National Balancing Market	Further efforts required	Further efforts required	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Price Deregulation	No	Further efforts required	Yes	Yes	Yes	Regulated prices were cut by 20% in 2013	In progress	Deregulated gas prices and regulated electricity prices	Electricity prices for non-households are deregulated	In progress.Electricity prices for non-households are deregulated	Regulated gas and electricity proces	Wholesale prices are not regulated; partial regulation of retail markets
TSO Unbundling	Legally Unbundled	In progress	Legally Unbundled	Legally Unbundled	DESFA Independence under review	Legally Unbundled	Legally Unbundled	Certification in progress	Acomplished	In progress since 2000.	Legally Unbundled	Unbundled completed in electricity but not in Gas Markets.
DSO Unbundling	Legally Unbundled	In progress	Legally Unbundled	Legally Unbundled	Legally Unbundled	Further efforts required	In progress	Legally Unbundled	In progress	In progress	Legally Unbundled	Unbundled
NRA Independence	Further efforts required	Further efforts required	Independent	Independent	Impared by severe budget cuts	Cannot set tariffs autonomously	Independent	Independent	Further efforts required	In progress	In progress	Dependent on the Executive

Source: DG Energy, Country Progress Reports 2015

Moreover, the degree of success varies from member state to member state. For example, the regulator has been able to ensure full price liberalization only in the Czech Republic and Slovenia. In other countries, such as Estonia, Greece, Latvia, Lithuania, Poland, Romania, and Slovakia they have been deregulated only partially, and mostly for industrial consumers in the gas and power markets. Bulgaria, Croatia and Hungary continue to fully regulate household gas and power prices due to popular pressure to keep natural gas and electricity cheap for protecting vulnerable households. The Bulgarian power price protests of 2013 and the pre-election campaign in Hungary in 2014 forced the governments to adopt policies aiming at keeping power and gas prices artificially low, below regional market levels. This has limited the liquidity of the market and has stifled supplier switching.

Furthermore, the main pillar of the EU energy liberalization initiatives includes ownership unbundling of the transmission and distribution system operators (TSOs and DSOs), which guarantees the non-discriminatory access to the transmission networks. Hence, the transmission system must also be independent from any vertically integrated undertakings which are involved in the generation and/or supply of electricity. In CEE, the unbundling process has proven lengthier and more difficult than initially anticipated in several countries. Both TSOs and DSOs have been legally unbundled in the Czech Republic, Estonia, and Slovakia. The other states need to step up their efforts so as to complete this process in a proper manner.

The situation has improved more quickly in the area of regional market integration. The Czech, Hungarian and Slovak power markets have coupled, while the three Central European countries have completed several interconnections and bi-directional upgrades on transit gas pipelines. The countries have also done a lot in diversifying their gas and power supply by allowing energy flows from West to East to increase the wholesale market liquidity and competition. The regional integration has brought about stability on the energy market and has strengthened the countries' resilience to supply crises. Market coupling and enhanced regional integration has been visible also in the Baltic region, where the Nord Pool power exchange has become a case-study for successful market coupling.

The model was set to be emulated in SEE but lack of political will, regulatory burdens and market imbalances have prevented a wide-reaching integration. Turkey will play a critical role in the latter's integration initiative as the country is the biggest energy consumer in the region, yielding a very strong gravitational pull for energy exports. EU-led initiatives in the Energy Union framework could help regional regulators better coordinate policies including by lifting the arbitrary cross-border capacity limits and by investing in regional gas and power interconnectors removing capacity bottlenecks and the state support for national energy incumbents. Turkey has already become more active regionally. The Transmission Systems Operator (TEIAS) is a shareholder in the SEE capacity auction platform (SEECAO), which aims to make cross-border capacity trading more transparent and less dependent on national decisions. Turkey is also an observer in the European Network of Transmissions System Operators for Electricity (ENTSO-E) and in the Energy Community.

Electricity

So where is Turkey in the process of implementing the EU energy law? The Turkish government has already implemented most of the EU energy laws governing the electricity wholesale, retail and transmission subsectors. In 1993, the Vertically-integrated state owned power company, TEK, which dominated the Turkish power sector until the early 1990s, was unbundled in a generation, transmission and wholesale company (TEAS), and in distribution (TEDAS). Later in 2001 with the enactment of the Electricity Market Law, TEAŞ was separate into EUAS (generation), TETAS (wholesale) and TEIAS (transmission), each being a legal entity on its own. This regulatory framework persists with EUAS and its subsidiaries holding around 30% of all generation capacity in the country in 2015[12]. The electricity law furthermore does not allow EUAS to build new capacity or take control of existing plants unless there is a risk to the security of supply[13].

Whereas TEİAŞ is a state-owned monopoly in electricity transmission, the distribution network, which is divided into 21 regions, was fully privatized by the end of 2013. Upon completion of the privatizations, the state share in electricity distribution and retail sales has been reduced down to zero. There are no privatization plans regarding TEİAŞ, in the short or medium term. Electricity trading is conducted through bilateral negotiated agreements and is not subject to the Energy Market Regulatory Authority (EMRA) approval. Therefore, all commercial conditions are open to negotiation and electricity can be traded on day-ahead and real-time basis. The completion of the liberalization process in the electricity sector came with the launch of Turkey's power exchange (EPİAŞ) in March 2015. The opening of EPİAŞ is believed to have the goal of attracting more foreign investors to Turkey and increasing the competition in the energy sector. These transformations are milestones in the quest for a competitive, transparent and liberalized energy market.

Natural Gas

The process of adhering to the EU energy acquis has been problematic in the liberalization and restructuring of the Turkish natural gas sector. Due to the importance of the natural gas sector reform for the overall success of future energy diversification projects and the Energy Union in the SEE, the EU has been insisting on the liberalization of the wholesale market and the unbundling of the state-owned monopoly of BOTAS. Comprehensive reorganization of BOTAS is essential if Turkey is to develop a dynamic market and to incentivise private sector involvement. The complete unbundling of BOTAS should be the ultimate goal with the creation of separate and legally defined entities that play a role in the storage, supply, transmission and import of natural gas.

The restructuring of the natural gas sector in Turkey began between 2001-2004 with the initiation of the Natural Gas Market Law (NGML) No. 4646 (2001). The main thrust of the law was to encourage liberalisation of the Turkish natural gas sector, the development of a competitive gas market, the reduction of state involvement, and the synchronization of EU and Turkish law. It also laid the grounds of the liberalization of the natural gas market by breaking up the monopoly position held by BOTAS. The NGML was broad in scope and covered transmission, distribution, marketing, trade, import and export of natural gas in Turkey.[14] The NGML stipulated that the natural gas transmission network that existed at the time of promulgation would be under BOTAS' mandate. However, the NGML granted private entrants the right to construct and operate private transmission networks, with the stipulation that any new transmission systems be linked to the existing BOTAS gas network.

The future of BOTAS has been the most difficult aspect to address during the sector restructuring. BOTAS has had a complete monopoly on imports, storage, distribution and the sale of natural gas. The complete execution of the NGML would have only retained BOTAS' monopoly in pipeline transmission, but would have allowed the free operation of the private sector to contribute in all other aspects of the Turkish natural gas market. However, the implementation of the NGML has so far lagged behind as all legal initiatives to unbundle the company. BOTAS continues to play a dominant role in the gas market as Turkey's dominant natural gas importer, owning 80% of all import contracts (principally pipeline), and for all intents and purposes still controls the national gas supply with limited scope for private companies to operate.

A key element of the reforms of Turkey's natural gas sector has been the divestment of import contracts by BOTAS to allow the private sector to undertake a greater role in the natural gas sector. Initially, the NGML aimed at reducing the role of BOTAS' share of imports to 20% of the total country's consumption, the state-owned company's share still hovers around 80%[15]. In effect, only one contract release had been successfully completed. On the positive side, the NGML forbade the natural gas monopoly from striking new import agreements excluding LNG[16]. Without robust secondary legislation to meet the goals of full liberalization, the development of a competitive market in Turkey remains distant.

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12 "Energy Governance In Turkey: Report on Compliance with the Energy Community Acquis", ENERGY COMMUNITY SECRETARIAT, October 1, 2015

13 Ibid

14 "The Report: Turkey 2008", The Oxford Business Group, 2008, 169-171.

15 Tunçalp, Emre (December 2015).Turkey's Natural Gas Strategy: Balancing Geopolitical Goals & Market Realities. Turkish Policy Quarterly. Vol. 14. No.3. Fall 2015

16 "Energy Governance In Turkey: Report on Compliance with the Energy Community Acquis", ENERGY COMMUNITY SECRETARIAT, October 1, 2015

On the positive side, the government aims to launch a natural gas trading platform on the electricity market exchange by the end of 2017/early 2018 that would serve as a balancing market. With the following implementation of a day-ahead market (similar to the electricity day-ahead market), the unbundling of BOTAS would be more likely as the company's transmission and trading activities would need to be clearly separated to ensure fair competition and market depth. At the moment, the market is dominated by bilateral, largely non-transparent contracts between BOTAS and gas consumers in Turkey, in which the pricing regime is not determined on consumption profiles and balancing needs.

To diminish the dominance of BOTAS on gas trading, the government had undergone a limited contract release program. However, a more ambitious strategy would bring into the NGML provisions allowing for initiating volume release as a means to introduce competition into the Turkish gas sector[17]. As the gas volume release framework is implemented, the regulator should pay special attention to how the process is facilitated. As a prelude to the process, the unit of BOTAS that oversees import contracts could be legally crafted into a separate entity.

For such a policy to be successful, there must be an enabling environment consisting of a group of purchasers willing and able to purchase released gas volumes from BOTAS, (which already exist in sufficient numbers in Turkey), and consumers should allowed to have the ability to select early termination of contractual options with BOTAS in order to purchase at more competitive prices from new entrants on the date EMRA determines the new gas contractual period.

The reform of the regulatory framework in the gas sector needs to go hand in hand with the upgrade of the physical infrastructure. The complete reorganization of the Turkish natural gas sector would stimulate energy security and would bring about more private investment. Yet for the transition to go smoothly, the government should continue on its set road of prioritizing the construction of LNG and storage infrastructure that would deal with peak demand, which some estimates put at 250 mcm/d. The current network capacity, estimated at 195 mcm/d, is not sufficient to satisfy Turkey's consumption patterns, especially in winter times when high Istanbul demand could often lead to temporary gas and power outages. New LNG and storage projects are underway but much more needs to be done to ensure supply security in the future.

Renewable Energy

The regulatory alignment of the Turkish energy sector with the European one includes also the process of energy transition to a low-carbon future. The energy *acquis* stipulates a comprehensive regulatory framework for the development of renewable energy sources and the increase of energy efficiency. The renewable energy sector in Turkey has been considered a success story in many ways with an initial boom in wind, followed by rising solar PV in the past few years, though starting from a very low base. Currently, renewables make up 32% of the power mix, above the 2023 target set in the 2009 Electricity Market and Supply Security Strategy Paper[18]. Most of the renewables is still made up of abundant hydro power coming from the pumped water storages in the East and Southeast of the country[19].

Turkey's wind and solar potential is large. Turkey uses less than 1% of its solar and less than 10% of its wind potential[20]. The National Renewable Energy Action Plan (NREAP) published in December, 2014, and aiming to mimic similar plans implementing the EU Directive 2009/28/EC on renewable energy targets, has been already bearing fruit. The main regulatory support instruments to promote the use of renewable have been feed-in tariffs, quota obligations, and tax exemptions and tenders. The Renewable Energy Law No: 6094, which entered into force in January 2011, designed preferential feed-in tariffs for different renewable energy resources to mobilize further investment (See Table 2). The energy regulator (EMRA) initiated pre-license tenders in 2013 for a solar energy portfolio including projects that have a combined generation capacity of 600 MW. Prior to 2013, solar energy projects were not subject to a license regime. During the first round of tenders in 2013, EPDK received 496 applications for a total capacity of 8,900MW.[21] On the back of the new subsidies regime, renewable energy consumption rose by 410% in the past five years reaching over 17 TWh in 2015.

Moreover, this law provides incentives for domestic production of renewable energy equipment that must have at least 55% local content. Another incentive is that companies investing in renewable energy are provided with 10-year power purchase guarantees and are free to select whether to receive guaranteed feed-in tariffs or sell the electricity on the wholesale markets.

Additionally, the renewable energy facilities, related roads, and transmission lines established in a forest area or on Treasury land benefit from 85% discounts on land allocation, lease or utilization fees for ten years, starting from the date when con-

17 Csilla Bartok, et al, A combination of gas release programmes and ownership unbundling as remedy to a problematic energy merger: E.ON / MOL, Competition Policy Newsletter, 1, Spring 2006, 79.

18 For Turkey, rather than the year 2020, the year 2023 is taken as the milestone, as it is the 100th anniversary year of the Republic and several macroeconomic and sectorial targets are set for that year.

19 Data from the Turkish Ministry of Energy and Natural Resources

20 Data from the Turkish Ministry of Energy and Natural Resources

21 PwC (2014) Spotlight on SolarPower in Turkey. Accessed on 12.12. 2015 https://www.pwc.com.tr/en/publications/industrial/energy/pdf/turkiyede-gunes-enerjisine-genel-bakis.pdf

struction starts, provided that the generation activity commences before 2020. Furthermore, upon the relevant ministry's or the relevant regional protection committee's approval, renewable energy facilities can be established in national parks, natural parks, near natural monuments and conservation zones, protected forests, wildlife protection areas and special environmental protection areas.

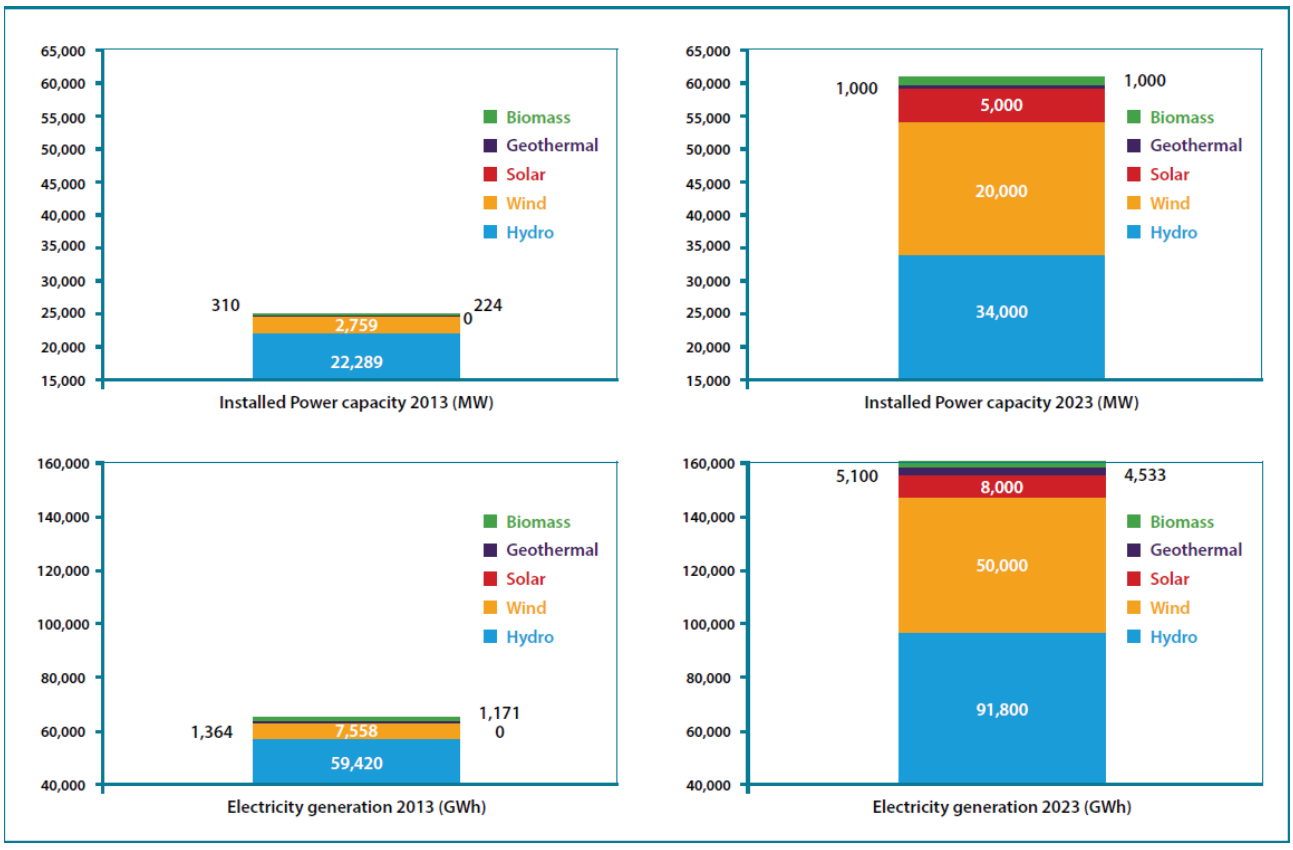
Table 2 Feed-in Tariffs for Renewable Energy in Turkey

Type of Plant	Feed-in Tariffs ($cent/kWh)	Additional rate from domestically manufactured equipment usage ($cent/kWh)	Max Feed-in Tariffs ($cent/kWh)
Hydro	7,3	2,3	9,6
Wind	7,3	3,7	11
Geothermal	10,5	2,7	13,2
Biomass	13,3	5,6	18,9
Solar PV	13,3	6,7	20
Solar CHP	13,3	9,2	22,5

Source: Law on Utilisation of Renewable Energy in Electricity Generation No. 5346

More than 90% of the so-called new renewable energy generation consists of wind power and biomass. Solar power capacity is also expanding. In total, non-hydro renewables made up almost 3% of the total primary energy supply of the country up from virtually non-existent less than a decade ago. Turkey has installed 571 MW of new solar PV capacity in 2016. At the tender in February 2017 for the Karapınar Renewable Energy Resource Area, where the largest solar energy power plant in Turkey will be established, the Kalyon-Hanwha Group consortium submitted the lowest offer of 6.99 cents kWh. This 1,000-megawatt solar power plant which is estimated to cost $1.3-billion will be Turkey's first large-scale licensed solar power plant.

Figure 1 Development of the Renewable Energy Potential of Turkey (2013 – 2023)

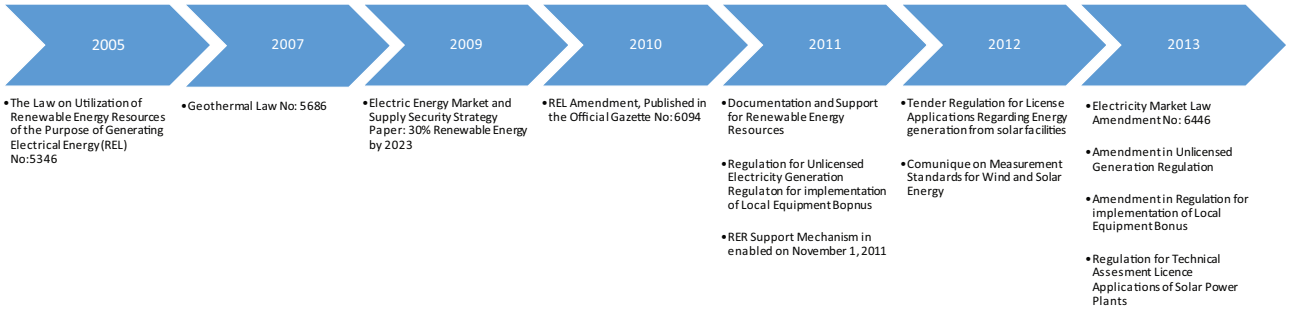


Source: National Renewable Energy Action Plan for Turkey

By 2023, according to the NREAP, the wind power generation capacity rises from 2.7 GW in 2013 to 20 GW in 2023. Meanwhile, the solar capacity jumps from practically zero in 2013 to 5 GW ten years later, which considering the enormous potential of the country for developing the solar energy sector, points to a modest ambition.[22] This is even truer when talking about Turkey's technical wind power potential, estimated by the European Commission at 275 GW.[23]

The potential, as estimated by the General Directorate of Mineral Research and Exploration, indicate around 31.5 GW. The power output from geothermal energy reached 3.43 TWh in 2015 up from almost zero a decade ago. The 2015 Energy Community report in Turkey revealed that 13 facilities or 327MW in capacity are under construction, while 15 plants are already operational.[24]

Figure 2 Timeline of the Renewable Energy Legislation Development in Turkey



Source: National Renewable Energy Action Plan for Turkey

Some of the key challenges and success factors for Turkey's renewable energy policy include:

- Reducing unnecessary delays in administrative processes;
- Improving the horizontal coordination between the different bodies in charge of granting permits;
- Increasing financial support for projects;
- Developing the legal framework for the implementation of new solutions;
- Providing secure access to renewable energy for electricity generation;
- Optimizing the usage of any relevant infrastructure.

Despite the government's strong push towards a transition to decarbonisation, decentralized, renewable-energy based power distribution systems are still not a priority despite the enormous potential Turkey has in renewable energy self-production and consumption. Government projections remain very much high-carbon focused. The opening of the Energy Chapter from the accession negotiations with the EU in 2016 might stimulate the Turkish government to further push for renewable energy production.

22 IEA (2014) Trends 2014 in Photovoltaic Applications

23 European Commission (2013) Bringing Europe and Third countries closer together through renewable Energies, See also the Climate Action Tracker for Turkey published by ECOFYS, Climate Analytics et al. http://climateactiontracker.org/countries/developed/turkey.html

24 "Energy Governance In Turkey: Report on Compliance with the Energy Community Acquis", ENERGY COMMUNITY SECRETARIAT, October 1, 2015

3 Turkey's Energy Security Profile

In the past decade, Turkey has seen a rapid rise in energy consumption, which can be attributed to both robust economic performance and the sheer increase in the population. The latter grew by 45 percent between 1990 and 2015.[25] According to the latest UN estimates, the population of Turkey would reach 88 million in 2030. This would impose a strong upward pressure on energy consumption. As a result, supply shortages could appear based on the current structure of the natural gas sector because some of the current pipeline suppliers suffer from production and transportation constraints, and there is not enough scope for new entrants in the sector. Therefore, it is crucial for the Turkish government to expedite the process of competitive liberalization of its natural gas sector to meet future demand increases and to secure enough private sector investments.[26]

This forecast might be changing in the near future as the Turkish economy might slow down on the back of a rising external corporate debt and a depreciating currency. Combined with improving energy efficiency and the increase of renewable energy generation, Turkish energy demand could begin to moderate already in 2017 carrying enormous implications for the country's macroeconomic position and its energy security risk. In 2016, energy imports were estimated at USD 27.1 billion or 13.6% of the country's total imports. Energy is also the biggest component in the current account deficit in the country that has so far been financed by abundant flows of foreign investment. Although the lower oil and gas prices have relieved the pressure on the Turkish macroeconomic balance, the worsening business climate and lower future growth prospects for the country could again make the country's energy bill unsustainable.

The second important energy security risk for Turkey is the country's ability to satisfy its growing energy needs reliably and cost effectively. Turkey is ranked 14 out of the 75 largest energy consumers in the world in terms of the energy security.[27] While this is still a fairly high position among large energy consumers, in the early 1980s, Turkey was deemed as one of the most energy secure countries. The rise in natural gas imports and the swift acceleration of energy consumption growth rates sharply increased the country's overall energy security risk score, which is currently 1,064.[28]

Turkey's energy security is around 20% worse than it was in 1980 largely due to the increasing energy dependence on oil, gas and coal imports, the slow progress in diminishing energy intensity and the unsustainable growth of CO2 emissions. Turkey scores around 22% higher than the OECD average (see Fig. 3), showing that despite the slight improvement since 2010, Turkey is still facing major vulnerabilities in the area of security of supply and energy intensity. The good news is that Turkey has a relatively diverse electricity generation portfolio divided among natural gas, coal, hydro power and increasingly, new renewables such as solar and wind. However, energy consumption figures per head and overall levels are much worse than the average for OECD implying unsustainable demand patterns and limited efficiency gains.

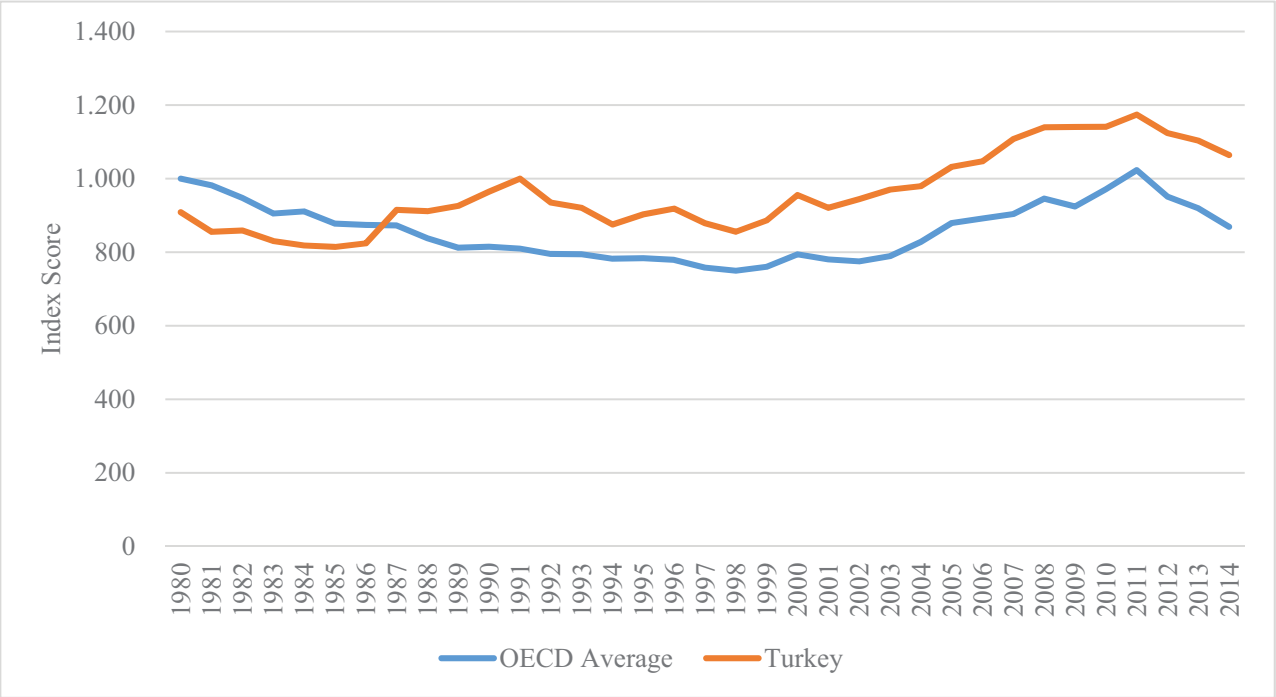
25 World Bank Population Growth Country Database, 2015.

26 According to OME's 2014 Mediterranean Energy Perspectives (MEP) report on Turkey, energy demand is likely to double by 2030 even in a conservative scenario of business-as-usual with around 85% of the supply coming from conventional fossil fuels.

27 Based on the latest estimate of the International Index of Energy Security Risks (IIESR), developed by the US Institute for 21st Century Energy, in 2014. The Index ranks the 75 largest energy consumers in the world with Norway being the most energy secure country and Ukraine the least.

28 The IIESR is an annual energy risk indicator, which uses quantifiable data, historical trend information, and government projections to identify the policies and other factors that contribute energy security. The index is based on a combination of global and national factors which affect energy security: global fuel reserves; fuel imports; national energy expenditure; price and market volatility; energy use intensity; reliability of electricity generation; efficiency of the transport sector and environmental policies. The purpose of the annual International Index is to help identifying significant transitions occurring in world energy markets while also monitoring the performance of major energy producers and consumers in coping with the energy security implications of these transitions.

Figure 3 Turkey and OECD-average Energy Security Risk Position (1980 – 2014)



Source: International Index of Energy Security Risks (IIESR), 21st Century Energy Institute

Turkey is one of the most vulnerable countries from possible energy supply cuts, especially during the seasonal peak demand period. In 2016, most of oil and gas, and half of coal supply came from imports. Additionally, Turkey was dependent on the imports of Russian natural gas for close to 56% of its total consumption in 2015, which has placed Ankara in the difficult position of paying one of the highest import gas prices in Europe.

3.1 Energy Security Risk Assessment

Low levels of energy security usually result in high-levels of energy dependency and energy poverty[29]. Energy security mainly refers to the level of uninterrupted availability of energy resources sufficient to meet energy consumption demand at affordable prices. Energy security continues to be one of Turkey's biggest concerns because key resources are limited and the county is one of the most dynamicly growing markets. Adequately tackling energy security is a challenge that relies upon precise understanding and quantifying the dimensions of energy security on national, regional, and international level.

Energy security, energy poverty and energy dependency are inter-related terms as low energy security and supply dependence usually translates into higher prices, or energy supply disruptions, and eventually into energy poverty and vice versa. It is important to be consider the following characteristics of energy security when designing its energy security position:

3.1.1 Availability of resources

For Turkey to become less dependent on energy imports weighting on its overall economy, the country should incorporate more of its domestic energy resources and pursue a more sustainable production based on renewable energy. One avenue has been the fostering of exploration activities. The US Energy Information Administration (EIA) reports that Turkey could have as much as 680 billion cubic meters (bcm) of technically recoverable shale gas reserves that if realized would represent a dramatic increase over the current very small reserve estimate of about 5.6 bcm. Turkey also is looking at potentially large reserves of natural gas offshore. In addition, EIA estimates Turkey holds 4.7 billion barrels of technically recoverable shale oil (compared to existing proven reserves of 270 million barrels. Significant oil reserves could potentially be discovered in offshore areas[30]. In addition, exploration drilling has begun in the Black Sea, while two wells have been drilled in the Diyarbakir province for shale gas[31]. International majors have expressed interest into looking for shale gas in the Northwestern part of Turkey[32].

29 CSD (2014). Energy Governance and (In)Security in Bulgaria. Policy Report. Center for the Study of Democracy

30 Country Report: Turkey, US Energy Information Administration, 2 February, 2017.

31 Ibid

32 Graeber, Daniel (2016). Statoil to help tap Turkish gas. UPI, 16 May, 2016.

To counter the energy dependence, Turkey had begun a program of investment in energy generation capacity. It has announced a USD 43 billion nuclear energy program that would be invested in the building of two nuclear power plants (Akkuyu and Sinop) with combined generation capacity of 9,400 MW. While Akkuyu is a well-advanced project, Sinop, which is being designed by a consortium of Japanese and French energy companies, has stalled at the feasibility stage with only little information known about the project's development.

Akkuyu's main shareholder is the Russian state-owned company, Rosenergoatom, which will also architect, engineer and construct the NPP through subsidiary firms. Russia is also going to supply the reactor fuel for the nuclear plant. The consortium company has fulfilled a large part of the licensing procedures including the environmental assessment analysis that could green light the start of construction activities. In December 2014, the Turkish government struck a power purchase agreement with Rosatom for the power sales. The Russian company now holds 15-year offtake guarantees for 70% of the power produced from the first two 1.2 GW units and for 30% from the third and fourth units. The total capacity of the nuclear plant will be 4.8 GW. While the work on the project began already in mid-2015, Rosatom is facing financial troubles amid lower power demand and a string of cancelled orders. Although the Turkish energy ministry has reiterated that the first stage of the project would come online in 2022, Rosatom has indicated that it is seeking a strategic investor for 49% of the project company if it is to complete the project on time. Completing this first nuclear power plant on time and with good output parameters would be of utmost importance for Turkey. At the same time its successful finalisation would rely on the unwavering further successful development of the Turkish economy.

Turkey has also been investing in hydro-power plants, and most recently in wind and solar capacity. Projections by the Turkish energy regulator show that by 2030, hydro power will make up 27% of the total installed power capacity, while wind, solar, biomass and geothermal – another 10%. The ultimate goal is to diminish the country's overreliance on coal and price-volatile natural gas, for power generation. When externalities are included in a consideration of the costs of energy, the electricity generation from wind and solar is already cheaper than generation from coal and the costs of renewables are expected to fall significantly over the next 15 years.

3.1.2 Reliability of Supply

The concept pertains to the protection of energy services from interruption. Most commonly, countries strive to enhance energy reliability through: 1) diversifying the supply sources and the supply chain; 2) stockpiling on additional storage capacity and emergency stocks; 3) reducing the demand for energy; 4) developing redundant infrastructure; etc. The security of supply had been placed on the top of the agenda of the Ministry of Energy and Natural Resources medium-term Strategic Plan for 2015-2019. It has three main objectives:

1. Invest in a reliable gas and power infrastructure that would manage demand peaks including by expanding gas storages, build up transmission and distribution grids.
2. Diversify of the fuel mix in the domestic energy supply and the energy imports including by limiting the role of gas in the power sector, boosting the renewable energy share, investing in new coal-fired power generation capacity and build nuclear power plants
3. Improve demand peak management through energy efficiency and demand-side incentives for reducing consumption

The Gas and Power Reliability Nexus

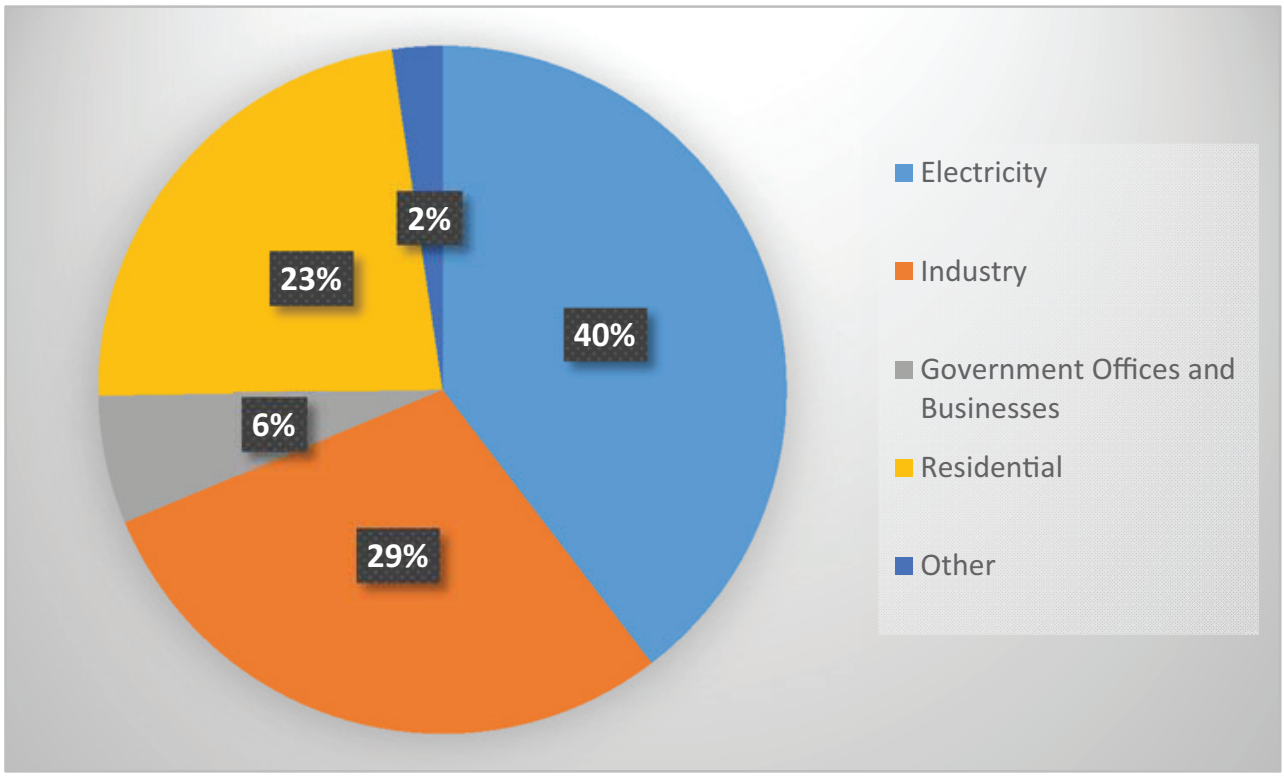
Turkey has a fairly diverse electricity generation mix. Generating capacity in Turkey's power sector is divided between conventional thermal capacity (about two-thirds of the total), and hydroelectric capacity (about 35%). Natural gas-fired facilities account for about 38% of Turkey's electricity production, coal 29%, and hydroelectric about 25%.

The excessive Turkish natural gas import dependence means that any interruption of supplies could cripple the economy. Albeit declining, the large share of natural gas in power generation makes gas supply diversification policy crucial for the predictability of power supply. In addition, around 32% of residential energy demand consisted of natural gas in 2015 up from around 25% just a couple of years ago. With gasification moving apace, the challenge of ensuring enough gas supply especially in the peak winter demand would become even more acute, if necessary investments are not made.

The reliability of supply is further challenged by the inadequacy of the internal gas network capacity. At the moment, the Turkish pipeline capacity is around 196.5 million cubic metres per day (mcm/d) while peak demand could reach over 250 mcm/d during the winter months requiring the Turkish authorities to preemptively switch off gas-fired power plants. This creates a cascade effect on the power sector, which routinely suffers from outages during peak demand. The latest brownout was at the end of December, 2016 when gas shortages led to the closing of 90% of the electricity generation from gas-fired power plants[33].

33 ICIS (2016). 'Turkish spot soars as outages ordered across the country'. 22 December, 2016.

Figure 4 Natural Gas Consumption by Sector in 2015 (%)



Source: EMRA 2015 Natural Gas Market Report

The gas supply deficits during winter are also the result of insufficient storage capacity, which stands at around 3.8 bcm, which is currently 6% of the country's annual consumption including the Silivri (2.661 bcm)and Tuz gölu (1.2 bcm), commissioned in February, 2017. The latter's capacity is planned to increase to 5 bcm in 2023[34]. Another 10 bcm of storage capacity is being built or is planned to be constructed in Turkey over the next decade with the goal of expanding storage capacity to 15% of consumption by 2023.

Turkey also relies on two LNG terminals including the Botas Marmara Ereglisi and the Aliaga terminal with combined regasification capacity 14.2 bcm/yr and maximum LNG to transmission network transfer of around 28.5 mcm/d. LNG imports have been critical for covering gas supply deficits especially during the peak demand months of the year. In 2016, LNG made up 16% of the country's natural gas supply based on data from the Ministry of Energy and Natural Resources[35]. To strengthen the role of LNG as a gas market balancer, in late December, 2016, Turkey also commissioned its first LNG floating storage and regasification unit (FSRU) near Izmir on the Aegean coast with an annual regasification and unloading capacity of around 5 bcm[36]. There are two other FSRU projects in the pipeline. Typically, due to cold temperatures, the LNG terminals operate at full capacity only during the winter season and operates at approximately 60% capacity during the summer. As the upcoming global gas glut is likely to push spot gas prices down, Turkey would benefit from expanding its spot gas imports replacing gradually expiring long-term contracts.

34 Data from the website of the Ministry of Energy and Natural Resources of Turkey.

35 Based on data from an article from the State Anadolu News Agency accessed via the following link: http://aaenergyterminal.com/news.php?newsid=11059902

36 Platts (2016). Turkey commissions first FSRU LNG unit. 23 December, 2016.

Figure 5 Turkey's Spot LNG Prices (USD/MMBtu)

Source: Argus Media

LNG import to Turkey is a flexible and robust supply source to meet growing consumer and industrial demand. LNG has the competitive price advantage and availability to meet any emergent supply deficits. Improvement in Turkey's LNG capacity would be a part of a virtuous cycle whereby it would generate a positive feedback loop with the other two policy goals of increasing competition in the market through new entrants and developing a gas trading hub in Turkey. Spot LNG prices are already competitive with long-term supply contracts even during the peak demand winter season (see Figure 5).

The reliability of supply depends not only on the technical capacity of satisfying the country's growing consumption but also on the diversity of sources. In 2015, Russia supplied 56% of all gas to Turkey or close to 27 bcm, followed by Iran with 16%, Azerbaijan with 11%, all via pipeline infrastructure. LNG imports came from Algeria (8%), Qatar (4%), Nigeria (3%) and other LNG suppliers (2%). Domestic production contributed just 1% of the total consumption in the country.

Table 3 Turkish Long-Term Contracts with the main gas suppliers

Supplier	Type	Volume (bcm/yr)	Period (years)	Start Date	End Date
Russia (Balkan route)	Pipeline	4	23	1998	2022
Russia (Balkan route)	Pipeline	1	23	2013	2036
Russia (Balkan route)	Pipeline	5	30	2013	2043
Russia (Balkan route)	Pipeline	4	23	1998	2022
Russia (Blue Stream)	Pipeline	16	25	2003	2028
Algeria	LNG	4,4	30	1994	2024
Nigeria	LNG	1,2	22	1999	2021
Iran	Pipeline	10	25	2001	2026
Azerbaijan	Pipeline	6,6	15	2007	2022
Total		52,2			

Source: Accenture and PETFORM (2013)

Turkey has contracted 52,2 bcm under long-term contracts, some of which would have to be replaced or renewed by mid-2020s, and which could satisfy more than 112% of the 2016 gas demand (see Table 3). It is not surprising, thus, that only between 1 and 2% of the gas supply comes from spot LNG deliveries, mostly during the winter peak demand period when the pipeline infrastructure that facilitates most of the imports is congested. The natural gas demand is also highly vulnerable to import disruptions, e.g. caused by terrorist attacks or excessive demand in neighboring countries. All suppliers, including Russia, have used the cuts to the natural gas supply as a geopolitical weapon to increase its bargaining position vis-à-vis Ankara. Gazprom also dominates the private segment of the wholesale gas market, where its subsidiaries

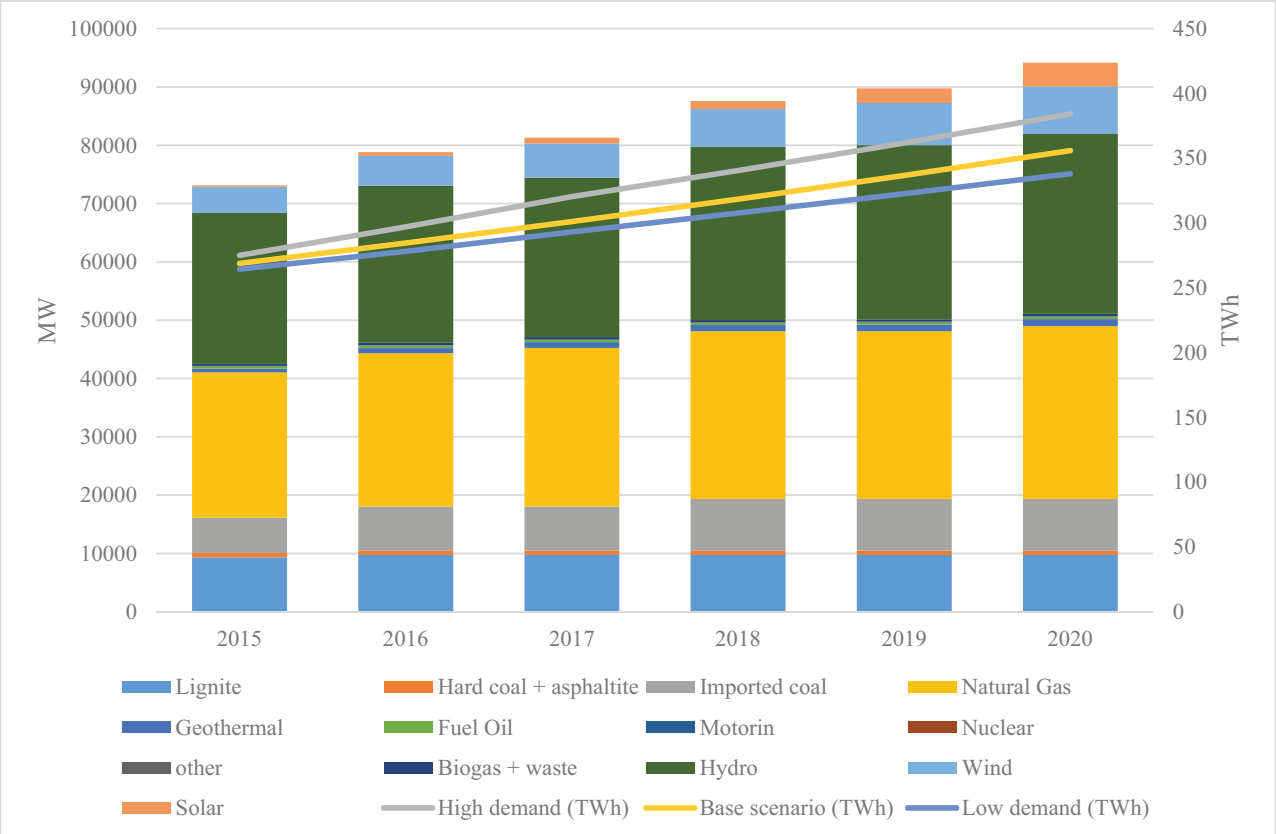
own at least 50% of the volumes under the long-term contracts released by BOTAS as part of the government's market liberalization push[37].

To ensure more diversity of supply, Turkey should tap into the enormous natural gas reserves located at close proximity in the MENA and Caspian regions. Turkey could also play an important role in natural gas trading, becoming a physical trading hub in the medium-term as it has a variety of supply options and import points (approximately six at the moment) due to its beneficial geographical position. If this is supplemented by an increase in Turkey's LNG terminals and storage capacity, it would increase the country's ability to become an energy trading centre to Europe.

Turkey's geographical position has helped the country position itself as one of the main transit points for future energy routes. Apart from the already discussed TANAP and Turkish Stream pipelines, Turkey and Iran could expand the current capacity of the import infrastructure provided that prices are competitive. The increase of gas trading capacity with Iran could also allow larger volumes of gas swaps with Turkmenistan, which would be potentially seeking to export a share of the natural gas produced in the Galkynysh field in Western direction.

The reliability of supply is not only related to gas but also to electricity as Turkey's electricity consumption has been growing by 6-7% annually for the last 15 years. The Turkish government has struggled to increase the generation capacity at a pace fast enough to cover the country's demand needs. The Turkish electricity energy security has been undermined by the large amounts of intermittent power generation sources such as renewable energy plants and partially the hydro power facilities that are not backed by enough base-load capacity. The March 31st, 2015 massive black-out demonstrated this vulnerability. It was caused by excessive load on the East-West power line and excessive hydro-power generation during maintenance period[38]. To mitigate large imbalances between large generation volumes in the East during lower demand volumes from the West, Turkey would need to strengthen its east-west transmission corridor reaching Istanbul, Ankara and Izmir, as well as increase base-load capacity to cover imbalances.

Figure 6 Installed Capacity and Demand Forecasts until 2020



Source: TEIAS

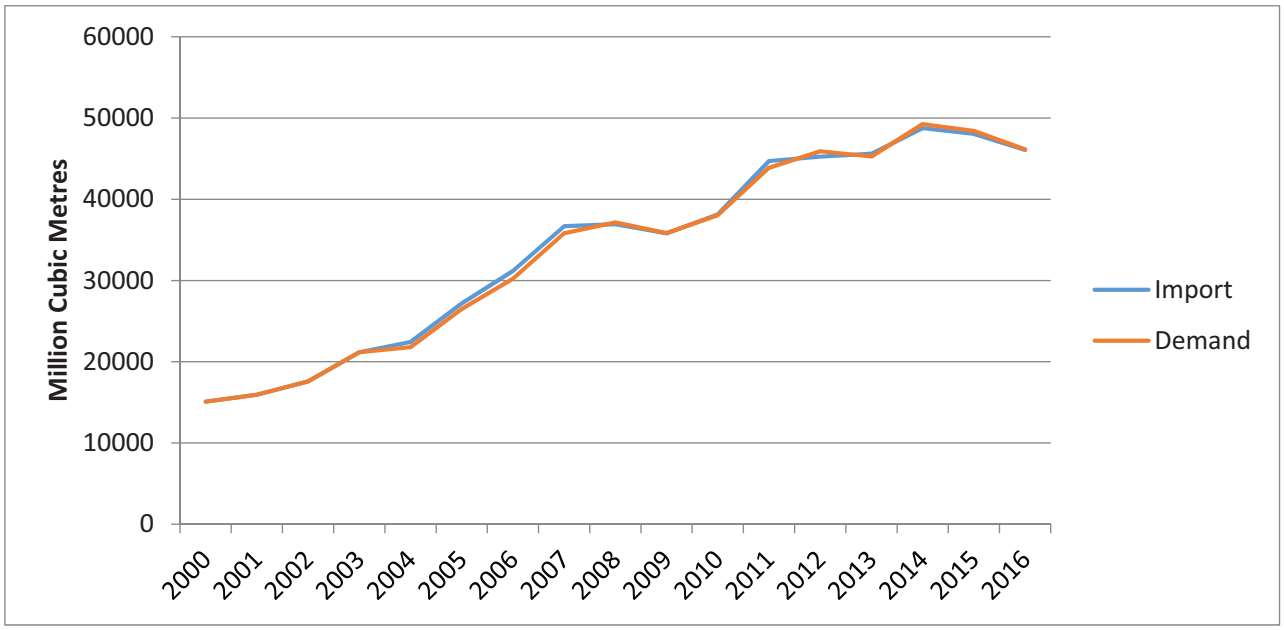
The rapid increase in the number of natural-gas fired power plants had been one way to solve the reliability of supply deficits but has created at the same time an excessive dependence on natural gas. In addition, the stall of the wholesale market liberalistion reform and the lack of transparency in BOTAS' transmission and trading activities has prevented the adequate forecasting of gas consumption profiles that in peak demand periods could lead to acute shortages both in the residential and industrial sectors.

37 Based on the country report for Turkey from the US Energy Information Administration and interviews with private gas market players

38 ENTSO-E (2015). Final Report on Blackout in Turkey on 31st March 2015.

The key question will be whether Turkish gas demand will follow the same growth trajectory in the next two decades as from 1990 to 2016 when annual gas consumption grew on average by 11% per year climbing from 3.4 bcm/yr in 1991 to over 46 bcm/yr in 2016 (See Fig. 6). The last two years had seen natural gas demand decline pointing to a shift in the previous trend. The fall has been driven by a shrinking gas use in the electricity sector where consumption decreased from 11,3 bcm in 2014 to 9,35 bcm in 2015. The continued growth of the gas demand in the residential and industrial sectors would likely replace the electricity sector as the chief engine of gas demand growth.

Figure 7 Natural Gas Demand and Imports



Source: International Energy Agency; Ministry of Energy and Natural Resources

In **Mediterranean Energy Perspectives 2015**, the Paris-based Mediterranean Energy Observatory tries to tackle the issue of the future demand trajectory for gas by developing two distinct scenarios[39]:

- **The Conservative Scenario:** based on past trends, ongoing policies and projects evaluated with caution.
- **The Proactive Scenario:** based on the diversification of energy supply sources, the increase of domestic production, and the improvement of energy efficiency. This scenario would require massive energy investment and a significant shift in policies.

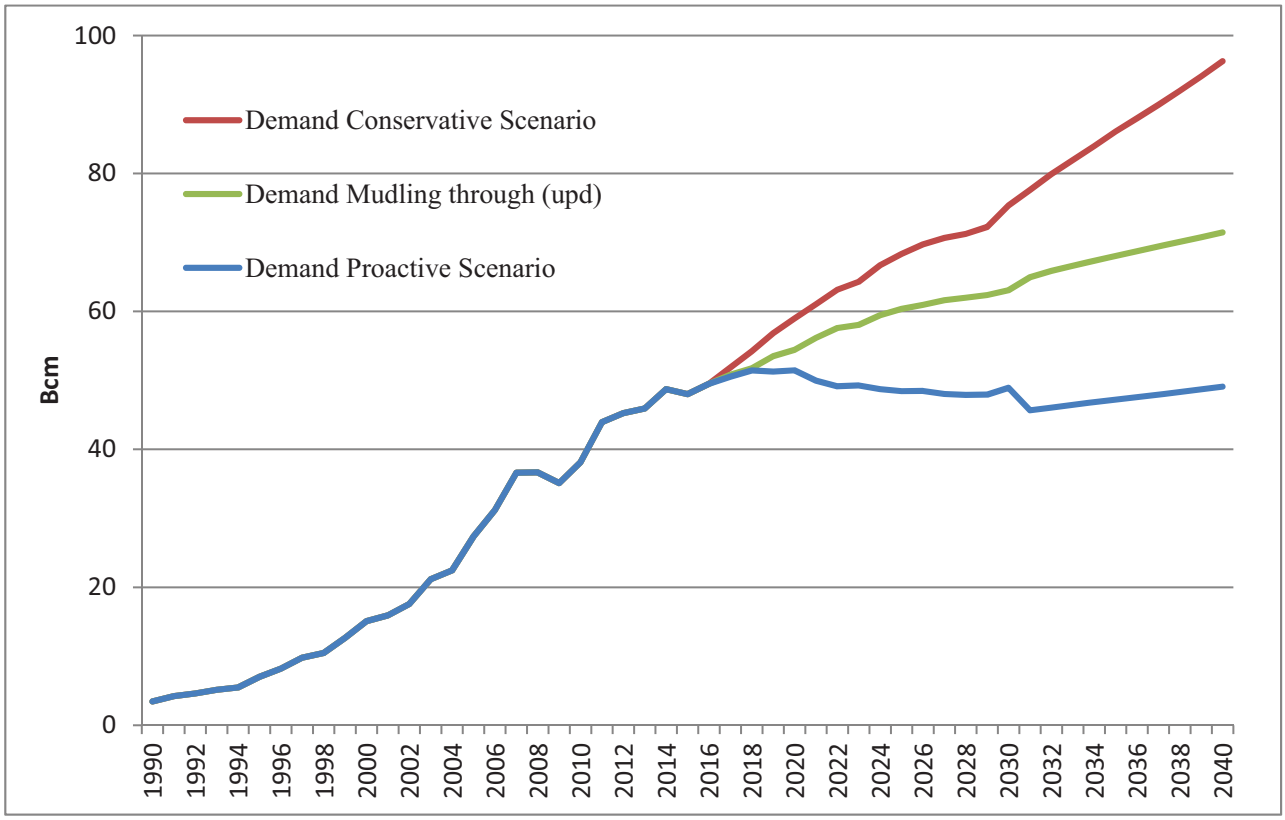
The conservative scenario, which could be interpreted as rather high demand scenario, forecasts that gas demand would reach over 75 bcm in 2030, and would double to 96 bcm by 2040. At least 60% of the demand growth would be driven by a rise in gas-fired power generation[40]. In the Proactive Scenario, the government takes measures to limit the share of gas in the electricity sector pushing it down to 22% in 2023 and to 11% in 2030[41]. Hence, demand stays almost flat at around 50 bcm after 2017. Gas consumption in Turkey had already stagnated below 50 bcm, and would probably not increase much beyond this level until at least 2020 considering the much lower economic growth expectations and the shrinking share of gas in the power sector. In 2016, natural gas already made up just 32.1% of electricity production down from almost half in 2013. With the planned commissioning of at least one nuclear power plant and a significant increase in coal-fired generation by 2023, the gas share could fall even further in line with projections in the proactive scenario and the medium-term strategy of the Turkish energy ministry. The gas demand path, which Turkey would take, would also ultimately depend on how the economy develops in the next decade. The slow-down of the country's economic growth amid political instability and a large outflow of foreign investment could dent the increase in industrial and commercial sector demand for gas. However, the population growth trend coupled with the continued gasification of the country could serve to delay the moderation of gas consumption but is unlikely to sustain in the longer term as energy efficiency gains kick in and decentralized energy production patterns become more sustainable.

39 OME (2016). Mediterranean Energy Perspectives 2015 (MEP 2015). Observatoire Méditerranéen de l'Energie

40 Ibid

41 Ibid

Figure 8 Natural Gas Demand Forecast Scenarios (Baseline year is 2013)



Source: Mediterranean Energy Observatory (OME)

Oil Supply Security

Reliability of energy supply also pertains to the oil sector. Turkey produced 2.5 million tons (around 50,000 barrels per day) of crude oil in 2015, which satisfied 7% of the country's total consumption[42]. The crude output has plateaued in the last 5 years after it had been steadily declining since it peaked in 1991 at 85,000 bpd. Although a lot of hope is pinned on the future exploration of conventional and shale oil reserves in the Black Sea, the Southeast of the country and the Aegean Sea, without a significant capital investment in exploration activities, oil output would probably continue declining hence opening an even bigger import gap.

Oil demand, on the other side, has increased by more than 25% since 2004 reaching over 37 Mt in 2016. Even in the pro-active scenario crude oil consumption would double by 2030 on the back of the continued growth of road transportation, where oil still makes up 93% of the total energy consumed[43]. The expansion of the electric, hybrid and CNG vehicle fleet is taken into consideration. Imports will, concurrently, also jump to 57 million tones (1.14 mbpd) by 2030. As a member of the IEA, Turkey has been strictly fulfilling the requirement for maintaining crude oil stocks that can last for 90 days of daily demand. The IEA registered that at the end of 2015, Turkey has held 66 million barrels of oil stocks equating 105 days of the 2014 demand in the country[44].

Despite the enormous dependence on crude oil imports, Turkey has quite a diversified supply. The biggest crude supplier to Turkey is Iraq with 41% of the total, followed by Iran (20%), Russia (11%) and Saudi Arabia (9%). The good cooperation between the Turkish and the KRG governments on facilitating an expansion of the oil trade culminated with the opening of an oil pipeline from the Taq Taq field to the port of Ceyhan in 2013 that was also connected to the existing Kirkuk-Ceyhan pipeline at Fishkhabur on the Turkish border. Despite the ISIS 2014 insurgency in Northern Iraq and the continued attacks against the pipeline infrastructure within Turkey by PKK terrorists, the oil export volumes had hovered between 450,000 and 600,000 bpd, of which around ¾ are coming from KRG fields[45]. However, the exports from Iraq remain highly volatile as the KRG and the central Iraqi government in Baghdad squabble over the proceeds of the oil exports. The pipeline was sitting idle for several weeks in February, 2016 after the conflict with the PKK in the Southeastern part of Turkey escalated[46].

42 Data from the website of the Ministry of Energy and Natural Resources.

43 OME (2015). Mediterranean Energy Perspectives (MEP 2015). Observatoire Méditerranéen de l'Energie

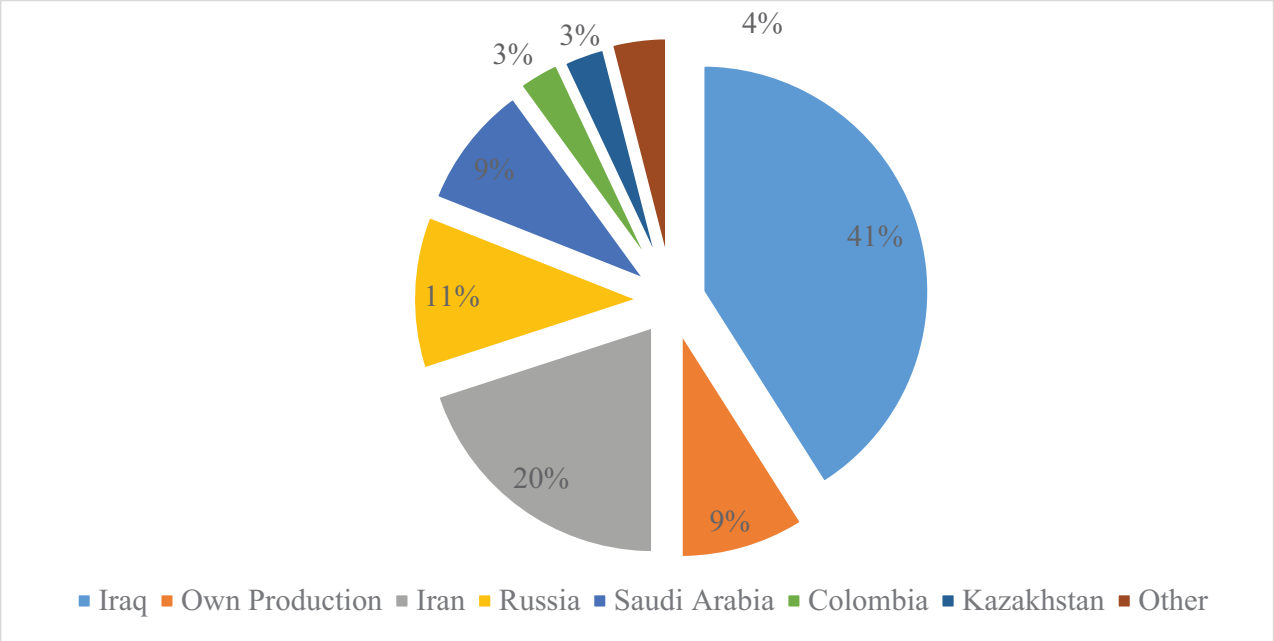
44 International Energy Agency (September, 2016). Energy Policies of IEA Countries: Turkey.

45 Reuters (16.03.2017). Iraq's oil exports dip so far in March after OPEC cut.

46 Reuters (06.03.2016). Pamuk, Humeyra and Orhan Coskun. Iraqi Kurdish oil pipeline could reopen soon.

The other major pipeline, the Baku-Tbilisi-Ceyhan (BTC) with 1.2 mbpd capacity, carrying crude oil from Kazakhstan and Azerbaijan to the port, had also been the subject of multiple attacks by terrorists over the years. Turkey is also a major transit country for oil. Around 2 mbpd of crude oil passed through the Bosphorus and Dardanelles Straits in 2015, while the Ceyhan port on the Mediterranean coast has handled more than 1 million bpd the same year[47]. The strategic geographic position of Turkey as an energy bridge between Asia and Europe could become a major opportunity for the country to become a physical energy centre that would not only guarantee Turkey's long-term security of supply but would also enable it to leverage its strategic position vis-à-vis its most important economic and political partner, the EU.

Figure 9 Crude Oil Supply by Origin



Source: US Energy Information Administration

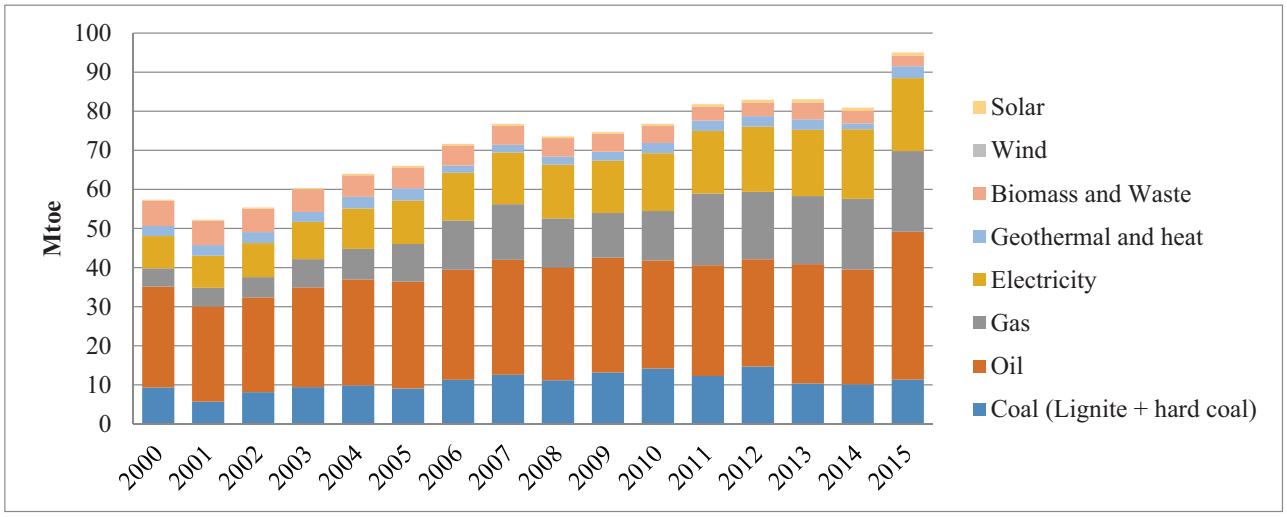
3.1.3 Environmental Sustainability

A sustainable energy future would require a low-carbon growth through policies that expand well beyond the energy system and support complex concepts such as smart cities and transport, green buildings, etc. The most important steps for the next decade towards this future in Turkey are to enhance the energy efficiency of buildings and to lower the energy intensity of the economy. Considering Turkey's difficult macroeconomic position and rising debt levels, measures to reduce the demand for energy are most logical in both the short-term and long-term perspective. However, Turkey has done little to boost its energy efficiency and minimize consumption, which has skyrocketed over the past 10 years. Total Final Energy Consumption (TFEC) has risen by close to 60% since 2004. Household and industrial energy consumption make up roughly 2/3 of the Turkish final demand, while the rest is taken up by transportation and other consumption. As one would expect to see in a rapidly growing emerging economy, the various energy intensity and carbon dioxide emissions measures also are worse than their corresponding OECD averages. However, these metrics appear to be improving vis-à-vis the OECD baseline, according to the IIESR index. They are around 5% below the average metrics for the OECD. According to the International Energy Agency (IEA), energy intensity rose by 7.1% between 2005 and 2015 making it the only country IEA member where average intensity increased over this period[48].

47 Based on the latest available data from the US Energy Information Administration based on Lloyd's List Intelligence (APEX tanker data)

48 International Energy Agency (September, 2016). Energy Policies of IEA Countries: Turkey.

Figure 10 Total Final Energy Consumption By Source



Source: Ministry of Energy and Natural Resources

To counter its excessive energy consumption patterns, Turkey published an Energy Efficiency Strategy Paper in 2012 containing a 20% reduction target for energy intensity by 2023 with a reference year of 2011[49]. The results so far are mixed. Turkey has more or less leveled its energy intensity rate in the past five years but a 20% decline over the next six years would be very difficult to achieve considering an average annual population growth from 2000 to 2015 at 1.3% and an expected cumulative growth of the economy of more than 31% until 2021, according to the latest forecast by IMF[50].

The Ministry has emphasized the reduction of energy use in the residential and commercial sectors, as well as the minimization of electricity generation and transmission losses. A move to a greater decentralization of the electricity generation has also been one of the country's energy efficiency policy objectives. This would have the combined effect of limiting the amount of investment in new generation capacity and the decline of carbon emissions in the energy sector.

To accelerate the shift in energy consumption patterns, the parliament transposed several EU energy efficiency directives including the Framework Labelling Directive 2010/30/EU, the Eco-design Directive 2009/125/EC and Energy Performance of Buildings Directive 2002/91/EC. The latter is expected to bring down annual energy consumption in public buildings and enterprises by 20% by 2023. Also, the ministry aims to complete the energy certification of all buildings in Turkey by the end of 2017[51]. Turkey still needs to also transpose the latest European Commission's (EC) directive on energy end-use efficiency and energy services, as well as the latest 2012/27/EC Energy Efficiency Directive (EED).

The Turkish ambition at reducing energy consumption goes through the significant renovation of the building stock, which reached 19 million units in 2016[52]. The ambition as prescribed in the Energy Efficiency Strategy is to make 25% of all the buildings in the country sustainable by 2023 through heat insulation, the replacement of heating systems and the installation of metering devices in all centrally-heated homes[53]. The country has benefitted from a multiple financing programs backed by international donors such as the European Commission (via the IPA program), the World Bank and EBRD. However, the overall size of the funding has been below EUR 1 billion, which is inadequate considering the expected investment volume needed to lower consumption.

Demand-side incentive schemes could be vital for the success of the energy efficiency programmes. The government provides up to 30% of the investment costs or EUR 250,000 for implementing a project for reducing energy consumption in large industrial users[54]. Similarly, the Voluntary Agreements Support Programme provides energy-intensive industrial consumers with a 20% cut in their energy bills if they commit to 10% of energy savings within three years[55].

49 Ministry of Energy and Natural Resources of Turkey (2012). Energy Efficiency Strategy Paper: 2012-2023.

50 IMF World Economic Outlook Country Database, October 2016.

51 Ministry of Energy and Natural Resources (2012). Energy Efficiency Strategy Paper.

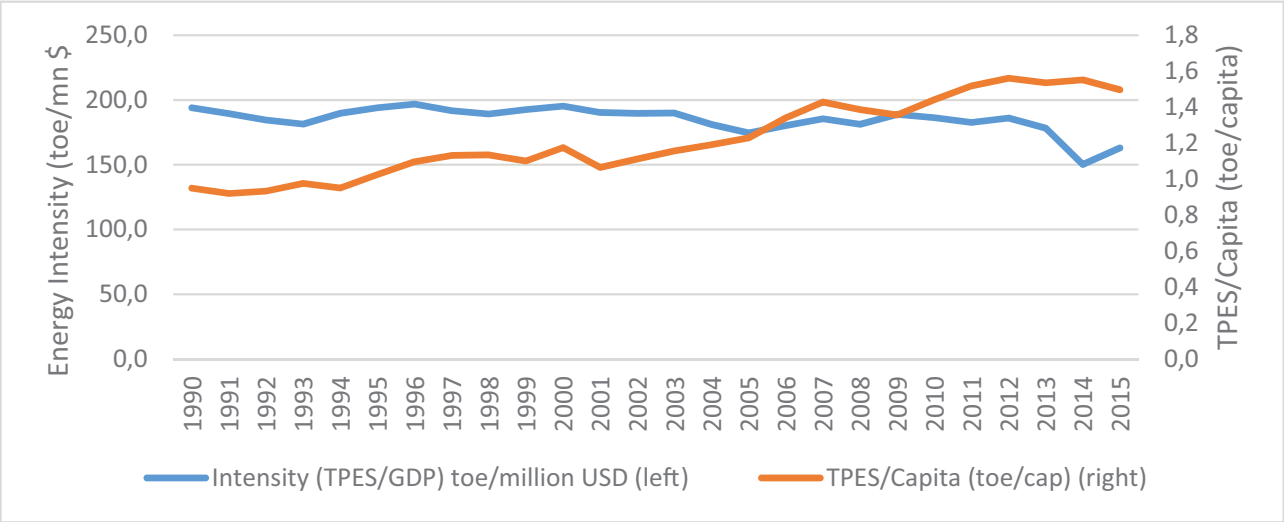
52 Turkish National Statistical Database.

53 IEA, Ibid

54 "Energy Governance In Turkey: Report on Compliance with the Energy Community Acquis", ENERGY COMMUNITY SECRETARIAT, October 1, 2015

55 Ibid

Figure 11 Total Primary Energy Supply per Capita Versus Energy Intensity



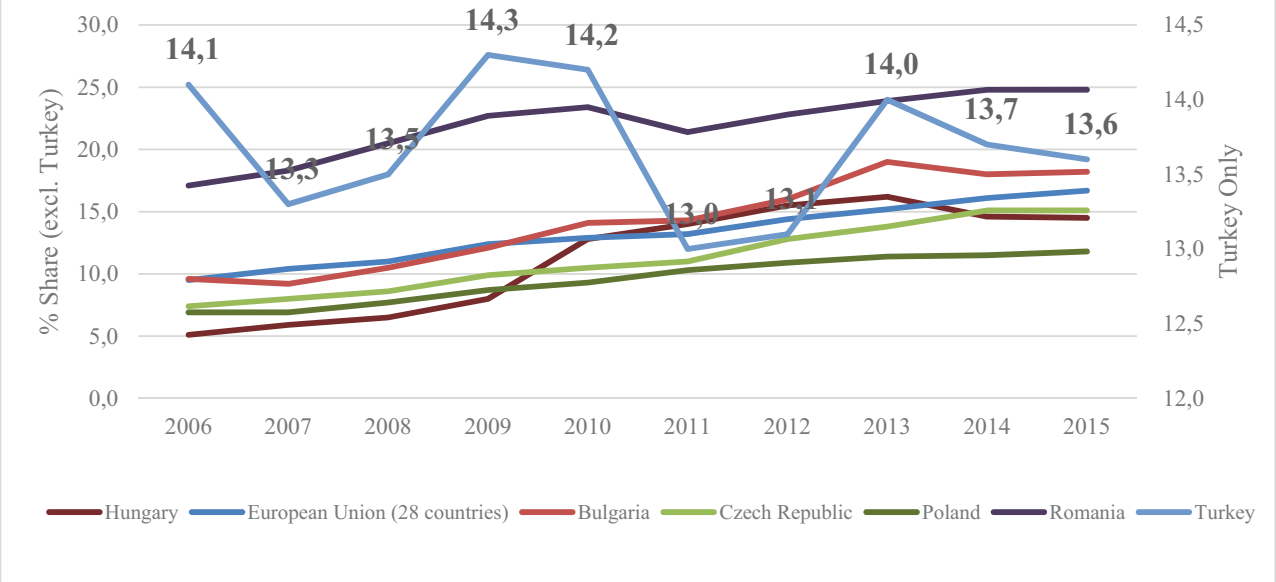
Source: Ministry of Energy and Natural Resources

The industry sector, which is based on energy-intensive and export-oriented companies, has enormous potential for savings. Looking more closely at the data on industrial production, energy intensive industries consumed approximately 30 percent of total energy consumption, with the steel and chemical industries taking the largest share.[56] Along the lines of high economic growth, a population surge and a policy of full electricity access, power generation has also been growing by leaps and bounds. Electricity generation jumped by close to 66% since 2004 to 261 TWh in 2016[57].

The rapid economic and population growth combined with industrialization and urbanization on an unprecedented scale have brought environmental issues to the forefront of the policy-making initiatives in the Turkish energy sector. Air pollution and climate change are already challenges that can no longer be ignored. It is not surprising, thus, that Turkey had embarked on an ambitious path of reversing its excessive dependence on fossil fuels for energy consumption by developing the country's huge potential for renewable energy. The following targets and policy objectives in the REAP had been set:

- ✓ RES-E production to increase to 30%
- ✓ 10% share of renewable energy in the transportation sector.
- ✓ Distributed generation based on RES-E and the usage of renewable energy in buildings.
- ✓ Agricultural sector enhancing the biofuel industry (biodiesel and bioethanol).

Figure 12 Share (%) of renewable energy sources in gross final energy consumption (incl. hydro power) – selected countries



Source: EUROSTAT

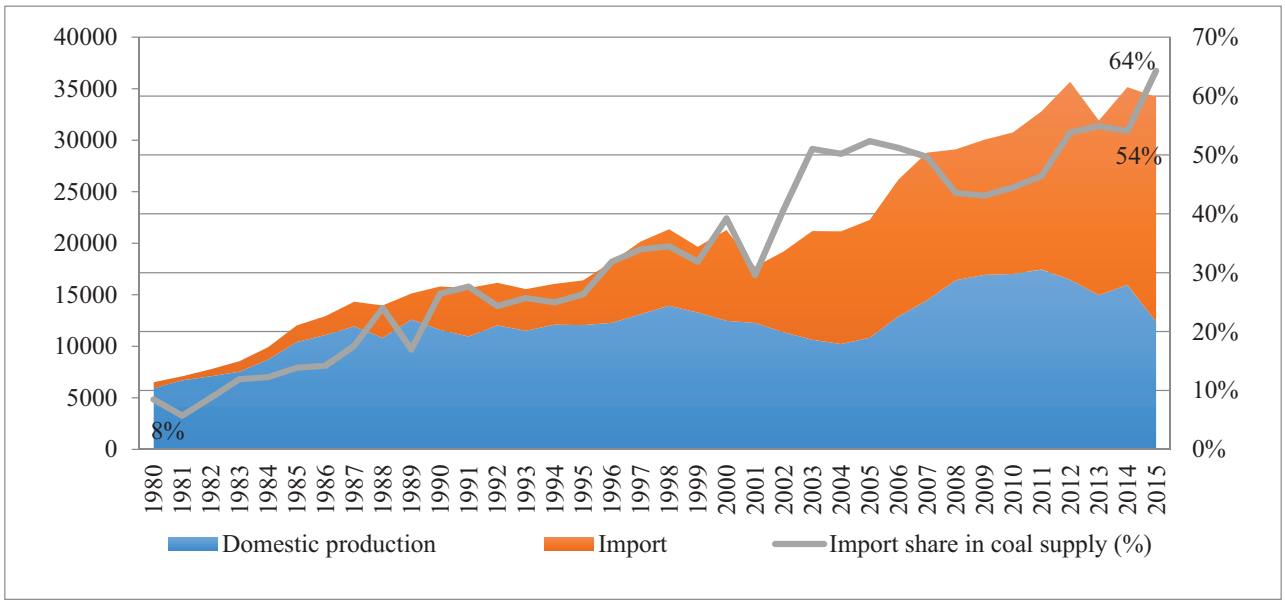
56 Data is for 2012 quoted in the OME (2014). Mediterranean Energy Perspectives – Turkey. Observatoire Méditerranéen de l'Energie (OME).

57 Data from the Ministry of Energy and Natural Resources.

Projections by the Turkish energy regulator show that by 2030, hydro power will make up 27% of the total installed power capacity, while wind, solar, biomass and geothermal – another 10%. Coal, on the other hand, which used to be the most important energy source for power generation, has been losing steam as natural gas-fired power plants are increasingly replacing coal-fired generation. However, coal consumption has grown by almost a third in the past ten years and is now making a little less than 30% of the TPES. The Turkish government has indicated plans to double its coal-power generation capacity by 2020, showing no signs of radical departure from this source of energy.[58] This means a quadrupling of the number of coal power plants from 22 today to around 80. Turkey is the sixth largest coal producer in Europe (46.2 million tonnes) despite a 28% drop in output in 2015[59].

Despite the large-scale production, Turkey still needs to import more than half of its coal demand. In 2015, the coal demand jumped by 10% year-on-year, while the share of coal imports in the total supply has reached 64%. In attempt to reduce the reliance on natural gas and cover the expected power supply deficit, the Turkish government in its 10th Development Plan 2014-2018 has adopted a policy aimed at increasing the production of both hard coal and lignite and the share of domestic coal in electricity generation. Due to its low calorific value, lignite is almost solely (90%) utilized in the energy sector. Half of the remaining 10% is used in the industry and the other half is delivered to households and services. Hard coal, on the other hand, has a wider utilisation range: 40% in energy, 15% in the industry, 28% in coking plants, 15% in households, services, etc., as well as 5% in the iron and steel industry.

Figure 13 Turkish coal (hard coal and lignite) production and imports (1000 toe)



Source: Ministry of Energy and Natural Resources

As Turkey's estimated lignite reserves are ten times larger than the estimated hard coal reserves, focusing on coal, as a domestic energy resource, directly translates into higher dependency on low quality lignite in comparison to other top coal producer countries. The heat content of coal reserves in Turkey is on average less than 3,000 kcal/kg, which is one of the lowest values in Europe and among most coal producing countries[60]. As a result, especially private coal power plants have been increasing their imports of more efficient, high calorific coal with Russia, Ukraine, Colombia and the US being the biggest suppliers of coal for Turkey. In the power sector, imported coal already exceeds domestic coal as main source of generation.

The state-owned Turkish Hard Coal Enterprises (TTK) forecast in 2014 that the country's coal consumption would be rising by 8% per year until 2019, above the 5% average rise during the 1965 to 2014 period. This would mean that despite the high rate of utilisation of above-the-ground methods for lignite mining, it would be difficult to close the demand gap without a further increase of coal imports. Turkey's Tenth Development Plan tries to diminish the dependence on imports by raising the public funding to utilize the lignite reserves in the country. Lignite is Turkey's largest domestic energy resource with proven reserves of 15.6 billion tonnes[61]. Afşin-Elbistan basin in Southeastern Anatolia, which is the most important coal production area in Turkey, will be a priority. The Plan also envisions that ready-to-operate state-owned mines would

58 Friedman, Lisa (2015). Can a country planning 80 coal-fired power plants get serious about climate change?. E&E news accessed at http://www.eenews.net/stories/1060026121

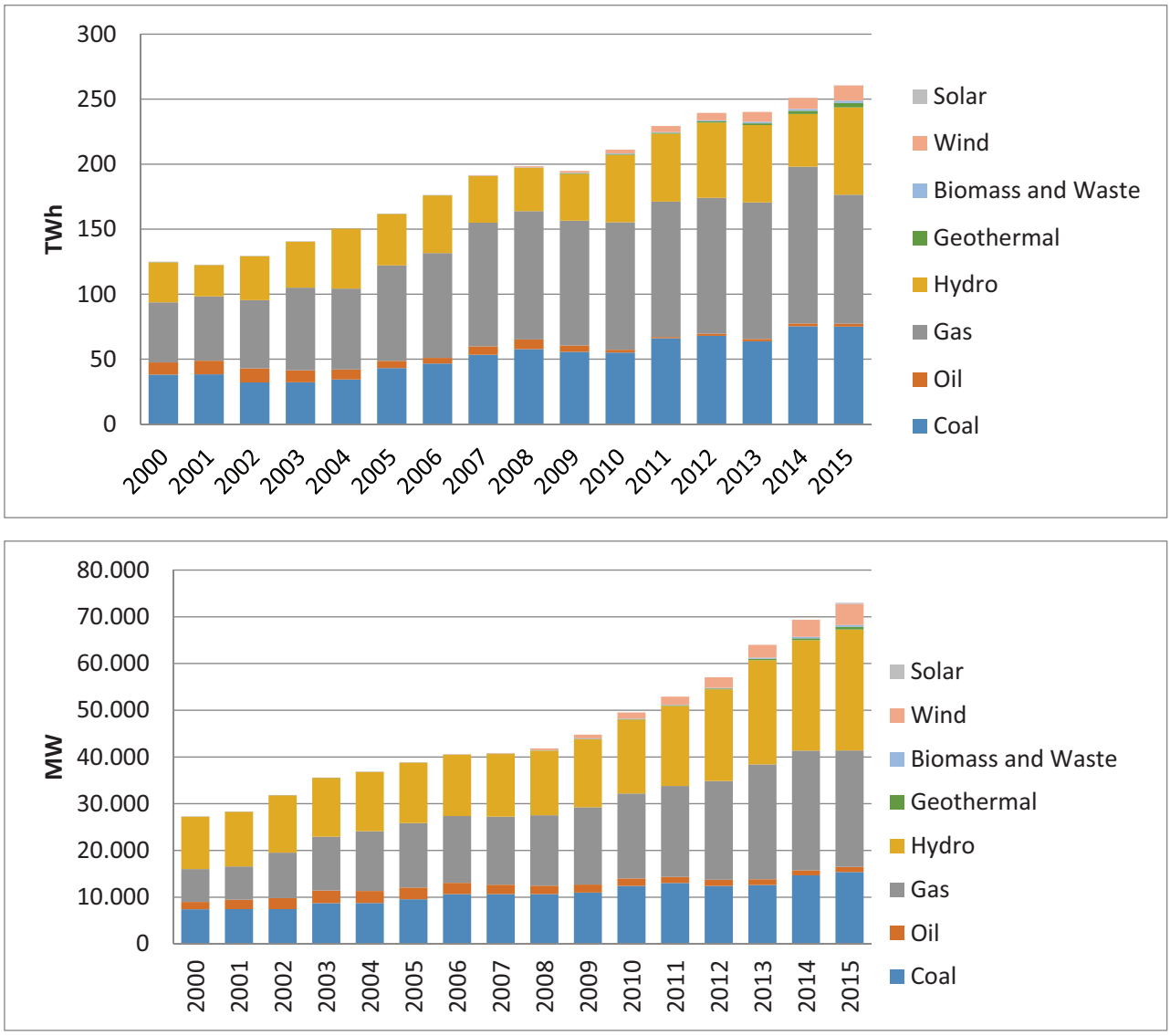
59 BP's 2016 Statistical Review of World Energy

60 FIKKERS, A., 2013. Coal resources, production and use in established markets. In The Coal Handbook: Towards Cleaner Production. Elsevier, pp. 105–117.

61 According to data from the Turkish Energy Ministry and Natural Resources

be privatised in order to improve efficiency, while state-owned power plants using coal should be refurbished to decrease air pollution and raise output.

Figure 14 Electricity Generation (graph 1 - TWh) and Installed Generation Capacity (graph 2 - MW) by Type of Energy Source



Source: Ministry of Energy and International Energy Agency

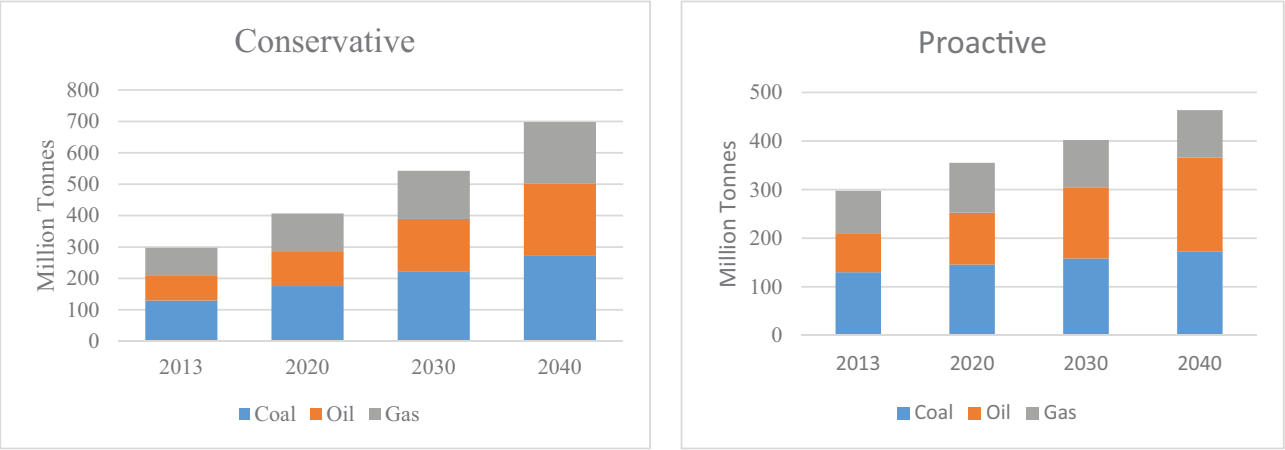
The shift in the government's coal policy contradicts the previous commitment by Ankara to decrease Turkey's carbon footprint. If it follows through with its plans, Turkey is expected to emit an estimated additional 340 MtCO2e in 2020 and 250 MtCO2e in 2030, relative to a business-as-usual scenario.[62] In 2013, the Turkish government granted direct subsidies to the domestic coal industry worth USD 730 million, which number excludes preferential VAT, land allocation and interest rate treatment.[63] By 2030, the share of coal in the power mix could rise from 27% to 32% on the back of the increased coal-generation capacity.[64] Around 2/3 of the new coal capacity is based on the low-calorific and highly polluting domestic lignite deposits, which is likely to further deter Turkey's efforts to combat climate change. In balancing its energy policy priorities, the security of supply and the preservation of the low electricity prices fuelling the economy's competitiveness seem to have overtaken the efforts for boosting the energy sector's environmental sustainability. The latter goes against the EU Energy Union's priorities for an energy transition based on low-carbon energy resources, energy efficiency and decentralisation of energy production.

62 Republic Of Turkey (2015). Intended Nationally Determined Contribution.

63 Acar, Sevil, Kitson, Lucy and Richard Bridle. Subsidies to Coal and Renewable Energy in Turkey. IISD Report. March, 2015.

64 Ibid.

Figure 15 Carbon Emissions in the OME Conservative/Proactive Scenarios



Source: Mediterranean Energy Perspectives, 2015

Turkey has largely complied with the international climate change agreements and regulations transposing much of the EU climate change acquis. Turkey is a member of the United Nations Framework Convention on Climate Change (UNFCCC) and in 2009 became part of the Kyoto protocol albeit it did not oblige to a set gas emission reduction target[65]. The government has sought a "special condition" argument based on the fact that both its per capita and total carbon emissions are lower than in most developed countries due to the lower socio-economic indicators of the country[66]. However, in both its conservative and proactive scenarios, Turkey would significantly increase its carbon emissions until 2040. Considering its policy direction of reviving its ailing coal industry, Turkey would probably double its carbon emissions by 2040. By proclaiming only qualitative carbon reduction measures and by not accepting any binding requirements based on the international agreements, Turkey would be unable to tap into international carbon markets in the future, which would be crucial if the country wants to offset the increase of emissions. In the conservative scenario, the growth in emissions is based on the increase in coal consumption, on the one hand, as well as the sustained increase of road transportation. Emissions from coal would rise by only 32% through 2040 if the country adopts an energy policy dominated by renewables and nuclear at the expense of gas and coal. Meanwhile, as the probability for a sustained expansion of the hybrid and electricity vehicles remains limited, oil-based emissions rise by over 140% even in the pro-active scenario.

3.1.4 Affordability

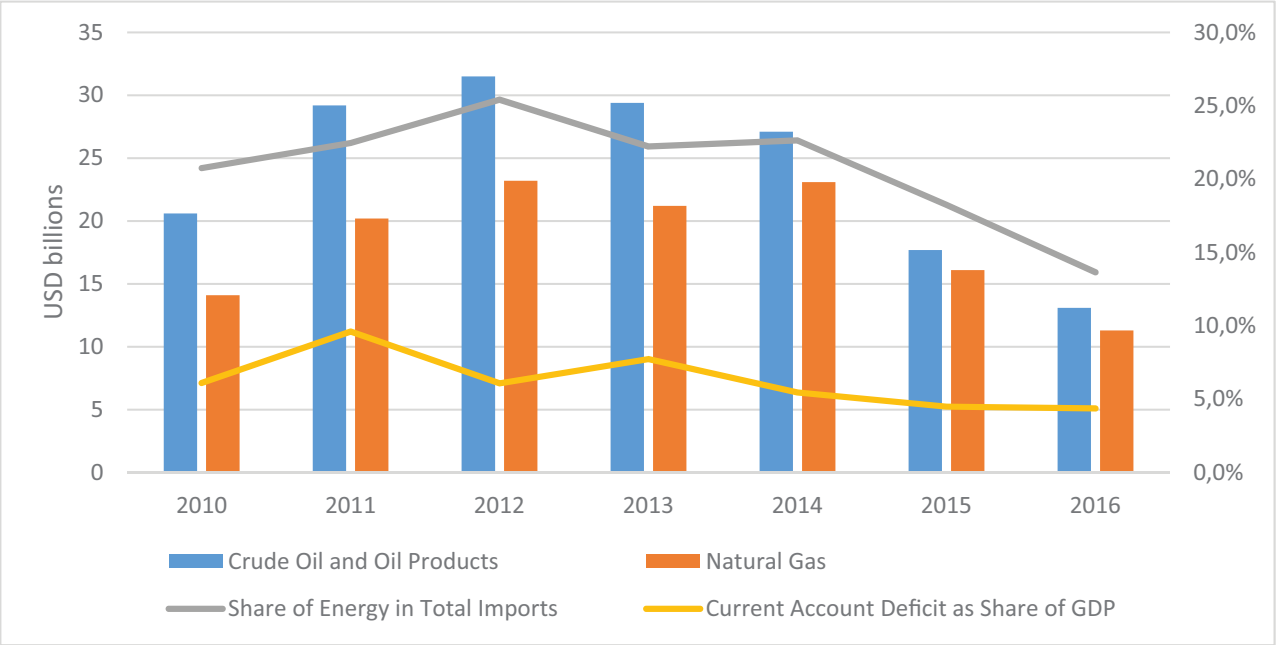
Turkey faces critical issues of energy affordability both on the macro level, where energy imports have contributed to an enormous current account deficits in nominal terms and as share of GDP. In 2016, energy imports made up 84% of the total current account deficit in the country, which was 4.4% of GDP, significantly lower than the almost 10% of GDP peak in 2011, but still a formidable challenge for an economy dependent on foreign capital inflows to cover its trade deficit. From 1990 to 2014, the costs of energy imports jumped from almost zero to close to USD 50 billion while energy imports in terms of volume had grown by a factor of three. Crude oil and oil products made up more than half of all energy imports followed by natural gas and to a much smaller degree, coal and electricity. Energy imports are likely to keep growing to reach at least USD 80 billion per year by 2030 (or around USD 1 trillion cumulatively over this period) despite energy efficiency gains and an increase of the renewable energy production at home[67].

65 Heinrich Böll Stiftung (16 November, 2015). Arif Cem Gündoğan and Semra Cerit Mazlum. Turkey and climate change talks on the eve of the Paris Agreement.

66 Ibid

67 OME (2014). Mediterranean Energy Perspectives – Turkey. Observatoire Méditerranéen de l'Energie (OME).

Figure 16 Share of Energy Imports in the Total Import Bill

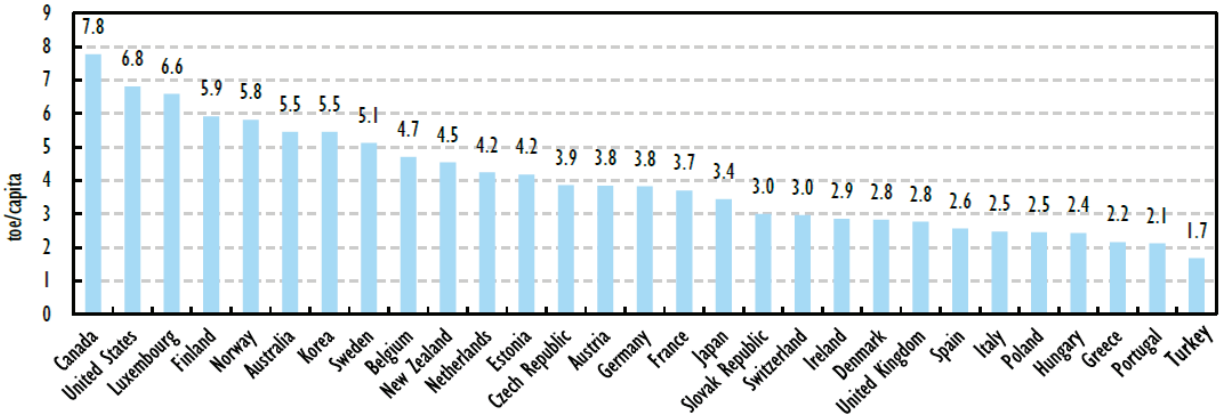


Source: Ministry of the Economy; PETFORM calculations

Turkey was ranked 16th out of the 25 largest energy consumers in terms of energy expenditure intensity and 13th when considering energy expenditure volatility[68]. The combination of high expenditures and high volatility in energy pricing has contributed to significant macroeconomic risks that can exacerbate the current private debt problems and the continued depreciation of the domestic currency, the Lira.

The situation is a bit better when observing the micro level statistics. Energy affordability issues on the household level are shaped by existing consumption patterns and pricing factors. Among the 29 IEA member-states, Turkey has the lowest total primary energy supply (TPES) per capita at 1.7 toe/cap although in 2015 it is almost double the level in 1990 and is bound to increase significantly over the next two decades.

Figure 17 Total Primary Energy Supply Per Capita in IEA Countries, 2015 (ton of oil equivalent/capita)



Source: IEA (2016), Energy Balances of OECD Countries 2016

As of today, virtually 100% of the Turkish population has access to electricity in the country. With electricity tariffs close to the average levels for the EU (See Table 5), around 4.5% of the households' expenditures are devoted to electricity. Meanwhile, the total share of rent and residential expenditures (incl. water, electricity and heating) in the household income had remained around 25-27% over the last 15 year (See Fig. 19). On average, around 40% of Turkish households spend more than 10% of their budgets on energy, i.e. are energy poor[69], which is similar to most countries in Central and Eastern Europe[70].

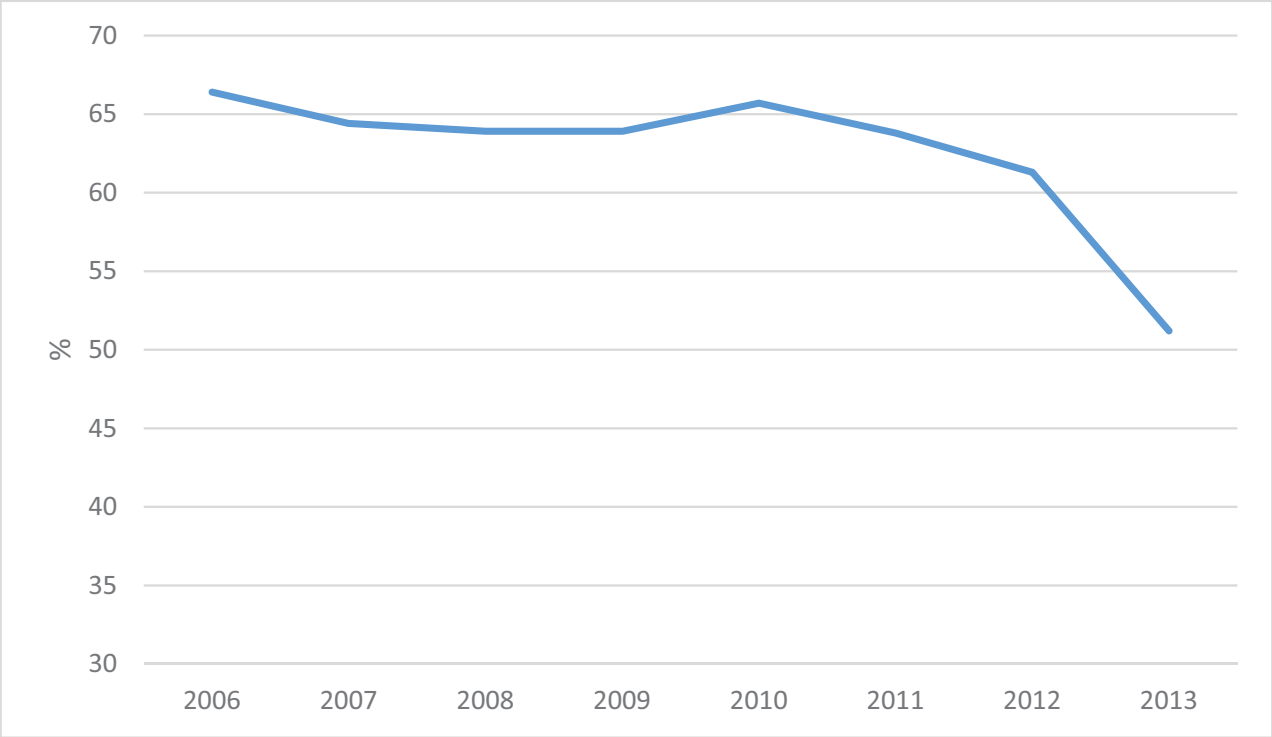
68 International Index of Energy Security Risk: Assessing Risk in a Global Energy Market. 21st Century Energy Institute. US Chamber of Commerce. 2016

69 Energy poverty has two components: access to electricity and reliance on traditional use of biomass (mostly wood and coal, and in efficient stoves for burning them).

70 Caterina Ruggeri Laderchi et. al. BALANCING ACT: Cutting Energy Subsidies While Protecting Affordability. World Bank. 2013

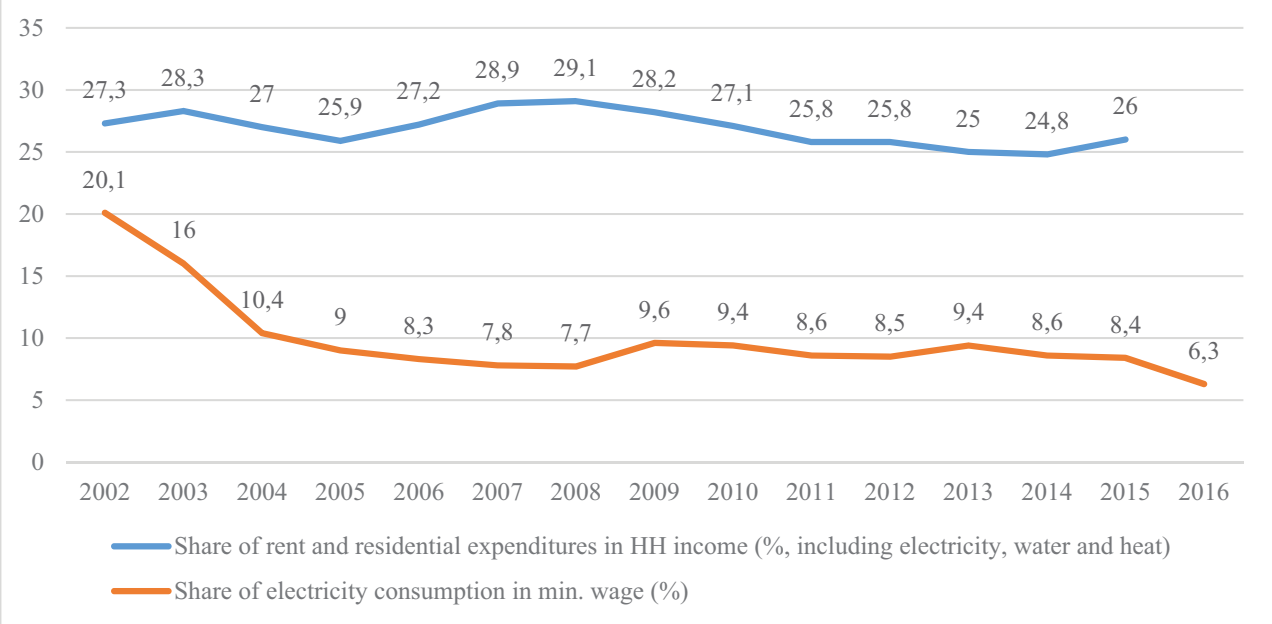
Analyzing spending by income quintile shows that 15% of the total expenditures of the poorest segments of the Turkish society go for different energy products or services[71]. This is still lower than let's say Hungary, where the poorest households spend close to 20% of their income on energy due to the high energy prices and despite some of the lowest levels of overall poverty. Meanwhile, even after the enormous improvement in living standards over the past 15 years, in 2013 still more than half of the country's population was considered at risk of poverty or social exclusion[72].

Figure 18 People at risk of poverty or social exclusion (% of total population)



Source: EUROSTAT

Figure 19 Share of Energy Expenditures in the Household Budget



Source: TurkSTAT, Household Expenditure Survey; Ministry of Energy

71 Ibid

72 According to data by the EU statistical office, EUROSTAT

Because of fears of driving large portions of the population into energy and social poverty EMRA has kept power and gas prices for households artificially low. The energy regulator approves the supply tariff for those households and SMEs, which a) have chosen not to change their supplier even if eligible to do so and b) all the non-eligible customers, whose number is constantly declining. Both groups are then supplied by companies purchasing power from the wholesale supplier (TETAS) as suppliers of last resort. EMRA regulates the tariff for suppliers of last resort at below cost of production. Although the prices of the suppliers of last resort differ slightly, EMRA uses a ceiling price for the whole market. The daily tariff for the residential sector stood at around 5.8 USD cents/KWh as of January, 2017, which is lower than even the lowest regulated tariffs in the EU found in Bulgaria, which are around 9.5 USD cents/KWh. In addition, EMRA is setting a special tariff for vulnerable consumers, whose consumption is much lower than the level allowed for non-eligible consumers, as well as for war veterans. The cross-subsidisation of power tariffs remains a significant problems as it distorts the market and incentivizes wasteful consumption. The latter is directly related to the security of supply in Turkey, especially during peak demand hours when there is little motivation for households and business consumers to lower their consumption. The political pressure to maintain regulated residential tariffs low has had a detrimental effect on investments in new generation capacity and the decapitalization of the country's wholesale supplier, which became an acute problem in the early 2010s when demand has begun outstripping supply creating reliability of electricity supply issues. Despite several attempts to raise prices up to at least cost-recovery level, the Turkish government has so far preferred to keep the power price increases below the general inflation for socio-economic reasons. This slumps private sector investment.

Table 4 Regulated Power Tariffs (USD cents/KWh)

	Industrial	SMEs	Residential	Agricultural irrigation	Lighting
Single	5.6	5.9	5.9	19.55	19.55
Day	5.6	5.8	5.8	19.42	
Peak	10.0	10.5	10.5	34.89	
Night	2.4	2.5	2.5	8.25	
Distribution costs	1.4	2.3	2.2	6.83	7.99

Source: EMRA

The retail gas sector prices are even more strictly regulated. The eligibility threshold for households is 75,000 cm/year, which pertains to only a small share of all household consumers. Eligible consumers are not obliged to change their supplier, and could continue receiving gas from the incumbent gas distributor. EMRA mandates that the retail companies should buy gas from the cheapest source and without adding a profit surcharge passing through the natural gas unit, storage, transmission and distribution costs[73]. The maintenance of the natural gas price at artificially low price has contributed to a steep rise in the residential gasification and its use in the industry, while the price difference has ended up as losses on the accounts of the wholesale supplier, BOTAS.

Table 5 Retail Gas Tariffs for Households 2015

		Euro/1 000m^3		TL/1 000m^3	
Consumption ranges (1000 m^3)		2015/1	2015/2	2015/1	2015/2
T < 522	EU	1000	1150	3010	3670
	Turkey	410	370	1220	1190
522 ≤ T < 5219	EU	710	750	2120	2400
	Turkey	400	370	1210	1180
T ≥ 5219	EU	650	650	1970	2080
	Turkey	400	370	1210	1170

Source: EMRA 2015 Report on the Natural Gas Market

Another energy poverty factor among Turkish households is the sources of energy consumption at home. Wood, coal and other solid fuels continue to be used on a large scale in Turkish households, consistent with patterns all over the SEE region. Close to 70% of all Turks use wood, coal and other solid fuels to heat their homes[74]. The data on the use of heating sources in households differs greatly in the 2011 Population and Housing Census, where 57% of the households use

73 Energy Community: Turkey Implementation Report, Ibid

74 The data is from 2009 based on World Bank estimates of the ECAPOV survey as cited in Caterina Ruggeri Laderchi et. al. BALANCING ACT: Cutting Energy Subsidies While Protecting Affordability. World Bank. 2013

stoves for heating, which includes also natural gas. Unlike other countries in CEE and SEE regions, electrification has not yet picked up and only about 6% of households use air conditioners to heat their homes[75]. As currently more than 90% of the country has access to natural gas either via central heating or local gas networks, the share of natural gas use in heating would probably continue to increase over the next decades. The limited reach of certain types of networked energy infrastructures, particularly gas in the Southeastern part of the country means that, in addition to affordability issues, energy deprivation is also predicated upon the spatial and technical limitations associated with switching towards more environmentally friendly fuel sources in the households.

Apart from being energy inefficient, the most important contributor to air pollution in Turkey together with road transportation has been the use of disproportionately high amounts of wood and solid fuels for heating. Their burning is extremely harmful to the health of residents due to the high concentration of particular matter units (PMUs) in the air. According to statistics by OECD, in 2010 28,924 people died prematurely due to high PMU concentration in Turkey[76]. The European Environment Agency (EEA) estimates that 97.2% of the urban population in Turkey had been exposed to unhealthy levels of PMU concentration[77]. Some parts of the population have had no option other than using wood and coal for heating. Switching towards this source of energy has had clear positive income dimension when gas prices shot up in the late 2000s and 2010s. However, the positive income effect is most probably outweighed by the negative environmental and health losses in the longer run.

Energy poverty is likely to remain a top energy security risk for Turkey with pervasive political and economic implications, although economic growth is likely to limit its acuteness. It has distinct geographical differences across Turkey. That is why focusing on energy efficiency and on developing alternative energy supplies that would lower or at lest check the rise of energy prices are the most viable options for reducing the energy security risks for Turkey in the future. These options align well with European energy priorities on delivering clean, competitive, and secure energy.

3.2 Natural Gas Market Liberalisation and Integration: Towards a Gas Hub for Europe

In a bid to overcome energy sector inefficiencies, albeit slowly Turkey has begun a comprehensive natural gas sector restructuring reform. The foundation was the Natural Gas Market Law (NGML) No. 4646 (2001). The NGML was designed to restructure the legal framework of the natural gas market. This law aimed at increasing competition in the market and moving away from its monopolistic structure by reducing the market share of BOTAŞ. The new law was a first step towards the gradual liberalization and vertical unbundling of the state-owned company. However, the government is yet to fully implement the legislation in practice despite contract releases in 2005 and 2012 that transferred two long-term contracts worth 10 bcm/yr from BOTAS to four private companies including:

2005 Release:

- Enerco Enerji San.Tic. A.Ş.- 2.5bcm/year
- Bosphorus Gaz Corporation A.Ş. - 0.75 bcm/year
- Avrasya Gaz A.Ş. - 0.5bcm/year
- Shell Enerji A.Ş.- 0.25bcm/year

2012 Release:

- Akfel – 2.25 bcm/yr
- Bosphorus Gaz – 1.75 bcm/yr
- Bati Hatti – 1 bcm/yr
- Kibar Holding – 1 bcm/yr

BOTAS has not transferred any additional contracts although the ultimate goal of the NGML had been to reduce the company's share in the gas imports to no more than 20%. Russia, which is the largest importer of natural gas in Turkey, showed limited interest to deal with companies other than BOTAŞ, and when it did it was mainly with companies partially or fully owned by itself such as Akfel and Bosphorus[78][79]. This puts BOTAS in a delicate situation to be sandwiched between Gazprom affiliates.

75 Turkish Statistical Institute (No: 15843). Population And Housing Census, 2011. 31 January, 2013

76 OECD, referring to data from the Global Burden of Disease assessment OECD (2014).The Cost of Air Pollution - Health Impacts of Road Transport, OECD Publishing. http://dx.doi.org/10.1787/9789264210448-en; http://www.oecd.org/environment/the-cost-of-air-pollution-9789264210448-en.htm

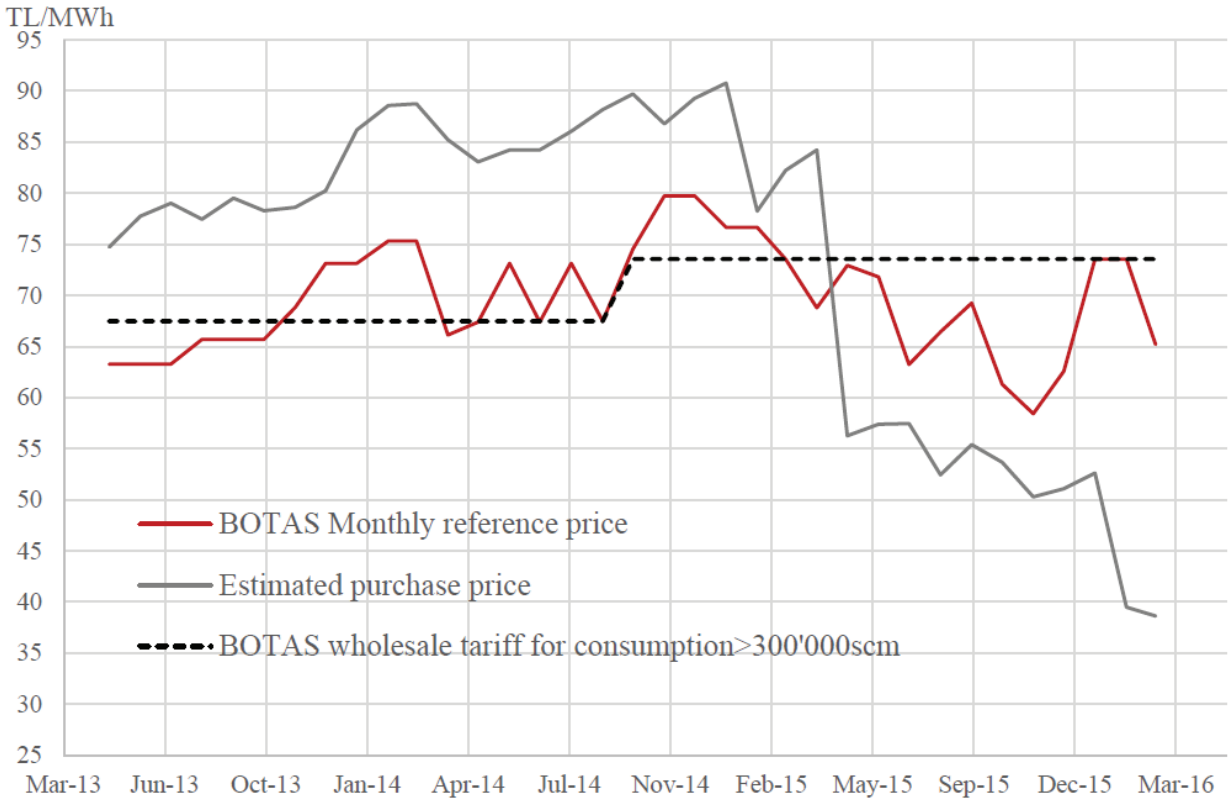
77 EEA Air Pollution Country Factsheet: Turkey (2014). http://www.eea.europa.eu/themes/air/air-pollution-country-fact-sheets

78 ICIS (2016). New board takes full control over Turkey's largest gas importer. 06 December, 2016

79 The Akfel holding includes three private gas importers with combined import contracts from Gazprom worth 5.25 bcm/yr - Akfel Gaz, Enerco Enerji and Avrasya Gaz

The NGML imposes significant restrictions on private companies. First, it forbids import companies from signing new natural gas purchase agreements with countries where BOTAŞ has already concluded a gas sale or purchase agreement. Second, private companies cannot sell and import natural gas corresponding to more than 20% of the estimated national consumption. BOTAS currently controls a little less than 80% of the wholesale market and around 70% of the distribution[80]. EMRA is responsible for estimating the natural gas consumption levels but it is obliged to take BOTAŞ's opinion on all import activity[81]. This creates a conflict of interest as decisions might affect the performance of BOTAŞ obligations arising out of its existing contracts and its gas import capacity. EMRA has to consult with BOTAŞ the technical suitability of all gas imports. BOTAŞ' affirmative opinion is required when issuing all import licenses. In short, no import activity can be managed by the private sector, if BOTAŞ determines that this would negatively affect its performance.

Figure 20 Estimated contractual gas prices against domestic market prices in TL/MWh



Source: Beyazgul, Doruk (2016). Liberalisation of the Turkish Natural Gas Market: A Critical Evaluation. Dissertation Thesis at the POLITECNICO DI MILANO

BOTAS sells the imported gas on the wholesale market at a regulated price that is often below the import cost leading to losses. Thus the pricing policy of natural gas is geared towards serving social and economic development rather than market considerations. BOTAS sells around 25% of its gas to state-owned power companies at regulated prices without incorporating a cost-based structure for pricing formation[82]. The devaluation of the national currency, which is not fully reflected in the regulated prices has put further pressure on BOTAŞ' bottom line leading to further losses. Like in other countries in SEE, in Turkey BOTAS has been squeezed by the dominant position of Russia as the key importer of gas, which has kept prices of deliveries higher than in the core of Europe[83]. Until the beginning of 2015, the difference between the estimated purchase price (oil-indexed) and the BOTAS Monthly Reference Price (See Fig. 20) was positive contributing to losses for the wholesale suppliers. The rapid reduction of the oil price in the fall and winter of 2014/2015 led to reversal of the trend as imports became much cheaper even with the Turkish Lira losing some of its value. It is however unclear whether the positive effect of falling oil prices has not been wiped out by the negative effect of the depreciation of the Turkish Lira since late 2016, making wholesale supply a loss-making operation again.

Apart from the import and wholesale sector, BOTAS also dominates gas transmission and storage as a vertically-integrated company. A draft amendment of the NGML that was tabled in parliament already in 2014 but is yet to be passed,

80 Leifheit, Drew. Liberalizing Turkey's Gas Market: BOTAS Loosening The Reins. Natural Gas World, March 2, 2015, accessed at http://www.naturalgasworld.com/botas-liberalizing-turkeys-gas-market

81 Board Decree No.725, EMRA

82 Accenture and PETFORM, Ibid

83 Sabadus, Aura (2015) Turkey Russian Stand Off: Energy and a Difficult Neighbourhood. Natural Gas Europe: http://www.naturalgaseurope.com/turkey-russia-stand-off-andenergy-relations-26797

envisions the unbundling of BOTAS in line with the EU energy acquis, restructuring the state-owned company in three legal entities including:

- Wholesale company;
- Transmission and underground storage company;
- LNG facility management company;
- Gas distribution company.

The amendment also stipulates that transmission and dispatch tariffs would be capped using a revenue method with two-tier structure that covers fixed capacity reservation and a variable service charge depending on gas volumes transported[84]. Storage fees will be negotiated bilaterally abolishing a fixed charge. EMRA will still have monitoring authority over the adequacy of the transmission and storage fees. An important factor for the success of this reform would be to ensure transparency of day-to-day operations and decision-making.

The draft law aims to lift the ban on private companies from purchasing gas from countries that have existing gas purchase agreements with BOTAS. If passed, this part of the new NGML would break BOTAS import and wholesale market monopoly especially after the expiration of some of the long-term contracts with Russia and Iran in the early 2020s. Import licenses would be issued for companies with import contracts but spot LNG supply would be excluded, which could expand the share of LNG in the total final gas consumption. Additionally, any wholesale company's sales would be capped at 20% of annual natural gas consumption. The proposed amendments of the NGML also reverses the earlier target of decreasing BOTAS' share in imports to 20%, and instead raises the commitment to 50% without providing timeframe or guidelines on how this would be achieved[85]. This points to the difficulty of reconciling the need for market liberalization and the government's fears to lose control over the security of gas supply guaranteed by the vertically-integrated state-owned company.

On the distribution side, the amendments would dictate that gas distribution companies would have to organise a tender for wholesale companies to prevent that distribution companies take gas from their wholesale parent company. The result could be an increase in the role that BOTAS plays in the distribution market as the state-owned company is likely to offer better terms than private suppliers[86]. The proposed legal amendments do not stipulate clear rules for distribution unbundling as gas distribution companies would be able to perform retail services as well.

Although more than two years have passed since the new amendments have been tabled in parliament, no indication has been given about when the new legislation will be passed. The future of BOTAS remains unclear, especially after the decision of the government to transfer its stakes to a newly-created Sovereign Wealth Fund (SWF) that would include also shares from Ziraat Bank and the Istanbul Stock Exchange, among others[87]. This might signal a change of mind in the government towards preserving BOTAS' monopoly to increase its valuation and returns but it would also mean giving up regulated prices for households and the industry to increase profits.

Even without the passage of the amended gas market law though, the market liberalization is slowly proceeding. The power exchange, EPIAS, according to officials from the energy ministry, would create a trading platform on the day-ahead, intra-day and balancing gas markets that could be launched in test mode in the coming months before being fully launched in early 2018. An adviser to the EPIAS said that the balancing market could grow four times after the launching of the platform. Following the creation of a liquid balancing market that operates on the basis of a supply/demand dynamic, the government could more easily liberalise gas prices[88].

A key pillar of Turkey's energy policy has been the drive towards turning the country into a regional gas hub. Turkey has significant advantages in this respect, as it has a variety of supply options and import points (approximately six at the moment) due to its beneficial geographical position. One of the key steps forward would be the development of the country's LNG import capacity amid increasing supply and falling international gas prices. In addition, Turkey needs to increase LNG terminals and storage capacity, to fulfill its ambition to become an energy centre between the MENA region and Europe. But delivering the hub promise would require a lot of persistent policy efforts in the coming decade, which would disrupt Turkey's currently established gas market model.

The successful gas trading hub should have two fundamental aspects: firstly, it must have the ability to import and export gas to the market, and secondly, there must be a mature consumption center, either through domestic demand or through the existence of markets easily reached from the hub. Every hub depends on four prerequisites: 1) policy driven regulatory body; 2) operational system (balancing mechanism-efficient nominations- integrated IT network); 3) transparent price discovery mechanism; 4) sufficient physical infrastructure (storage, interconnections, LNG facilities, etc.). Turkey has the potential to satisfy all requirements. Additionally, Turkey is the fourth largest natural gas consumer in Europe after Germany, the UK and Italy, and could become the third biggest by mid 2020s.

84 Accenture and PETFORM, Ibid

85 Rzayeva, Gulmira (2014). Natural gas in the Turkish domestic energy market. Oxford Institute for Energy Studies, February, 2014.

86 Ibid

87 Toksabay, Ece. (Reuters, 2017). Turkey transfers its Ziraat Bank, Istanbul bourse, Botas stakes to wealth fund. February 5, 2017

88 The observations were based on conversations with energy ministry, EMRA and EPIAS officials during a study visit to Ankara in January, 2017.

Among the success factors for a Turkish gas trading hub are:

- A competitive market with minimal entry barriers
- Limited transaction costs in terms of administrative and contractual terms
- Development of a liquid derivatives market
- Transparent price benchmarking following the example of mature gas exchanges in Western Europe
- Enabling the access to a diverse set of regional natural gas sources
- Ensuring enough physical capacity for delivery and storage of natural gas that goes beyond domestic demand satisfaction
- Development of a virtual gas trading platform that supports a physical distribution point.
- Having gas supply contract terms with no oil linkage and destination clauses.

Turkey should focus on four main aspects of the core structure of the hub: depth, breadth, immediacy and resilience.[89] Depth implies liquidity that prevents severe price fluctuations at a virtual trading exchange; breadth refers to the inclusion of a large number of diverse market players trading spot, forward and futures contracts; immediacy requires the elimination of contractual congestion and a vibrant spot trading; and finally resilience relates to the ability of the hub to absorb external shocks including supply cuts, e.g. through offsetting sudden drops in supply by LNG, storage capacity or alternative pipeline routes. Once these core features have been developed, liquidity is developed as more and more entrants enter the market. Their engagement in the market can only be assured by transparency and level-playing field.[90]

Policy makers will have to determine how to define the gas trading hub's legal parameters. It is suggested that instead of locating the hub at a physical point, the Turkish government should create a virtual point, a non-physical location in the transmission network where all the gas must flow[91]. The British National Balancing Point (NBP) is a good example of this method.[92] It is advantageous because gas prices in the system will be harmonized no matter the delivery point. While there are certain potential vulnerabilities, such as bottlenecks which could cascade throughout the grid instead of being localized, the transmission operator should monitor the network closely to mitigate development of bottlenecks and invest in system optimization. These proactive policies would overcome some of these latent deficiencies.

To establish a virtual trading point that could easily become a reference for the whole SEE region, Turkey would need to demonopolise the gas import and wholesale supply, increase storage capacity, optimize the use of LNG regasification facilities and launch a transparent electronic clearing system that would be open to all private market participants on equal terms. To prevent capacity bottlenecks, the transmission systems operator would have to ensure open access to capacity booking and efficient balancing mechanisms.

A robust storage capacity would need to be constructed in Turkey. Gas storage is a very important aspect of a gas hub as it creates flexibility in the system. Natural gas companies would have an incentive to develop storage facilities because of short term price volatility and seasonality. But, preceding storage development, transparent pricing regime needs to be in place otherwise companies would not take the business risk to construct storage facilities if they cannot assess the market fundamentals behind solid, liberal price formation.

89 Ian Cronshaw, et al, Development of competitive gas trading in continental Europe: how to achieve workable competition in European gas markets?, International Energy Agency, May 2008,46.

90 Ibid.

91 Accenture and PETFORM, Ibid

92 In the UK natural gas sector, the NBP is the theoretical node whereby all producers are required to sell and all buyers to take delivery in the national transmission grid. Ibid., 54.

Benefits of a Natural Gas Trading Hub

The benefits of creating a natural gas hub for Turkey are immense. Turkey would be able to benefit from the following:

- Increased economic activity, through both investment and job creation by the expansion of the national transmission grid and/or the construction of transit pipelines.
- Turkish consumers would likely see lower transmission costs as the average rate of capacity utilization is achieved.
- Enhancement of market liquidity in the natural gas sector through the creation of a natural gas trading market.
- The creation of a gas market hub would have notable spillover effects into the wider economy, particularly, through the development of secondary and tertiary markets in the service industries. Moreover, once liquidity is achieved, international energy companies would invest more capital into the sector, thereby helping to meet Turkey's increasing natural gas requirements.
- A gas trading hub would meet Turkey's strategic energy supply needs by moving large amounts of natural gas through the network.
- Make Turkey more attractive for the EU energy s ecurity needs, and therefore enhance Turkey's political clout within the EU, while also making its eventual membership more pivotal.

For Turkey to fulfil its historic shift to gas from oil and coal, it would have to complete the process of sector reorganization. With demand rising, Turkey needs to diversify and increase its access to various supply countries. Turkey's current over-dependence on pipeline gas has rendered it vulnerable to disruptions due to pricing disputes with its major suppliers, as well as disruptions related to technical problems of certain pipelines and rising seasonal demand from its suppliers, e.g., winter season for Iranian gas. In many ways, the NGM Law was more far reaching than the legislation adopted in the EU towards deregulation, however, Turkey has not had as much success with implementation. Undertaking the policy options listed above would grant Turkey the flexibility to meet its energy security needs for the long term.

4 Reforming Energy Sector Management and Governance in Turkey

Turkey's energy sector governance has been subject to a number of changes since 2000 on the back of its EU negotiations. The results have been most visible in the electricity and oil sectors, where the government has largely succeeded in privatizing and unbundling most generation and distribution companies. The same process has begun in the natural gas sector, albeit with a mixed success. Also, after years of delaying this policy shift, Ankara has pushed through an ambitious renewable energy programme based on a support regime similar to many of the renewable energy regulatory frameworks in the EU. With its strategic decision to cut wasteful energy consumption and improve energy efficiency in residential buildings, Turkey has been in line with all major aspects of the Energy Union.

These successful policy changes need to be supplemented by improving the country's state-owned enterprises and the energy regulator (EMRA) governance and management. The earlier emphasis on harmonising national legislation with EU standards has now been substituted by a focus on its enforcement. However, enforcement is difficult due to corporate governance issues of state-owned energy enterprises (SOEs) and the independence and decision-making of the regulator, EMRA. Management and administrative bottlenecks prevent the full liberalization of the natural gas sector and the execution of the renewable energy licensing regime.

Regulatory (In)Dependence

A key precondition for the success of the implementation of the energy acquis is the establishment of a strong independent regulator. This is crucial for the liberalization of the market, the setting up and maintaining transparent and accountable procedures for licensing and standardization of the energy companies' operation. In Turkey, EMRA is responsible for providing supervision and insights on operation of electricity, downstream natural gas market and downstream petroleum to Ministry of Energy and Natural Resources (hereafter MENR), which is also ultimately responsible for preparing energy policies. EMRA issues licenses, drafts performance standards, sets the pricing principles, and ensures infrastructure development. EMRA holds the authority to determine the principles for setting the regulated prices and tariffs. EMRA also publishes regulations, prepares communiqués, arranges privatization and manages license auctions.

Furthermore, established in 1994, the Turkish Competition Authority (TCA) oversees competition in all sectors as well as the operations of the Turkish SOEs. The Authority has financial and administrative independence. Its decision-making body is the Board, whose seven members are nominated by the Ministry of Customs and Trade, Ministry of Development, the Turkish Union of Chambers and Commodity Exchanges, the Supreme Court of Appeals and the Council of State, and appointed by the Council of Ministers. In the energy sector, the Electricity Market Law and the Natural Gas Market Law also contain provisions on competition, such as those on market limits, control and acquisitions of shares. For mergers and acquisitions, approvals from both EMRA and the TCA is required.

The Turkish Competition Authority has enforced rules of competition in the energy sector since 2008 when it investigated the the petroleum sector which revealed an oligopolistic structure in the petroleum market. In 2011, the TCA limited the duration of usage and lease rights agreements between distribution companies and vendors to five years, resulting in important changes in the market that allowed smaller distribution companies to enter the market. Also, in 2012 TCA accepted OECD's Compliance Regulations. Even though Turkey embraced the 2005 OECD Guidelines on Corporate Governance of State-Owned Enterprises as a main reference document, the Turkish government voiced on many occasions its concerns that the document has to be modified in order to better address the realities in their countries.

TCA's intervention in the energy sector has so far remained in the area of performing sector inquiries rather than opening investigations. For example, the Turkish Competition Authority found out that BOTAS was selling natural gas below cost in 2008 and started a sector inquiry, and the preliminary investigation in 2010 did not result in an investigation of BOTAS. While State aid rules are properly reflected in the Turkish legislation, enforcement of actions by the Authority is still low.

Corporate governance of State Owned Enterprises

The overcoming of energy governance deficits requires the consistent implementation of corporate governance standards in the management of the energy state-owned energy enterprises (SOEs). This is necessary to ensure that the companies are profitable, efficiently managed and corruption risks are avoided. Better corporate governance leads towards not only company-level, but also state-level positive externalities. Specifically, governance reform impacts the SOEs' operational performance in the sense that labour productivity, tariffs and, most importantly, the magnitude and quality of service coverage tend to improve if there is a solid legal and ownership framework, professional board and staff, fiscal discipline, a good performance management and monitoring system and a high degree of transparency, both voluntarily (activity reports, disclosures) as well as during audits.[93]

The OECD Guidelines on Corporate Governance of SOEs stipulate that the legal and regulatory framework for state-owned enterprises should ensure a level-playing field in markets where state-owned enterprises and private sector companies compete in order to avoid market distortions. The operation autonomy of management boards and executives is a guarantee for the company's independence, shielding it away from potential political meddling. A weak corporate governance structure and a legal framework could leave space for political patronage and the misuse of public funds, at the end hurting government revenues itself through lower dividends.

93 World Bank Group, Corporate Governance of State-Owned Enterprises. A Toolkit, 2014, p. 16, http://documents.worldbank.org/curated/en/2014/10/20286791/corporate-governance-state-owned-enterprises-toolkit, last accessed on 09.05.2016.

State owned enterprises in Turkey contribute to a significant part of the GDP and exists mostly in industries that are of great importance to broad segments of the society, such as energy. Besides offering broad employment opportunities and market capitalization, SOEs are sensitive to the evolving political agenda[94]. Energy SOEs have faced difficulties in finding an accurate balance between the state's responsibility for actively exercising its ownership function, such as nomination and election of the board, and at the same time, refraining from imposing undue political interference in management decisions[95].

One way to seek to solve this conundrum has been to privatise most of the energy companies in Turkey. The gross revenue from the privatization of SOEs in Turkey stood at around USD 60 billion for the 1985-2014 period.[96] Currently, 50 out of 188 Turkish companies that used to be owned by the state, are fully privatized and another 128 are partially privatized. Only 27 companies remain fully in the hands of the state. Furthermore, Turkish SOEs operations are closely governed by the Turkish Competitive Authority which in 2012 accepted OECD's Compliance Regulations. Even though Turkey embraced the 2005 OECD Guidelines on Corporate Governance of State-Owned Enterprises as a main reference document, the Turkish government voiced on many occasions its concerns that the document has to be modified in order to better address the realities in their countries.

One of the major issues of contention is the appointment of the SOEs management. The executive board members and high level bureaucrats of state owned enterprises are appointed by "decree of three", namely the President, Prime Minister, and the Minister responsible for the related institution. The procedural control by the executive branch might possibly contribute to political interference.

The OECD guidelines also mandate a clear separation between the political parties and the management of SOEs. The state should act as an informed and active owner and establish a clear and consistent ownership policy, ensuring that the governance of state-owned enterprises is carried out in a transparent and accountable manner, with the necessary degree of professionalism and effectiveness. Political patronage is somewhat executed in companies that have become at least partially privatised[97].

Despite the fact that the executive branch has the final say in appointing the management of energy SOEs, accountability can be guaranteed by the parliamentary mandatory supervision, which can assess whether the SOEs have been subject to political pressure from the government. In addition, many SOEs have adopted qualitative requirements for the appointments of their Boards including long-term previous relevant experience. Promotion policies have also been defined by law and are generally considered transparent and fair. However, the government still has a lot of decision-making power over the financial management of the companies. An important balancing power is the authority of the Capital Market Board (CAB), which has the role of monitoring the implementation of the Turkish Commercial Law, to request from courts to take legal measures against potential fraudulent activities by SOE management. In addition, the CEOs of SOEs are obliged to submit declarations of conflicts of interest similar to those of public officials[98].

Apart from the staffing policies of energy SOEs, a key prerequisite for their good governance, is the level of management transparency. The opacity of decision-making affects multiple processes across the board - from the SOEs financial viability and attractiveness (discourages investors by increasing risks) to its ability to service its customers and to create overall wealth (misallocation of limited resources). Corporate governance transparency in Turkish SOEs in some areas such as financial reporting, information sharing on attributes, accessibility of company disclosures and stakeholder policies has been improved significantly in the last decade. Disclosures relating to the sensitive topics of ownership and control, related party transactions, effectiveness of internal controls and perhaps most importantly actual decision-making processes and structures remain less transparent.

A recent development that may have an impact on the quality of corporate governance of energy SOEs in the future is BOTAS and the oil Exploration & Production company, TPAO's transfer to the Turkish Sovereign Wealth Fund. Turkish Sovereign Wealth Fund was established in February 2017 with the aim of financing large-scale strategic investment projects in Turkey, using funds generated by companies included in the Fund. The Fund management operates under the Prime Ministry as an independent state-owned entity. The Fund currently includes many SOEs. Since the Sovereign Wealth Fund's resources and strength are dependent on the management capabilities of the SOEs it includes, the transfer may result in positive developments. The management and operations of the two energy SOEs (BOTAŞ and TPAO) may be expected to improve in the future. On the other hand, if the uncertainty brought about by the establishment of the Sovereign Wealth Fund and the discussions related with the management of the Fund has not yet been resolved, it has the potential to induce concerns on the future of these SOEs and the energy sector in the longer term.

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94 SELDI (2016). Corruption Reports 2016: Assessment of Turkey's State-Owned Energy Enterprises. December, 2016

95 Ibid

96 Strength in Flexibility in Turkey: Updating Corporate Governance in a Changing World, Yusuf Türker/World Bank. July 14, 2014. http://www.worldbank.org/en/news/feature/2014/07/14/strength-in-flexibility-in-turkey

97 For example, there has been public outcry over the appropriateness of the appointment of the Chief of the Istanbul Police, to the Board of TEDAS, the largest Turkish Electricity Distribution company.

98 According to Law No: 5176, the Law on the Ethics Council for Public Officials

Financial Performance of Energy SOEs

The financial management of energy SOEs is a critical monitoring area as most of these institutions are the recipients of the biggest budget subventions among all SOEs in Turkey. The Turkish Court of Accounts (Sayıştay) is the primary authority for financial and performance audits of the public administrative bodies which also includes the state-owned enterprises. Sayıştay evaluates and comments on the accuracy of financial reports and statements, also monitors if the financial decisions, transactions, programs and activities are compliant with the law. Although there are questions about the scope of TCA audits and transparency of its audit reports, the TCA has significantly improved its accountability standards since it had begun filing reports in 2010.

Being bound with the Sayıştay law, energy SOEs' financial performance is also reported regularly and the financial tables are presented online. The data[99] compiled from these reports and tables, provides an overview of the financial performance of Turkish energy SOEs, which can allow for additional oversight and accountability. In order to evaluate their performance, we look at four financial performance ratios: quick ratio, liquidity ratio, debt ratio and long-term debt ratio. In the case of EPİAŞ, which was established in September 2015, there exists only one data point that makes it hard to derive conclusions.

Quick ratio

Although there are multiple ways of calculating the quick ratio, here the current assets over current liabilities, which is the indicator of the ability of the firm to meet its short-term debts with its most liquid assets, is used. It also provides a general overview on the financial situation of the company. Although quick ratios of all SOEs are strong especially for TKİ, 2015 seems to be a troubling year for BOTAŞ, TKİ, TETAŞ and TEİAŞ with decreasing ratios. For BOTAŞ and TEİAŞ it is a two-year trend, whereas for others it can be considered as a temporary fall. Although liabilities are also decreasing (except for that of TKİ), the main driver behind falling ratios is their decreasing current assets faster than the liabilities.

Table 6 Quick Ratio of Energy SOEs[100] (2011-2015)

	2011	2012	2013	2014	2015
BOTAŞ	1.49	1.32	1.44	1.31	1.26
EÜAŞ	5.30	4.50	3.71	3.03	4.59
TKİ	3.04	5.53	6.12	7.15	4.35
TETAŞ	0.46	1.27	1.15	1.47	1.18
TEİAŞ	1.90	1.90	1.72	1.63	1.38
TPAO	7.34	7.35	8.83	2.86	3.30
TEDAŞ			0.70	1.35	1.55
EPİAŞ					1.02

Long-term debt ratio

The percentage of the company's assets that are financed with loans and financial obligations lasting more than one year can be followed from long-term debt ratios. An increase in this ratio would indicate company's increasing dependence on long-term debt to manage their business, therefore higher long-term debt ratios signal increasing risks of principal and interest payments in years to come.

Energy SOEs display varying long-term debt structures (see Table 7). BOTAŞ and TETAŞ present low and stable ratios; whereas EÜAŞ, TKİ, TPAO, TEİAŞ and TEDAŞ have high and increasing ratios. The steep jump in the long-term debt of the first three (EÜAŞ, TKİ and TPAO) from 2013 to 2014 is especially noteworthy. In the case of EÜAŞ and TKİ, this jump is due to decreasing total assets through privatization of their plants, with respect to their outstanding long-term debts. Whereas for TPAO, the rate of long-term debt increase is higher than that of its total assets, pulling the ratio to a higher level. EPİAŞ, on the other hand, does not hold any long-term debt during its initiation phase.

99 These data include: Total assets, total depth, equity, current assets, current liabilities, long-term depth, EBIT (operating income) and net profit. All of these numbers can be found in Annex 1.

100 Ratios are calculated with the financial data retrieved from the Annual Reports of the SOEs.

Table 7 Long-Term Debt Ratio of Energy SOEs (2011-2015)

	2011	2012	2013	2014	2015
BOTAŞ	0.03	0.04	0.05	0.06	0.07
EÜAŞ	0.08	0.07	0.07	0.18	0.19
TKİ	0.04	0.03	0.05	0.13	0.13
TETAŞ	0.80	0.02	0.01	0.02	0.01
TEİAŞ	0.15	0.13	0.13	0.13	0.15
TPAO	0.04	0.04	0.04	0.21	0.38
TEDAŞ			0.18	0.11	0.14
EPİAŞ					0.00

Debt ratio

Similar to long-term debt ratio, total debt ratio measures the extent of a company's leverage factoring in the short-term debt as well. This ratio indicates the riskiness of the company. Although it has improved to some extent after being in bad financial state in 2011, TETAŞ still seems to be the worst performing energy SOE. TKİ and TPAO also have high and increasing indebtedness. TEDAŞ's performance is also striking, as it was able to cut down its debt ratio by half in 2 years, through decreasing its current debt. TEİAŞ has the best financial performance with its stable (even slightly decreasing) ratio over the years, through increased assets.

Table 8 Debt Ratio of Energy SOEs (2011-2015)

	2011	2012	2013	2014	2015
BOTAŞ	0.57	0.65	0.55	0.57	0.51
EÜAŞ	0.17	0.18	0.21	0.31	0.28
TKİ	0.14	0.10	0.18	0.23	0.30
TETAŞ	5.94	0.80	1.00	1.00	0.86
TEİAŞ	0.30	0.30	0.31	0.29	0.22
TPAO	0.12	0.12	0.10	0.26	0.40
TEDAŞ			1.20	0.64	0.57
EPİAŞ					0.96

Box 1 Overview of the SOEs' financial performance

BOTAŞ (Petroleum Pipeline Corporation)

With its 37.1 billion TL gross sales in 2015, BOTAŞ is ranked as the biggest enterprise in Turkey. Although down by 5.2 billion TL, it is also the first among SOEs with the highest revenues. The decrease in revenues is mainly linked to low energy prices. BOTAŞ has increased its natural gas revenues by 3% compared to 2014, but the amount it has received in monetary terms has been down by 9% between 2014 and 2015. This decrease in the energy bill is also reflected in the total imports of SOEs, bringing it down by 4.5%. In 2015, BOTAŞ received the second largest budget (1.2 billion TL) appropriated from the central budget by the Treasury and the Privatization Agency. This amount equals to 13 % of all such payments to SOEs.

EÜAŞ (Electricity Generation Company)

Despite its decreasing revenues (48% decrease, from 7.9 billion TL to 4 billion TL) in 2015, EÜAŞ was one of the most profitable SOEs. Such that two electricity generator SOEs (together with Ankara Doğal Electricity Production Company) and TEİAŞ (the transmission company) were able to cover for 750 million TL loss of two other electricity sector players, TETAŞ (wholesale) and TEDAŞ (distribution). Through privatization of some of its plants, its power production capacity of 21,879 MW in 2014 was reduced to 19,900 MW by the end of 2015, bringing SOE's share in electricity production down to 27.2% (from 31.5%). Due to this privatization, EÜAŞ's decreased demand and production has brought down Turkey's total lignite production by 49 % in 2015. EÜAŞ recorded 7.1 billion TL sales in 2015, which was about 15% of TETAŞ, EÜAŞ and TEİAŞ sales combined (46.7 billion TL)..

TKİ (Turkish Coal Enterprises Institution)

EÜAŞ and TKİ are the sole public providers of coal in Turkey. In 2015, majority of their production was distributed among thermal power plants (64%) and industrial plants (16%). As a result of these operations TKİ's total sales reached 2.1 billion TL in 2015, down by 9.6% from its 2014 level. TKİ ranks the 9th largest purchasing enterprise in 2015 with 1.2 billion TL (up by 20% with respect to 2014) where 85% of this purchase is composed of coal.

TKİ's provision of coal to poor families as a result of a Cabinet Decree has continued in 2015. Since these without charge provisions are recorded as duty loses, TKİ is one of the highest duty loss incurring SOEs. It received 732 million TL payments for its duty loss in 2015, out of a 2.3 billion TL of such transfers to SOEs in total.

TETAŞ (Turkish Electricity Trade and Contracting Company)

In 2015 8% decrease in the net sales volume of TETAŞ to 19.6 billion TL, has induced a 4% decrease in the overall energy sector net revenues.. Still, with this sales figure TETAŞ was ranked the 6th largest enterprise in Turkey in 2015. In the energy sector TETAŞ is one of the two SOEs recording losses (559 million TL) along with TEDAŞ. As mentioned above, their loss was covered by TEİAŞ, EÜAŞ and Ankara Doğal Electricity Production Company and in overall the sector closed 2015 with a 1.3 billion TL profit.

TETAŞ's revenues have peaked from 14.3 billion TL to 22.6 billion TL in 2013. With a slight decrease in the following two years, in 2015 it stands at 20.2 billion TL, which is the second highest-level following BOTAŞ.

TEİAŞ (Turkish Electricity Transmission Company)

In 2015, 53.4% of the energy sector investments (2.1 billion TL of 3.9 billion TL investments) were claimed by TEİAŞ. Acting as a monopoly in energy transmission TEİAŞ's investments are reported as the highest realization rate.

As noted above, TEİAŞ is one of the profitable energy SOEs covering for the losses of TETAŞ and TEDAŞ. Although its revenues have jumped from 55.4 million to 81.5 million TL in 2015, TEİAŞ's revenues are ranked low (22nd) among 25 highest purchasing SOEs. TEİAŞ also accounts for half of the net sales in the electricity market (20 billion TL of 46.7 billion TL).

5 Conclusions and Recommendations

Turkey with its natural role as a centre between Asia and Europe will be instrumental for the diversification of the regional and EU energy supply with alternative sources from the Caspian basin and the Middle East. In this regards, Turkey's gas market should be restructured and liberalised as to be consistent with the regulatory framework of EU markets. For this to happen, though, there is a need for improved energy policy coordination between the EU and Turkey. Some success is already visible with the progress of the Southern Gas Corridor aiming to ship 10 billion cubic meters of Azeri natural gas in Europe by 2020. By taking part in the construction of the Trans-Anatolian Pipeline (TANAP), Turkey is a major contributor to the improvement of the region's energy security. The success of the TANAP project might be undermined by its high capital investment costs that could drive the price of gas from the second phase of the Shah Deniz field higher than its competition. However, as noted in subsequent Reports on its progress to EU accession Turkey is still lagging in the transposition of EU energy law and the implementation of the market liberalization reforms. Turkey has not been able to catch up with other OECD countries in terms of energy intensity reduction and needs to scale-up its investment in energy efficiency measures. This will accomplish two interrelated policy objectives: an increase of energy savings and a reduction of the country's energy import dependence.

Turkey's energy security in times of rising demand can be ensured only through a meaningful restructuring of the energy market system, which lacks efficiency and is hampering competition. Investment in energy infrastructure needs to be scaled up to improve power and gas connectivity and to enable Turkey to fulfil its policy objective of becoming a transit hub for oil and gas from the Caspian basin and the Middle East. According to the Investment Support and Promotion Agency of Turkey (ISPAT), Turkey's energy investment requirements amount to USD 120 billion by 2023. Also, in an attempt to decrease its dependence on foreign energy imports, Turkey needs to further develop its renewable energy market.

A new EU-Turkey energy initiative is necessary, which matches the EU's and Turkey's energy security profiles. While it should be natural given that both sides are energy poor producers, such an initiative would require common diplomacy in order to unlock new energy supply sources in the Caspian Sea, the Mediterranean and the Middle East. It would also require a common political will to work for regional market integration by investing in cross-border energy infrastructure and the synchronization of the regulatory framework. More specifically, Turkish policy-makers need to follow-up with their commitment to fully liberalize the energy sector, improve transparency in decision-making and corporate governance, and increase the investment in regional energy links. On the latter issue, EU can provide both financial and political support using its dedicated infrastructure funds and drive forward a common energy strategy that focuses on diversification of resources and the narrowing of energy imbalances.

Improving the energy security and the governance of the energy sector in Turkey in the context of better integration in the EU Energy Union entails, at a minimum, the implementation of the following actions:

- Enhancement of EU efforts to form a common energy security policy based on close cooperation with its extra-EU key energy partners.
- Expansion of the regional natural gas and power interconnectors to facilitate the physical integration of Turkey in the European internal energy market leading to an increase in liquidity and competitiveness.
- Natural gas diversification away from pipeline trade, and development of LNG capacity on the Mediterranean coast to tap world markets and assist the development of a virtual natural gas hub.
- Improving the governance of the Turkish energy sector through the introduction of transparent regulation and management of the state-owned companies, as well as a consistent regulatory framework.
- Introduce prioritization and selection of large investments projects in the Turkish decision-making process, based on clear and transparent procedures and fact-based analyses, synchronized with EU priorities.
- The private sector must understand that there are no risk-free energy investments. A guaranteed profit mentality should be buried in the pages of history.
- Turkey should pursue a more balanced and diverse energy mix and electricity generation mix. In this sense, the diversity of its supply sources and routes need to be improved as well.
- Turkey needs a strong push for renewable energy sources and aggressive implementation of energy efficiency and energy conservation policies. The effect of energy efficiency improvements would help the Turkish government achieve three energy policy objectives at the same time, namely to reduce the macroeconomic effect of energy imports on the current account balance, improve the security of supply and raise the competitiveness of Turkish businesses.
- Turkey must pay more attention to R&D and innovation in the energy sector, especially when it comes to making use of its domestic lignite reserves.
- The EU needs to pay particular attention to strengthening its engagement with Turkey on other Southern Gas Corridor and on other issues of common energy security concern.
- Member-states and Energy Community members form SEE should intensify their dialogue with Turkey and seek to leverage EU funding for improving energy integration and liberalisation in the region.