

# Global LNG demand to more than double to 800mn tonnes by 2050: GECF



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Global LNG demand will more than double from 356mn tonnes in 2020 to 800mn tonnes by 2050, “fuelled by solid demand from Asia and a rise in gas use for powering hard-to-electrify sectors”, according to the Gas Exporting Countries Forum (GECF).

The biggest regasification capacity additions to 2050 are expected in Asia Pacific, GECF said in its ‘Global Gas Outlook 2050’.

Total regasification capacity rose from 572mn tonnes per year (MTPY) in 2010 up to 947 MTPY in 2020.

By 2050, regasification capacity is projected to grow to 1465mn tonnes per year, significantly outrunning the actual projected LNG demand.

That will include, by 2050, almost 1050 MTPY in Asia, and 190 MTPY in Europe. China will top the list of regasification capacity by 2050 with almost 340 MTPY, followed by Japan with 210 MTPY, South Korea with over 150 MTPY and India with 100

MTPY, GECF said.

Some eight new regasification terminals were commissioned in 2020 with a total LNG regas capacity of 26 MTPY, primarily in Asia Pacific region as well as Latin America (Brazil, Puerto Rico). Gas infrastructure build-out, coal-to-gas switching and market deregulation are the main determinants for LNG demand growth.

South and Southeast Asia are likely to drive LNG demand growth in the future as the countries are investing heavily in gas pipelines and regasification terminals. India offers the most demand growth potential in the region due to the scale of its infrastructure expansion. The South and Southeast Asia region might grow its share of global LNG demand from 14% in 2020 to over 40% by 2050.

Around 150 MTPY of new LNG regasification terminals are under construction, of which about almost three-fourth, or 110 MTPY is in Asia Pacific, where the top countries are China (over 50 MTPY), India (20 MTPY) and 28 MTPY in the Middle East, in Kuwait and Bahrain.

By 2050, the majority of incremental growth in natural gas imports will be undoubtedly attributed to Asia Pacific with almost 650 bcm additions over 2020-2050.

Latin America and Europe, with total increases of 55 bcm and 35 bcm, respectively will follow. The underlying demand will be balanced out by supply increases from primarily Eurasia (285 bcm) Middle East (230 bcm) together with North America (160 bcm) and Africa (50 bcm) over the long term.

Asia Pacific will account for the highest share of global imports by 2050, while the share held by the European market will be gradually decreasing as import volumes increase slowly by 2030, GECF noted.

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## **Big Oil Spends on Investors,**

# Not Output, Prolonging Crude Crunch



By  
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May 7, 2022, 10:30 AM GMT+3

Big Oil is raking in historic amounts of cash, but the windfall isn't being invested in new production to help displace Russian oil and gas. Instead, executives are rewarding shareholders – setting the world up for an even tighter energy market in the years ahead.

The West's five biggest oil companies together earned \$36.6 billion over and above their spending in the first quarter, or about \$400 million in spare cash a day. It was the second-highest quarterly free cash flow on record and enough to relegate billions of dollars of Russia-related writedowns to mere footnotes in their recent earnings reports.

Oil booms typically spark a chase for higher production – but not this time. All five supermajors have kept their capital expenditure budgets firmly in check and pledged that this discipline will hold in future years – even as oil prices have closed above \$100 a barrel on all but five days since Russia invaded Ukraine in February. With wells naturally declining in production every year and large projects taking half a decade or more to come online, any expansion lag happening now will push the possibility of new production even further into the future.

“In prior cycles of high oil prices, the majors would be investing heavily in long-cycle deepwater projects that wouldn’t see production for many years,” said Noah Barrett, lead energy analyst at Janus Henderson, which manages \$361 billion. “Those type of projects are just off the table right now.”

In short, if consumers are looking for Big Oil to replace Russian production with any urgency, they better look elsewhere.

The last time crude was consistently over \$100 a barrel in 2013, Big Oil’s combined capital expenditure was \$158.7 billion, almost double what the companies are currently spending, according to data compiled by Bloomberg. The group includes Shell Plc, TotalEnergies SE, BP Plc, Exxon Mobil Corp. and Chevron Corp.

“Discipline is the order of the day,” BP Chief Executive Officer Bernard Looney told analysts Tuesday. The London-based major isn’t budging on its \$14 billion to \$15 billion spending plans for the year, with its mid-term guidance creeping up to a maximum of \$16 billion despite 10% cost inflation in some parts of its business.

Shell, which posted record profits that exceeded even the highest analyst estimate, was equally clear. In her first set

of results as chief financial officer, Sinead Gorman repeated time and time again that Shell would keep within its \$23 billion to \$27 billion range. "Nothing has changed in terms of our capital allocation framework," she said.

Instead of spending on new projects, companies are opting to reward shareholders after years of poor returns. Exxon, BP and TotalEnergies increased share buybacks while Chevron is already repurchasing record amounts of stock.

There are clear reasons why Big Oil is choosing not to spend more. Chief among them are climate concerns and uncertainty over the future direction of oil demand. Years of pressure from investors, politicians and climate activists came to a head in the past two years, when all the oil majors pledged some form of net zero target by mid-century. BP and Shell actively positioned themselves to move away from oil and gas over the long-term. All are under added pressure to improve returns that dwindled over the past decade due to cost blowouts and low prices.

"Any decision to increase, support or add-in new fossil projects today could see returns risk within a few years," said Banco Santander SA analyst Jason Kenney. Climate change, technology developments like electric cars and rapidly evolving government policy on emissions are major risks today when deciding whether to invest billions in a new project, he said.

Against that backdrop, investment in the upstream oil and gas sector slumped 30% in 2020, while last year's spend of \$341 billion was 23% below pre-pandemic levels, the International Energy Forum wrote in a report.

"Two years in a row of large and abrupt underinvestment in oil and gas development is a recipe for higher prices and volatility later this decade," warned Joseph McMonigle, Secretary General of the IEF.

That message has not gone down well with consumers around the globe. From Pakistan to Paris, billions of people are suffering a cost-of-living crisis fueled in large part by high energy costs. In the U.S., President Joe Biden has implored oil companies to reinvest profits from surging oil prices into more production to help ease the shortages caused by Russia's war against Ukraine. Some U.S. and European politicians have called for a windfall tax on companies' profits to help ease the burden on consumers.

To be fair, that doesn't mean companies aren't investing in growth at all. But they will "focus only on low risk, high return assets" such as shale or expanding offshore fields near existing operations, according to Kenney.

Exxon and Chevron, for instance, are spending aggressively to grow production in the U.S.'s Permian Basin, the world largest shale oil region, with planned growth rates of 25% and 15%, respectively. BP is boosting investment in U.S. shale, but the company won't be able to ramp up Permian production until it finishes building two large gathering systems at the end of the year.

However, most Permian growth will largely offset declines from elsewhere in the U.S. supermajors' global portfolio, rather than adding to total barrels. Exxon's first quarter production of 3.7 million barrels per day was the lowest since its merger with Mobil in the late 1990s. Together Exxon and Chevron plan to spend more on buybacks and dividends this year than they do on production.

"For so long the industry has been told by investors and politicians we need less oil and executives remember that," said Barrett of Janus Henderson. "If the world needs an extra million barrels a day to ease prices, I'm not sure where it will come from."



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# Public-private decarbonisation



As we mark the 52nd Earth Day, we must recognise that achieving net-zero carbon dioxide emissions by 2050 will require significant investment to finance the necessary economic and social transitions. McKinsey estimates that this will take \$9.2tn of annual global investment over the next 30 years – an increase of \$3.5tn per year from what is spent today on clean, renewable energy.

Most of these investments will come from the private sector, which is already leading the charge. The value of assets under management with net-zero commitments is now \$57tn. The 450 members of the Glasgow Financial Alliance for Net Zero, representing more than \$130tn in assets, have pledged to align their portfolios with the Paris climate agreement's 1.5° Celsius warming target. The First Movers Coalition (whose founding members include companies like Amazon, Apple, Boeing, Trane, and Volvo) has pledged to create demand for early-stage

clean technologies in “hard-to-abate” sectors like steel, cement, and aviation. In the United States alone, private investment in clean-energy assets reached a record \$105 billion in 2021, 11% higher than in 2020 and up 70% over the previous five years.

Moreover, last fall, the International Financial Reporting Standards Foundation created a new International Sustainability Standards Board to develop industry-specific climate disclosure guidelines that will build on reporting standards developed by the Sustainability Accounting Standards Board. By the end of 2021, 258 institutional investors, representing \$76tn in assets, had adopted the SASB’s voluntary standards. And, in a significant policy move, the US Securities and Exchange Commission recently proposed new rules that would require public companies to disclose information about their carbon emissions and their plans for addressing climate-related real asset and transition risks.

As these examples suggest, the net-zero challenge cannot be solved by private actors alone. Public-private co-operation and co-ordination will be critical to deploying private capital at the necessary speed and scale. The public sector – from international organisations like the International Monetary Fund and the International Bank for Reconstruction and Development to national, state, and municipal governments – must shape incentives and issue regulations to fuel the necessary private investment in clean-energy projects and infrastructure.

In the US, public-private collaboration has already yielded some clean-energy commercial success stories – most notably Tesla, which was created with the help of a US Department of Energy loan. Government-furnished funding for research and development, loans, and tax incentives have accelerated the growth of the electric-vehicle industry and supported a remarkable reduction in the costs of solar and wind energy over the past 15 years.

Publicly funded and directed innovation has a long history of success in the US. In California, standards set by the



California Air Resources Board led to the widespread adoption of the catalytic converter, reducing tailpipe emissions in the state by 90% between the mid-1960s and the early 1980s. The technology then became a standard part of all motor vehicles sold in the US, because automakers needed to comply with the regulations set first by California (and then by the newly formed Environmental Protection Agency).

Owing to the size of the California market, the fuel-efficiency standards it sets continue to be adopted by major car manufacturers. And within the state, private capital is now being mobilised through public initiatives like the Self-Generation Incentive Program, which provides rebates to organisations that install onsite energy-storage technologies, and through investment tax credits for solar and storage.

As William H Janeway notes in a recent Project Syndicate commentary, the explosion of venture capital in the information-technology and health industries over the past half-century occurred only after the government had invested billions of dollars in upstream R&D and advance-purchase commitments for new products and services. Historically, alternative-energy and decarbonisation technologies have received nowhere near the support provided by the US Department of Defense and the National Institutes of Health for information-technology and biomedical innovations. Increased government support for R&D of climate technologies would accelerate venture capital investment, which has lately gathered momentum.

Policymakers and business leaders should take advantage of this moment to supercharge public-private partnerships for climate-change adaptation and mitigation. The new \$1tn Bipartisan Infrastructure Deal allocates \$62bn to the DOE to accelerate the developing and scaling up of clean-energy technologies through R&D support, demonstration projects, an expansion of the DOE loan program, and targeted tax credits. These are major first steps. The \$555bn of climate provisions in the Build Back Better bill would provide additional de-risking incentives to unlock the private investment required

for the net-zero transition.

Although Russia's war in Ukraine has forced the US to look for ways to increase fossil-fuel production in the short run, it has also provided a wake-up call. Domestic clean-energy production will be key not just to mitigating climate change but also to energy security over the long run. The climate policies in the Build Back Better legislation would accelerate progress toward both of these goals.

But regardless of what happens at the federal level, states and cities can follow California's example and implement bold climate policies of their own. California has pledged \$37bn over the next six years – more than most national governments – to combat climate change, and has introduced its own new loan program to encourage innovation in clean-energy technologies.

This is a unique and critical moment for the private sector. It must step up and deploy its capital, building on public-policy catalysts to drive innovation and investment for a sustainable future. – Project Syndicate

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# LNG liquefaction investment may have scaled up to \$23bn in 2021: GECF



Qatar's \$29bn FID on North Field expansion is a game-changer, noted GECF Global Gas Outlook 2050

LNG liquefaction investment that dropped in 2020 may have scaled up to more than \$23bn in 2021 led by Qatar, US and Russia, according to Gas Exporting Countries Forum (GECF).

Qatar's project, with a final investment decision (FID) of \$29bn taken in February 2021 on North East Field expansion, which will add 33m tonnes per year (mtpy) to the currently existing 77mtpy, is a game-changer, noted the GECF Global Gas Outlook 2050.

Asia Pacific, the main destination of the world's LNG at present and by 2050, will represent the largest transformational challenge for the currently fragmented natural gas market. Asia Pacific with 70% share of LNG trade in 2020 to make up for even more impressive over 80% by 2050.

The top four largest LNG importers emerged in Asia Pacific and will remain so in 2050 with India becoming second largest LNG importer. China became the top global LNG importer in 2021 overtaking Japan as the leader in the consumption of liquefied

gas, followed by South Korea, and India.

By 2050, the majority of incremental growth in natural gas imports will be undoubtedly attributed to Asia Pacific with almost 650bcm additions over 2020-2050. Latin America and Europe, with total increases of 55bcm and 35bcm, respectively will follow, the GECF noted.

The underlying demand will be balanced out by supply increases from primarily Eurasia (285bcm) Middle East (230bcm) together with North America (160bcm) and Africa (50bcm) over the long term.

Asia Pacific will account for the highest share of global imports by 2050, while the share held by the European market will be gradually decreasing as import volumes increase slowly by 2030 due to a significant drop in domestic production but will later slow down till 2050. The overall natural gas demand in Europe is starting to decrease as decarbonisation and the "green deal" efforts are seen to move gas out of energy mix.

Slow LNG demand is seen in Africa, the Caribbean and partially in the Middle East. A very few import terminal projects are currently being built there.

Pipeline trade will see relatively modest growth, mainly due to shifting the export focus from the European to the Asian market, ramping up exports from Russia and Turkmenistan to China.

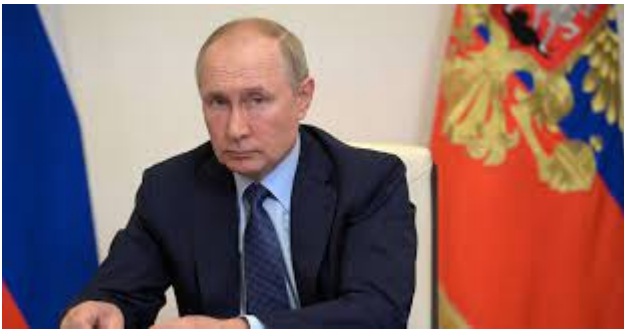
According to the GECF, a rapid shift in demand for LNG from traditional markets to emerging markets will be envisaged in the coming 30 years. The Asian natural gas market is anticipated to stay the largest regional market over the 2020-2050 period, as more countries start importing natural gas with existing importers from predominantly developing Asia ramp-up the existing inflow trade.

The incremental growth in Asian imports will be attributed to China (195bcm) and India (107bcm), 14bcm by South Korea, with the balance taken by new importers from South and Southeast Asia and other developing Asia. Legacy importers such as Japan and Taiwan will slowly decrease gas imports.

The share of global demand met by the traditional markets – Japan, South Korea, and Taiwan – will drop from 39% in 2020 to 18% by 2040, mainly due to lower gas demand for power generation in Japan, the GECF said.

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# Europe risks rationing if Putin cuts off Russian gas supply



The prospect of Europe getting cut off from Russian gas supplies is starting to get real.

The clock is ticking in a standoff over the Kremlin's demand that its customers in Europe pay in rubles for the fuel, which the region depends on for a fifth of its power generation.

The European Union has said the decree violates sanctions and hands more power to Russia. It suggested an alternative that avoids rubles on Friday, but it's up to Moscow to decide if that's acceptable. Payments come due in May, and that's when the moment of truth arrives.

By refusing President Vladimir Putin's payment terms and testing his threat to turn off the taps, European buyers "would be running a very real risk of their supplies being cut," said Katja Yafimava, a senior research fellow at the Oxford Institute for Energy Studies.

The game of geopolitical chicken could lead to Europe rationing energy for the first time since the oil crisis in the 1970s. As the biggest consumer of Russian gas in Europe,

Germany is most exposed, but the fallout would ripple across the continent and beyond. Here's what could happen:

#### Market meltdown

Europe's natural gas market would show the impact immediately. Trading is already on edge, with prices five times higher than the same time last year. That could get worse.

In the event of a supply disruption, forward contracts could more than triple, especially if Europe enters next winter with depleted storage, according to Kaushal Ramesh, senior analyst, gas and LNG at Rystad Energy.

Such a surge would put governments and central banks under pressure as they seek to control soaring inflation. The risk is that the mounting cost-of-living crisis intensifies and spills over into wider unrest and a deeper crisis.

#### Power shift

With less fuel for gas-fired generators, the risks of rolling blackouts would increase. While countries would try to shift to other sources, the options are limited.

France would halt large gas-fired power plants to conserve the fuel for other needs, Italy would maximize production from coal or fuel oil, and Germany has discussed burning more local lignite – the dirtiest form of coal. The workarounds are likely to make the region even more polluting.

On the upside, warmer weather would reduce gas consumption for heating, delaying the worst impacts at least until the fall.

By ramping up other energy sources, including an accelerated expansion of renewable power, the EU aims to cut its gas dependency on Russia by two thirds this year.

#### German rationing

Germany has triggered an emergency plan, with a task force meeting daily to monitor consumption and inventories. Its



energy regulator is surveying companies about their usage to help determine how to distribute supplies.

Consumers would be protected as long as possible, and that means industry would bear the brunt of a rationing plan. That's a big risk for Europe's largest economy. The country depends on Russia for 40% of its gas supplies, and the fuel is critical for processes in the chemicals and metals industries.

At Europe's biggest chemical factory, BASF SE churns out compounds used in manufacturing autos, medicines and fertilizers and all fueled by pipelines filled with Russian gas. The company warns that a sudden halt would send shock waves through many industries and cause irreversible damage to German competitiveness.

The concerns are echoed by the likes of steelmaker Thyssenkrupp AG, automaker Volkswagen AG and utility RWE AG.

"Stopping the pipeline-bound gas supply at this time would have dramatic consequences," RWE Chief Executive Officer Markus Krebber said in an advanced copy of a speech for the company's shareholder meeting next week. Many manufacturers "would no longer be able to operate their plants."

Chancellor Olaf Scholz has said a halt to gas flows from Russia would trigger a serious economic crisis in Europe, leading to the loss of millions of jobs.

The sudden halt in Russian gas deliveries could cost Germany's economy 220 billion euros, or about 6.5% of annual gross domestic product, according to a joint forecast of the country's leading economic institutes. The Bundesbank estimates that output could shrink nearly 2% this year in the event of an embargo on Russian coal, oil and gas.

Read more: Germany to Borrow Extra 40 Billion Euros to Cushion War Blow

But the Berlin-based DIW think tank says a combination of energy savings and optimizing alternative supplies could put Germany in position to offset Russian gas as soon as this winter.

The government has expanded its authority over the energy sector with new rules on gas storage. It's also planning to grant itself powers to put critical energy infrastructure under temporary state control.

### Global squeeze

Emerging nations would get squeezed by Europe's thirst for energy, especially liquefied natural gas, as they would struggle to compete on price. The region is already pulling most of the spare LNG supply from the U.S. and other nearby exporters, keeping spot rates for the super-chilled fuel well above normal for this time of year.

Pakistan is suffering from blackouts, due in part to European nations outbidding the cash-strapped country for LNG cargoes. Argentina is also dependent on LNG from the spot market and has been forced to fork over hundreds of millions of dollars to secure deliveries for the southern hemisphere's upcoming winter.

### Double bluff

As in any game of chicken, there's the chance for one side or both to pull away from the brink. While Europe needs the gas, the continent remains the only potential market in the near term for production from Russian fields.

Turning off the tap now may permanently close the door on Russian energy imports to its neighbor, choking off a key source of revenue in the process. Germany, which has been criticized for cautious support of Ukraine, would face renewed pressure to stand up to Putin more forcefully.

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# U.S. Natural Gas Surges to 13-Year High on Global Supply Crunch



As a result of strong demand, U.S. natural gasoline prices soared to their highest intraday levels in more than 13 years.

- Despite a drop in backup inventories, production is still flat
- Strong demand from Europe has almost pushed LNG exports to the limit

Futures rose to \$7.558 per million British Thermal Units, surpassing January's -fueled the rally. This was roughly twice the level at the beginning of the year.

As suppliers struggle to keep up with a surge in demand after a pandemic, a global fuel shortage is emerging across the markets. This situation is further complicated by the conflict in Ukraine. This discount is shrinking, even though U.S. natural gasoline prices have been well below those in Europe and Asia over the past year due to a bounty from shale fields.

The underground caverns and the aquifers holding backup inventories are lower than normal, and production is flat. To help Europe reduce its dependence on Russian energy, the U.S. is currently exporting every molecule possible of liquefied gas.

According to the National Oceanic and Atmospheric Administration, temperatures below normal are expected in parts of the northern U.S.A. between April 25 and May 1. This could lead to an increase in demand for heating and power-plant fuels, which would divert supply from storage that is normally used during this time. The U.S.'s shortage of coal has also contributed to the rise in gas prices, which has limited power generators' ability to switch fuels.

According to the Energy Information Administration, inventories increased by 15 billion cubic yards in the week ending April 8, which was less than half of the average gain over the past five years. Stockpiles are still 18% lower than usual.

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## **How Ethanol and E15 Gas Fit Into Biden's Plans to Fight**

# Inflation



Ethanol, the intoxicating alcohol found in beer, wine and liquor, has been powering automobiles in the U.S. since the era of the Model T more than a century ago. Since the 1970s, when oil became more expensive and subject to international disputes – and as worries rose about the environmental damage caused by fossil fuels – the U.S. government has used tax policy and regulations to encourage use of ethanol and other environmentally friendly alternatives to gasoline. U.S. President Joe Biden, as part of his efforts to combat rising prices, is making it easier to sell more ethanol in the coming summer months, even as critics raise concerns about the corn-based fuel.

1. What does ethanol do?

It provides oxygen, making gasoline burn more cleanly in engines. The biofuel E10, so named because it contains 10%

ethanol and 90% gasoline, is widely accepted and available at U.S. gas stations. E15, with its 15% ethanol, is currently 5 to 10 cents cheaper per gallon than E10, a discount that's especially appealing in these times of sky-high fuel prices. However, ethanol is corrosive, and some critics believe that E15 can cause damage to cars. In 2011, the EPA authorized the use of E15 for newer cars made in 2001 and later. But it's still not common at U.S. service stations; just about 2,300 of the nation's more than 150,000 filling stations sell E15. And E15 is typically banned in most areas of the U.S. during the summer months.

## 2. Why is summer an issue?

Since the heat of summer increases the evaporation of all liquids, including gasoline, the EPA has had more stringent rules in place between June 1 and Sept. 15 to regulate Reid vapor pressure, the propensity for gasoline to evaporate and lead to smog. The EPA has granted E10 a waiver from the vapor pressure limit, but not E15.

## 3. What change is Biden making?

The U.S. Environmental Protection Agency, which regulates air pollution from gasoline, is issuing a national emergency waiver to allow E15 fuel to be widely sold this summer, even in areas where it's typically off-limits. The move temporarily exempts E15 from air pollution requirements that block the fuel's sale in most areas of the country from June 1 to Sept. 15.

## 4. Why is this change temporary?

The EPA tried making the change permanent in 2019 under former President Donald Trump, issuing a rule allowing year-round sales of E15 even in areas where smog is a problem. The nation's top refining trade group successfully challenged the regulation in federal court, and the rule was tossed out two years later. Ethanol producers have lobbied the Biden



administration to try again. The three-and-a-half-month summer blackout period deters some retailers from offering E15 at all, since they'd need to change pumps and warning labels at the start and end of each summer.

#### 5. Who supports year-round use of E15?

Mainly agricultural interests in the Midwest. Corn use for ethanol has more than tripled since 2005, when President George W. Bush enacted the Renewable Fuel Standard that compels refiners and fuel importers to use a variety of biofuels. Ethanol now accounts for about 10% of U.S. gasoline usage, up from less than a 10th of 1% in 1993. Demand also was given a boost by the Clean Air Act amendments of 1990, which spurred the use of ethanol as an oxygenate to combat pollution. Support for ethanol is a political litmus test in the Midwest U.S.; while campaigning for the presidency in 2020, Biden promised to "promote and advance renewable energy, ethanol and other biofuels."

#### 6. Who opposes year-round use of E15?

Oil companies have battled it for years, warning about potential engine damage from motorists inadvertently pumping the fuel into vehicles and other equipment not approved to use it. Some automakers warn that car warranties would be voided if motorists use E15. Oil refiners worry that increased use of ethanol will pare their share of the fuels market. (This risk is less acute for refiners that also produce ethanol, such as Valero Energy Corp.) Some environmental activists argue that expanding the availability of E15 will drive the production of more corn, resulting in more prairies being plowed and waterways polluted by agricultural runoff.

#### 7. What would broader use of E15 mean for industry?

Not very much, especially right away under the emergency waiver, since the necessary equipment to distribute E15 is limited and concentrated in the Midwest. For refiners and fuel

importers obligated to blend renewable fuels into their products, the move could trigger the generation of more biofuel credits and modestly lower the price of compliance. A long-term shift to allow E15 sales year-round could mean a gradual reduction in U.S. demand for petroleum, which refineries can offset with increased exports.

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**Russia-Ukraine war could  
delay Europe's  
decarbonization plans for a  
decade**



Russia's invasion of Ukraine could force Europe to delay key decarbonization efforts for up to a decade, a prominent regional energy expert has warned in Greece.

"They don't have many choices left," said Roudi Baroudi, CEO of Doha-based Energy and Environment Holding, an independent consultancy. "Unless some European countries pull out all the stops, much of the continent could soon be looking at crippling shortages, prohibitively high prices, or both."

Now that Europe is moving to reduce imports of Russian oil and gas, he explained, some of the measures expected to reduce carbon emissions may have to be put off "for eight, nine, maybe 10 years," as would planned shutdowns of nuclear generating stations.

"The European Union will need to provide the necessary permissions in some cases, plus financing in others," he said. "Eight to 10 nuclear plants and as many as 30 coal stations slated for decommissioning will have to remain online to keep up with electricity demand, and several projects required to replace Russian gas will need to be accelerated with additional funding and/or guarantees."

If and when gas stops flowing through pipelines from Russia, Baroudi told the 7th Delphi Economic Forum last week, "it cannot be replaced by simply ordering more liquefied natural gas from Qatar, the US, and/or other producers. Europe doesn't have enough receiving facilities to re-gasify such huge amounts, which is why efforts to expand capacity in Germany and the Netherlands are so urgent."

Coordinated releases of strategic oil reserves by the US and other countries are helping to contain upward pressure on crude and other energy prices, he said, but reasonable levels "cannot be maintained unless more supply makes it to market and that means oil producers – primarily OPEC but others as well – have to start pumping more."

On yet another front, "Spain has both spare LNG receiving capacity and an undersea pipeline for imports of gas from North Africa – but very little of that can reach the rest of Europe unless and until a new pipeline connects the Iberian Peninsula to the rest of Europe via France," said Baroudi, who has been advising companies and governments on energy policy for decades. "Paris has recently voiced new openness to that idea, but the EU can and should do more to facilitate it. It should also do more to establish an agreed route for another pipeline to carry gas from the Eastern Mediterranean to Greece and/or Turkey."

Baroudi also argued that the EU would be wise to ensure adequate capital flows into renewables such as wind and solar. "We might have to retain fossil fuels longer than we had planned, but that's no reason to stop funding a cleaner future," he said. "In fact it's a reason to move as quickly as possible."

"The whole situation is very sad," he added. "Ever since the Paris Agreements of 2015, and especially since the Glasgow climate summit last year, Europe had been on the right track to be ready for a decarbonized economy. But now those plans are being pushed temporarily to the back burner. Apart from the lives being lost in the fighting, the energy and economic

implications will mean severe hardships across the continent, especially for lower-income people. And much of the cause is due to the fact that Europe had delays to diversify its sources of supply. Now it finds itself scrambling to prevent an economic disaster.”