

Europe's tough emissions rules come with \$39bn threat



EPA

Time is running out for car makers in Europe. Just six months out from stiff new emissions rules, the industry is facing up to an estimated €34bn (\$39bn) in penalties as well as eroding profits from selling more electric cars. Starting in 2020, car fleets in Europe will need to meet more stringent regulations on how much carbon dioxide they're allowed to release. The industry is ill prepared for the looming change, and the huge fines pending for subverting the new rules could prompt some brands to abandon the European market and test the mettle of those that remain. The threat is part of a broader pileup: vehicle sales are falling in key markets around the world, and the US is exchange- ing blows on trade with China and the European Union, threatening to raise costs and rattle the global economy. Worse yet, automakers have been unable to pry buyers from the highest-emission cars, such as the Mercedes-AMG GLE 63 S sport utility vehicle that spouts more than three times the car maker's targeted CO₂ fleet level from 2020. "In an industry that is already suffering from global

trade issues, from Brexit, from peaking sales, that's a very, very dangerous cocktail," Evercore IS auto analyst Arndt Ellinghorst said on a call earlier this month regarding the EU emissions issue.

Fines could mount to €34bn through 2021, according to research firm Jato Dynamics, whose projection tracks with other industry estimates. While the new regulations are expected to be painful for the industry to adjust to, past precedent suggests the EU is unlikely to allow Europe-based carmakers to be driven to ruin. Volkswagen AG, the world's biggest carmaker, faces the largest penalty at about €9bn based on 2018 reported emissions, followed by Peugeot maker PSA Group and Fiat Chrysler Automobiles NV – the company with the single largest gap between actual performance and the new targets. BMW AG and Daimler AG could see earnings drop sharply due to their heavy reliance on high-emission SUVs. Toyota Motor Corp, maker of the Prius and several other hybrids, was the only automaker to see its emissions fall last year in Europe, according to Jato. While its calculation doesn't take into account a blitz of upcoming electric models like Volkswagen's ID.3 hatchback and Porsche Taycan, European Environment Agency data show emissions rising – not falling – for the past two years to a four-year high in 2018. Fumes are emitted from the exhaust pipe of an Audi in London. A Volkswagen spokesman reiterated recent comments by officials including chief executive officer Herbert Diess that it's the company's goal to meet European emission limits. A spokesman for BMW said paying fines wasn't a strategic option, and the company on Tuesday brought forward its planned rollout of electric cars by two years. Daimler said its plan to reach the targets also depended on customer decisions. "It's not quite an existential problem yet, but there are going to be questions of how do you explain to shareholders that I'm losing so much money, and it's going to create immense pressure," Michael Schweikl, managing consultant responsible for automotive at PA Consulting Group, said in an interview. Starting January 1,

all but 5% of the EU's car fleet can emit no more than 95 grams of carbon dioxide per kilometre driven. One year later, no new vehicle can exceed that level.

Fines of 95 euros per gram for each car over the target will add up quickly, driving automakers to speed up the electrification of their lineups by offering more gasoline-electric hybrids and cars fully powered by batteries. "I have never seen such a material event risk in my career," Evercore's Ellinghorst warned in a research note to clients last month under the subject line "The 2020 CO2 cliff." Automakers aren't panicking — yet. PSA expects to be compliant from day one and won't pay any fines, a spokesman said. However, in 2018, sales of EVs and hybrid vehicles accounted for less than 1% of PSA's registered sales. The quandary on CO2 doesn't end there, because in addition to being less popular, low-emission cars are much less profitable than the rest of automakers' fleets. At Volkswagen, less than 1% of sales were plug-ins or battery cars last year, and about 6% at BMW. An analysis by UBS last year estimated Ebit margins on Tesla Inc's Model 3 sedan were, at best, half those of BMW's gasoline-powered 330i model.

The push for electrification in Europe means selling mass-market vehicles there will be unprofitable "for a decade or two," John Murphy, an auto analyst for Bank of America Merrill Lynch, said during a presentation this month in Detroit. The 2020 limits were agreed to in 2014 after years of back-and-forth on balancing a reduction in emissions while not costing carmakers too much. What no one foresaw was the extent of consumers' love affair with gas-guzzling SUVs and Volkswagen's diesel-emissions cheating scandal that surfaced the following year. Diesels, which emit about a fifth less CO2 than equivalent gasoline cars, were a key plank in carmakers meeting the tighter regulation. But some European cities have started to ban diesels, leaving the cars to languish on dealer lots. "The top automakers will face trouble as none of them

are currently on track to meet the target," Jato Dynamics said in an April blog post. "The incoming CO₂ targets can be seen as the apocalypse of the car industry in Europe." The new rules may prompt some brands without a strong presence in Europe to abandon the market altogether, said Ellinghorst, though he declined to specify which might do so. General Motors Co already effectively withdrew in 2017 when it sold the Opel brand to PSA. Companies without fully-electric vehicles in Europe such as Ford Motor Co and Japan's Mazda Motor Corp face steep challenges. Honda Motor Co does too, but it plans to launch a small battery-electric model later this year. Ford said in a statement it expects to meet the 2020-2021 targets, but that its longer-term strategy in Europe through 2030 "assumes a strong uptake of electrified vehicles" by consumers. Representatives for Mazda had no immediate comment. If the industry fails to clear the new bar set by regulators, it won't be the first time.

When many automakers missed the boat on the switch to new emissions testing in September, it was nearly enough to send Europe's largest economy into recession. Employees work on BMW i3 electric cars on the assembly line at a factory in Leipzig, Germany. Simply selling more small cars won't help, as even the most fuel-efficient gas-powered vehicles also face tougher mandates. Carmakers aren't likely to be able to pass along the added costs for equipping those cars with cleaner technology, Bernstein analyst Max Warburton wrote in a recent report. He said that may lead to "the death of the small car" in Europe. The regulations do allow for some creative ways to lower average fleet emissions and mitigate penalties, at least during a phase-in period. Cars that emit less than 50 grams CO₂ per kilometre will count for two cars in 2020, and slightly less each year after. Fiat Chrysler has also made use of the option to pool fleets of high-emission autos with low- or zero-polluting cars, pairing up with Tesla Inc in a deal that likely will involve paying the US company several hundred million dollars. Mazda and Toyota are also forming a

pool. "I think that 2020 is doable. The concern is about customer acceptance for new technology," said Antonio Massacesi, head of fuel economy and greenhouse gas compliance for Fiat Chrysler's European business. "That risk is one of the reasons why we decided to enter into a pool with Tesla."

Saudi Arabian crude inventories sink to historic low



Riyadh's production cuts to support the oil price have caused domestic stocks to plummet

Saudi Arabia's crude oil inventories have fallen under 200 mn bl for the first time in a decade as the Kingdom's production cuts continue, according to Jodi data released on Wednesday.

The Kingdom's oil stocks fell to 193.4mn bl in April,

representing a 17pc drop year-on-year. It is the lowest inventory level since February 2009, when the price of WTI was just \$35/bl.

The decline in stocks continues a trend that has gathered speed since the inventory peaked at 329mn bl in September 2015. The trend accelerated in Q1 due to crude refinery runs growing 8pc to 2.653mn bl/d and a 7.4mn bl draw during April alone.

However, the inventory decline comes despite a rise in average production in the Q1, year-on-year, by 0.7pc to 9.993mn bl/d. Average monthly oil exports during Q1 2019 were 1pc lower than the same period in 2018, at 7.137mn bl/d.

Opec+ production

Opec+ members agreed last December to cut a combined 1.2 mn b/d of production. Saudi Arabia is contributing the lion's share of Opec's 800,000 bl/d contribution, which equates to roughly 6pc of its income.

Saudi Arabia needs to maintain stable production and export figures to limit the damage to the government's coffers.

Saudi rulers are also mindful maintaining good relations with the US Trump administration. By ensuring the global oil market is well supplied it bolsters the partnership that is aligned against the shared regional rival, Iran.

The price of WTI plummeted 23pc from a high of \$66.5/ bl in mid-April to \$50.82/ bl in early June, led by global demand concerns worsened by the US-China trade war as well as continued growth of US inventories.

The price slide persisted until a bomb attack on shipping in the Gulf led to rising tensions and a subsequent price surge starting 19 June.

All eyes are now on the Opec+ meeting to be held in Vienna on 1-2 July, where the organisation will decide whether to extend the cuts.

Solar, storage and wind can keep us on track as far as 2030



With solar and wind power already the cheapest source of new power generation across two-thirds of the globe, analysts at Bloomberg New Energy Finance (BNEF) have predicted Europe will lead the race to decarbonize its grid.

The authors of this year's *New Energy Outlook* report, published today, expect Europe to generate 92% of its electricity from renewables by 2050 thanks to carbon

pricing and other supportive policies. The U.K. last week voiced a net zero carbon 2050 ambition and it is expected Ireland and the EU will follow suit in due course.

Power sector emissions in China, however, are not set to peak until 2026 – thanks to an extensive modern coal power fleet – although they are expected to decline by more than half in the subsequent 20 years. That is in part because of an anticipated rise in demand for electricity of more than 50% by 2050, with Asia due to present a \$5.8 trillion power demand market – more than half the global figure during that period – and India and China alone a \$4.3 trillion opportunity.

The U.S. will also lag behind Europe when it comes to decarbonization, according to the annual study, which is based on analysis of the costs of competing energy technologies. Renewables will more than double their contribution to the U.S. energy mix, to 43% in 2050, but will have to compete with abundant natural gas in a \$1.1 trillion new energy capacity market.

Renewables are the big winner

Despite the prevalence of natural gas in the U.S., the *New Energy Outlook 2019* study predicts that as an energy source, gas will occupy roughly the same share of the market in 2050 as it does today, as will hydropower and nuclear. Oil will have disappeared as a source of energy by mid century, added the BNEF report, and coal – which supplies 37% of power generation today – will have been reduced to a 12% slice of the pie.

Renewables, helped by lithium-ion battery storage will fill the void, according to BNEF, with a rise from 7% of power generation today to 48% by 2050.

That is down to an estimation price reductions in solar, energy storage and wind technologies will continue at rates of 28%, 18% and 14%, respectively, for every doubling in

installed capacity. If those predictions are borne out, renewables will supply and store more energy than coal and gas "almost everywhere" by 2030, stated the report.

The good news is that would ensure the world stays on track for global heating of less than two degrees Celsius by 2050 up to the year 2030, without the need for any new public money incentives for renewables in the next 15 years. Beyond that point, however, new technologies would be required as renewables could top out at contributing 80% of energy generation in many countries by 2050.

New solutions needed

That would mean innovations and alternative solutions such as nuclear, biogas-to-power, green hydrogen-to-power and carbon capture and storage would need to be rolled out after 2030, which in turn would require significant spending on R&D before that point.

One other requirement needed to keep us on track as far as 2030 would be for power markets to be reformed to correctly acknowledge, and reward, the role played by renewables and storage in helping the grid.

In a press release issued to publicize today's BNEF report – which also considers the potential carbon savings to be made in a world with fully electrified transport and building heating – the organization's head of energy economics Elena Giannakopoulou stated: "[The] NEO [New Energy Outlook] is fundamentally policy agnostic but it does assume that markets operate rationally and fairly to allow lowest cost providers to win."

Therein lies the rub, perhaps.

Renewable Power Generation Costs in 2018



Renewable energy has become an increasingly competitive way to meet new power generation needs. This comprehensive cost study from the International Renewable Energy Agency (IRENA) highlights the latest trends for each of the main renewable power technologies.

Released ahead of high-profile United Nations energy and climate discussions, Renewable Power Generation Costs in 2018 draws on cost and auction price data from projects around the world.

Download the chart data

Costs from all commercially available renewable power generation technologies declined in 2018. The global weighted-average cost of electricity declined 26% year-on-year for concentrated solar power (CSP), followed by bioenergy (-14%),

solar photovoltaic (PV) and onshore wind (both -13%), hydropower (-12%), geothermal and offshore wind (both -1%), the report finds.

Continuing cost declines, meanwhile, underline renewable power as a low-cost climate and decarbonisation solution. Within IRENA's global database, over three-quarters of the onshore wind and four-fifths of the utility-scale solar PV project capacity due to be commissioned in 2020 should provide lower-priced electricity than the cheapest new coal-fired, oil or natural gas option, the report notes.

Among other findings:

- Onshore wind and solar PV power are now, frequently, less expensive than any fossil-fuel option, without financial assistance.
- New solar and wind installations will increasingly undercut even the operating-only costs of existing coal-fired plants.
- Low and falling technology costs make renewables the competitive backbone of energy decarbonisation – a crucial climate goal.
- Cost forecasts for solar PV and onshore wind continue to be revised as new data emerges, with renewables consistently beating earlier expectations.

Along with reviewing cost trends, the report analyses cost components in detail. The report draws on IRENA's cost database of around 17 000 renewable power generation projects and 9 000 auction and power purchase agreements for renewable power.

Sample figure

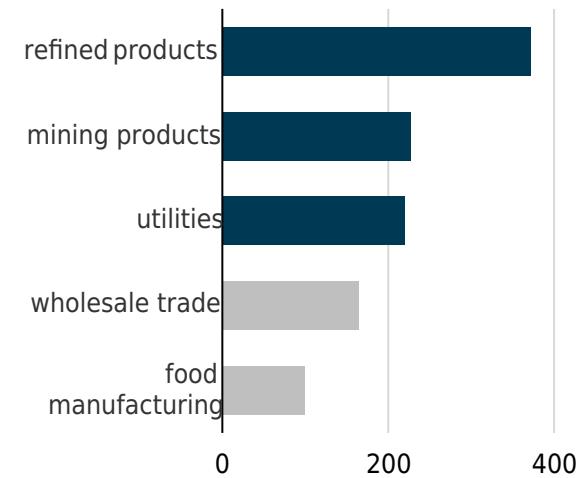
Utility-scale solar PV:

Total installed costs in 2018 by component and country

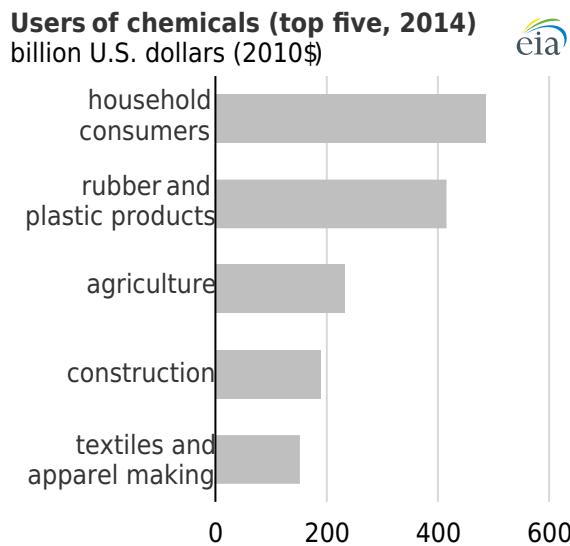
Energy products are key inputs to global chemicals industry



Chemicals industry inputs (top five, 2014)
billion U.S. dollars (2010\$)



Users of chemicals (top five, 2014)
billion U.S. dollars (2010\$)



ea

Source: U.S. Energy Information Administration, based on World Input-Output Database

Note: Dollar values are expressed in 2010 U.S. dollars, converted based on purchasing power parity.

The industrial sector of the worldwide economy consumed more than half (55%) of all delivered energy in 2018, according to the International Energy Agency. Within the industrial sector,

the chemicals industry is one of the largest energy users, accounting for 12% of global industrial energy use. Energy—whether purchased or produced onsite at plants—is very important to the chemicals industry, and it links the chemical industry to many parts of the energy supply chain including utilities, mines, and other energy product manufacturers.

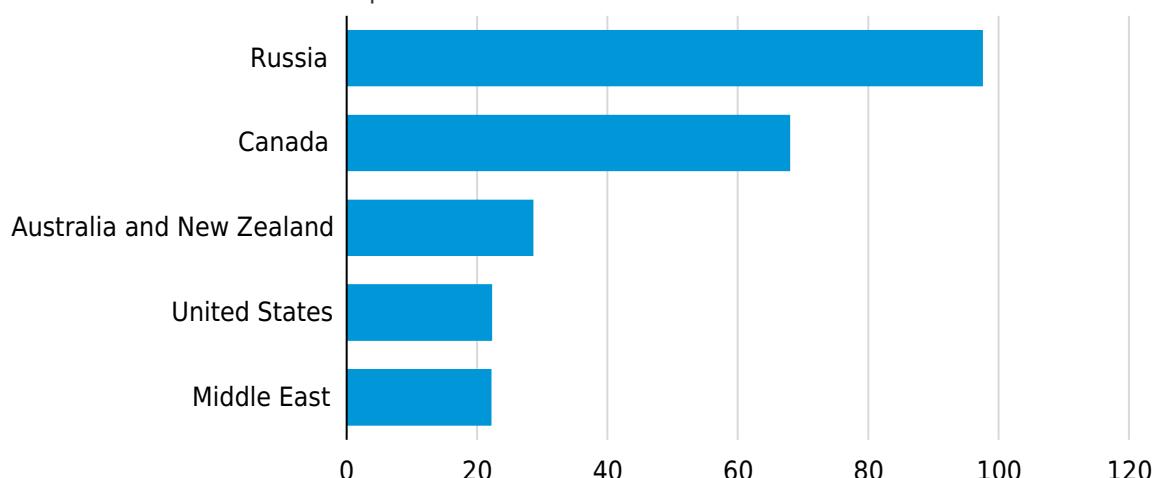
The chemicals industry is often divided into two major categories: basic chemicals and other chemicals. Basic chemicals are chemicals that are the essential building blocks for other products. These include raw material gases, pigments, fertilizers, plastics, and rubber. Basic chemicals are sometimes called bulk chemicals or commodity chemicals because they are produced in large amounts and have relatively low prices. Other chemicals—sometimes called fine or specialty chemicals—require less energy to produce and sell for much higher prices. The category of other chemicals includes medicines, soaps, and paints.

The chemicals industry uses energy products such as natural gas for both heat and feedstock. Basic chemicals are often made in large factories that use a variety of energy sources to produce heat, much of which is for steam, and for equipment, such as pumps. The largest feedstock use is for producing petrochemicals, which can use oil-based or natural-gas-based feedstocks.

In terms of value, households are the largest users of chemicals because they use higher value chemicals, which are often chemicals that help to improve standards of living, such as medicines or sanitation products. Chemicals are also often intermediate goods—materials used in the production of other products, such as rubber and plastic products manufacturing, agricultural production, construction, and textiles and apparel making.

Basic chemicals industry energy intensity in select regions (top five, 2015)
thousand British thermal units per dollar

bia



Source: U.S. Energy Information Administration, *WEPS+*, August 2018

Note: Dollar values are expressed in 2010 U.S. dollars, converted based on purchasing power parity.

The energy intensity of the basic chemicals industry, or energy consumed per unit of output, is relatively high compared with other industries. However, the energy intensity of the basic chemicals industry varies widely by region, largely based on the chemicals a region produces. According to EIA's *International Energy Outlook 2018*, Russia had the most energy-intensive basic chemicals industry in 2015, with an average energy intensity of approximately 98,000 British thermal units (Btu) per dollar, followed by Canada with an average intensity of 68,000 Btu/dollar.

The Russian and Canadian basic chemicals industries are led by fertilizers and petrochemicals. Petrochemicals and fertilizers are the most energy intensive basic chemicals, all of which rely on energy for breaking chemical bonds and affecting the recombination of molecules to create the intended chemical output. These countries produce these specific basic chemicals in part because they also produce the natural resources needed as inputs, such as potash, oil, and natural gas.

By comparison, the energy intensity of the U.S. basic chemical

industry in 2015 was much lower, at 22,000 Btu/dollar, because the industry in the United States has a more diverse production mix of other basic chemicals, such as gases and synthetic fibers. However, EIA expects that increasing petrochemical development in the United States will increase the energy intensity of the U.S. basic chemicals industry.

The United States exports chemicals worldwide, with the largest flows to Mexico, Canada, and China. According to the World Input-Output Database, U.S. exports of all chemicals in 2014 were valued at \$118 billion—about 6% of total U.S. exports—the highest level in decades.

Principal contributor: Elizabeth Sendich

Saudi Aramco allows sneak peek into its finances



The world's focus, not surprisingly, has been on Saudi Aramco's \$111bn of net income recorded in 2018, making it the most profitable company in the world. But elements of the upstream story were largely ignored.

For example, the prospectus showed the company's largest oilfield, Ghawar, undershooting what many had thought was its current capacity of around 5mn bl/d, instead coming in at 3.8mn bl/d.

Ghawar has contributed about half of the estimated 150bn barrels of crude that Saudi Arabia has produced to date. Without doubt, Ghawar is an enormous field. Its remaining reserves are put at 48bn bl, so there is still a lot of oil out there, but it will get harder to recover, and require substantive expenditure.

Aramco is developing new fields to plug depletion, with half a dozen expected to come on stream by 2026 – adding an extra 1.25mn bl/d, according to data from consultancy Energy Aspects. Its co-founder Richard Mallinson emphasises that future upstream development is designed to keep things steady “at current capacity levels...Aramco is not talking, as it has done in the past, about possibly raising potential capacity from 12mn bl/d to 15mn bl/d.”

Still, Aramco is not giving up on Ghawar anytime soon. The prospectus says field facilities and infrastructure there remain a central component in the company's long-term strategic framework.

“The scope of the utilisation and maintenance of the established infrastructure has expanded to be a hub for development of secondary reservoirs and satellite fields,” says the prospectus.

The prospectus also shows how it has boosted production at other fields. At Shaybah in the south of the kingdom, and at the offshore Safaniyah field in the Gulf, Aramco reported production was close to double earlier Western estimates. At the Khurais field, near Ghawar in the east of the country, a “mega-project that started in 2009 with initial capacity of 1.2mn bl/d, has hoisted production to 1.5mn bl.” In 2018,

Aramco produced 13.6mn bl/d of oil, including 10.3mn bl/d of crude.

Half a century of reserves

Overall, Aramco's reserves come in at a similar level to an independent audit published earlier this year: 261.5bn bl of crude and condensate, sufficient for proved reserves life of 54 years, "significantly longer than the 9 to 15 year proved reserves life of any of the five major IOCs based on publicly available information", claims the prospectus. The document also records 36.1bn bl of NGLs and 233.8tn ft³ of natural gas.

Another scarcely mentioned disclosure in the prospectus was Aramco's shift to lighter-grade oil, in terms of projects that have come on line, and new ones in the pipeline. The question now is the extent to which Aramco can match this type of product to demand in the marketplace. The move to lighter is good in terms of petrochemical demand and positive when gasoline/diesel demand is strong.

The prospectus flags Aramco's rock-bottom cost of production based on a comparison of data of the five major IOCs and other leading oil and gas companies. The company's "average upstream lifting cost was \$2.80/bl" of oil equivalent produced in 2018. Revenue from upstream operations stood at around \$217bn, while downstream revenue was \$139bn. It had \$86bn in free cash flow at the end of 2018, with minimal debt.

But all that glistens is not gold. Aramco may be the world's most profitable oil company, producing more than 10pc of global crude, but the prospectus shows the state's reliance on the company means it generates less per barrel than privately-owned competitors. Riyadh relied on the oil sector for 63pc of its total revenue in 2017, according to the prospectus. In 2018, Aramco paid about \$160bn to the government in dividends, taxes and royalties.

Top credit rating

The transfer of funds from Aramco to the kingdom meant the oil company made about \$26/bl last year, compared with \$38/bl for Shell and \$31/bl for Total. That's why Moody's and Fitch assigned the company ratings of A1 and A+, respectively, arguing the government's reliance on the oil producer to fund its budget acted as a cap on its creditworthiness. ExxonMobil is rated AAA by Moody's.

The linkage between the state and company is an important one in the debate about whether Riyadh really does intend to float a minority stake in Aramco in 2021. Investors worry about the government's control over the oil giant and whether future decisions will be made for the benefit of the state or shareholders.

Andy Critchlow of S&P Global Platts says "investors may be cautious about an IPO because of uncertainty linked to sovereign risk and the kingdom's future potential financing needs [particularly if prices crash due to a swifter switch to green technologies]".

In the interim, the company is shoring up its defences in an uncertain world. It plans to double its refining network, mostly outside the country. The idea is to feed about 50pc of its oil into its fully-owned or joint-venture refineries, making it the largest consumer of its own crude. The prospectus states categorically that refinery expansion was a means "to secure crude oil demand by selling to its captive system" of refineries.

Also revealed is the way Aramco ensures it always has enough spare capacity up its sleeve. The aim is to have "the average maximum number of barrels per day of crude oil (MSC) that can be produced for one year during any future planning period".

Sovereign wealth boost

As of 31 December 2018, MSC stood at 12mn bl/d of crude. Spare capacity afforded by maintaining MSC enables the company “to increase production above planned levels rapidly in response to changes in global crude oil supply and demand”.

Saudi Arabia is drawing on Aramco’s cash to bolster its sovereign wealth fund to develop new industries to break the kingdom’s reliance on oil. It is also trying to extract more profit from the crude it pumps by turning it into gasoline and diesel, as well as plastics and other materials used in consumer goods. The \$69bn purchase of Sabic was a case in point and a major factor behind the bond offering.

The aim is to provide more cash for the Public Investment Fund, the kingdom’s sovereign wealth fund, to invest both internally and overseas to wean Saudi off its addiction to fossil fuels. It is a race against time as the bond prospectus indirectly acknowledges via its references to risk factors that span climate change, among others. And that raises, once again, the issue of an IPO down the line in which the Saudis would like to raise a cool \$100bn.

A listing may be better sooner than later if you believe in the relentless switch to cleaner fuel sources. That said, traders are wondering whether Aramco and Riyadh really need the money.

After all, have they not demonstrated how easily they can tap the bond markets for credit?

Scott Modell, head of geopolitical risk at Washington-based consultancy Rapidan Energy, disagrees with this thesis. “An IPO is necessary [otherwise MBS’s] ambitious Vision 2030 programme designed to reduce oil dependence [could end up becoming] Vision 2130,” he says. “And for that reason, the IPO [postponed last year] is certainly back on the table.”

Trump talks to Saudi crown prince on Iran, oil



(Reuters) – U.S. President Donald Trump spoke on Friday to Saudi Crown Prince Mohammed bin Salman about Middle East stability and the oil market, the White House said, after tensions with Iran prompted a rise in oil prices.

“The two leaders discussed Saudi Arabia’s critical role in ensuring stability in the Middle East and in the global oil market. They also discussed the threat posed by the Iranian regime’s escalatory behavior,” White House spokesman Hogan Gidley said in a statement.

The phone call took place in the wake of Iran's shooting down of an unmanned U.S. drone in the Gulf region, which prompted Trump to prepare but ultimately hold back from launching a retaliatory attack.

There was no word from the White House statement on whether Trump raised with the crown prince the death last October of Saudi journalist Jamal Khashoggi.

A 100-page report by the U.N. special rapporteur on extrajudicial executions, Agnes Callamard, earlier this week accused Saudi Arabia of a "deliberate, premeditated execution" and said the crown prince should be investigated for it.

(Reporting by Steve Holland; Writing by Doina Chiacu; Editing by David Alexander and James Dagleish)

IIEFA report: Advances in electricity storage suggest rapid disruption of U.S. electricity sector



Institute for Energy Economics and Financial Analysis

IEEFA.org

June 14, 2019 (IEEFA) – Momentum is gaining around an industry shift toward utility-scale battery storage systems nationally, finds a report published today by the Institute for Energy Economics and Financial Analysis (IEEFA).

The report – *Advances in Electricity Storage Suggest Rapid Disruption of U.S. Electricity Sector* –details upstart storage and storage-expansion projects in Arizona, California, Hawaii, Florida, Massachusetts, New Hampshire, Nevada, Texas, and Vermont.

Dennis Wamsted, an IEEFA editor/analyst and lead author of the report, said recent evidence of utility-scale storage adoption is most likely the beginning of a trend that will take hold broadly across the industry, benefitting renewables at the expense of gas- and coal-fired plants.

“Bigger changes loom,” Wamsted said. “In the many examples we researched, each project, by and large was driven by one of several value streams—cutting transmission charges, providing grid resilience, offering peak power, allowing for early plant closures and the like—even if other benefits were accrued too.”

The report details dozens of examples of electric companies large and small finding an assortment of cost savings in

electricity-storage technology and portability.

"Installation is still tiny in terms of absolute numbers, but power storage is now ubiquitous and energy storage is no longer a pie-in-the sky proposition," Wamsted said. "These changes are taking place today."

Excerpts from the report:

- Battery storage in combination with solar can be used to facilitate closure of coal and natural gas plants currently being used largely for peaking or seasonal needs, as shown by the NV Energy decision to close the North Valmy coal plant in Nevada, and by Florida Power and Light's's plan to shut two aging natural gas units in Florida.
- Battery storage can be used to meet system peak needs, as SCE is doing in California in replacing the two-unit Mandalay natural gas peaker plant.
- Battery storage can be used to provide firm renewable power, as both Arizona Public Service and Hawaiian Electric are demonstrating with projects they have named, respectively, "Solar after Sunset" and "Renewable Dispatchable Generation."
- Battery storage offers utilities significant opportunities to boost system resilience and cut costs at the same time, as is being demonstrated in a number of other projects highlighted in the report.
- Battery storage can be used to enable more residential solar systems to be installed on local distribution lines without requiring potentially costly and time-consuming system upgrades, as can be seen in an existing program in Vermont and in one being proposed in New Hampshire.
- Battery storage can be used to improve the economics of existing utility-scale solar generation, as can be seen in the discussion about Vistra's battery storage retrofit at a Texas PV plant.

Wamsted said economies of scale will help drive the expansion of utility-scale battery storage, as will a growing recognition by utility companies of the business case for embracing the shift: “It is likely that developers and utilities will be able to stack these benefits, making storage even more economically competitive.”

Full report: Advances in Electricity Storage Suggest Rapid Disruption of U.S. Electricity Sector

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About IEEFA

The Institute for Energy Economics and Financial Analysis (IEEFA) conducts global research and analyses on financial and economic issues related to energy and the environment. The Institute's mission is to accelerate the transition to a diverse, sustainable and profitable energy economy.

Large Exxon Shareholder Starts Divesting Over Climate Change



(Bloomberg) – One of Britain's biggest fund managers started selling shares in Exxon Mobil Corp., saying America's largest oil company isn't doing enough to address climate change.

Legal & General Investment Management, which oversees about \$1.3 trillion and is one of Exxon's top 20 shareholders, said some of its funds have already divested from the company and will ask its clients if it can withdraw more money.

The global oil industry has become increasingly unfashionable for investors as the transition away from fossil fuels raises doubts about its long-term future. Energy stocks currently make up 5% of the S&P 500 Index, down from 13% a decade ago.

The divestment affects a small portion of Exxon's equity – Legal & General owns about 0.6% of the company, and the divesting funds hold just a fraction of that – but it intensifies pressure on the Texas firm, once the world's largest public company. It will also be a fillip for campaigners who want investors to divest from the most polluting companies.

Divestment is a way to “hold Exxon accountable for something that’s really material for their future,” said Meryam Omi, head of sustainability at Legal & General Investment Management. “People in the street who have their own pension that’s going to mature in 30 years time don’t get a chance to talk to Exxon themselves.”

Exxon is the only oil major Legal & General is divesting, as competitors including Chevron Corp. and Royal Dutch Shell Plc meet or exceed the insurer’s basic standards on climate change action. It would also use its remaining shareholding in the company to vote next year against the reappointment of the chairman, a role currently held by Chief Executive Officer Darren Woods.

Exxon is the largest of 11 companies that Legal & General said it will exclude from its “Future World” funds because of climate change risk. Others include MetLife Inc., Subaru Corp., Hormel Foods Corp., Sysco Corp. and Rosneft PJSC. Two companies it withdrew capital from last year for the same reason, Occidental Petroleum Corp. and Dominion Energy Inc., will be added back to the funds because they addressed concerns raised by the insurer.

While standards differ by sector, Legal & General said it expects oil and gas companies to set targets to cut pollution in their own operations as a bare minimum. It also wants the company to disclose the volume of greenhouse gas emissions its operations and customers are responsible for each year.

“We’re on track to meet greenhouse gas reduction measures we announced last year which are expected to help significantly to improve emissions performance,” Exxon spokesman Scott Silvestri said in an email. “They include a 15% decrease in methane emissions and a 25% reduction in flaring by 2020.”

Exxon already publishes an annual tally of emissions from its operations and is “providing solutions to consumers to help

them reduce their emissions," Silvestri wrote.

Legal & General declined to disclose the exact value of its divestment from the oil company. At the end of March, the stock made up 0.7% of one of the asset manager's funds, according to its website. The overall value of that fund at the time was about 4.4 billion pounds (\$5.5 billion), suggesting the Exxon stake was worth more than \$350 million.

Several other companies are "on the cusp" of divestment when it comes to climate action, according to Sacha Sadan, the director of corporate governance at the insurer's investment unit, without saying which ones. And even those that were named as particularly strong on sustainability compared to their peers, such as Equinor ASA and French bank BNP Paribas SA, will be expected to continuously move their businesses away from polluting activities or risk being divested.

"This engagement is not about picking up the laggards, it's about pushing up the whole industry," said Omi. "We need to keep the pressure on."

Returns at Legal & General's Future World funds will suffer very little as a result of the divestments, Omi said. The difference between what the funds would return without divesting and what they will return otherwise, which she called a "tracking error," will be less than 0.3%.

The insurer is hoping to convince all clients to follow its advice around companies lagging in climate action, partly by demonstrating it doesn't sacrifice returns. That could lead to further capital outflows.

A campaigner at ShareAction, a London non-profit that helps investors engage with companies on climate change and other issues, said the move could also inspire other asset managers to reconsider their holdings.

"We expect this to signal to markets the huge risk of investment inaction on the climate emergency ahead of us," Jeanne Martin, senior campaigns officer at ShareAction, said.

Veering away from companies that are performing well is a major departure from its peers and Legal & General's own past. The insurer has held Exxon stock for about 20 years, and it's the asset manager's seventh-largest equity holding overall, worth about \$2 billion at the end of March. Since the day it started its investment in Exxon, the shares have returned 200% in total, according to data compiled by Bloomberg.

(Updates with an estimate of divestment value in 11th paragraph.)

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European Council conclusions on the MFF, climate change, disinformation and hybrid threats, external relations,

enlargement and the European Semester, 20 June 2019



II. Multiannual financial framework

2. The European Council welcomed the work done under the Romanian Presidency and took note of the various elements of the MFF package. It called on Finland's Presidency to pursue the work and to develop the Negotiating Box. On that basis the European Council will hold an exchange of views in October 2019, aiming for an agreement before the end of the year.

III. Climate change

3. The European Council emphasises the importance of the United Nations Secretary General's Climate Action Summit in September for stepping up global climate action so as to achieve the objective of the Paris Agreement, including by pursuing efforts to limit the temperature increase to 1.5°C above pre-industrial levels. It welcomes the active involvement of Member States and the Commission in the preparations.

4. Following the sectoral discussions held over recent months, the European Council invites the Council and the Commission to advance work on the conditions, the incentives and the enabling framework to be put in place so as to ensure a transition to a climate-neutral EU in line with the Paris Agreement [1] that will preserve European competitiveness, be just and socially balanced, take account of Member States' national circumstances and respect their right to decide on their own energy mix, while building on the measures already agreed to achieve the 2030 reduction target. The European Council will finalise its guidance before the end of the year with a view to the adoption and submission of the EU's long-term strategy to the UNFCCC in early 2020. In this context, the European Council invites the European Investment Bank to step up its activities in support of climate action.

5. The EU and its Member States remain committed to scaling up the mobilisation of international climate finance from a wide variety of private and public sources and to working towards a timely, well-managed and successful replenishment process for the Green Climate Fund.

IV. Disinformation and hybrid threats

6. Further to the Presidency report and the contributions from the Commission and the High Representative on lessons learnt with regard to disinformation and securing free and fair elections, the European Council calls for sustained efforts to raise awareness, increase preparedness and strengthen the resilience of our democracies to disinformation. It welcomes the Commission's intention to conduct an in-depth evaluation of the implementation of commitments undertaken by online platforms and other signatories under the Code of Practice. The evolving nature of the threats and the growing risk of malicious interference and online manipulation associated with

the development of Artificial Intelligence and data-gathering techniques require continuous assessment and an appropriate response.

7. The EU must ensure a coordinated response to hybrid and cyber threats and strengthen its cooperation with relevant international actors. The European Council welcomes the adoption of a new framework for targeted restrictive measures, and the work on coordinated attribution at EU level in the context of the cyber diplomacy toolbox, to better deter and respond to cyber-attacks. It invites the EU institutions, together with the Member States, to work on measures to enhance the resilience and improve the security culture of the EU against cyber and hybrid threats from outside the EU, and to better protect the EU's information and communication networks, and its decision-making processes, from malicious activities of all kinds.

V. External relations

8. On the occasion of the Eastern Partnership's 10th anniversary, the European Council reaffirms the importance of this strategic partnership and invites the Commission and the High Representative to evaluate existing instruments and measures and, on the basis of appropriate consultations, to present by early 2020, with a view to the next Eastern Partnership Summit, a further set of long-term policy objectives.

9. The European Council welcomes the peaceful transfer of power in the Republic of Moldova and invites the European Commission and the High Representative to work on a set of concrete measures to support the Republic of Moldova, based on its sustained implementation of reforms under the Association Agreement / DCFTA.

10. The European Council underlines the crucial importance of the EU's strategic partnership with Africa. We are committed

to developing it further with a shared ambition to face together common and global challenges.

11. The stability, security and prosperity of the countries on the southern shore of the Mediterranean are of crucial importance for the EU. In this context, peace and long-term stability in Libya are a common priority. The EU reiterates its support for the UN-led process for the cessation of hostilities and an inclusive political solution.

12. The European Council welcomes the renewed impetus in EU-Morocco relations and looks forward to the upcoming EU-Morocco Association Council.

13. The European Council reiterates its call on Russia to release the captured Ukrainian sailors unconditionally, return the seized vessels and ensure free passage of all ships through the Kerch Straits, in accordance with international law.

14. The European Council expresses its utmost concern about the Russian presidential decree of 24 April, enabling the simplified issuing of passports in certain areas of Ukraine's Donetsk and Luhansk regions, which runs counter to the spirit and the objectives of the Minsk agreements.

15. The European Council will continue to monitor the situation in eastern Ukraine and stands ready to consider further options, including non-recognition of Russian passports issued in contradiction to the Minsk agreements, in close coordination with its international partners. The European Council calls for an urgent resumption of negotiating efforts with a view to the implementation of the Minsk agreements and for measures aimed at rebuilding confidence among the parties.

16. 17 July will mark five years since the downing of flight MH17, which claimed 298 lives. The European Council reiterates its full support for all efforts to establish truth, justice

and accountability for the victims and their next of kin, in accordance with UNSC Resolution 2166. In this context, it welcomes the announcement by the Joint Investigation Team on 19 June 2019 that criminal charges will be brought in the Netherlands against four individuals, calls on Russia to cooperate fully with the ongoing investigation, and expresses its full confidence in the independence and professionalism of the legal procedures that lie ahead.

17. The European Council recalls and reaffirms previous Council and European Council conclusions, including the European Council conclusions of 22 March 2018 strongly condemning Turkey's continued illegal actions in the Eastern Mediterranean and the Aegean Sea. The European Council expresses serious concerns over Turkey's current illegal drilling activities in the Eastern Mediterranean and deplores that Turkey has not yet responded to the EU's repeated calls to cease such activities. The European Council underlines the serious immediate negative impact that such illegal actions have across the range of EU-Turkey relations. The European Council calls on Turkey to show restraint, respect the sovereign rights of Cyprus and refrain from any such actions. The European Council endorses the invitation to the Commission and the EEAS to submit options for appropriate measures without delay, including targeted measures. The EU will continue to closely monitor developments and stands ready to respond appropriately and in full solidarity with Cyprus. The European Council will remain seized of the matter and will revert accordingly.

VI. Other items

18. The European Council endorses the conclusions on enlargement and stabilisation and association process adopted by the Council on 18 June 2019.

19. In the context of the European Semester, the European

Council held a discussion on the basis of a horizontal report on Country-Specific Recommendations.

[1] For a large majority of Member States, climate neutrality must be achieved by 2050.