

10th IICEC Energy Conference Brought Together Global Energy Dynamics



IICEC Energy Conference Hosted the Turkey Launch of the IEA's Flagship Publication, World Energy Outlook 2019 by IEA's Executive Director Dr. Fatih Birol.

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RENEWABLE

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SAW A RECORD
HIGH LEVEL WITH
46% IN TURKEY'S
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10TH IICEC ENERGY CONFERENCE BROUGHT TOGETHER GLOBAL ENERGY DYNAMICS



Sabancı University Istanbul International Energy and Climate Center (IICEC), which brings together key stakeholders in energy and climate since its establishment in 2010, brought the energy world together at the 10th Annual IICEC Energy Conference.

The International Energy Agency's (IEA) World Energy Outlook 2019 report was also launched for Turkey during the conference held in Istanbul on December 20, 2019.

Senior public representatives, executives of global leading organizations in the national and international energy sector, and representatives of leading universities, policy centers and think tanks attended the conference, hosted by Güler Sabancı, Sabancı University Founding Chairman of the Board of Trustees and Prof. Carmine Difiglio, Sabancı University IICEC Director.

More Liberalized Natural Gas Market with Multi-Players

Minister of Energy and Natural Resources Fatih Dönmez, the honorary guest of the conference,



made important statements about Turkey's energy policies. "Turkey is a natural energy center with its two onshore and two FSRUs with underground storage facilities and various gas entry points." said Minister Dönmez, during his opening remarks.

Minister Dönmez stressed that the energy trading centers need risk assessment tools, and EXIST would improve these tools to market players in the near future. "Therefore, Turkey's natural gas market will contribute to regional welfare with multi-players." said Minister Dönmez. Minister Dönmez highlighted the importance of increasing the number of sellers and buyers in a liberalized market and said, "We need to achieve a more developed market by attracting more sellers and buyers to be a real energy trading center, rather than being an energy transit country."

"We are currently working on a new tariff model for consumers who would like to buy electricity only from renewable resources." said Fatih Dönmez, emphasizing their policy for promoting local and renewable sources.

Highlighting the importance of transformation in the electricity market, he stressed that Turkey should build up an ecosystem for producing and exporting technology, rather than importing and using it.



"We are Moving Towards an Energy Ecosystem that Is Rapidly Transforming with the Effect of Technology"

"We are conducting the 10th Annual Energy Conference of IICEC, befitting its identity of 'International Research Center' in the 20th anniversary of the Sabancı University." said Güler Sabancı, during her opening remarks.

“We have achieved significant improvements for the future of our sector by the tripled installed capacity as an outcome of investments over \$100 billion, promoting renewable energy by the YEKA model, strong increase in the share of domestic resources in electricity generation, and the level operational excellence and supply quality.” added Güler Sabancı, by emphasizing the crucial role of the Ministry of Energy and all regulatory and decision-making bodies in the strategic energy sector.

“We are moving towards an energy ecosystem that is rapidly transforming with the effect of technology. But there is an unchanging element: Human. When we talk about energy in our country, we are talking about a broad ecosystem with over 500 thousand employees in public institutions, private sectors, NGOs, and universities. Therefore, our most important value for the future is our professional human resources. At this

point, we attach great importance to public-industry-university cooperation in energy, like in many fields. IICEC continues to work on this triple model. We can call this the “Success Triangle.” We will continue to focus on high value-added, information, and technology-intensive projects and collaborations in the upcoming period. We need to move our sector to a better future by using our human resources and technology more effectively in addition to our energy resources.” she added.

New Policy to Focus on Efficient Growth

Simone Kaslowski, Chairman of the Turkish Industry and Business Association (TUSIAD), urged that Turkey’s new policy need to focus on efficient growth, in his speech at the 10th IICEC Conference.

“Sustainability, efficiency, resource optimization, environmental compliance, strong infrastructures,



and security of supply, have to be considered as our targets for the upcoming period. We would like to propose four main focal points in order to ensure the sustainability of existing investments in the sector and to provide a reliable investment environment for new investors: We must quickly eliminate factors that hinder predictability in line with the objectives of the Electricity Market Law and the 11th Development Plan. We need to adopt new tools for increasing competition in the market for improving the benefits of the consumers. And we need to increase predictability in the market.” said the head of Turkey’s biggest business association.

10TH ANNUAL IICEC ENERGY CONFERENCE HOSTED THE TURKEY LAUNCH OF WORLD ENERGY OUTLOOK 2019

The Turkey launch of the International Energy Agency’s (IEA) flagship publication, World Energy Outlook 2019 report is made by the IEA’s Executive Director and IICEC’s Honorary Board Chairman Dr. Fatih Birol, during the 10th Annual IICEC Energy Conference.

World Energy Outlook 2019 explains the impact of today’s decisions on tomorrow’s energy systems and describes a pathway that enables the world to meet climate, energy access, and air quality goals while maintaining a strong focus on the

reliability and affordability of energy for a growing global population.

Highlighting crucial considerations for the global energy industry, Dr. Birol stated the abundance of energy as one of the most important topics of the global energy sector.

“The most important topic in the global energy sector is the abundance of energy, including oil, natural gas, coal, and other resources. We are now entering a period of abundance. Decision-makers have to determine how to supply energy with reasonable



prices and the least harm to the environment in this period. Because cheap energy source is not always friendly to the environment, while environmentally friendly resources can also be expensive.” Dr. Birol explained.

IEA’s Executive Director Dr. Fatih Birol pointed out that there are serious contradictions in the global energy sector as well as the abundance of energy and continued

his speech as follows:

“The first of these is in the oil markets. In 2019, Venezuelan oil production declined enormously, while Iranian exports were almost zero due to sanctions. There was a serious attack on Saudi Arabia. Despite such problems, oil prices remained at the level of \$60. After the meeting of the

OPEC in Vienna, prices remained unchanged as OPEC and Russia’s share in oil production is rapidly declining. So, there is a significant decline in their ability to dictate prices in the world oil markets. This case is favorable for the global economy and the import-dependent countries like Turkey, but it is a contradiction at

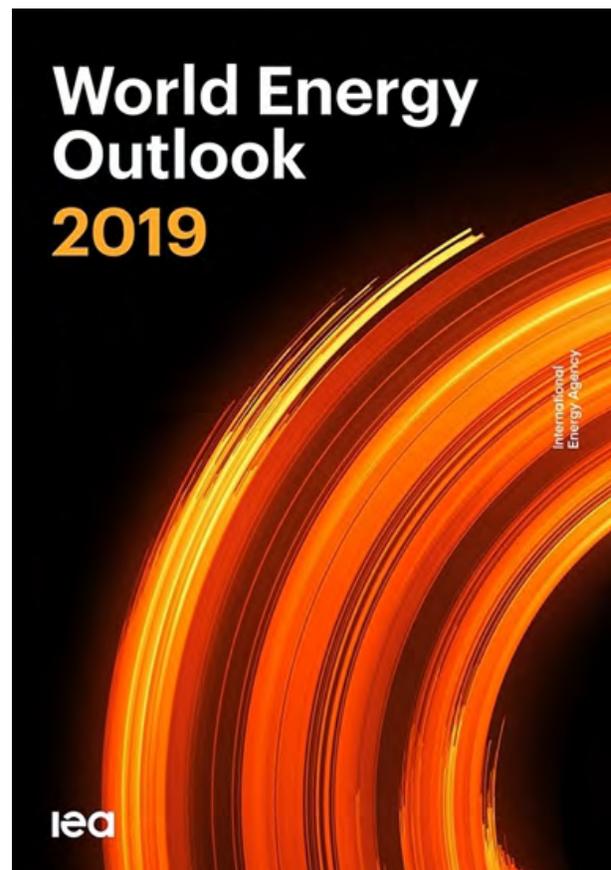
the same time. Another contradiction is the climate change. The energy sector is responsible for 80 percent of the emissions that cause climate change. The access to electricity is prioritized as a human right, however 850 million people still do not have electricity. This is also another contradiction.”

The Executive Summary of the IEA’s flagship publication brightens the future of the global market with the below findings:

● **The Current Policies Scenario** shows what happens if the world continues along its present path, without any additional changes in policy. In this scenario, energy demand rises by 1.3% each year to 2040, with increasing demand for energy services unrestrained by further efforts to improve efficiency. While this is well below the remarkable 2.3% growth seen in 2018, it would result in a relentless upward march in energy-related emissions, as well as growing strains on almost all aspects of energy security.

● **The Stated Policies Scenario**, by contrast, incorporates today’s policy intentions and targets. Previously known as the New Policies Scenario, it has been renamed to underline that it considers only specific policy initiatives that have already been announced. The aim is to hold up a mirror to the plans of today’s policymakers and illustrate their consequences, not to guess how these policy preferences may change in the future.

● **In the Stated Policies Scenario**, energy demand rises by 1% per year to 2040. Low-carbon sources, led by solar photovoltaics (PV), supply more than half of this growth, and natural gas, boosted by rising trade in liquefied natural gas (LNG), accounts for another third. Oil demand flattens out in the 2030s, and coal use edges lower. Some parts of the energy sector, led by electricity, undergo rapid transformations. Some countries, notably those with “net zero” aspirations, go far in reshaping all aspects of their supply and consumption. However, the momentum behind clean energy technologies is not enough to offset the effects of an expanding global



economy and growing population. The rise in emissions slows but, with no peak before 2040, the world falls far short of shared sustainability goals.

● **The Sustainable Development Scenario** maps out a way to meet sustainable energy goals in full, requiring rapid and widespread changes across all parts of the energy system. This scenario charts a path fully aligned with the Paris Agreement by holding the rise in global temperatures to “well below 2°C ... and pursuing efforts to limit [it] to 1.5°C”, and meets objectives related to universal energy access and cleaner air. The breadth of the world’s energy needs means that there are no simple or single solutions. Sharp emission cuts are

achieved across the board thanks to multiple fuels and technologies providing efficient and cost-effective energy services for all.

● **Shale output from the United States** stays higher for longer, reshaping global markets, trade flows, and security. Annual US production growth slows from the breakneck pace seen in recent years, but updated official estimates of underlying resources nonetheless mean that the United States accounts for 85% of the increase in global oil production to 2030 in the Stated Policies Scenario, and for 30% of the increase in gas. This bolsters the position of the United States as an exporter of both fuels. By 2025, total US shale output (oil and gas) overtakes total oil and gas production from Russia.

● **Higher US output pushes down the share of OPEC countries and Russia** in total oil production. This share drops to 47% in 2030, from 55% in the mid-2000s, implying that efforts to manage conditions in the oil market could face strong headwinds. Pressures on the hydrocarbon revenues of some of the world's major producers also underline the importance of their efforts to diversify their economies.

● **Cost reductions in renewables and advances in digital technologies** are opening huge opportunities for energy transitions while creating some new energy security dilemmas. Wind and solar PV provide more than half of the additional electricity generation to 2040 in the Stated Policies Scenario and almost all the growth in the Sustainable Development Scenario. Policymakers and regulators will have to move fast to keep up with the pace of technological change and the rising need for flexible operation of power systems. Issues such as the market design for storage, the interface between electric vehicles and the grid, and data privacy all have the potential to expose consumers to new risks.

● **Consumer preferences for SUVs** could offset the benefits of electric cars. The growing appetite among consumers for bigger and heavier cars (SUVs) is already adding extra barrels to global oil consumption. SUVs are more difficult to electrify fully, and conventional SUVs consume 25% more fuel per kilometer than medium-sized cars. If the popularity of SUVs continues to rise in line with recent trends, this could add another 2 million barrels per day to our projection for 2040 oil demand.

● **Solar PV becomes the largest component of global installed capacity** in the Stated Policies Scenario. The expansion of generation from wind and solar PV helps

renewables overtake coal in the power generation mix in the mid-2020s. By 2040, low-carbon sources provide more than half of total electricity generation. Wind and solar PV are the star performers, but hydropower (15% of total generation in 2040) and nuclear (8%) retain major shares.

● **The speed at which battery costs decline is a critical variable for power markets** as well as for electric cars. India is the largest overall source of energy demand growth in this year's Outlook, and we examine how a cost-effective combination of cheaper battery storage and solar PV could reshape the evolution of India's power mix in the coming decades. Battery storage is well suited to provide the short-term flexibility that India needs, allowing a lunchtime peak in solar PV supply to meet an early evening peak in demand. In the Stated Policies Scenario, a major reduction in battery costs means that some 120 GW of storage are installed by 2040. We also examine the possibility that battery costs could decline even faster – an extra 40% by 2040 – because of greater industrial economies of scale or a breakthrough in battery chemistry, for example. In this case, combined solar and battery storage plants would be a very compelling economic and environmental proposition, reducing sharply India's projected investment in new coal-fired power plants.

● **Offshore wind is gathering speed.** Cost reductions and experience gained in Europe's North Sea are opening up a huge renewable resource. Offshore wind has the technical potential to meet today's electricity demand many times over. It is a variable source of generation, but offshore wind offers considerably higher capacity factors than solar PV and onshore wind thanks to ever-larger turbines that tap higher and more reliable wind speeds farther away from shore. There are further innovations on the horizon, including floating turbines that can open up new resources and markets.

● **Increasingly cost-competitive offshore wind projects** are on course to attract a trillion dollars of investment to 2040. Europe's success with technology has sparked interest in China, the United States, and elsewhere. In the Sustainable Development Scenario, offshore wind rivals its onshore counterpart as the leading source of electricity generation in the European Union, paving the way to full decarbonization of Europe's power sector. Even higher deployment is possible if the offshore wind becomes the foundation for the production of low-carbon hydrogen.

DR. BIROL CHAIRED THE TURKEY ENERGY BUSINESS LEADERS PANEL

The 10th Annual IICEC Energy Conference concluded with a comprehensive panel discussion, moderated by IEA's Executive Director and IICEC's Honorary Board Chairman Dr. Fatih Birol.



Sinan Ak, CEO of Zorlu Energy, Ebru Dildar Edin, Deputy General Manager of Garanti BBVA, Ahmet Erdem, Country Chairman of Shell Turkey, Zaur Gahramanov, CEO of SOCAR Turkey, Ebru Özdemir, Chairperson of the Board of Limak Investment, and Kıvanç Zaimler, President of Energy Group of Sabancı Holding participated in the "Turkey Energy Business Leaders" Panel.

The panelists highlighted the importance of liberalization in Turkey's energy market for achieving financial



sustainability while emphasizing the crucial role of predictability.

Our Annual Conference Series Become a Tradition

The 10th Annual IICEC Energy

Conference started with the welcoming speech of Dr. Mehmet Doğan Üçok, the Coordinator of IICEC.

"IICEC is now organizing the 10th Annual Energy Conference, and we are delighted and honored to be here with you. We have organized national and international conferences over the last decade, and we had an increasing synergy and a cumulative impact every year. Our annual conference series become a tradition." said Dr. Üçok.

IICEC TO LAUNCH FIRST-OF-A-KIND TURKEY ENERGY OUTLOOK IN SPRING 2020

IICEC is preparing to launch Turkey Energy Outlook in the first half of next year, Prof. Carmine Difiglio, the Director of Sabancı University IICEC, revealed during his speech at the 10th Annual IICEC Energy Conference.

Prof. Carmine Difiglio gave brief information about the methodology, perspective, and the content of the Turkey Energy Outlook, in his presentation.

"We realized that we had to consider simultaneously a wide variety of drivers that push the energy market in the long term. Therefore, we have started with Turkey's energy policy pillars, energy security, localization, and predictable markets." said Prof. Difiglio.

Prof. Difiglio revealed that the Turkey Energy Outlook would have detailed information for each supply and



end-user sectors while providing pathways to be more competitive, efficient, localized, and sustainable energy economy.

"The report will conduct detailed analysis for outlining two scenarios, the Reference Scenario, and the Value Scenario." he added.

RENEWABLES SAW A RECORD HIGH LEVEL WITH 46% IN TURKEY'S ELECTRICITY PRODUCTION

Speaking recent at the Turkish Wind Energy Association, Energy and Natural Resources Minister Dönmez projected even higher levels for Turkey's renewable energy fleet. He pointed out that Turkey has already produces 46% of its electricity from renewable resources.

While most of this is from hydropower, there has been rapid growth in wind and solar as a result of Turkey's "Renewable Energy Law" enacted in 2005. Progress towards a larger renewable fleet has ramped up in recent years after renewable energy zones (REZs) were introduced in late 2016. REZs structure renewable power investments supported by

government incentives.

"With these figures, we reached our objective of producing two-thirds of our electricity in the short-term from local and renewable resources. Now, we aim to raise this ratio to higher levels. This average is not a volatile rate but regular progress." Dönmez said.

Turkey's renewable energy goals have also been expanding as renewable progress has exceeded past goals, permitting the new goals to be ramped up. They are now to produce two-thirds of Turkey's power from renewables within the decade.

The Turkish solar energy association expects installed solar photovoltaic

generation capacity to rise to about 14 GW in 2023, with solar and wind having a cumulative capacity of 30 GW by 2030.

Dönmez at the November conference said, "Our electricity production from wind energy rose 14.6% in October from the same month last year and increased approximately 70% in the last five years. We rank sixth in Europe and 12th in the world in wind installed capacity."

The minister continued that "In the period to come, we will increase our capacity with new 40–50 MW mini Renewable Energy Resources Zones (YEKA), wind energy plants and solar plants."



Local and renewable energy resources saw a total share of 64% in electricity production between January and October this year, marking a record high, Minister Dönmez said.

BOTAS PLANNING INCREASED FLEXIBILITY FOR POWER SECTOR AND INDUSTRIAL CONSUMERS



With declining power-sector gas consumption closing out 2019, BOTAS indicated that a new pricing strategy would be announced with increased flexibility for consumers. Power plants and large industrial consumers can choose to purchase gas from BOTAS or private industry. BOTAS customers' take or pay obligation would be reduced from 85% to 80% in 2020 and BOTAS will allow consumers to exceed their monthly draws by up to 25% of their highest monthly nomination. (These flexibilities reduce the effective take-

or-pay obligation to 64%)

BOTAS announced its tariff for natural gas fired power plants as 1,600 TL/kscm (Thousand Standard Cubic Meters) on December 26, for the first quarter of 2020.

The share of natural gas-fired power plants in Turkey's electricity production is expected to be higher in 2020 as the water inflow through the hydroelectric power plants and dams is forecasted to be relatively lower than the rates recorded in 2019.

BOTAS, aiming to diversify its gas imports, recently launched two LNG

tenders for a total of 100 cargoes. The first tender for 70 cargoes covers mid-term deliveries, and the remaining 30 cargoes for short-term deliveries, starting from this winter.

Turkey currently has four LNG entry points, with two onshore gasification plants, and two FSRUs (Floating Storage and regasification Units). The fifth LNG entry point for another FSRU is planned to be constructed at Saros Bay on the Northern Aegean coast of Turkey. However, the construction of the jetty and the pipeline connection to the main grid has not started yet.

ENVIRONMENTAL REQUIREMENTS TO CLOSE 4-6 COAL FIRED POWER PLANTS BUT ANNUAL POWER LOSSES MAY NOT BE THAT LARGE

Due to Turkish environmental legislation at least four coal-fired power plants are likely to close as of 1 January 2020, that have a name plate capacity of 4 GW.

However, only about one-half of this capacity is currently being dispatched resulting in a likely loss of about 15



TWh/yr of power if they do not come back on line. If retrofits bring some of these plants online during the year or later, the annual losses of power generation would be less.

Less generation from coal power plants is anticipated to increase the capacity factor of the gas fired fleet

which has ample excess capacity. The impact on spot electricity prices will depend on a variety of factors such as power demand growth (which has largely stagnated over 2019), expected capacity additions during 2020 and hydrology, particularly in Q1 2020.

AS SOUTH KOREA PHASING OUT COAL, CHINA STILL PUSHES FOR NEW COAL-FIRED POWER PLANTS

South Korean Energy Ministry announced on November 28 that the government will shut down a quarter of its coal-fired power plants until the end of February in accordance with the new anti-pollution measures. South Korea has about 60 coal-fired power plants, generating 40% of the country's electricity.

While a presidential committee in September recommended shutting down up to 14 coal plants by February and up to 27 by March, the government decided in early November to close 6 older coal-fired power plants by 2021, a year earlier than planned. Now according to the



latest policy, 8 to 15 plants with higher emission levels will be closed within 3 months.

While Asia's fourth-largest economy strives to phase out coal-fired power generation in the country, Asia's number one economy still increases its coal-fired power capacity. According to the latest report of Global Energy Monitor, China raised its coal-fired power capacity by 42.9 gigawatts (GW), or about 4.5%, within 18 months, while another 121.3 GW is under construction.

The report forecasts that China has to close more than 40% of 1,000 GW coal-fired power capacity of the country in order to meet greenhouse gas reductions required to keep global temperature rises well below 2 degrees Celsius. Although the government announced its pledge for an 'energy revolution', some policymakers worry renewables like wind and solar are unreliable, and there are concerns that decarbonisation will hurt the country's coal regions.

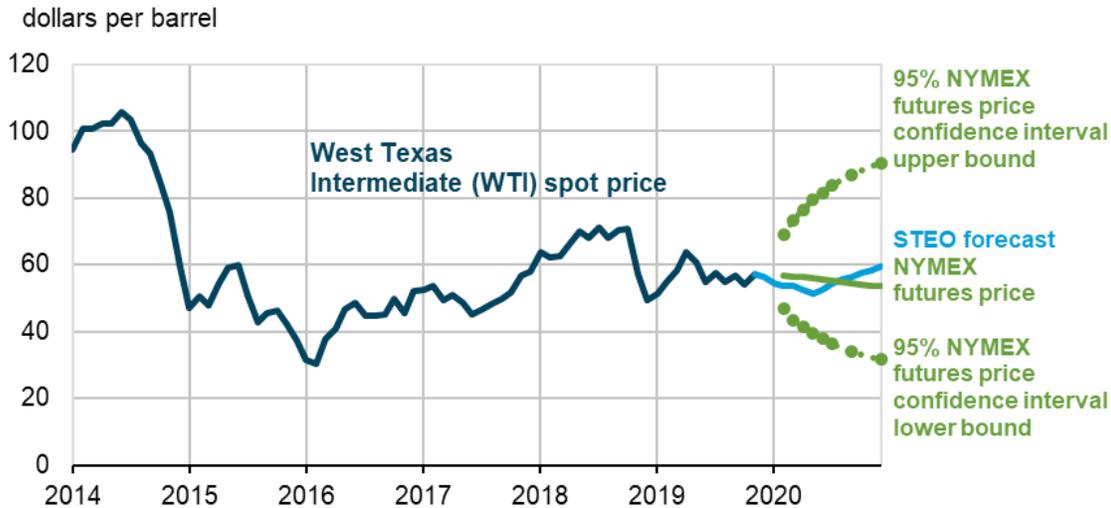
EIA EXPECTS THE U.S. TO BECOME A NET EXPORTER BY 2020

The U.S. Energy Information Administration (EIA) has kept its oil price forecasts for 2020 unchanged, according to its latest monthly Short-Term Energy Outlook report

released on December 10.

While EIA forecasts Brent spot prices will average \$61/b in 2020, slightly lower than 2019 average of \$64/b due to rising global oil

inventories, particularly in the first half of next year, it expects the margin between Brent and West Texas Intermediate (WTI) prices will average \$5.50/b.

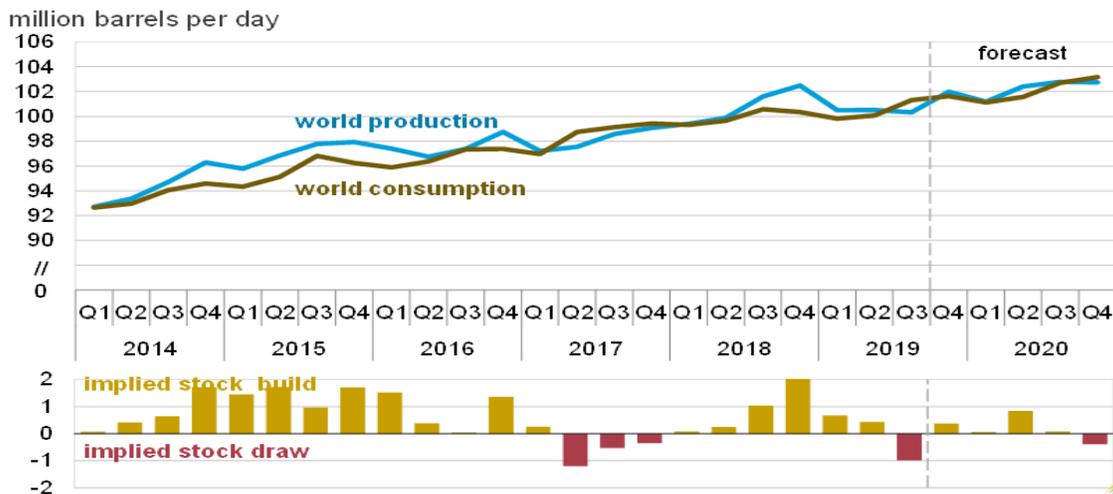


Graphic 1 – West Texas Intermediate (WTI) Crude Oil Price & NYMEX Confidence Intervals ¹

Upon the latest decision of the Organization of the Petroleum Exporting Countries (OPEC) to deepen production cuts, EIA assumes

that OPEC will limit production through all of 2020, rather than being in effect through the end of March 2020 as it previously announced,

and it forecasts OPEC crude oil production will average 29.3 million b/d in 2020, 0.5 million b/d lower than 2019 average.



Graphic 2 – World Liquid Fuels Production & Consumption Balance ²

¹ U.S. Energy Information Administration (EIA), (December 10, 2019) Short-Term Energy Outlook

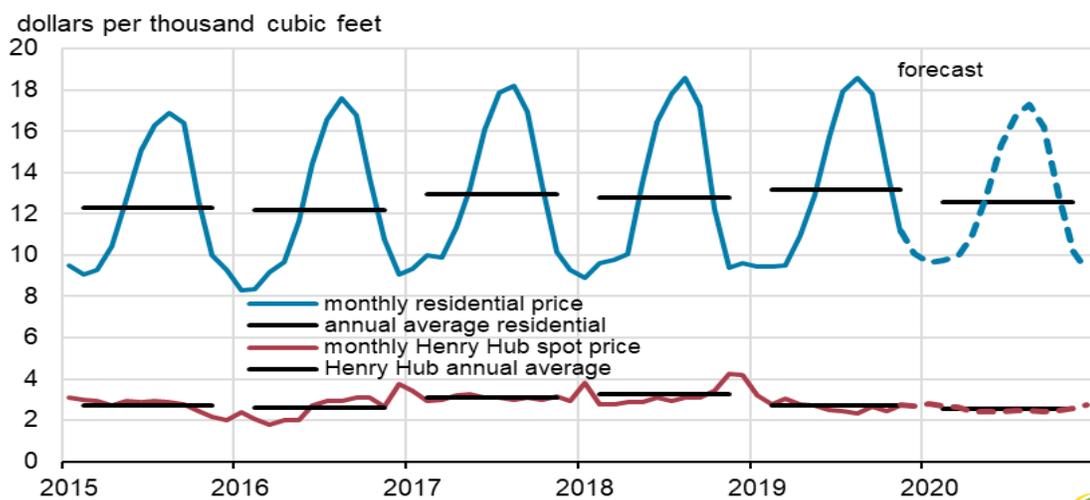
² U.S. Energy Information Administration (EIA), (December 10, 2019) Short-Term Energy Outlook

According to the report, September 2019 had been the first month since 1973, the year EIA started to keep export/import records on a monthly basis, that the United States exported more total crude oil and petroleum products in than it imported (90,000 b/d). While the U.S. was a net importer in 2019 by 490,000 b/d, EIA expects the country to become a net exporter in 2020 by 570,000 b/d.

Although EIA expects U.S. crude oil production to reach 13.2 million b/d in 2020, annual growth rate (0.9 million b/d) will be lower than in 2018 (1.6 million b/d) and in 2019 (1.3 million b/d) due to ongoing decline in drilling rigs which will be offsetted by rig efficiency and well-level productivity rises.

As for the natural gas prices, EIA forecasts the Henry Hub spot price to average \$2.45 per million British

thermal units (MMBtu) in 2020, down 14 cents/MMBtu from the 2019 average. The Administration expects natural gas production growth in 2020 will be lower than in 2019 mainly due to the lag between changes in price and changes in future drilling activity. EIA forecasts natural gas production in 2020 will average 95.1 billion cubic feet per day (Bcf/d), compared with 92.1 Bcf/d in 2019.



Graphic 3 – U.S. Natural Gas Prices³

While the share of power generation from coal-fired power plants is expected to continue to fall (from 28% in 2018 down to 22% in 2020),

this will be mainly covered by gas-fired power plants (from 34% in 2018 up to 39% in 2020). On the other hand, EIA expects no rise in share

of nuclear (20%) and hydropower (7%), but a slightly increase in other renewables (from 9% in 2018 up to 12% in 2020).

IEA SEES 'NO DEFINITIVE PEAK' AS OIL DEMAND PLATEAUS BY 2030

Global oil demand will hit a plateau around 2030 as fuel efficiency improves and the use of electric vehicles increases, but this does not lead to a definitive peak in oil use in the next two decades, the International Energy Agency said in its annual World Energy Outlook for the period to 2040.

While the current growth in global oil demand will continue by 1 million barrels a day (bpd) on average every

year to 2025, from 97 million bpd in 2018, the growth rate will drastically decline to 0.1 million bpd a year on average during the 2030s to reach 106.4 million bpd in 2040. "Oil demand plateaus post-2030," said Fatih Birol, executive director of the Paris-based agency. "Demand growth is robust to 2025, but growth slows to a crawl thereafter."

IEA forecasts Brent crude price will

reach \$90 in 2030 and \$103 a barrel in 2040, because the necessity to find new oil reserves should cause prices to rise.

The agency expects that increasing fuel efficiency in car engines will displace 9 million bpd of demand and electric cars another 4 million bpd, while it forecasts 330 million electric cars on the road by 2040, up from an estimate of 300 million in previous outlook.

³ U.S. Energy Information Administration (EIA), (December 10, 2019) Short-Term Energy Outlook

OPEC+ DECIDED TO DEEPEN THE CURRENT OUTPUT CUTS FOR SUPPORTING PRICES

The Organization of the Petroleum Exporting Countries (OPEC), Russia and other producers, a group known as OPEC+, decided to deepen the current output cuts in an effort to avert oversupply and support prices.

OPEC+ ministers called for a new supply cut of 500,000 barrels per day (bpd), on top of the deal they have since January 1 implemented to cut output by 1.2 million bpd. Saudi Arabia also announced an additional cut by 400,000 bpd more than its quota voluntarily which brings the pact's total cuts up to 2.1 million bpd, about 2% of global supply.

According to the latest deal agreed on December 5-6 in Vienna, OPEC will shoulder 372,000 bpd and non-OPEC producers an extra 131,000 bpd. 11 OPEC members along with Russia and 9 other non-OPEC countries will participate the latest deal while Iran, Libya and Venezuela will be exempted.

Although some OPEC members asked for a longer period, OPEC+ ministers finally agreed the deal to expire in March 2020. The group will meet again on March 5-6 for an

extraordinary meeting to review the quotas.

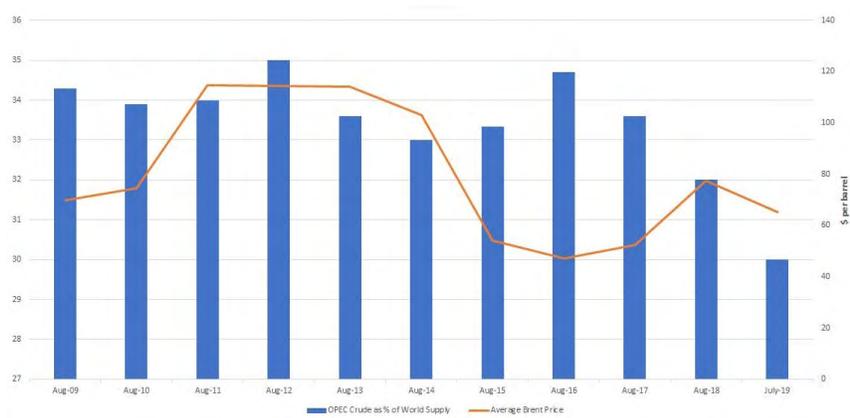
International media outlets reported that there were two sticking points during the unusual 5-hour meeting of the pact: Firstly, when Saudi Arabia, the de-facto leader of the pact, has been pushing for a deeper and longer deal, Russia and some small countries was reluctant to deepen cuts. After a series of negotiations, all parties agreed on a deeper, but shorter-than-expected deal. The agreement will also allow all OPEC+ members to exclude condensate from their oil output calculations which was a key issue particularly for Russia. Thanks to this arrangement, some 760,000 bpd of Russian condensate would be excluded from calculations.

Secondly, compliance has been a controversial issue among member countries since the coordinated cuts began in 2017. While Saudi Arabia has always been cutting more than required, some OPEC members like Iraq and Nigeria have been continuing over-producing. Besides that, since Iran and Venezuela are under the United States sanctions that have

severely constrained their ability to export, it has been highly complicated to measure the real output of these countries.

OPEC+ has been curtailing output since 2017 to deal with the oversupply in global oil market due to the shale boom in the U.S. and increasing supply in some other non-OPEC countries like Brazil and Norway. While the U.S. shale oil producers enjoy higher oil prices thanks to OPEC+ output cuts, they're not taking part in cuts which resulted the U.S. to become world's biggest oil producer.

Additional Output Cut (bpd)	
Saudi Arabia	167,000
United Arab Emirates	60,000
Kuwait	55,000
Iraq	50,000
Nigeria	21,000
Algeria	12,000
Congo	4,000
Gabon	2,000
Equatorial Guinea	1,000
Angola	0
Iran	Exempt
Libya	Exempt
Venezuela	Exempt
OPEC Members	372,000
Russia	70,000
Mexico	18,000
Kazakhstan	17,000
Oman	9,000
Azerbaijan	7,000
Malaysia	5,000
Bahrain	2,000
Brunei	1,000
South Sudan	1,000
Sudan	1,000
Non-OPEC Members	131,000
Total	503,000



Graphic – OPEC's share in global oil supply vs average Brent price (2009-2019)⁴

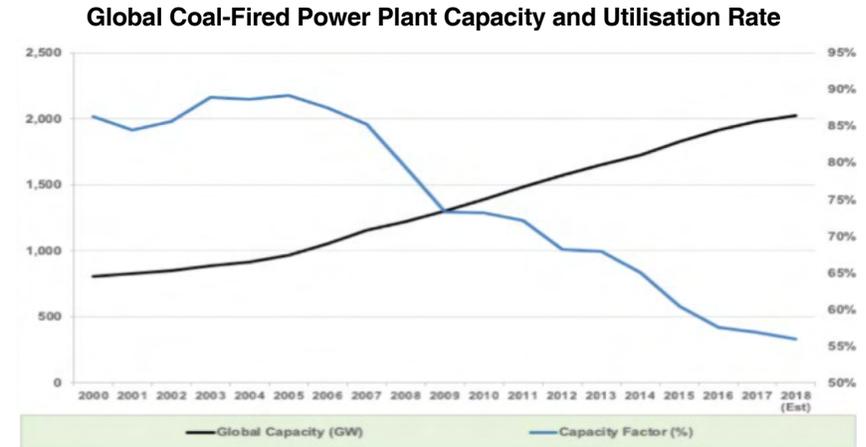
⁴ Reuters (December 6, 2019) Saudi delivers deeper cuts as OPEC+ oil producers back new pact

EUROPEAN BANKS CONSECUTIVELY EXIT COAL FINANCING

As the financial companies have come under pressure from investors and climate activists to ease the transition toward a low-carbon economy, European banks one after another announce their new green energy lending policies.

The European Investment Bank (EIB) announced on November 14 that it will end funding fossil fuel projects at the end of 2021. According to the new policy, all energy projects asking for EIB funding should meet the new emission criteria of 250 grams of carbon dioxide per one kilowatt hour of energy. As this new policy implies that the bank will no longer finance any new traditional gas-fired power plants, gas projects would have to be based on new technologies such as carbon capture and storage (CCS), combining heat and power generation or mixing in renewable gases with the fossil natural gas.

This move was expected to be announced in October, but was postponed due to divisions within the European Union (EU), the bank's current 28 shareholders. While



(Source: Global Tracker, BP Statistics, IEEFA estimates & calculations)

some EU member states insisted gas funding to continue, EIB could eventually get the approval of the shareholders representing 90% of its capital thanks to the one year delay (from the end of 2020 to the end of 2021) over negotiations.

Just after EIB's decision, France's BNP Paribas announced that it will completely exit financing thermal coal projects by 2030 in the EU and by 2040 worldwide.

And in the following week, UniCredit, Italy's biggest bank by assets, unveiled its new 4-year strategy which includes to halt all lending for thermal coal projects by 2023. UniCredit will also raise its exposure to the renewable energy sector by a quarter to more

than \$10 billion by 2023. UniCredit's new policy bans the financing of new oil and gas projects in Arctic as well as shale, tar sands and deep offshore oil and gas projects. While the bank plans to derive 100% of the electricity for its offices in Italy, Germany and Austria from renewable sources (up from 78% in 2018), it will remove all single-use plastics from its buildings by 2023 as well.

On the other hand, French insurer AXA said that it would exit completely from the coal industry in the OECD-member countries and the EU by 2030 and the rest of the world by 2040. AXA also announced that it will allocate \$13.2 billion in green investments between 2020-2023.

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