IICEC | SABANCI UNIVERSITY ISTANBUL INTERNATIONAL CENTER FOR ENERGY AND CLIMATE | NEWSLETTER

IICEC Energy Market Newsletter October 2, 2020 No:15

TPAO Announced Largest-Ever Gas Discovery in Black Sea

4


Dr. Fatih Birol

Dr. Birol: Discovery Would Help Turkey Reduce its Gas Import Bill

Turkey's offshore natural gas discovery of 320 bcm in the Black Sea is worth $80 billion in line with current price trends, Dr. Fatih Birol, the IEA's Executive Director and IICEC's Honorary Board Chairman told Anadolu Agency.

6

WIND

Global Offshore Wind Capacity Peaked in 2019: GWEC

12

SOLAR

Turkey's First Integrated Solar Panel Factory Opened in Ankara

15

VIEWPOINT BY AHMET EREN

Ahmet Eren

The Process of Liberalization in the Energy Market

3

Monthly Highlights

VIEWPOINT BY AHMET EREN

The Process of Liberalization in the Energy Market

Ahmet Eren

Although reforms have been going on in the energy sector since the 1980s, the breaking point is the year 2001. As a prerequisite to standby agreements with IMF, energy was among the sectors to be restructured. It is unfortunate that the change came about not out of our own accord, but under pressure from international finance institutions. Among the 15 "Derviş" laws enacted within just 15 days were two that targeted the liberalization and reorganization of the energy sector: the Electricity Market Law numbered 4628, and the Natural Gas Market Law numbered 4646. These laws were then joined by the Petroleum Market Law numbered 5015 and LPG Market Law numbered 5307.

All laws were aiming at the liberalization of the energy market, creating a competitive market structure and opening it to the private sector, and at eliminating the state as an actor in the energy sector, giving it the role of regulator and supervisor that ensures smooth operation of the market. One consequence of the Electricity Market Law numbered 4628 was the establishment of the Energy Market Regulatory Authority; an institution that was independent in budget and decision-making, tasked with oversight into system entry and exit, and building a competitive market structure. Among the priorities of EMRA were not only directing and supervising the market, but also creating a sustainable and rational market in the first place. One other reason for the reform was to harmonize Turkey's energy market with the Acquis Communautaire of the EU.

The Electricity Market Law not only required the establishment of an independent regulatory authority, but also that the public sector stopped investing in electricity generation, and privatized its existing generation and distribution portfolio at once to cease being a player.

While EMRA worked to build a predictable energy market, the Privatization Authority implemented restructuring programs and successfully completed the privatization of generation and distribution/retail companies that were public enterprises.

The Market as Envisioned

The envisioned market was free from public monopolies; production and distribution had been restructured through privatization, liberalization had been completed, appropriate regulatory measures had been taken, and an independent authority (EMRA) to ensure all of the above had been established.

Accordingly, energy prices would be set based on cost; there would be no cross-subsidies and consumers would be free to choose their suppliers; prices would be set by contracts and intraday or day-ahead markets, and the public authority would not interfere in price setting. The same vision would rule the petroleum and natural gas markets.

The competitive market thus achieved led to the private sector investing more than 120 billion dollars in the energy sector over 17 years, including privatization fees.

The Current State

There is a backtrack from the decision to base energy prices on cost. End-user tariffs are not increased in parallel to the current levels despite increases in cost. The public intervenes in free pricing in a liberal market via institutions such as BOTAŞ, EÜAŞ and others. Legislative changes and de facto situations have reduced the independence and power of EMRA.

Purchase-guaranteed projects (Nuclear, BOO, BOT, guarantees for coal-fired plants using domestic coal), and non-competitive practices like YEKDEM have created additional system costs. Additional financial liabilities imposed on plants burning imported coal have robbed these plants of their competitive strength. Such measures by the public have reduced predictability and the security of the feasibility of any investment.

Conclusion

Previously, free market dynamics as implemented had finally solved Turkey's security of supply issues in electricity once and for all, and had created excess capacity.

If we are to stray from a free and competitive market, the private sector would not only stop future investments, but head for the nearest exit. This in turn would drive consumer prices up, or, if this were to be subsidized through public funding, result in great budget deficits and its consequences.

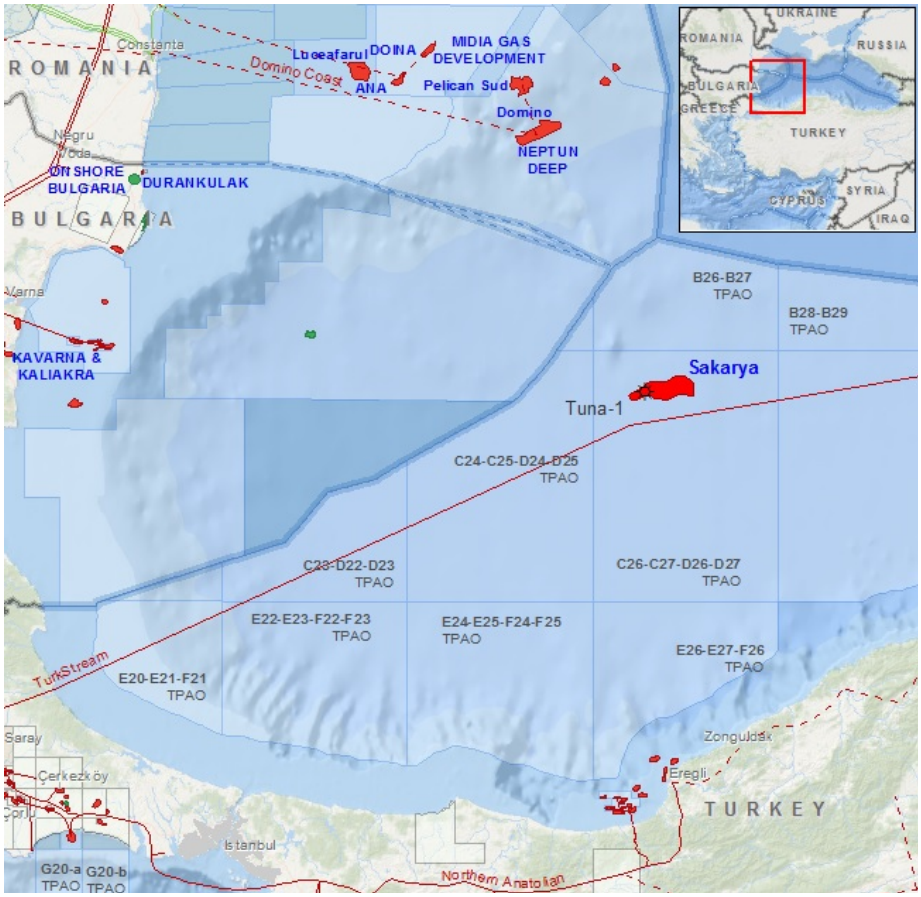
It must not be forgotten that publicly-subsidized cheap energy is a major cause of wasted energy.

TPAO Announced Largest-Ever Gas Discovery in Black Sea

Turkey has made a major gas discovery in its sector of the Black Sea with the Tuna-1 well, which is estimated to hold 320 billion cubic meters (bcm), or 11.3 trillion cubic feet, of dry gas, Turkish President Recep Tayyip Erdogan announced on August 21. President Erdogan said he was targeting 2023, the centennial year of the Turkish Republic's foundation, to bring the gas to "the service of the people." "We have finished our studies. There are indications that there can be other reserves so that reserves could increase. We have many licenses for further exploration and discovery. Sakarya was the first, and we hope more will follow," he said.

Energy and Natural Resources Minister Fatih Dönmez also described the discovery as a 'milestone' for Turkey, emphasizing state-owned oil producer TPAO (Turkish Petroleum Corporation) discovered this gas reserve at the 9th deep-water drilling, only 14 months of detailed seismic exploration in a region covering almost 2,000 square kilometers. "We will continue seismic explorations in an additional area of 6,000 square kilometers," Dönmez said, adding that new wells would be drilled in the Sakarya field.

Having conducted six failed deep-water drilling through partnerships with international companies in the Black Sea since 2004, Dönmez underlined that TPAO had gained extensive knowledge and experience in recent years, and Turkey will continue its drilling and seismic studies through its own means. "Probably, an international tender will be held for the construction of the required pipeline. But the operation will be fully managed by Turkish



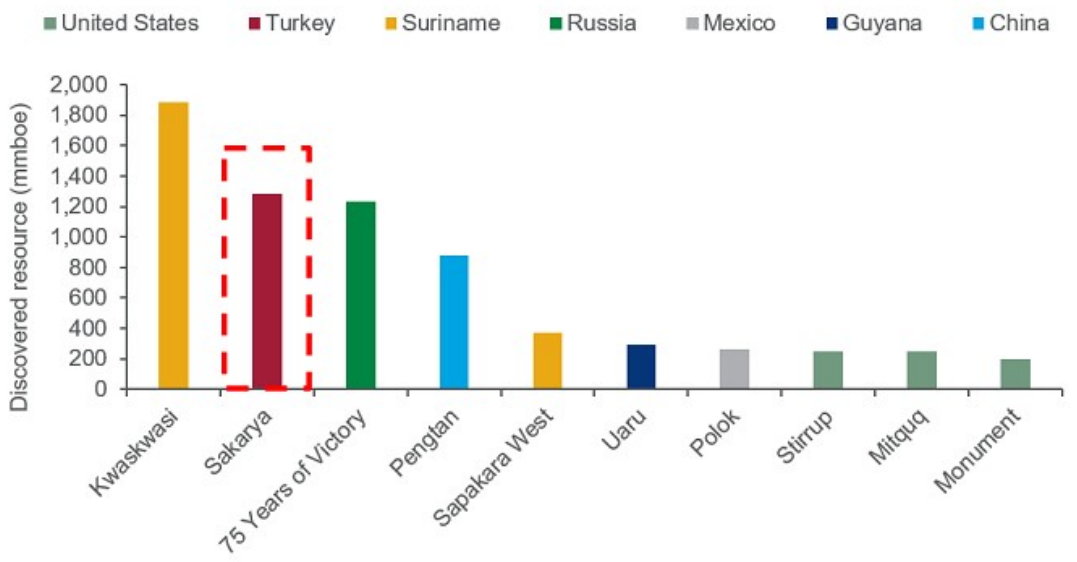
***Map** – Tuna-1 well's location in western Black Sea* [1]

[1] Wood MacKenzie, (August 24, 2020) Turkish delight at giant deepwater Black Sea gas discovery

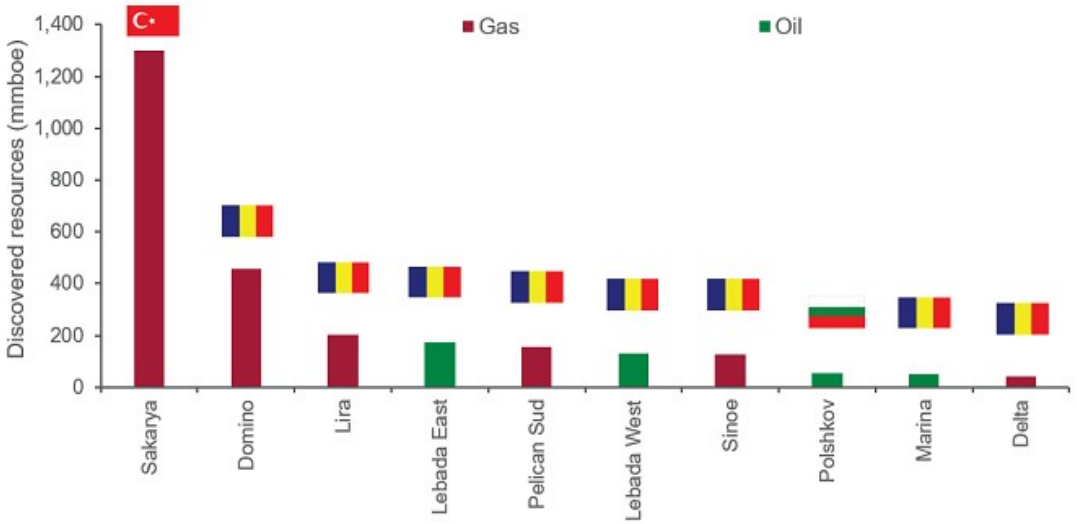
Petroleum," Minister Dönmez explained during his interview on state broadcaster TRT Haber on the following day of the discovery announcement. This is Turkey's largest-ever find in its history and the second-biggest globally in 2020 so far.

The Tuna-1 well is located off the mouth of the Danube block at the crossroads between the Bulgarian and Romanian maritime borders within Turkey's inland waters. The drilling in Tuna-1 was started on July 20 with 6th generation drillship Fatih in Block AR/TPO/KD/C26-C27-D26-D27, in which TPAO has 100% equity. According to TPAO's press release, the well is drilled to 1,415 meters under the seabed, at a water depth of 2,115 meters, making the total depth 3,530 meters. The well encountered more than 100 meters of a natural gas-bearing reservoir in Pliocene and Miocene sands. Drilling will continue to a final total depth of 4,525 meters to look for possible reserves in further layers.

The Black Sea has been a deep-water exploration hotspot in Europe, where



***Graphic 1** – Top 10 global oil and gas discoveries in 2020* [2]



***Graphic 2** – Top 10 oil and gas discoveries to date in Black Sea* [3]

various international oil companies have eyed its potential in recent years. Following ExxonMobil's giant Domino gas discovery in Neptun Deep block offshore Romania in 2012, and Polshkov oil discovery offshore Bulgaria in 2016, a series of ultra-deep-water wells were drilled in the region since 2017.

After discovering gas presence at the Ayazlı-1 well in Akçakoca offshore in 2004, TPAO's seismic and drilling activities in the western Black Sea increased in cooperation with international oil companies. Deepwater drillings started with the HPX-1 well in 2006 in the eastern Black Sea by BP, but the company abandoned the drilling venture and transferred its license to TPAO. This well was followed by Sinop-1 under the partnership of TPAO-Petrobras-ExxonMobil, Yassıhöyük-1 in 2010 (TPAO-Chevron), Sürmene-1 in 2011 (TPAO), Kastamonu-1 (TPAO-ExxonMobil), and Istranca-1 in 2012 (TPAO). All of those wells except Istranca-1 came out dry.

[2] Wood MacKenzie, (August 24, 2020) Turkish delight at giant deepwater Black Sea gas discovery
[3] Wood MacKenzie, (August 24, 2020) Turkish delight at giant deepwater Black Sea gas discovery

Minister Dönmez: Turkey May Report More Good News in Two Months

Minister of Energy and Natural Resources Fatih Dönmez said that more "good news" may come in two months in the Black Sea region, highlighting new discoveries' potential.

"It is highly probable that we will make new discoveries in the layers below the discovery area. New good news may come in two months," Fatih Dönmez said in an interview with TV. Minister Dönmez also said that the gas production from the wells drilled in Tuna-1 field would be achieved in 2023. He said work had been conducted only in a quarter of the 8,000 square kilometer area of the well, adding that discoveries may occur in similar structures.

Minister Dönmez revealed that Turkey's other drilling vessel Kanuni will be in the Black Sea until the end of this year, and the vessel is scheduled to drill nearly 40


Fatih Dönmez

wells at that point to expand the reserves.

Fatih Dönmez underlined that the seismic data is evaluated both in the Black Sea and the Mediterranean Sea for further drillings. Emphasizing that drilling activities will continue in the Eastern Mediterranean's potential regions, Dönmez said Turkey has the chance to explore not only natural gas but also oil. “There are points in the same field where oil and natural gas are produced. Our expectation looks like gas, but this will become clear according to the drilling to be made." he added.

Dr. Birol: Discovery Would Help Turkey Reduce its Gas Import Bill

Turkey's offshore natural gas discovery of 320 bcm in the Black Sea is worth $80 billion in line with current price trends, Dr. Fatih Birol, the IEA's Executive Director and IICEC's Honorary Board Chairman told Anadolu Agency. [4]

Dr. Birol said the latest discovery is considered a "giant" exploration in international terms and, by comparison, is equal to all Norway's discoveries in the North Sea since 2010. He stressed Turkey's discoveries' importance, a country that is 99% dependent on gas imports, highlighting that it would help Turkey reduce its current account deficit and natural gas import bill.

According to Dr. Birol, an investment of approximately $6 billion is necessary to initiate production from the Tuna-1 field, which is targeted for 2023. "This will help Turkey reduce its import bill, but it does not

Dr. Fatih Birol

totally solve its trade deficit problems." Dr. Birol said. He also noted that Turkey could avail of cooperation negotiations with oil service and engineering companies, as many have seen significant layoffs in the oil and gas industry, which has suffered from a 50% year-on-year drop in investments in 2020.

"Thousands of people working in oil service and engineering companies are unemployed, as there is no investment in this field. Thus, Turkey's discovery came at a very good time as Turkey will be in an a very strong negotiating position with these oil and gas service companies," Dr. Birol revealed.

[4] Anadolu Agency, (August 24, 2020) Turkey's giant gas find worth $80 billion: IEA Head

Natural Gas Discovery in Black Sea Will Make a Significant Contribution to Turkey's Energy Goals

Sabancı University Istanbul International Energy and Climate Center (IICEC) has shared its views on Turkey's natural gas discovery. IICEC's Research Director Bora Şekip Güray stated that, "as a result of intensive work and important steps taken by the Ministry of Energy and Natural Resources in recent years, the Fatih drilling ship had discovered 320 billion cubic meters (bcm) of natural gas reserves in the Black Sea, which would make a significant contribution to the more secure, competitive and sustainable growth of the Turkish energy sector."

Güray stated that this important discovery that has been the lucrative result of Turkey's technology-oriented exploration and production efforts will be instrumental in finding new reserves in the future. Güray also underscored that this development would


Bora Şekip Güray

strengthen Turkey's negotiation power in its gas import negotiations over the next few years. Güray emphasized that natural gas plays a key role in the energy sector, in electricity generation, many industrial sectors and heating in buildings and that the benefit to be provided by increasing domestic production in the natural gas supply through this discovery and future discoveries would be very important for Turkey. It will reduce the current account deficit stemming from energy imports and strengthen Turkey's energy security.

"Outlook for Global Energy and Climate Trends Post-Covid-19" Discussed by Dr. Fatih Birol at the MITei Energy Colloquium

IEA Executive Director Fatih Birol was the featured speaker at a colloquium hosted by the MIT Energy Institute Energy Initiative (MITei) discussing how the Covid-19 pandemic and current global economic turmoil are affecting global energy markets and their prospects in the years to come (15 September 2020).

Dr. Birol explained how to use more cost-effective clean energy technologies to fight climate change. He also pointed out that we needed multidimensional solutions to address the rapidly evolving clean energy and energy security challenges. Birol started by touching upon the ongoing Covid-19 pandemic and said that 2020 has been a grim year due to the pandemic, however, he

stated that there are grounds for optimism for clean energy despite the global economic contraction. Birol summarized five major issues:

- Solar PV and offshore wind costs are dropping across the globe. Solar PV is likely to soon become the cheapest source of new power generation.
- Today's crisis means interest rates will stay lower for longer: Ultra-low interest rates will increase energy investment, including clean energy investments.
- More governments are supporting clean energy programs with a variety of incentives and energy companies are incorporating clean energy transitions into their long-term strategies. Besides government support and falling clean energy costs, shareholders are also supporting clean energy

progress.

- Oil and gas companies are expanding into clean energy taking advantage of their engineering expertise, investment savvy and capacity to finance large projects.
- Other costs besides wind and solar PV are going down. Innovation is driving down the costs of batteries, electrolyzers and a variety of other emerging clean energy technologies.

Birol also pointed out the vast renewable resources at all latitudes (for example, wind in Northern Europe and solar PV further south). Straddling the equator, Africa has the highest level of solar radiation but hardly any installed solar PV capacity, only 5 GW, about equal to the Netherland's. But Birol said that African countries are now giving this a priority in comparison to a few years back. Another concern raised by Birol is the lack of focus on existing infrastructure: "We have a huge existing infrastructure; power plants, iron and steel plants, aluminum and cement factories (that are mainly in developing Asia) which are very young and emitting a big chunk of emissions. If they were to operate in line with their economic needs and their economic lifetime, reaching at currently set climate goals is almost impossible even if whatever built right now is completely clean - emitting zero carbon."

During the Colloquium Q&A, Dr. Birol touched on several matters, such as CCUS, carbon pricing, nuclear energy, and hydrogen saying:

- CCUS is very critical because it is a balancing technology. The cost is still too high but there is potential to bring it down. CCUS applications include, not just power plants but also heavy industry.
- Pricing carbon is an effective climate policy but, outside some EU countries, it is not yet a plausible option in countries such as China, India etc.
- Nuclear energy should not be ignored no matter what the current perception is. After hydropower, nuclear is the second largest clean energy source in the world. Flexibility and dispatchability provided by nuclear power plants cannot be replaced by other alternatives as easily as it is thought. Small modular reactors (SMR's) would be more flexible and less risky to customers and new manufacturing technologies may allow them to be produced efficiently in factories so the installed SMR has a competitive levelized cost of energy.
- Hydrogen is likely to be an important part of our clean energy future. However, there should be an orderly transition; not be from one day to another with uncoordinated efforts.


Dr. Fatih Birol

Despite the difficulties caused by the Covid-19 crisis, several recent developments give us grounds for increasing optimism about the world's ability to accelerate clean energy transitions and reach its energy and climate goals. Still, major issues remain. This new IEA report not only shows the scale of the challenge but also offers vital guidance for overcoming it.

Dr Fatih Birol, IEA Executive Director

Still, major issues remain. This new IEA report not only shows the scale of the challenge but also offers vital guidance for overcoming it. Solar is leading renewables to new heights in markets across the globe, ultralow interest rates can help finance a growing number of clean energy projects, more governments and companies are throwing their weight behind these critical technologies, and all-important energy innovation may be about to take off.

Dr Fatih Birol, IEA Executive Director

More and more governments around the world are backing clean energy technologies as part of their economic recovery plans in response to the Covid-19 crisis – as was made clear by many of the 40 Ministers who attended the IEA Clean Energy Transitions Summit on 9 July 2020.

Dr Fatih Birol, IEA Executive Director

New Flagship Publication of the IEA: Energy Technology Perspectives (ETP 2020)

WHITHER GLOBE IN ENERGY TECHNOLOGIES?

The International Energy Agency (IEA) released another important publication on energy technology, Energy Technology Perspectives 2020, conveying the urgent need to develop and deploy clean energy technologies to meet international energy and climate goals. Although the COP21 agreement was a step forward, it will not be enough to put the world on a "2°C path." More progress in clean energy innovation towards net-zero emissions is needed.

ETP2020 provides an assessment of emissions from existing infrastructure and what can be done to address them. Absent new investment in new fossil fuels, emissions from the global energy system would begin to decline, but the decline would take time as seen in Figure 1.

Cumulative emissions from existing energy infrastructure would reach nearly 750 $GtCO_2$ by 2070 if operated under normal conditions. This would exhaust the bulk of the remaining CO2 budget that is estimated to be compatible with limiting the global temperature rise to "well below 2°C". The ETP Sustainable Development Scenario sets out the major changes that would be required to keep temperatures below a 2°C increase identifying the technologies that are needed to tackle emissions in all parts of the energy sector.

As the power sector alone can only get one-third of the way to the necessary emission reductions; the report highlights the need for greater efforts in other key sectors such as transport, buildings and industry.

Energy sector transition to net-zero CO2 emissions of the kind depicted

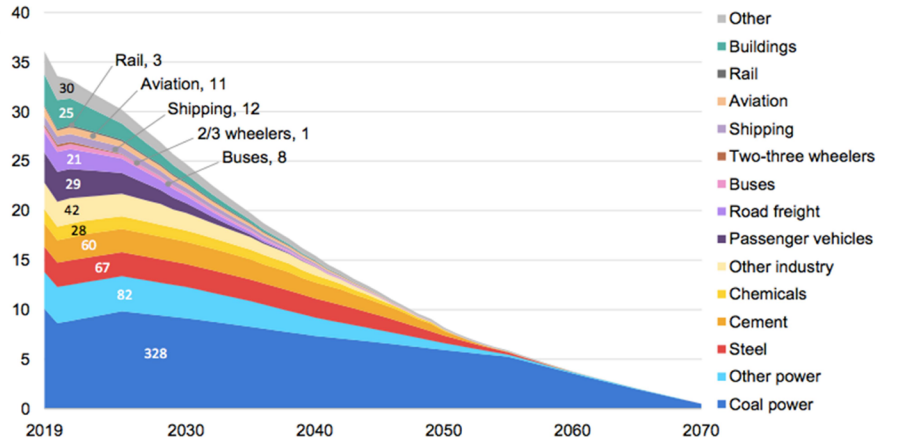


Figure 1: *Global CO2 emissions from existing energy infrastructure by sub-sector, 2019-2070. (ETP2020)*

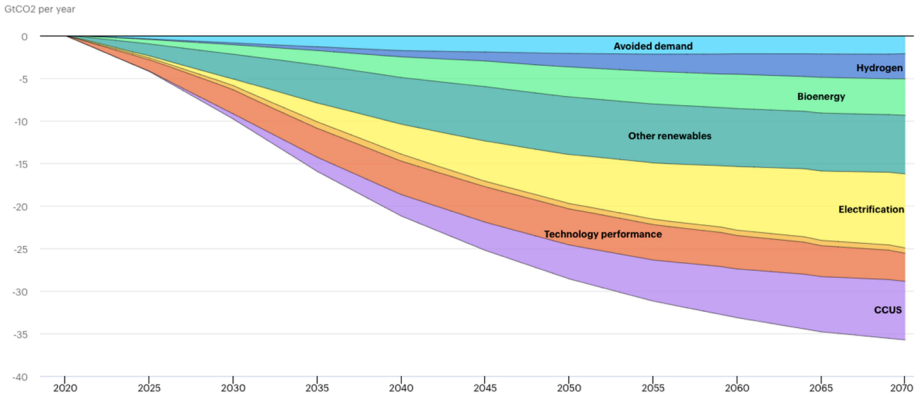


Figure 2: *Global energy sector CO2 emissions reductions by measure in the Sustainable Development Scenario* [5]

in the Sustainable Development Scenario requires a radical technological transformation of the energy sector. While energy efficiency and renewables are central pillars, additional technologies are needed to achieve net-zero emissions. Four technology pathways contribute about half of the cumulative CO2 savings: 1) technologies that electrify end-use sectors; 2) carbon capture, utilization and storage; 3) hydrogen; and 4) bioenergy. The report also details the amount of emissions reductions that are required from these pathways (Figure 2).

Although spreading the use of electricity into more parts of the economy is the single largest contributor to reaching net-zero emissions, it is also stated that electricity cannot decarbonize entire economies alone and that hydrogen is needed as another clean energy carrier. The report says that "hydrogen is expected to play a large and varied role in helping the world reach net-zero emissions."

[5] Relative to the Stated Policies Scenario, https://www.iea.org/reports/energy-technology-perspectives-2020/technology-needs-for-net-zero-emissions#abstract

Hydrogen Towards Resource and Technology Independence

The webinar entitled "Turkey's Hydrogen Economy" was organized by the Sabancı University Istanbul International Center for Energy and Climate (IICEC) with the participation of Dr.Emre Gençer, Research Scientist at MIT Energy Initiative, Prof.Dr.İskender Gökalp from the Middle East Technical University's Department of Mechanical Engineering, and Yaşar Arslan, Chairman of GAZBİR (Natural Gas Distribution Companies Association of Turkey).

Sabancı University Istanbul International Center for Energy and Climate (IICEC) organized 4th event within its webinar series on "Turkey's Hydrogen Economy" on September 24. During the panel, which was moderated by Barış Sanlı, Researcher at Bilkent University's Energy Policy Research Center, GAZBİR Chairman Yaşar Arslan, Prof.Dr.İskender Gökalp from METU and ICARE-CNRS in France and Dr.Emre Gençer from MIT Energy Initiative shared their knowledge and views on leading technical and strategic dimensions of hydrogen energy and discussed the key elements of a roadmap on hydrogen technology both in Turkey and in theworld.

IICEC Research Director Bora Şekip Güray hosted the event and made the closing remarks.

"We succeeded in mixing 10 percent of hydrogen with natural gas"

Giving information on GAZBİR's studies on the injection of hydrogen into the natural gas distribution network and the test center in Konya, Yaşar Arslan stated that they have also completed the combustion tests in various pressures and volumes regarding hydrogen-injected natural gas. Sharing his evaluations regarding the steps to be taken within the legal and regulatory framework in this field, Arslan also said that an incentive model similar to YEKA, which was implemented in renewable energy, can increase hydrogen supply opportunities.

"Perspective of independence in energy resources and technologies"

Providing information about his laboratory studies in this field both at METU and in France, Prof.Dr.İskender Gökalp shared his views on hydrogen production within the scope of Turkey's lignite resources as well as its wind and solar potential. Saying that the energy system perspective and system safety issues should also be handled meticulously, Prof.Gökalp drew attention to the importance of increasing cooperation among universities and industrial cooperations in hydrogen technologies.

Dr.Emre Gençer stated that hydrogen, which was firstly mentioned in Jules Verne's novel 'Mysterious Island' in 1874, has become one of the leading energy technology issues globally today and is expected to play a key role in combating global climate change.

"Turkey can become not only a producer, but also an exporter in hydrogen"

Emphasizing the importance of hydrogen in reducing the global carbon footprint, Dr.Gençer pointed out that hydrogen can provide significant gains in many areas from industry to transportation as a supporter of low-carbon power generation. Giving some examples from important projects recently developed in this field in Europe, Dr.Gençer said that he believes that Turkey can become not only a hydrogen producer, but also a regional exporter.

"Can Turkey become a Hydrogen Hub?"

Barış Sanlı stated that a holistic approach from hydrogen production to all system details should compose the major elements of Turkey's hydrogen strategy and roadmap, and Turkey can discuss its potential to become a Hydrogen Hub through increasing studies in this field.

"Hydrogen will be more prominent in the coming period"

Bora Şekip Güray, Research Director of IICEC, also said that developing joint projects on hydrogen production and other related technologies in cooperation with the public, private sector, industry, industry associations and universities can create significant opportunities in terms of reducing energy imports and enhancing localization in developing technology.

Turkey Aims to be Natural Gas Trade Center with its Evolving Gas Market

Turkey's Energy Market Regulatory Authority (EMRA) initiated detailed studies to assess the impacts of the 320 bcm gas discovery at Sakarya Gas Field, announced by President Recep Tayyip Erdoğan late August.

Turkey strengthened its natural gas infrastructure significantly in recent years by the investments undertaken by BOTAŞ and the private sector. The capacities of the transmission, distribution, and storage facilities have been increased while international projects such as Turk Stream and TANAP were implemented, in addition to new LNG / FSRU facilities that were commissioned. The natural gas distribution grid also expanded to cover all of the 81 cities and 555 districts across the country.

In line with the joint strategy determined by the Ministry of Energy and Natural Resources and the regulator EMRA, the roles such as being a bridge, crossroad, or a transit country, which were assigned to Turkey in the previous years, were rejected, while the target was determined as "becoming a natural gas trade center".

One of the most important points here is undoubtedly the commissioning of the Organized Wholesale Natural Gas Sales Market (Natural Gas Exchange), established by EXIST in line with EMRA's legislative base, on September 1, 2018. Considering the 2-year realization figures of the natural gas exchange, it is seen that in this period, a total of 3.2 bcm of natural gas was traded, a total transaction volume of 4.7 billion TL was realized, and the average Gas Reference Price (GRF) was formed at 1,460 TL/1000 Sm3 levels. These figures are very satisfactory for a newly established stock exchange and indicate market players' trust in our legislation and institutions, said EMRA in a statement published on its website. [6]

"Natural gas traders will have the opportunity to trade the domestic gas after the establishment of Natural gas Futures Market in 2021 before the production starts in 2023." said Mustafa Yılmaz, the President of EMRA. "Therefore, the natural gas discovered in Black Sea will start to contribute to price formation in the country before it is being produced." he added.

"We, as EMRA, will be engaged in the process of introducing and commercializing our domestic natural gas discovered in the Black Sea, after it is produced. Hopefully, we will ensure that our domestic natural gas is offered to our consumers most economically by carrying out the necessary licensing and regulation studies. We will be one step closer to our goal of becoming a gas trading hub with the contributions of the Natural Gas Futures Market and the gas discovery. Our natural gas market is already at a perfect point. However, it is a special pleasure to discover our own natural gas during this process. We will be proud of being the regulator of our natural gas." he continued.


Mustafa Yılmaz

Natural Gas Futures Market to be Launched in 2021

The Natural Gas Futures Market, which is planned to be operational in 2021 according to the 2019-2023 Strategic Plan of the Ministry of Energy, will enable locally produced natural gas to be traded with futures contracts.

EMRA organized a workshop in September to finalize the Futures Natural Gas Market Regulation, which will be effective following the Energy Market Regulatory Board approval. EXIST, BOTAŞ, NGOs, and companies joined EMRA's online workshop to discuss the regulation. In this first meeting with more than 50 participants, the product types and maturities to be processed in the Natural Gas Futures Market Regulation were evaluated by the parties, and EMRA informed the participants about the types of futures traded in international developed markets.

Being indispensable for a well-functioning competitive natural gas market, the Natural Gas Futures Market is expected to bring market predictability as its first contribution as suppliers and customers hedge their price risks and as the market achieves increasing depth and liquidity.

[6] EMRA (September 15, 2020) Türkiye doğal gaz piyasası kabuk değiştiriyor… Hedef, doğal gaz ticaret merkezi olmak.

IEA Launched Key World Energy Statistics 2020 Report Providing Top-Level Numbers

The International Energy Agency (IEA) published the IEA Key World Energy Statistics (KWES) that provides top-level numbers across the energy mix, from supply and demand to prices and research budgets, including outlooks, energy indicators, and definitions.

"In KWES, we look to highlight some of the key facts and trends from across the vast number of datasets the IEA produces to enable everyone to know more about energy." said Dr. Fatih Birol, the IEA's Executive Director and IICEC's Honorary Board Chairman in his foreword.

Statistics report

Key World Energy Statistics 2020

"I hope that these statistics will not only inform but also help policymakers and others to make wise decisions so that energy is produced and consumed in a secure, affordable, efficient, and sustainable manner. As I like to say, in the world of energy, data always wins. This has never been more true than it is today, with the world economy undergoing significant structural change as a consequence of Covid-19." he added.

KWES is part of the IEA's annual edition of the world's most comprehensive series of energy databases and data services, including World Energy Statistics and Balances and the full range of fuel information data services.

Offshore Wind Capacity Peaked in 2019: GWEC

Global offshore wind capacity will surge to over 234 gigawatts (GW) by 2030 from 29.1 GW at the end of 2019, while last year was the industry's peak year so far with 6.1 GW of new capacity installed, the Global Wind Energy Council (GWEC) said in its latest report.

In terms of global wind installations by capacity, offshore wind has grown to over 10% in 2019 from 1% in 2009, according to the Global Offshore Wind Report 2020 released by the GWEC on August 5. China ranked first for new installations with a record 2.4 GW, followed by the UK at 1.8 GW and Germany at 1.1 GW. While Europe continued to show a strong position globally, the Asia-Pacific region --including China, Taiwan, Vietnam, Japan, and South Korea-- fueled the global exponential growth.

GWEC forecasts that 205 GW of new offshore wind capacity will be added over the next decade, including 6.2 GW of floating offshore wind.

"With an average annual growth rate of 18.6% until 2024 and 8.2% up to the end of the decade, new annual installations are expected to sail past 20 GW milestones in 2025 and 30 GW in 2030," the report said.

While the global offshore wind industry has recorded 24% average annual growth since 2013, Europe currently remains the largest market with 75% of total installations. Although North America's capacity is expected to accelerate within a limited level (23 GW to be installed by 2030 in addition to 30 GW current capacity), the Asia-Pacific region will lead exponential capacity growth thanks to aggressive national targets of China (additional 5 GW by 2025 and 10 GW by 2035), as well as Vietnam, Japan and South Korea (5.2 GW, 7.2 GW and 12 GW new installations by 2030 respectively).

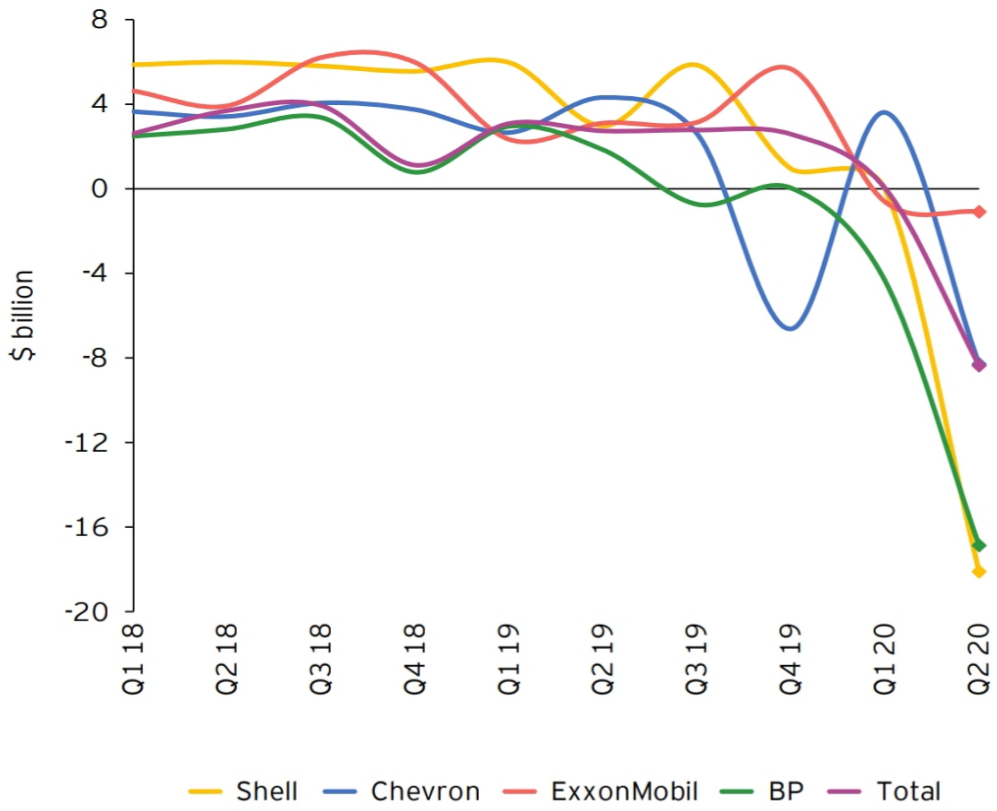
GWEC also claimed that the industry would create around 900,000 jobs over the next five years during the installation of 51 GW of new wind. The Council estimates that 17.3 direct jobs (defined as 1-year of full-time employment) are created per megawatts of generation capacity over the 25-year lifetime of an offshore wind project. According to the report, the global offshore wind sector is expected to reach an average annual growth rate of 18.6% until 2024 and 8.2% until 2030, as new annual installations are expected reach 20 GW in 2025 and 30 GW in 2030. [7]

[7] Global Wind Energy Council, (August 5, 2020) Global Offshore Wind Report 2020

Oil Prices Steadied in August with OPEC+ Supply Cuts but Large Oil Company Losses

Oil Company Losses: August began with record high second-quarter losses posted by the majors and the largest oilfield service companies. While the COVID-19 outbreak has caused a massive decline in global oil demand and pushed crude prices in April to their lowest level since 1999, the world's top 12 publicly-traded oil companies (Baker Hughes, BP, Chevron, ConocoPhillips, Eni, Equinor, ExxonMobil, Halliburton, Rosneft, Royal Dutch Shell, Schlumberger, Total) posted a combined net loss of $80 billion in the first half of 2020. These 12 companies posted a collective $395 billion revenue, 38% ($240 billion) lower than the same period of last year.

According to financial results statements released on July 31, the U.S.' largest oil company, ExxonMobil, posted a $1.1 billion loss in the second quarter and a 53% year-on-year loss of revenues. The U.S.' second-largest oil company, Chevron, posted an $8.3 billion loss and a 65% year-on-year revenue loss. British BP also reported a $16.8 billion second quarter loss.



***Graphic 3** – Change in Big Oil's net profits (2018Q1 – 2020Q2)* [8]

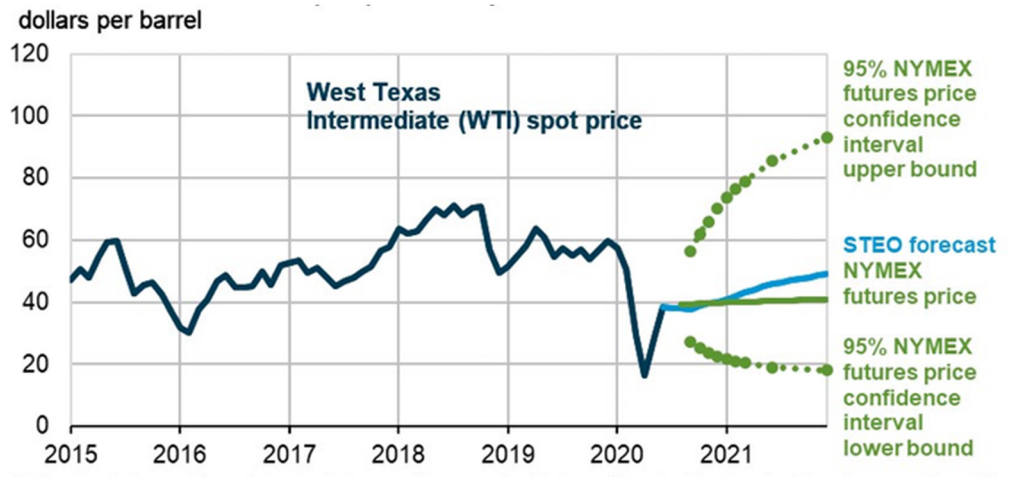
OPEC Supply Cuts: OPEC+ countries began September by cutting their target production to 7.7 million barrels per day (mbpd), down from 9.7 mbpd reflecting expectations that global oil consumption will remain weak for the rest of the year. Rising worldwide Covid-19 cases have dampened expectations for a travel recovery. Brent crude traded at $43 per barrel at the beginning of September and WTI at $40 a barrel.

During the JMMC, which advises the whole of OPEC+ and does not make decisions, Saudi Arabia increased its pressure on the alliance's quota violators to make up for their excess crude production with deeper cuts in the coming weeks. Nigeria and Iraq, two of the biggest compliance laggards, received calls from Saudi Arabia's King Salman and Crown Prince Mohammed bin Salman "to stress the importance of adhering with their commitments," including so-called compensation cuts they are scheduled to implement in August and September, the official Saudi Press Agency reported.

Russian Energy Minister Alexander Novak said the market was still extremely fragile, and despite the 23-country OPEC+ coalition's 95% compliance level with its production cuts in July, members should remain cautious. "The market remains extremely volatile, and we should keep 100% conformity of the

[8] EY, (August 6, 2020) Energy Market Note

deal. Now more than ever, it is extremely important to deliver a full commitment to the deal and closely monitor the market," he said. The committee noted in its post-meeting communique that "the fragility of the market and significant uncertainties, particularly associated with oil demand" and called for "vigilance by all participating countries."



***Graphic 4** – WTI price and NYMEX confidence intervals* [9]

Global Oil Demand: OPEC has downgraded its outlook on global oil demand in 2020 by 100 thousand bpd due to the continuing global economic slowdown. OPEC does expect a 7 mbpd increase to 97.6 mbpd by early 2021 over its 90.6 mbpd projection for 2020.

The U.S. Energy Information Administration (EIA) raised its forecast of 2020 global oil demand to 93.14 million bpd, 250 thousand bpd higher from its July forecast, and increased its 2021 projection by 280 thousand bpd to 100.16 million bpd. This is more bullish than the OPEC forecast but still means that EIA is predicting that 2021 global oil demand will fall short of "normal" 2019 demand by 1 million bpd. EIA said, "Global petroleum demand continued to recover in July, but continued growth in global coronavirus cases could bring renewed lockdown measures and presents considerable uncertainty to global oil demand for the remainder of the year."

Lying between the OPEC and EIA projections, the International Energy Agency (IEA) also cut its 2020 oil demand forecast on August 13, warning that reduced air travel due to the coronavirus pandemic would lower global oil demand this year by 8.1 mbpd. The Paris-based agency cut its 2020 outlook by 140 thousand bpd to 91.9 mbpd, its first downgrade in several months. Damage to demand wrought by less cross-border travel was mitigated somewhat by recovery in industry and e-commerce that was supporting trucking, but the IEA still predicted 2021 oil consumption would be slightly lower than in 2019. The agency said that while supply exceeded demand in June, uncertainty over future demand along with increased output by top producers means re-balancing oil markets will be 'delicate'.

U.S. Tight Oil: Rystad Energy reported that U.S. horizontal drilling activity is not likely to recover this year. Drilling permits in July, which do not necessarily reflect subsequent drilling, dipped to its lowest since September 2010, with only 454 awards.

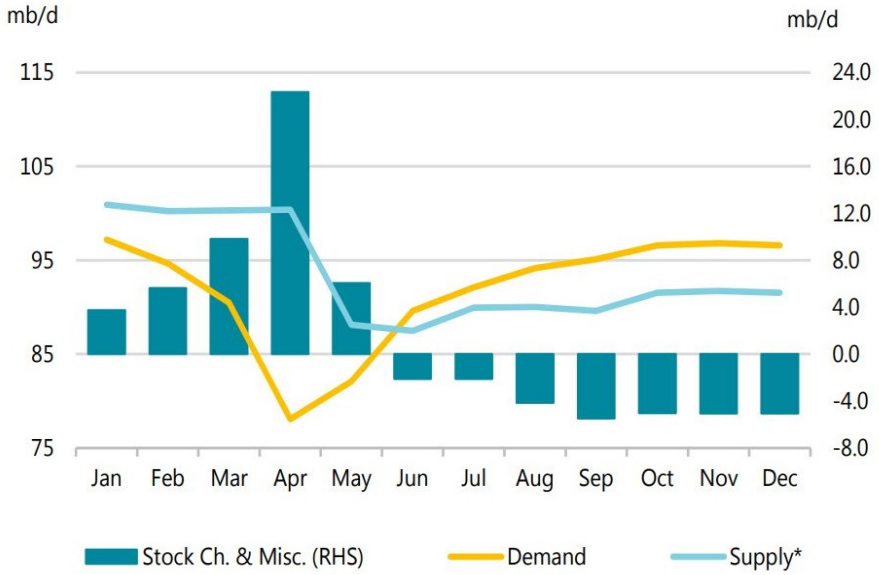
Oil Prices: In early August, IHS Markit revised its 2020 average Brent price outlook to $42.35 per barrel (bbl), up $7.09/bbl from May. For 2021, HIS predicts $49.25/bbl, a $5.25/bbl increase from its May report. IHS Markit's report explained, "As long as prices hold in the current range, demand concerns will likely help keep the [OPEC+] agreement on course. When prices surpass $50/bbl, potentially lifting capital spending in the U.S. higher, that is when changes to the tenor of the discussion, and the divergence of interest could start to play out."

Towards the end of the month, crude oil prices rose to a five-month high as U.S. producers cut crude output ahead of Hurricane Laura at a rate approaching the level of 2005's Hurricane Katrina and also halted most oil refining along the Texas/Louisiana coast. Companies evacuated 310 offshore facilities and shut 1.56 mbpd of crude output, 84% of Gulf of Mexico's offshore production --90% during Katrina--.

U.S. Refinery Storm Damage: Hurricane Laura, a Category 4 storm, made landfall along the U.S. Gulf Coast on August 27. Two large refineries in Louisiana

[9] U.S. Energy Information Administration (EIA), (August 11, 2020) Short-Term Energy Outlook (July 2020)

were most directly in the path of the hurricane. However, minimal damages are expected for other refineries, and energy infrastructures in the surrounding region, with most of them, shut expected to return once power is restored, according to the U.S. Secretary of Energy Dan Brouillette. The Gulf of Mexico shut-in production is also expected to return within days as impairments were thought to be better than expected.



Graphic 5 *– Global oil supply-demand balance forecast for 2020* [10]

Turkey's First Integrated Solar Panel Factory Opened in Capital Ankara

Turkey's first integrated solar ingot-wafer-module-cell factory, established by Kalyon Solar Energy Technologies Production Co., started production on August 19, after the inauguration ceremony in Ankara.

Speaking at the opening ceremony of the Kalyon factory, Energy Minister Dönmez said Turkey would now be included on the list of 20 other similar integrated solar panel manufacturers, most of which are located in China.

"The first panels produced in this factory, which has more than 70% domestic production ratio and 500 MW of annual solar cell production capacity, will be used in Turkey's biggest solar power plant in Konya's Karapinar." Minister Dönmez added. The Karapinar solar power plant, which will have a 1 GW installed capacity, is expected to be operational in increments of 40 MW per month beginning in October. The

plant will become fully operational in 33 months.

"With Karapinar solar power plant coming fully online, the share of solar energy in our electricity generation will be up 25%, eliminating nearly 2 million tons of CO2 emissions per year", Dönmez emphasized. Minister Dönmez also noted that the share of renewable energy in Turkey's overall installed capacity reached 50.3% as of the end of July 2020. "Solar energy, which did not have any place in our portfolio until 2013, today reached about 6,232 MW. Solar power plants broke a monthly record in May this year by providing 5.6% of the total electricity generation," Fatih Dönmez explained. In just six years since 2014, he also stressed that Turkey became the ninth country in the world and third country in Europe to boost the most installed solar energy capacity.

The Ministry of Energy will hold third solar YEKA (Renewable Resource Area) tender in October for small and medium-sized investors in 36 districts with a total capacity of 1 GW.

[10] International Energy Agency (IEA), (August 13, 2020) Oil Market Report (August 2020)

Petrol Ofisi keeps launching solar-powered stations

Petrol Ofisi launched its fifth solar-powered station in Ankara and maintained its leadership in this field. They increased installed capacity by 258 kWp with the aim to provide almost all of their power needs from solar energy as well as to supply the excess power to the national grid. Underlining Petrol Ofisi's pioneering role in innovation in the Turkish downstream industry, Selim Şiper, CEO of the company, said:

Selim Şiper

"With the mission of the leadership in its sectors, Petrol Ofisi has been leading R&D and innovation. The fact that these five stations supply their power needs from solar energy is just a reflection and one of the best examples of our approach and philosophy. We've always targeted the best, the most ideal, and the most advanced technology. We also did not limit our goals in this project with any number of stations. We ultimately aim to meet the power needs of every possible station in our network with solar energy."

Zorlu merges its hydro, geothermal, and wind affiliates

Zorlu Group announced that its hydroelectric, geothermal and wind investments under Zorlu Natural, Zorlu Geothermal, and Rotor affiliates will be merged under a single company named Zorlu Renewable Energy. The company also confirmed that all the procedures regarding establishing this new company were concluded, and its public offering is expected to be completed in the first half of 2021.

Zorlu Enerji CEO Sinan Ak said in one of his earlier statements in June that the company decided to postpone its secondary public offering, which was scheduled to September this year, to the first half of next year due to the Covid-19 outbreak's impact on the energy industry.

Stating that the serial lockdowns between mid-March and June 1 caused a rise in residential power consumption along with a sudden drop in industrial power consumption, Ak said: "We overcame this period with a certain recovery. Our power generation business continued without any interruption; we did not see any problems. Our revenues in gas distribution regions slightly decreased, but it also recovered later in June. We had planned our second public offering for September, but we shifted its timeline to the first half of 2021 since we could not foresee the following impact of the pandemic."


Sinan Ak

Fuel retail sale figures may recover rapidly in the last quarter in case of no second wave: Ahmet Erdem


Ahmet Erdem

Ahmet Erdem, Country Chairman of Shell in Turkey and Chairman of the Oil and Oil Products Industry Assembly at the Union of Chambers and Commodity Exchanges of Turkey (TOBB), gave an exclusive interview to the YouTube channel of energy periodical Petroturk. Stating that retail fuel sales within the first two months of this year were higher than the same period in 2019, Erdem emphasized that the demand sharply dropped by around 90% during the early period of nationwide lockdowns and the overall demand fall in the first half of the year reached up to 50%. "We have seen gradual recovery as the restrictions are lifted. Recovery peaked during the Feast of Sacrifice holiday. A key factor behind the fast recovery was that 8 million Turkish citizens, who have taken their vacations abroad in previous years, preferred to make their vacation plans this year within the country due to outbreak concerns. If this trend continues, although it is unlikely to compensate for all lockdown period losses, it would be possible to approach last year's sales figures in the last quarter on a monthly basis. But if there is a second wave in winter and certain restrictions are re-imposed, then it would be very difficult to catch last year's figures," he said.

Erdem also said that TOBB's Oil and Oil Products Industry Assembly submitted the industry's expectations from public authorities under 30 main topics in order to cope with pandemic-related challenges. "Some of them were adopted and implemented very quickly, but some of our support requests are still pending. We preferred to bring forward the major issues that would decrease the industry's cost burden or delay some additional costs in line with some new regulations or spread them over time if possible," he added.

Erdem underlined the importance of profits in the challenging downstream business saying that public authorities should focus on 'return on investment after tax' rather than 'profit per unit.' He also praised the vigorous efforts of various public authorities, the Energy Market Regulatory Authority (EMRA) in particular, against fuel smuggling. Stating that "any single drop of oil products can now be tracked right from the moment it entered into the country through the customs until the moment it leaves the exhaust of a car", Erdem added: "We cannot say that the fuel smuggling completely ended in Turkey, but its impact on the sector has certainly decreased. We also reached a good level on 'Lubricants Numbered 10' thanks to a series of tax regulations. The focus recently shifted to the tax evasion and the black economy."

IICEC | SABANCI UNIVERSITY ISTANBUL INTERNATIONAL CENTER FOR ENERGY AND CLIMATE | NEWSLETTER

Publisher

IICEC SABANCI UNIVERSITY ISTANBUL INTERNATIONAL CENTER FOR ENERGY AND CLIMATE

For any questions and additional information, please contact:

Prof. Dr. Carmine Difiglio
E-mail: *carminedifiglio@sabanciuniv.edu*

Dr. Mehmet Doğan Üçok
E-mail: *mdoganucok@sabanciuniv.edu*

CONTACT

Address:
IICEC, Sabancı University Minerva Palace,
Bankalar Cad. No: 2, Karaköy, 34420, Istanbul Turkey

Phone: *+90 (212) 292 49 39 / 1114*