

SYNERGY

Bilkent Energy Policy Research Center Newsletter



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Renewable Energy Law in Turkey



Renewable energy is the energy that is produced from sources that are not exhaustive and can be replenished, such as wind, solar, geothermal, or hydropower. According to Mete and Heffron, renewable energy can be examined under Energy Law and the triangle of energy financing, energy security, and environment. Turkey is a country that has high import dependency; therefore, it has led Turkey to pursue a diversification policy of energy sources. Even though Turkey has a strong potential for wind, solar, and hydropower, Turkey uses fossil fuels, and in particular, natural gas.

The primary legislation governing renewable energy in Turkey is Law No. 5346 on Utilization of Renewable Energy Sources for the Purpose of Generating Electrical Energy. On the energy financing side, some incentives are being provided by the Ministry of Economy. E.g., only 10% of the electricity generation license fee is charged on companies that meet the requirements of the Renewable Energy Support Mechanism; further, they are exempt from the annual license fee for eight years after they have started generating electricity. There are also tax incentives that are provided to the companies. For example, there is a VAT exemption for the purchase or imports of equipment, a customs duty exemption for the equipment, and exclusion from other funds and charges. Further, according to Law No. 6446, documents and transactions related to power plants are exempt from stamp tax and du-

ties related to it. The undertakings that meet the requirement of the Renewable Energy Support Mechanism are also granted a 10-year purchase guarantee in the amount determined by the Energy Market Regulatory Authority, with the minimum amount being 8%. Also, for the first ten years of their operations, as an incentive, there are high tariffs set out as the minimum price per MWh for hydro, wind, geothermal, and solar energy. There are even additional incentives if the companies use local equipment to generate these energies. Lastly, in the context of financing, there is a regulation named Law No. 5627 on Energy Efficiency that published Energy Efficiency Strategy Paper for years between 2012-2023 and takes the appropriate measures for the efficient use of energy in every sector.

To prevent climate change, a Climate Change Action Plan has been published that set out objectives to be achieved by the year 2023. Its goals are to limit and control greenhouse gas emissions and providing resources for the development of cleaner energy efficiency technologies. Furthermore, concerning the United Nations Framework Convention on Climate Change (UNFCCC), Turkey has promised to take the necessary steps for promoting renewable energy, while reducing their greenhouse gas emissions. Turkey is also a founding member of the International Renewable Energy Agency. Whether the required actions have been taken by now in regards to all the promises that were made is up to debate. Ac-

ording to the Fourth Biennial Report of Turkey, dated 2019 December, Turkey's Greenhouse Gas Emissions have increased more than 30% between 2010-2017, which accelerated between 2015-2017.

However, Turkey is making the necessary investments for its hydropower; its geothermal potential is highest in Europe and seventh in the world. However, there is only 71MW of solar capacity in Turkey, necessary steps are being taken to reach a total capacity of 600 MW. There is also talks about building the world's largest solar plants in the south of Turkey that could have a capacity of 3-4 GW's. Furthermore, according to the Minister of Energy, Turkey needs to invest 12 billion USD in the renewable energy sector in the short term. And according to the World Bank, the investment required for the long run could go as high as around 130 billion USD. This kind of investment can be harder to get overtime if the country's economy does not go into a boom in the upcoming years, making it more attractive and risk-free for potential investors.

In conclusion, Turkey has regulated the necessary incentives and created a chance for a competitive market to be established and for the required investments to be made to renewable energy establishments in Turkey. However, the country is still not making the radical changes to its energy policy required for it to take down its Greenhouse Gas Emissions in the short time it has left and lastly, there need to be swift changes in Turkey's economy for it to become a hot spot for investors in the years to come for it to have a hope in reaching its goals and making the world a better place to live in.

For more information, check out Gokce Mete and Raphael Heffron's "Renewable Energy Law and Policy in Turkey"!

Canberk Taze

Military News From Eastern Mediterranean

For far too long, since the late 1990s, the Turkish Navy had desires to augment its surface fleet with amphibious assault ships consisting of large flight decks. Today, one of Turkey's most ambitious and expensive defense programs is coming near completion. TCG Anadolu, the Navy's future flagship with a length of 230 meters and 32 meters of width, has completed its main propulsion and drive system integration on the 1st of February. The ship will now undertake harbor tests followed by sensor and armament integrations.



Although often portrayed by media as an "aircraft carrier," this vessel is a multi-purpose amphibious assault ship that can be fitted with various configurations, including fixed-wing aircraft such as the F-35B or the legacy AV-8B Harrier in addition to a combination of attack and medium utility helicopters with a 990 m² aviation hangar below the flight deck. With a displacement of over 27,000 tones and a 1400 m² cargo bay, the ship will also carry 13 main battle tanks and 27 amphibious assault vehicles. But so far, what you just heard are only numbers. When ready to be accepted by the Navy with full operational capability, one major problem awaits TCG Anadolu.

Initially, when the contract was awarded to a joint consortium of Sedef Shipyards and Spain's Navantia, the preliminary design did not include a ski-jump flight deck, which is the ramp curved upwards at the front of the ship, used to launch combat aircraft. But on late months of 2016s amid the developments in Eastern Mediterranean and Turkish forward basing posture expansion towards Africa and the Gulf, the Navy has decided to amend the contract and go back to the original Spanish design to include a ski-jump with a declared requirement to have a fixed air wing stationed on TCG Anadolu. And although there were no official memos submitted to United States government at the time, the director of the F-35 Joint Strike Fighter Program at Lockheed Martin, a US naval officer made remarks on social media that they were having talks with the Turkish Navy for the acquisition of STOVL variant of the fifth-generation plane, the F-35B that would be able to take off and land at TCG Anadolu. The problem is, of course, in 2019, Turkey

was removed from the F-35 program. And once the ship is ready for service, it will lack a fundamental force multiplier that nowadays the Turkish Navy is in dire need of.



Because the ship was built on NATO standards and had a ski-jump ramp instead of a conventional arresting system (CATOBAR) for aircraft such as F-18 Hornet or the Russian Mig-29K, there is only one alternative platform left for Turkish authorities to think of and that is the AV-8B Harrier which we are familiar with from Hollywood movies. As much as this is an aviation legend for being the first aircraft that can take-off and land vertically like a helicopter, it has also become a 35-years old plane with a high-ratio of flight accidents due to its aging engine. But still, it instead seems like the only viable option until the political problems between two allies remain unsolved.

In the meantime, existing national aircraft projects such as Hürjet or TF-X can be expanded to have naval variants, but this will also require significant adjustments to the flight deck of TCG Anadolu which would be both

very expensive and take so much time that would not be optimal to meet the medium to long term need of the Turkish Navy. And with the TF-2000 class destroyers and İ-class frigates not even near completion, when completed, TCG Anadolu will need a significant aerial capability to protect itself until the projects mentioned above are completed to provide escort.

Now looking beyond our horizon, there is another naval development that occurred concerning the Eastern Mediterranean. Egypt has become a customer for a French/Italian-made FREMM-class modern frigate initially built for Italy. Italy decided to cut the number of frigates of this kind, Egyptian authorities sat to table with Italy to negotiate a sale. As we have talked about this class of frigate earlier in our previous issue, these are robust and modern frigates able to provide a sufficient anti-air capability that can put Operation Mediterranean Shield's aerial arm at risk by harassing and locking-on Turkish aerial surveillance and patrol missions.

European defense journals report that the Egyptian Navy is 'very close' to purchase the ship from its Italian shipbuilder. As a platform designed and produced jointly by Italy and France, Paris has become one of the primary suppliers of the Egyptian Navy. Although Macron administration had reluctant views on Egyptian government citing human rights violations, amid Turkish efforts in Eastern Mediterranean, France and Egypt had opened a new page in their relations, especially on regional issues to counter Turkish activities in the region.

Ercan Emre Çelik

Possible Blockade of Hormuz Strait and Its Effects on Energy Market

Hormuz Strait is one of the essential chokepoints in the world. It provides passage for six country's exports to the world (Iraq, Iran, Bahrain, Qatar, UAE, and Saudi Arabia), especially in the energy market. Approximately %30 of globally consumed petroleum passes through the strait. Hence, it holds great importance for the world economy, and it is a natural target for Iran when there are threats against their will. Tehran has made similar declarations about closing the narrow Strait of Hormuz over the past 40 years (since Britain's withdrawal of its military forces from the Gulf back in December 1971), whenever it has felt threatened.

As it occurred in the past, killing of Qasem Soleimani by U.S. strike in Baghdad and the developments that took place after the incident, once again turned Iran's attention to Hormuz Strait, for possible retaliation. Trump's call for extended sanctions & embargoes over Iran was hinged to a thwart towards Iran's oil export. Even this implication itself is enough for Iran to threaten the Hormuz Strait despite severe consequences for themselves. Such a move would push international oil markets into considerable turmoil.

First, as the result of the blockade, higher crude prices would likely similarly affect everyone, even with a release of IEA strategic stocks. If it lasts long enough, the crisis and high oil prices would have a dumping effect on global energy consumption and could result in a worldwide economic slowdown. Because typically, when volatility increases in the oil market, OPEC (and its leader Saudi Arabia) steps in, uses its spare capacity, and avoids any hard swings at prices to protect both sides. However, with a blockade or severe limitation in traffic in the Strait of Hormuz, Saudi Arabia's ability to release its spare capacity to the market would be significantly impeded, if not disabled



altogether. Moreover, because of sanctions, countries like Venezuela and Iran (countries with vast spare capacity) cannot step in either. This sudden power vacuum in the oil market leaves only two countries to take responsibility: the USA and Russia. When it comes to the USA, crude production is led by private companies, meaning that the market dictates it. Additionally, crude quality around the world is not the same everywhere. For example, the U.S. shale is lower in density (lighter) and sweeter (includes less sulfur). Hence, it cannot immediately act as a substitute.

Only and the right option to take action is Russia. They already produce a crude that can be a substitute for Saudi oil, and an agreement that stipulates production cut with OPEC was signed to prevent oil prices from falling too low in a high-supply environment. The status quo was already unnerving for Russian oil companies so that they would agree to increase their productions. Besides, Russia signaled it would be able to provide additional supplies after the attack on the Saudi Arabian oil facilities (2019 Abqaiq – Khurais Attack) late

last year, which sets an example for their readiness to fill in the gap because it is quite beneficial for them if they choose to do so. Russia would be ahead of the game in terms of both actual revenues and terms of geopolitical influence. Moreover, it is a fact that crude is traded in U.S. dollars, the currency that Russia thoroughly needs. Thus, higher prices and production would alleviate the burden over the Russian budget after the U.S.-imposed sanctions on Russian financial institutions.

Overall, just as it wasn't blocked in many Iranian threats over political conflicts over the years, Strait of Hormuz seems to stay open for now, but blockade is always a possibility. Therefore, it is crucial to think through the potential effects that a blockade could have not only on pricing or availability of crude but also on the geopolitical power transfer to a player like Russia—which is already seen as strategic and diplomatic beneficiary of the U.S.-Iran conflict as well as the forced departure of U.S. forces from Iraq.

Yiğit Mert Yürekliürk

BRENT OIL	54.38 \$/BL	GASOLINE	6.79 ₺/LT
USD/TRY	5.98	DIESEL	6.40 ₺/LT
EUR/TRY	6.56	FUEL OIL	3.90 ₺

From OPEC's Markets Towards New Realities



An analysis of OPEC's situation reveals quite a few crucial details about its structure. Even one of the essential aims of the cartel, limiting depletion rates, is being cheated on by a vast majority of its members. Ensuring long-term domination over the markets would require the members to comply with this rule. On the production quotas side, a large share of its members also seems to be giving false numbers on their reports or simply outmaneuvering the cycle by increasing their production numbers before the general meetings of the institution.

A counter-argument is raised, concerning these practices, stating that OPEC takes into account the potential behavior of its members and factors in the estimated margin of non-compliance into its rate decisions. The cornerstone of OPEC is, however, undoubtedly Saudi Arabia. With its vast oil reserves and slightly relaxed domestic budget constraints, Saudi Arabia can easily comply with mandates of the institution and also steer the direction of its decisions by its power on the markets. Being able to increase or decrease production in large quantities gives Saudi Arabia extensive leverage as it can enjoy the status of being a swing producer. Adjusting to the market conditions in relatively short notice and responding with large quantities creates substantial implications in the global marketplace.

On the demand side, most analysts are aware of OPEC's inability to operate jointly and flexibly state that OPEC is an excellent platform for observing Saudi Arabia's actions and future an-

icipations. Being well aware of this, Saudi Arabia withholds the status of OPEC, as the institution's market arm is indirectly controlled by itself even though most other members vaguely freeride on the benefits of the institutions' political implications and remain non-compliant with the economic decisions.

Having seen the age of oil under OPEC and the climate risks that a fossil fuel-based economy create, the clean energy push that gained significant traction in early 2000s started to differentiate within itself as the internal dynamics dictated some countries to be superior to others in terms of geography. In contrast, others pushed for technological developments to make-up for the geographical limitations present. In some countries like Germany, public perception also had a significant say in the formation of new energy policies.

The term clean energy brings up the image of solar and wind in the minds of many in Europe while nuclear, hydro, geothermal, and Carbon Capture and Storage (CCS) systems also join the list in other parts of the world. The difference in the implementation rests in the power of veto players present in one's internal state system. The more access points there are, which create multiple gates and gatekeepers, the more likely that there will be resistance for change within a system, and preserving the status quo would prevail as the outcome. It can be observed from multiple governing regime examples that authoritarian ones are swifter and more flexible in their approach for policy changes. In contrast, demo-

cratic ones are slower and have much more red tape to deal with.

While it can be inferred that technocratic terms and stricter regime policies will dictate the age of renewables, a parallel reality is also being charted. Natural gas, which is being promoted as the cleanest of the fossil fuels and an ideal candidate for the transition period, is gaining prominence as a prime source of energy that is also becoming liberalized in its market dynamics. The oil sector, on the other hand, is counting on the increasing future demand for petrochemicals to drive its growth engine, and oil companies are already consolidating their operations by combining both their upstream and downstream businesses. Saudi Aramco's purchase of a %30 stake in India's Reliance Industries is a good example, and their expansion strategy for SABIC is another indicator. The U.S. is making considerable investments in its downstream sector worth around \$200 billion, according to American Chemistry Council, and Russia is expanding the number of gas pipelines it has with Europe and China as it seeks to increase its political advantage over these regions.

All 3 of these countries have different political structures with diverse domestic dynamics, and it would be hard to interpret whether these new policies would fall in line with either preserving the status quo of fossil fuel dominated markets or instead being innovative in shifting the existing markets elsewhere through their robust approaches.

Is 100% Renewable Energy Possible for Turkey?



With the Paris agreement signed in 2015 and has entered the force on 5th November 2016, a significant amount of countries have fastened their renewable energy projects. So renewable and green energy process has been privileged on energy politics. As a pioneer, Scotland is almost ready to generate its energy from renewable sources with 100%. 76% of Scotland's electricity has been provided by green energy so far. Because Scotland has almost stopped using fossil fuels, unlike many countries and stopped using coal in 2016, 100% renewable energy policy is nearly done. In Norway, energy need is mostly supplied by hydropower since the end of the 1800s. Every year, Norway has been enhancing its hydropower, wind power, and solar energy facilities. Thus, at the end of 2020, Norway will have the largest wind power facility, which nearly doubles Norway's installed capacity. Recent studies show that 100% of green energy is possible even for the US.

Turkey counterbalances the highest average energy demand growth among OECD countries. In the last 15 years, Turkey was able to produce its 25% of energy need. Because of that, Turkey has been importing 98% of natural gas, 92% of oil, and 50% of coal need. It is expected for Turkey that in a decade, Turkey's

energy requires will be doubled. For both green energy policy and external independence, Turkey can easily gravitate toward renewable energy sources. Thanks to its geographic location, Turkey can use several renewable energy sources highly effective. According to experts, Turkey is considered to have the strictest local content requirements for renewables of any country in the world.

Turkey has an overall natural hydropower potential of 1.1% of the world and 14% of Europe's potential. Even though 65-70% of its potential is technically possible, hydropower is a great opportunity for Turkey's energy needs. Also, Turkey can use solar energy to satisfy its demand since the potential of solar energy in Turkey is determined as 200% of electricity demand in Turkey. Moreover, again its geographic location, Turkey, is high on different pressure systems. With the effect of these winds, Turkey can quickly produce wind energy by building wind turbines across the country. With the potential of wind energy, Turkey can supply its energy needs by 20 to 40%. Although 43% of installed wind turbines are in the Aegean Region, a high percentage of Turkey has the potential to produce a high amount of wind energy. Apart from these sources, as a return of location, Turkey has a tremendous geothermal

energy potential, which mostly located at Aegean and Central Anatolian Region with the amount of 4,5 GW. Besides, It is estimated that the biomass potential in Turkey is about 8,6 million tonnes of equivalent petrol (MTEP), and biogas quantities that can be produced from biomass are 1,5-2 MTEP.

According to TEİAŞ, Turkey produces 28% of its electricity demand from renewable sources. So far, steps have been sufficient to achieve energy targets in 2023, which was targeted at 30% of total demand. Turkey had 42 GW of installed renewable power, and this is expected to increase by 50% in 2019-2024. With this capacity, Turkey would become 11th of the highest renewable-based capacity in the world. However, it is still below the growing energy demand of Turkey. As it is observable, 100% renewable energy is not a figment, especially for Turkey having great potential with various options. Turkey must give more weight to generate and usage of renewable energy and invest in these facilities. By using its potential, Turkey can pursue towards Paris Agreement, protect the nature of the world, increase its economic growth, and decrease its extreme external dependence related to energy.

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