Energy Tidbits

EU Waiting to See if any Damage to Ukraine Natural Gas Infrastructure from Multiple Russia “Hits” Yesterday

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PRESS RELEASE

Oman: TotalEnergies launches the Marsa LNG project and deploys its multi-energy strategy in the Sultanate of Oman

Paris, April 22, 2024 – During a visit in Muscat on April 21st, Patrick Pouyanné, Chairman and CEO of TotalEnergies met with His Majesty Sultan Haitham bin Tariq Al Said and His Excellency Eng. Salim bin Nasser Al Aufi, Minister of Energy & Minerals, to reaffirm the long-term partnership between TotalEnergies and the Sultanate of Oman.

On the occasion of this visit, Patrick Pouyanné and Mr. Mulham Basheer Al Jarf, Chairman of OQ, the Oman National Oil Company, announced the Final Investment Decision (FID) of the Marsa LNG project.

TotalEnergies had signed a Sale and Purchase Agreement (SPA) with Oman LNG to offtake 0.8 Mtpa of LNG for ten years from 2025, making the Company one of the main offtaker of Oman LNG's production.

Finally, TotalEnergies (49%) and OQ Alternative Energy (51%), the national renewable energy champion, have confirmed being at an advanced stage of discussions to jointly develop a portfolio of up to 800 MW, including the 300 MWp solar project that will supply Marsa LNG

Marsa LNG, an innovative integrated project

Through their joint company Marsa Liquefied Natural Gas ("Marsa"), TotalEnergies (80%) and OQ (20%) launch the integrated Marsa LNG project which combines:

- **upstream gas production:** 150 Mcf/d of natural gas, coming from the 33.19% interest held by Marsa in the Mabrouk North-East field on onshore Block 10, which will provide the required feedstock for the LNG plant. Block 10 production started in January 2023 and reached plateau in April 2024. The FID allows Marsa LNG to extend its rights in Block 10 until its term in 2050.

- **downstream gas liquefaction:** a 1 Mt/y capacity LNG liquefaction plant will be built in the port of Sohar. The LNG production is expected to start by first quarter 2028 and is primarily intended to serve the marine fuel market (LNG bunkering) in the Gulf. LNG quantities not sold as bunker fuel will be off-taken by TotalEnergies (80%) and OQ (20%).

- **renewable power generation:** a dedicated 300 MWp PV solar plant will be built to cover 100% of the annual power consumption of the LNG plant, allowing a significant reduction in greenhouse gas emissions.

Setting very low carbon intensity standards for the next generation of LNG plants

The Marsa LNG plant will be 100% electrically driven and supplied with solar power, positioning the site as one of the lowest GHG emissions intensity LNG plants ever built worldwide, with a

GHG intensity below 3 kg CO_2e/boe. (for reference, the average emission intensity of LNG plants is around 35 kg CO_2e/boe - this represents a reduction in emissions of more than 90%).

The main Engineering, Procurement and Construction contracts have been awarded to Technip Energies for the LNG plant and to CB&I for the 165,000 m^3 LNG tank.

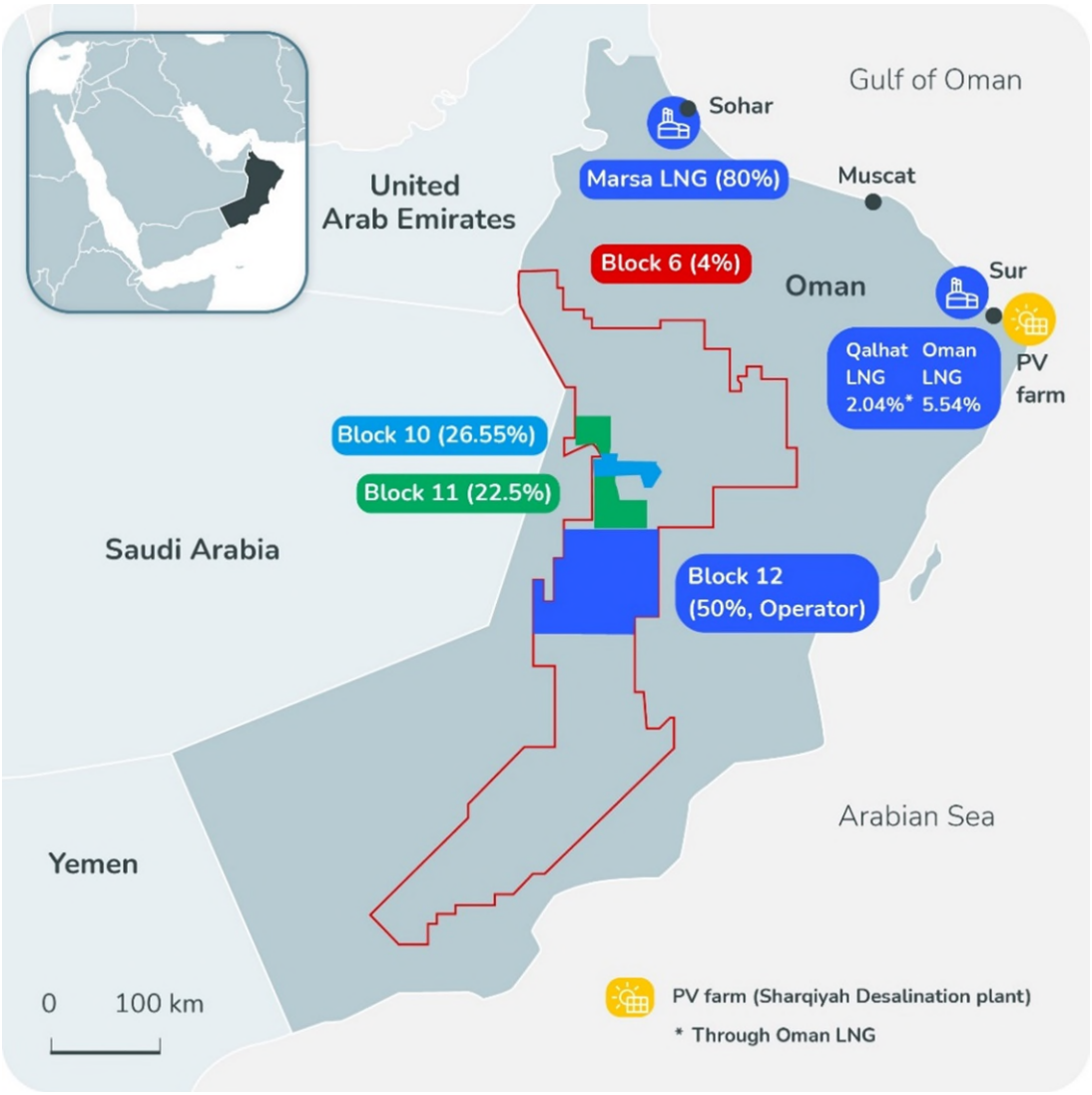
The Marsa LNG project will generate long-term employment opportunities and significant socio-economic benefits for the city of Sohar and the region.

The first LNG bunkering hub in the Middle East

The ambition of the Marsa LNG project is to serve as the first LNG bunkering hub in the Middle East, showcasing an available and competitive alternative marine fuel to reduce the shipping industry's emissions. Compared to conventional marine fuel, LNG helps to cut:

- Greenhouse gas emissions by up to 23%,
- Nitrogen oxide emissions by up to 85%.
- Sulfur emissions by 99%,
- Fine particle emissions by 99%.

“We are proud to open a new chapter in our history in the Sultanate of Oman with the launch of the Marsa LNG project, together with our partner OQ, demonstrating our long-term commitment to the country. We are especially pleased to deploy the two pillars of our transition strategy, LNG and renewables, and thus support the Sultanate on a new scale in the sustainable development of its energy resources”, said **Patrick Pouyanné, Chairman and CEO of TotalEnergies.** “This very innovative project illustrates our pioneer spirit and showcases the relevance of our integrated multi-energy strategy, with the ambition of being a responsible player in the energy transition. By paving the way for the next generation of very low emission LNG plants, Marsa LNG is contributing to making gas a long-term transition energy.”



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TotalEnergies in Oman

TotalEnergies has been present in Oman since 1937.

In the first quarter 2024, TotalEnergies' production in Oman was 61 kboe/d. TotalEnergies produces oil in Block 6 (4%), natural gas in Block 10 (26.55% via Marsa LNG LLC) as well as LNG through its participation in the Oman LNG (5.54%)/Qalhat LNG (2.04% via Oman LNG) liquefaction complex with an overall capacity of 11.4 Mtpa. TotalEnergies is currently conducting exploration activities in Block 12 (50%, operator), and is appraising Block 11 (22.5%).

TotalEnergies also contributes to the development of renewables in the country, such as the largest solar photovoltaic system built to provide power for a desalination plant in Oman (17 MWp – 30,000 MWh/y), in a joint-venture with Veolia, which began commercial operation in April 2023.

TotalEnergies, the world's third largest LNG player

TotalEnergies is the world's third largest LNG player with a global portfolio of 44 Mt/y in 2023 thanks to its interests in liquefaction plants in all geographies. The Company benefits from an integrated position across the LNG value chain, including production, transportation, access to more than 20 Mt/y of regasification capacity in Europe, trading, and LNG bunkering. TotalEnergies' ambition is to increase the share of natural gas in its sales mix to close to 50% by 2030, to reduce carbon emissions and eliminate methane emissions associated with the gas value chain, and to work with local partners to promote the transition from coal to natural gas.

TotalEnergies supports the role of LNG in shipping's energy transition
Marine LNG sharply reduces emissions from ships and significantly improves air quality, in particular when at berth, for the benefit of port cities and communities in coastal areas. Used as a marine fuel, LNG helps to cut greenhouse gas emissions by up to 23% compared to conventional marine fuel and has the potential to reduce emissions significantly more if bio or synthetic LNG is used. As such, marine LNG is a sustainable, affordable and immediately available way of reducing emissions in the shipping sector. TotalEnergies has actively invested in LNG bunkering infrastructure, critical to supporting its shipping customers' adoption of LNG as a marine fuel. The Company currently deploys three LNG bunker vessels: the *Gas Agility* at the Port of Rotterdam, Netherlands, the *Gas Vitality* at the Port of Marseille-Fos, France, and the *Brassavola* at the Port of Singapore.

About TotalEnergies
TotalEnergies is a global integrated energy company that produces and markets energies: oil and biofuels, natural gas and green gases, renewables and electricity. Our more than 100,000 employees are committed to provide as many people as possible with energy that is more reliable, more affordable and more sustainable. Active in about 120 countries, TotalEnergies places sustainability at the heart of its strategy, its projects and its operations.

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https://rbnenergy.com/this-must-be-the-place-enbridge-expands-corpus-christi-assets-to-bolster-crude-exports

This Must Be The Place - Enbridge Expands Corpus Christi Assets To Bolster Crude Exports

Monday, 04/22/2024 Published by: Sheela Tobben

Enbridge's recent $200 million deal to buy two marine docks and land in Ingleside, TX, from Flint Hills Resources (FHR) may not be much of a surprise, as expanding its role in U.S. crude exports has been part of Enbridge's strategy since it bought Moda Midstream's big marine terminal next door nearly three years ago. The former Moda terminal, now known as the Enbridge Ingleside Energy Center (EIEC), can receive and partially load Very Large Crude Carriers (VLCCs) — a key reason why the facility is #1 in crude exports in the nation. In today's RBN blog, we will take a closer look at Enbridge's deal with FHR and how it might help grow its crude export volumes.

Let's first do a quick overview of Enbridge's impressive array of assets. It owns and operates the massive Mainline/Lakehead pipeline system, which transports Western Canadian crude oil to the U.S. Midwest. (Canadian regulators recently approved a new Mainline tolling program — see For Whom The Pipeline Tolls.) From the Midwest, Enbridge owns pipelines that transport crude to Eastern Canada and the Gulf Coast — these include Spearhead and Flanagan South from the Flanagan terminal in central Illinois to Cushing, OK, and a half interest in the Seaway system from Cushing to the Texas coast. The midstream giant also holds partial ownership interests in two crude oil pipelines out of the Permian: Gray Oak (68.5%) and Cactus II (30%). It also has partial ownership (27.6%) in the Bakken Pipeline System, which comprises the Dakota Access Pipeline (DAPL) and the Energy Transfer Crude Oil Pipeline (ETCOP). The network moves Bakken crude to the Midwest and Texas. Beyond pipes, it owns and operates EIEC and, through its ownership of Seaway, it has interests in the Seaway, Texas City and Seaway Freeport marine facilities. Enbridge is also building the Enbridge Houston Oil Terminal (EHOT), a Canadian-heavy focused terminal that will support additional exports through Seaway, plus blending and storage (see From Here to There to You).

EIEC really stands out, though, not just because it exports more crude than any other U.S. terminal — more than 900 Mb/d in Q1 2024 — but also because it is one of only three Gulf Coast terminals that regularly handle VLCCs. The original owner of the terminal, Occidental Petroleum, outfitted it with VLCC capabilities soon after it was built in 2016 (see Take It To The Limit), ostensibly betting that crude shipments abroad would take off rapidly after the U.S. ended its ban on most exports in late 2015. They were spot on!

Enbridge's other VLCC-capable asset is the Seaway Texas City complex, a joint venture with Enterprise Products Partners near Houston. It received several supertankers in 2018 but pretty much stopped the following year because of technical challenges, although it still handles smaller ships. The Gulf's only existing offshore crude terminal, the Louisiana Offshore Oil Port (LOOP), can fully load VLCCs, while EIEC (green tank icon in Figure 1 below) and its other Ingleside neighbor — South Texas Gateway (STG; yellow tank icon), now owned by Gibson Energy — each can load VLCCs to about two-thirds of their 2-MMbbl capacity before sending them into the Gulf for topping off via reverse lightering.

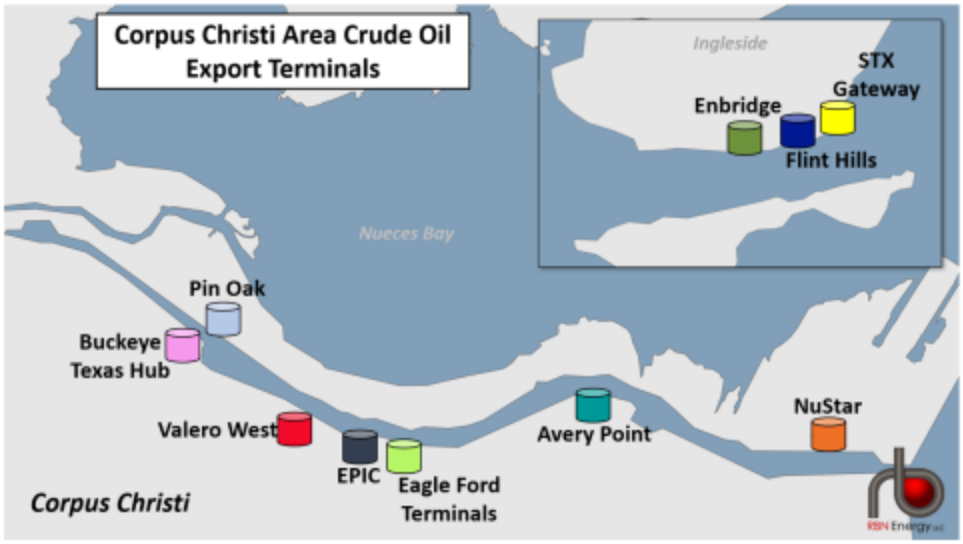


Figure 1. Crude Oil Export Terminals in Corpus Christi Area. Source: RBN

Before we review Enbridge's latest deal, let's look at the setup at FHR Ingleside and, after that, EIEC next door. The FHR terminal (dark-blue tank icon) has 17 crude oil tanks with a combined capacity of about 4 MMbbl. The tanks receive barrels from the all-important Permian via the Gray Oak, Cactus II and EPIC Crude pipelines. They also get supplies from the Harvest Midstream-operated Arrowhead Ingleside system, which transports Eagle Ford crude. There are two docks at the terminal — Docks 4 and 5 — that FHR has said have a combined export loading rate of nearly 380 Mb/d. Both can handle Aframax tankers, which can carry as much as 750 Mbbl, but only one can support Suezmax vessels, which have a maximum capacity of 800 Mbbl to 1 MMbbl. Unlike its neighbors along the La Quinta Ship Channel near Corpus Christi — EIEC and STG — the FHR site has not been as active in crude exports. It sent out about 70 Mb/d of crude in 2023 (green line in Figure 2 below), according to data from RBN's Crude Voyager. That same year, EIEC (blue line) shipped about 900 Mb/d while STG (orange line) sent out nearly 540 Mb/d.

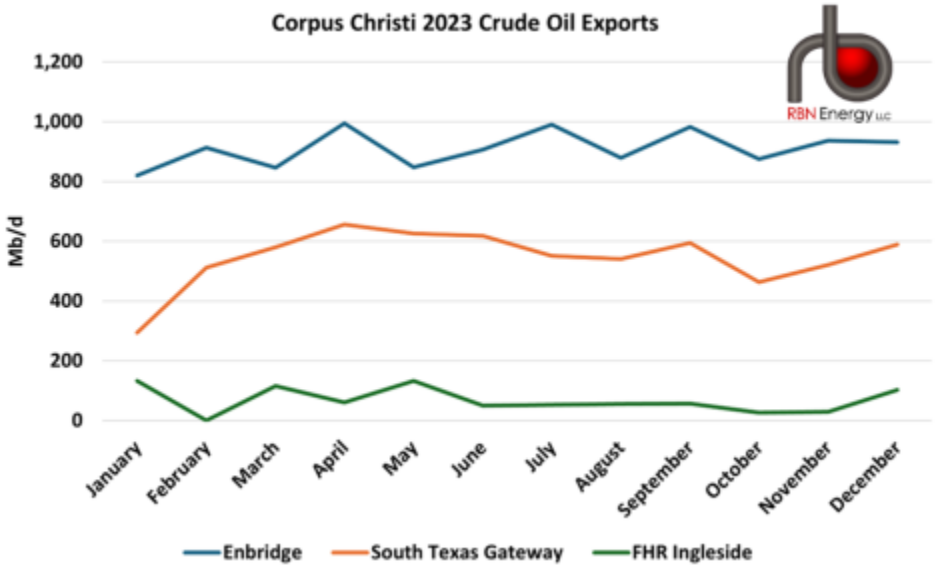


Figure 2. Corpus Christi/Ingleside 2023 Crude Oil Exports. Source: RBN Crude Voyager

Next, let's look at Enbridge's much larger EIEC terminal and then the company's deal with FHR. As we described in The Payback and other blogs, EIEC now has 15.3 MMbbl of storage capacity and direct links

to Cactus II, Gray Oak and EPIC Crude, as well as to Enbridge's Viola, which brings in crude from the Cactus I and Eagle Ford JV pipelines. Further, Harvest Midstream's Harvest Ingleside pipeline links its Midway terminal to EIEC. Enbridge's three berths can load two VLCCs at the same time, although only partially as stated earlier; it can also handle smaller ships. Beyond crude oil, it hosts a barge dock for marine fuels along with some storage, with an additional 2 MMbbl expected to come online this spring.

Enbridge's deal with FHR enables it to protect EIEC's position as the #1 crude export terminal. For $200 million, Enbridge gets FHR's two Ingleside docks and more than 500 acres of land adjacent to EIEC, while FHR will retain its storage tanks. The docks will augment Enbridge's crude export capacity immediately, although the gains may be relatively modest, at least for now. FHR's outbound capacity is less than a quarter of what Enbridge has reported as EIEC's monthly average capacity of 1.6 MMb/d (though the terminal has loaded in excess of 2 MMb/d in a single day), but we understand there are plans to upgrade both FHR docks to be able to fully load Suezmaxes once the deal concludes. (The project will need additional permits, particularly to deepen the draft, and the target for this improvement is Q1 2025.) Enbridge is also looking to streamline activity by dedicating EIEC berths to VLCCs and devoting the smaller docks to Aframax and Suezmax vessels. FHR's assets — aside from the storage tanks — will be integrated with Enbridge's existing Ingleside operations to optimize crude loadings. The sites are adjacent to one another and EIEC already accesses the same pipelines as FHR, plus one more — Cactus I — which also transports Permian crude.

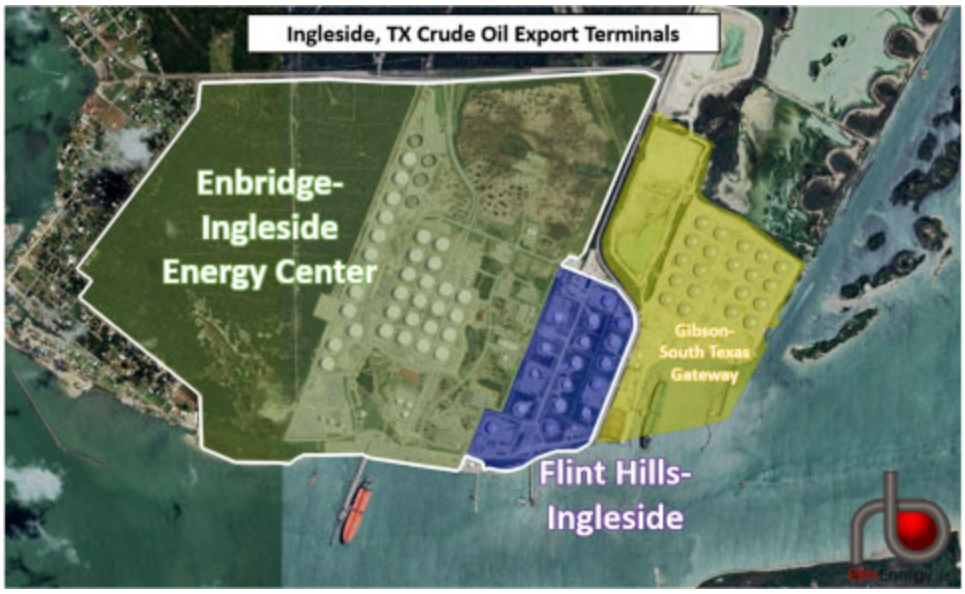


Figure 3. Enbridge and Flint Hills Resources Assets in Ingleside Area. Source: RBN

The deal was also partly aimed at capturing business from rising Permian production, officials said during a March 6 investor call. In fact, the company has had an eye on rising basin output for some time, spurring plans to seek a 200-Mb/d capacity increase for the 900-Mb/d Gray Oak pipeline. However, its scope has been scaled back for a phased-in addition totaling 120 Mb/d through 2026, which Enbridge said will be put forward to shippers in an open season to gauge support. The Gray Oak expansion will likely end up pulling barrels away from other Gulf Coast export regions — at least until Permian production catches back up.

To boost their business even more, Enbridge plans to add 2.5 MMbbl of crude storage at EIEC, with construction to start in June 2024 and take 18-24 months to complete; the first tank is estimated to be in service in late 2025. Enbridge is also considering another 5 MMbbl of storage and a fourth berth at the site, according to its March 6 presentation. There are no timelines for when that might be done or how much effective outbound capacity would be gained from the proposed berth.

As Enbridge gears up for more crude export business there are looming headwinds from proposals to build offshore VLCC terminals that would fully load supertankers in one swoop before sailing to export

markets. Enterprise Products Partners said April 9 that it had received the long-awaited deepwater port license for its export facility proposal — Sea Port Oil Terminal (SPOT) — allowing it to take the next steps in developing the project (see Leader Of The Pack). We have blogged extensively about the loading efficiencies afforded by such projects compared with existing onshore terminals, which can only perform partial loads and thus require reverse lightering to be topped-off, driving up expenses. There are three other projects (Texas Gulf Link, Blue Marlin and Bluewater; see Gulf Coast Time and Patience) in the queue waiting for similar critical permits but we think it's unlikely that more than one or two of them gets built in the near-term. If one of those projects does come online, it could divert some supertankers away from onshore facilities.

Enbridge may be girding itself for these developments. It is preparing to broaden the range of commodities that can be exported from its existing Corpus Christi facilities and the FHR docks. Ultimately, it wants to harness the advantages found at the site for other products like blue ammonia and NGLs. Enbridge may also seek to utilize its available land — EIEC sits on 925 acres, with more available after the FHR deal — to get a head start on a few greenfield projects, including Project YaREN, a joint venture to develop a blue ammonia production facility, and a joint venture with Oxy Low Carbon Ventures (OLCV) to set up a carbon dioxide (CO_2) sequestration hub. Whichever path it takes, it looks like Enbridge is setting the stage for more growth in the years to come.

"This Must Be the Place (Naive Melody)" was written by David Byrne, Chris Frantz, Jerry Harrison and Tina Weymouth. It appears as the fourth song on side two of Talking Heads' fifth studio album, *Speaking in Tongues.* Talking about the song, David Byrne stated, "It's a real honest kind of love song, that didn't sound lame the way many do." "This Must Be the Place" is also the title of a 1965 lithograph by artist Roy Lichtenstein. Released as a single in November 1983, it went to #62 on the Billboard Hot 100 Singles chart. David Byrne directed the video for the song which featured band members watching home movies. The song is also featured in *Stop Making Sense*, a concert film featuring Talking Heads. Personnel on the record were: David Byrne (vocals, lead guitar, synthesizer), Tina Weymouth (rhythm guitar), Jerry Harrison (synthesizer), Chris Frantz (drums), Wally Badarou (synthesizer), and David Van Tieghem (percussion).

Speaking in Tongues was recorded between July 1982 to February 1983 at Blank Tape in New York City, Sigma Sound in Philadelphia, and Compass Point in Nassau. Produced by Talking Heads, the album was released in June 1983 and went to #15 on the Billboard 200 Albums chart. It has been certified Platinum by the Recording Industry Association of America. "Burning Down the House," released as the first single from the album in July 1983, became the band's only U.S. Top 10 single, going to #9 on the Billboard Hot 100 Singles chart. Three singles were released from the LP.

Talking Heads were an American new wave band formed in New York City in 1975 by David Byrne, Jerry Harrison, Chris Frantz and Tina Weymouth. They combined elements of pop, funk and world music and incorporated a unique new wave art school nerd image. After earning a large following at the ground-breaking punk club CBGB in the bowery of New York City, they released their first album, *Talking Heads:77*, on Sire Records in 1977. They have released eight studio albums, two live albums, eight compilation albums, and 31 singles. The band was inducted into the Rock and Roll Hall of Fame in 2002. They officially broke up in 1991 but have reunited a few times on various occasions. All four members have gone on to successful careers post-Talking Heads as solo artists, collaborative artists, producers and musicians.

https://gasprices.aaa.com/dont-get-april-fooled-by-wobbling-gas-prices/

DON’T GET APRIL FOOLED BY WOBBLING GAS PRICES

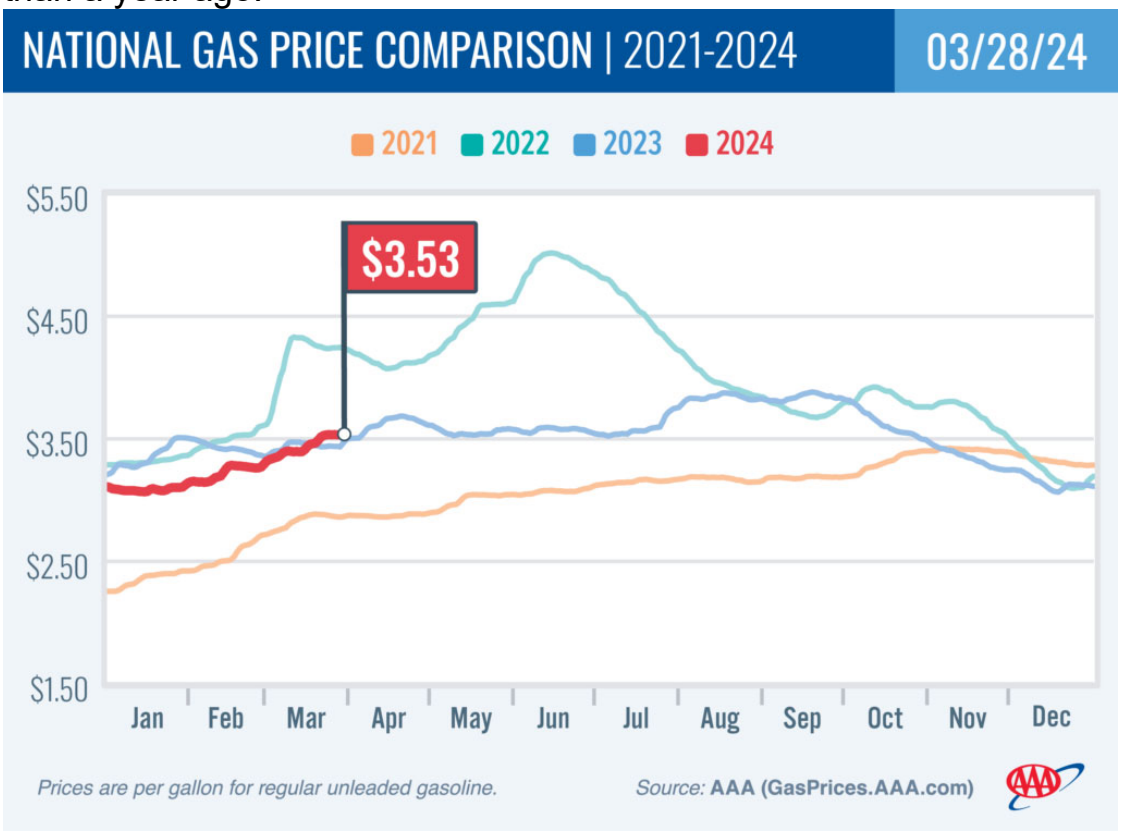
March 28,2024

WASHINGTON, D.C. — After an early spring surge, the national average for a gallon of gas spent the past week drifting up and down by a fraction of a cent before settling a penny higher at $3.53. But the break may be temporary, as gas pump prices will likely resume a spring increase.

“Uncertainty of the impact of Ukraine’s targeting of Russia’s oil infrastructure likely spiked oil prices recently,” said Andrew Gross, AAA spokesperson. “But those concerns have abated somewhat for now, and gas prices are settling into a pattern similar to last year when the usual seasonal increase was slow and steady.”

According to new data from the Energy Information Administration (EIA), gas demand dipped slightly from 8.81 to 8.72 million b/d last week. Meanwhile, total domestic gasoline stocks increased by 1.3 million bbl to 232.1 million bbl. Lower demand would typically contribute to pushing pump prices lower or slowing increases, but rising oil prices have kept them elevated instead.

Today’s national average of $3.53 is 24 cents more than a month ago and 10 cents more than a year ago.



Quick Stats

- Since last Thursday, these **10 states have seen the largest increases** in their averages: Utah (+26 cents), Idaho (+17 cents), Alaska (+15 cents), Nevada (+12 cents), Washington (+12 cents), Oregon (+11 cents), Wyoming (+7 cents), California (+7 cents), North Dakota (+6 cents) and Washington, DC (+6 cents).
- The nation's **top 10 most expensive markets**: California ($5.02), Hawaii ($4.69), Washington ($4.49), Nevada ($4.38), Oregon ($4.25), Alaska ($4.07), Illinois ($3.90), Arizona ($3.78), Utah ($3.76) and Washington, DC ($3.69).

Oil Market Dynamics

At the close of Wednesday's formal trading session, WTI decreased by 27 cents to settle at $81.35. Oil prices fell after the EIA reported that total domestic commercial crude stocks increased by 3.2 million bbl to 448.2 million bbl last week. Although stocks increased when compared to a year ago, the current stock level is 25.5 million bbl lower than at the end of March 2023.

Drivers can find current gas prices along their route using the AAA TripTik Travel planner.

https://www.convenience.org/Topics/Fuels/Changing-Seasons-Changing-Gas-Prices

Seasonal Gas Prices Explained

From refinery maintenance to consumer demand, seasonal fuel production affects gasolines prices at the dispenser.

February 28, 2024 3 min read

Traditionally, gasoline prices are at their lowest during the first week of February and then begin to climb, often peaking right before Memorial Day. Seasonal increases in demand plus a transition to unique fuel blends put pressure on gas prices each spring.

Since 2000, gasoline prices have increased about 50 cents from the seasonal low at the beginning of February to the seasonal high in mid-May. Here's a timeline of events that can affect gas prices during the first half of the year.

February: Refinery Maintenance

U.S. demand for gasoline is generally at its lowest during the first two months of the year, so refinery maintenance, known as a "turnaround," is often scheduled during the first quarter. A turnaround is a planned, periodic shut down (total or partial) of a refinery process unit or plant to perform maintenance, overhaul and repair operations and to inspect, test and replace materials and equipment.

Refineries undergo turnarounds roughly once every four year so about 25% of refineries undergo a turnaround each spring. Another reason for scheduling turnarounds is that they allow refineries to retool for summer-blend fuels.

March-April: Refineries Switch to Summer-Blend Production

The U.S. Environmental Protection Agency (EPA) defines April to June as the "transition season" for fuel production. Refineries lead this transition and switch over to summer-blend production in March and April.

Gasoline blends used in the summer months are different than the blends used in the winter. In the winter, fuels have a higher Reid vapor pressure, meaning they evaporate more easily and allow cars to start in colder weather. In the warm summer months, these evaporative attributes would lead to increased emissions and the formation of smog.

There are also more fuels to produce during the transition season. In the winter months, only a few fuels are used across the United States. However, because of various state or regional requirements, 14 different fuel specifications are required for the summer months. Refineries must produce enough fuel for each area to ensure there are no supply shortages, and that can complicate the production and distribution of fuels.

Summer-blend fuel is also more expensive to make than winter-blend fuel. First, the production process takes longer and, second, the overall yield of gasoline per barrel of oil is lower. These complexities add as much as 15 cents per gallon to the cost to produce these higher-grade fuels.

May-June: Deadlines for Terminals and Retailers

The May 1 compliance deadline for terminals to fully purge their systems of winter-blend fuels is considered one of the biggest factors in seasonal price increases. This regulatory requirement can lead to lower inventories at the terminal, which also puts upward pressure on gas prices. It can also take fuels refined in the Gulf Coast several weeks to reach storage terminals throughout the country, which is why it's important to have summer-blend fuel at terminals and storage facilities by May 1. This date is the most important reason that seasonal gas prices tend to peak in May.

In most areas of the country that require summer-blend fuels, retailers have until June 1 to switch to summer-grade gas.

February-August: Summer Drive Season and Increased Demand

Demand can play a role in elevating seasonal gas prices. Gas demand increases a few percentage points each month beginning in February and peaks in August. Total fuel demand is 10% to 15% greater in August than in February, and any stress to the system—such as a refinery or pipeline outage—can cause a supply/demand imbalance and affect prices.

September: A Welcome Change

As gasoline demand decreases and temperatures cool, retailers are able to switch to selling winter-blend fuel beginning September 15. While these winter-blend fuels are cheaper to produce, the complications of the switchover can result in a temporary bump in price. Weather conditions, such as hurricanes, can also affect gas prices in the late summer to fall months.

Unlike in the spring, the change to winter-blend fuel is not required. However, because winter-blend fuel costs less, retailers often sell the fuel blend to remain price competitive. Not all retailers begin selling this fuel on September 15; many make the switch when their inventories are low.

By the end of September, gas prices generally decrease as the switchover processes and demand continues to fall. And despite conspiracy theories, lower gas prices do not correlate to pre-election politics.

In California, the season for summer-blend fuels is longer than the rest of the country. Both Northern and Southern California's summer-blend requirements run through the end of October. This exacerbated supply issues within the state in early October 2012, when fires at two large refineries limited state-specific production and caused wholesale and retail gas prices to spike to record levels.

Meanwhile, demand for distillate fuel (diesel fuel and home heating oil) begins to increase in September because of both greater diesel fuel demand related to the harvest and greater home heating oil demand because of the colder weather.

Exceptions to the Rule

Summer-blend fuel requirements may be relaxed in times of emergencies or when potential shortages are possible.

In 2005, NACS worked with Congress to give the EPA the authority to waive certain regulations affecting the motor fuels system in times of emergency. The EPA's immediate use of these waivers is critical to bringing the entire fuel supply chain into operation as quickly and safely as possible. For example, this flexibility allowed winter blends of gasoline to enter into the market in 2017 before the traditional transition date of September 15 in response to Hurricanes Harvey, Irma and Maria.

NORWEGIAN OFFSHORE DIRECTORATE

https://www.sodir.no/en/whats-new/news/general-news/2024/high-price-to-pay-for-halting-exploration-for-oil-and-gas/

High price to pay for halting exploration for oil and gas

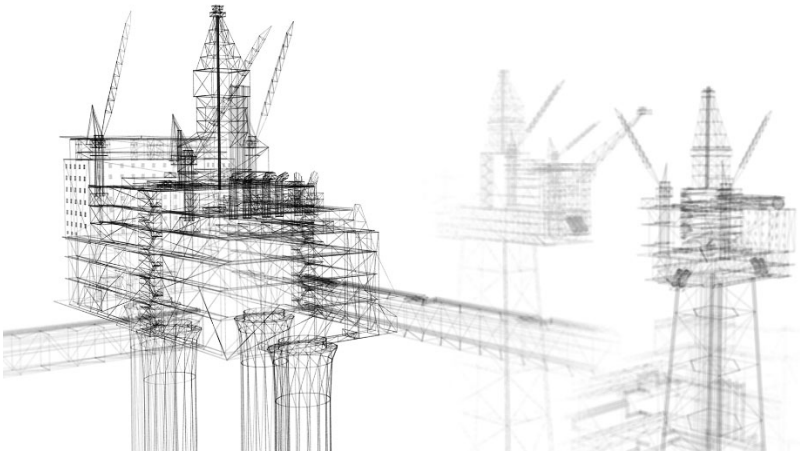


Illustration of a production facility on the Norwegian Continental Shelf.

11/03/2024 Stopping exploration activity on the Norwegian shelf will accelerate the scale-down of the oil and gas industry.

The Climate Change Committee's report was broadly covered when it was published last autumn. The deadline for comments regarding the report has now expired, and the Norwegian Offshore Directorate has submitted a comprehensive consultation response in which we point out significant deficiencies in this report. In light of this, Torgeir Stordal, Director General of the Norwegian Offshore Directorate, wrote this article, which was first published on altinget.no on 11 March.

This will be very harmful for the Norwegian economy and will complicate Europe's situation. Is that truly what we want?

Among other things, the Committee has proposed the development of a strategy for the tail-end phase of Norwegian petroleum activities. Until this strategy is in place, the Committee recommends not awarding new licences for exploration, production or installation and operation.

The Norwegian Offshore Directorate just submitted its input on the report. We believe that the Committee's proposals will have a substantial socio-economic impact if they are adopted. The purpose of a tail-end phase strategy is to discontinue profitable activity faster than what would otherwise have been the case.

The Committee has not addressed the major consequences this will have for value creation, employment around the country and state revenues. It could also weaken the EU's security of supply.

A temporary hiatus will immediately result in reduced exploration activity on the Norwegian shelf, and will weaken the basis for new discoveries that can be developed. Time-critical and profitable oil and gas resources could be lost and existing infrastructure will be shut down earlier than planned.

The 2050 Climate Change Committee has bolstered its mandate and is advocating for an amendment to the Climate Act when it proposes to cut emissions from Norwegian territory by 90-95 per cent by 2050 compared with 1990. This means disregarding the possibility of purchasing emission credits - which are among the most

effective ways to attempt to reach climate targets. The cost of domestic cuts can be much higher than equivalent cuts in the EU.

163,000 jobs in play

Exploration activity on the Norwegian shelf has provided substantial values to society over the last 20 years. Overall net revenues are estimated at more than NOK 3000 billion.

163,000 people were directly or indirectly employed by the petroleum industry in 2020, which means about 6 per cent of total employment in Norway. The industry creates jobs throughout the country and helps maintain less centralised population patterns.

Production is declining on its own

The Committee presumes that activity in the oil and gas industry on the Norwegian shelf is too high leading up to 2050, which means that measures must be implemented to cut production.

On the other hand, the Norwegian Offshore Directorate expects activity in the industry to naturally decline following a production peak in 2025. The production decline towards 2050 is within what the Intergovernmental Panel on Climate Change and the IEA have projected is in line with successfully following up the Paris Agreement.

Despite the decline in activity, the Norwegian Offshore Directorate expects the industry to continue creating significant values leading up to 2050. The net cash flow in 2030-2050 is expected to amount to 4.5 thousand billion 2024-NOK. While the estimate is uncertain, the State's revenues in the form of taxes and ownership will account for close to 90 per cent of this.

Significant values could be lost

The Committee does not want to build new infrastructure that commits us to emissions toward 2050 and beyond. This means that no new export capacity will be built in the Barents Sea. If so, society will be losing out on substantial values.

The Norwegian Offshore Directorate projects that there are significant resources left to discover in the Barents Sea, but the LNG plant on Melkøya has no available export capacity beyond the gas from Snøhvit. This lack of capacity affects the companies' interest in exploration. Gas discoveries are of little value if the gas cannot be transported to the market. Without increased capacity, all other gas resources in the Barents Sea will remain stranded for a long time, which means that society can lose out on substantial values. At the same time, the energy situation in Europe indicates that there will be a need for gas for a long time to come.

Security for Europe

The energy crisis following Russia's invasion of Ukraine demonstrates the importance of stable gas deliveries from Norway to Europe. In 2022, Norway increased its gas exports by about 100 TWh of energy, the equivalent of about 65 per cent of all Norwegian power generation that year. Without Norwegian gas, it would have been more difficult to cover Europe’s demand for gas, and the price of energy would have been higher for all Europeans. Norway can be a safe and stable supplier to Europe for many years to come, but security of supply and geopolitics are crucial considerations that the 2050 Climate Change Committee does not appear to emphasise in its assessments.

The Norwegian Offshore Directorate would like to see calculations of the cost of these proposed measures for the petroleum industry for the broader society. As no such calculations have been made, the Committee's recommendations are deficient and misleading, given that socio-economically profitable measures are being replaced by more costly measures.

Updated: 11/03/2024

GLOBAL COMMODITY STRATEGY AND MENA | RESEARCH

Geopolitical Update: Temperatures Rising

Analysis and Updates on Conflicts in Ukraine and the Middle East

March 27, 2024

RBC Capital Markets, LLC
Helima Croft (Head of Global Commodity Strategy and MENA Research) (212) 618-7798; helima.croft@rbccm.com

President Biden faces the prospect of a cruel summer if the Russia-Ukraine and Middle East conflicts continue to pose risks to global energy supplies.

- **This week brought more attacks by Ukraine on Russian refineries with drones circling back to two previously targeted refineries, Novokuibyshevsky and Kuibyshevsky, in the Samara region, resulting in significant damage to the latter's primary crude distillation unit.** As a result, we now count 5 refineries facing significant throughput disruptions, with our estimates for downed refining capacity rising to 13% of Russia's total. These attacks seem to be serving the twin purposes of partially denying the Russian frontlines diesel as well as reducing Russia's essential energy revenue to fund the war. Preliminary estimates already show aggregate Russian refinery runs in March down 650 kb/d y/y. While it is still too early to see how these disruptions will ultimately affect seaborne refined product export flows, the largest impacts would be seen on global gasoil and fuel oil markets. Turkey, Africa, and Brazil have been the top destinations for Russian gasoil since exports were barred from Europe.
- **There have been reports that the White House has tried to dissuade Kyiv from this strategy, fearing the energy price impact – we find this entirely credible based on our conversations.** As we have repeatedly noted, the White House has sought to avert a Russian supply disruption and has shaped policy towards this end; including price caps designed as a release valve to ensure Russian barrels locked out of Europe would flow to Asia, or directly telling Ukraine to not target Black Sea oil tankers. However, with US assistance being held up in Congress, and Russia making battlefield gains, Ukraine and key regional allies appear to be questioning the utility of this energy bargain with Washington.
- **A key dynamic worth watching is whether Congress moves to approve the $60bln supplementary military, budgetary, and humanitarian aid package being held up in the House after already passing in the Senate.** House Speaker Mike Johnson (R-LA) has signaled a willingness to hold a vote on Ukraine support after Congress's Easter recess, however at the time of writing, there are no clear indications of imminent passage. Moreover, with a complete cutoff of funding potentially in the offing if President Trump wins in November, the window for Ukraine to make battlefield advances in the two-year conflict may be closing.

- **Hence, we will be closely watching whether Ukraine moves at some stage to target actual export facilities to strike a deeper blow on the Russian balance sheet.** We continue to contend that Ukraine seemingly has the capability to target the majority of export facilities in western Russia, which would put ~60% of Russia's crude exports at risk. While Washington would certainly not be happy with such a move because of the serious price implications, Kyiv could decide that such asymmetrical measures may be necessary. Resilient energy revenue has been essential for Russia's continued military strength – the 2024 budget contains record defense spending, with the Russian Federation for the time poised to spend over 6% of GDP on military and defense spending. At the same time, Moscow is forecasting a shrinking deficit based on an anticipated rise in revenue this year. According to the Carnegie Endowment, the 2024 budget is based on the assumption that revenue will climb by over a third to over ₽35tln ($378bln), of which ₽11.5tln ($124bln) is expected to come from the oil and gas sector.
- **While OPEC is sitting on over 2 mb/d of spare capacity, we do not think the producer group would rush in to cool the rally and ramp up output given what transpired in the months immediately following the Russian invasion of Ukraine.** Washington made unprecedented interventions in the market by releasing 180 mb from the SPR after the IEA and other market participants warned of a multimillion b/d Russian disruption that never materialized. Certainly, we do not see any indications that the recent run up in prices due to the heightened Russian infrastructure risk will prompt any policy reversal at next week's Joint Ministerial Monitoring Committee Meeting. Any serious shift will likely have to wait until the June 1 Ministerial Meeting, and even then, we believe the group will be very judicious when it comes to unwinding any cuts.
- **Complicating the challenge for the White House is the lack of progress in resolving the six-month Middle East war.** The Houthis continue to attack ships in the Red Sea, claiming six attacks on Tuesday, while Houthi officials this week have renewed threats against Saudi Arabia over providing support and airspace access to US jets conducting strikes in Yemen. In addition, the continuing exchange of fire between Hezbollah and Israel – with Hezbollah launching "dozens" of rockets in response to deadly Israeli strikes in southern Lebanon yesterday – still represents a serious contagion risk.
- **Hence, it is our view that Washington may once again have to resort to policy tools such as the SPR if these twin conflicts continue to imperil global energy supplies. Certainly, this raises a campaign risk for President Biden, as his opponents will likely accuse him of endangering energy security by tapping further into the strategic reserve. However, if President Biden cannot find a way to ameliorate the risk from these conflicts, the White House may decide that SPR releases are more politically palatable than retail gasoline prices north of $4/gallon for the summer driving season.**

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04/22/2024 08:58:36 [BN] Bloomberg News

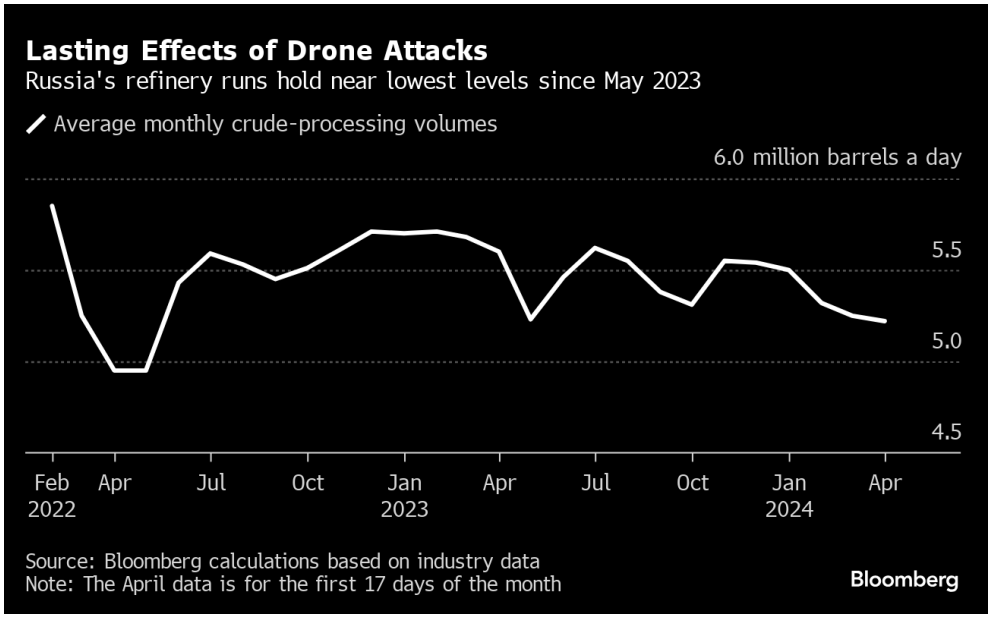
Russia Oil Refining Curbed by Flood as Drone Damage Persists (1)

- The nation processed 5.22 million barrels a day on April 11–17
- Flooding in Urals region has temporarily closed Orsk refinery

By Bloomberg News

(Bloomberg) -- Russian weekly oil refining is near an 11-month low as flooding hampers operations and repairs to plants affected by drone attacks slow down.

Russia processed 5.22 million barrels of crude a day April 11–17, according to a person with knowledge of industry data. That's about 10,000 barrels a day, or 0.2%, below the average of the prior seven days, Bloomberg calculations show.



With the invasion of Ukraine well into its third year, Kyiv has been using drones to hit Russia's most important industry. The Ukrainian government has defended that strategy in the face of US concerns, saying it's seeking to curb fuel supplies to the front line and cut the flow of petrodollars to Kremlin coffers.

Read More: US Slams Strikes on Russia Oil Refineries as Risk to Oil Markets

Earlier this year, drones targeted key Russian refineries, causing their partial or complete shutdown. There's been no further damage during the past month, giving operators time to conduct repairs, yet the pace of recovery has slowed.

In the April 11–17 period, most of the major facilities affected ran at levels near the previous weekly average – and

still below pre-attack output.

Daily crude processing rates at refineries damaged by Ukrainian drone attacks averaged 1.23 million barrels April 1-17, according to the person. That's some 280,000 barrels a day lower than the average for January 1-24, before the attacks, Bloomberg calculations show.

Rosneft PJSC's Tuapse plant hit at the end of January remains offline, and other damaged refineries owned by the producer still haven't recovered their runs to pre-attack levels. Crude processing at Lukoil PJSC's Norsi facility in Nizhny Novgorod is also below January levels, but the facility also had a technical incident earlier this year that also put pressure on its operations

During April as a whole, Russian refinery runs have averaged about 5.23 million barrels a day, near the lowest levels since last May.

Flooding Impact

Severe weather has also affected processing, with floods in Russia's Urals region forcing the Orsk refinery offline April 7. In the latest reporting period, the facility didn't process any crude, according to the person familiar with the matter.

Read More: Russia, Kazakhstan Suffer Worst Floods in 80 Years as Snow Melts

In the previous seven days, the facility had churned through an average 26,500 barrels a day. The loss of those volumes became one of the biggest contributors to the overall decline in Russian processing rates April 11-17, the person said. Orsk is preparing to restart operations, the facility's press service said Friday.

Two other refineries – the independent Novoshakhtinsk plant and Lukoil's Perm site – lowered average processing by a combined 45,000 barrels a day. That may be due to maintenance, which Russian operators typically carry out in spring before demand rises in summer.

Press offices at the Novoshakhtinsk refinery and Lukoil didn't immediately respond to requests for comment.

(Updates with total crude processing rates at damaged refineries in sixth and seventh paragraphs.)

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04/23/2024 07:23:59 [BN] Bloomberg News

Russia's Crude Exports Cling to Gains With Refineries Hobbled

Flooding and drone strikes on refineries likely help to keep flows elevated

By Julian Lee

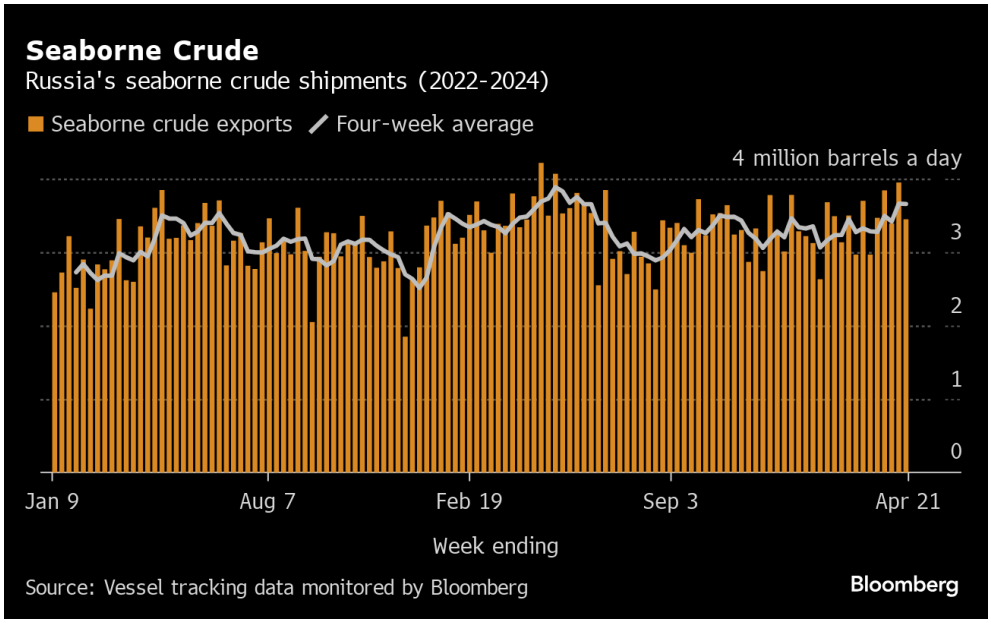
(Bloomberg) -- Russia's seaborne crude exports maintained a multimonth high in the four weeks to April 21 as the country's refineries struggled to recover from flooding and Ukrainian drone attacks.

Oil processing is near the lowest since May last year after floods forced the Orsk refinery offline, while runs at plants damaged by military strikes continue to lag normal levels, encouraging diversion of crude supplies into exports. The April loading program at the key Baltic ports has been revised to the highest since May 2023.

Moscow has been able to maintain export levels to major customers such as China and India even as the US intensifies sanctions, with new traders appearing whenever an existing one attracts the attention of American authorities. In the trade with India, firms with names unfamiliar to even the most experienced merchants have emerged to handle shipments between the OPEC+ producer and the world's third-largest importer and consumer.

Still, the latest data showed that more volatile weekly flows gave up most of the gains from the previous seven days, with the slump driven by a drop in the amount of Russian crude exported through the port of Novorossiysk on the Black Sea. That, combined with a big number a month ago, is likely to push the four-week figure lower next week.

The gross value of Russia's crude exports in the four weeks to April 21 was up by about $24 million to $1.94 billion a week from the period to April 14, helped by higher prices.



Four-week average shipments to Asia — predominantly China and India — also remained close to the highest since June at 3.33 million barrels a day.

China's imports of Russian crude surged to a record high in March, customs data show. The Asian nation imported 10.81m tons of crude, equivalent to about 2.56 million barrels a day, from Russia in March, the most in data going back to 2004. The numbers include amounts delivered by pipeline as well as by ship.

The backlog of Russia's Sokol crude that built up after being turned away by Indian refiners has now almost disappeared. About 9.1 million barrels, half of the total, have been delivered to refineries in China. Another 7 million barrels have eventually found their way back to India. Two cargoes have been delivered to Pakistan.

That leaves just 1.4 million barrels still to show a destination. Half of those are being discharged from the tanker that has been storing them since January onto a smaller vessel. The transfer is taking place in the Strait of Malacca, suggesting the cargoes could eventually end up in India. All of the Sokol cargoes loaded since mid-February headed directly to China.

Flows by Destination

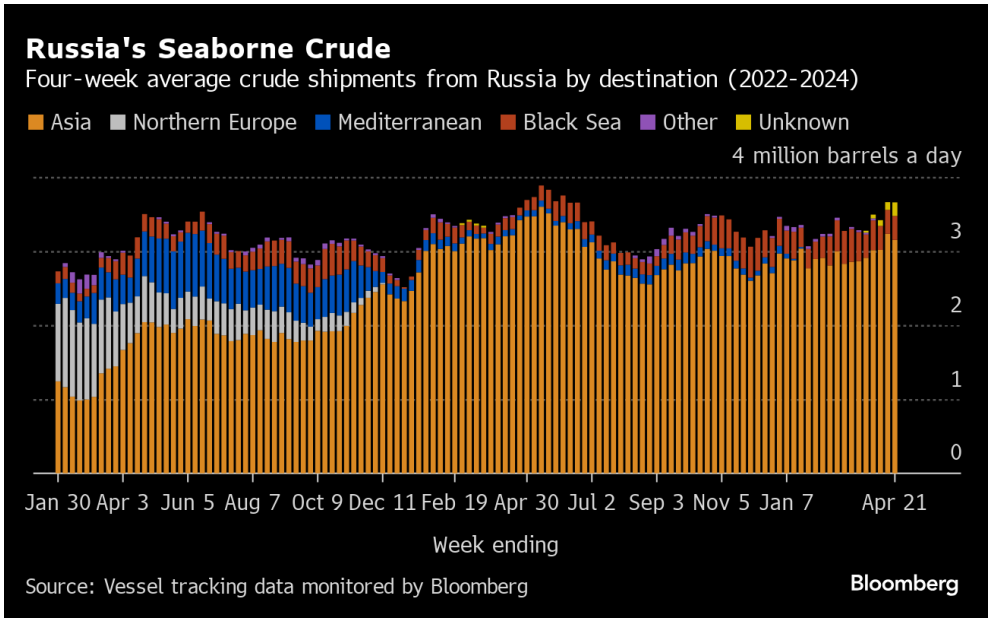
Russia's seaborne crude flows in the week to April 21 gave up most of the previous week's surge, falling by 500,000 barrels a day to 3.45 million.

The slump was driven by a drop in the amount of Russian crude exported through the port of Novorossiysk on the Black Sea, which were down by more than 60%, vessel-tracking data compiled by Bloomberg show.

The less volatile four-week average was virtually unchanged at 3.66 million, the highest since June.

Weekly shipments were about 135,000 barrels a day lower than the average seen in May and June, or about 15,000 barrels a day below Russia's April target, which is part of the OPEC+ alliance's broader effort to curb supplies and support prices. The four-week average was about 195,000 barrels a day above the target.

Russia said it would cut crude exports during April by 121,000 barrels a day from their average May-June level as part of the wider OPEC+ initiative, as Moscow shifts more of the burden onto production targets, which are preferred by other members of the group. Seaborne shipments in the first three months of the year exceeded Russia's target level for that period by just 16,000 barrels a day.



All figures exclude cargoes identified as Kazakhstan's KEBCO grade. Those are shipments made by KazTransoil JSC that transit Russia for export through Novorossiysk and Ust-Luga and are not subject to European Union sanctions or a price cap.

The Kazakh barrels are blended with crude of Russian origin to create a uniform export stream. Since Russia's invasion of Ukraine, Kazakhstan has rebranded its cargoes to distinguish them from those shipped by Russian companies.

Vessel-tracking data are cross-checked against port agent reports as well as flows and ship movements reported by other information providers including Kpler and Vortexa Ltd.

- **Asia**

Observed shipments to Russia's Asian customers, including those showing no final destination, edged lower to 3.33 million barrels a day in the four weeks to April 21, from 3.34 million in the previous four-week period.

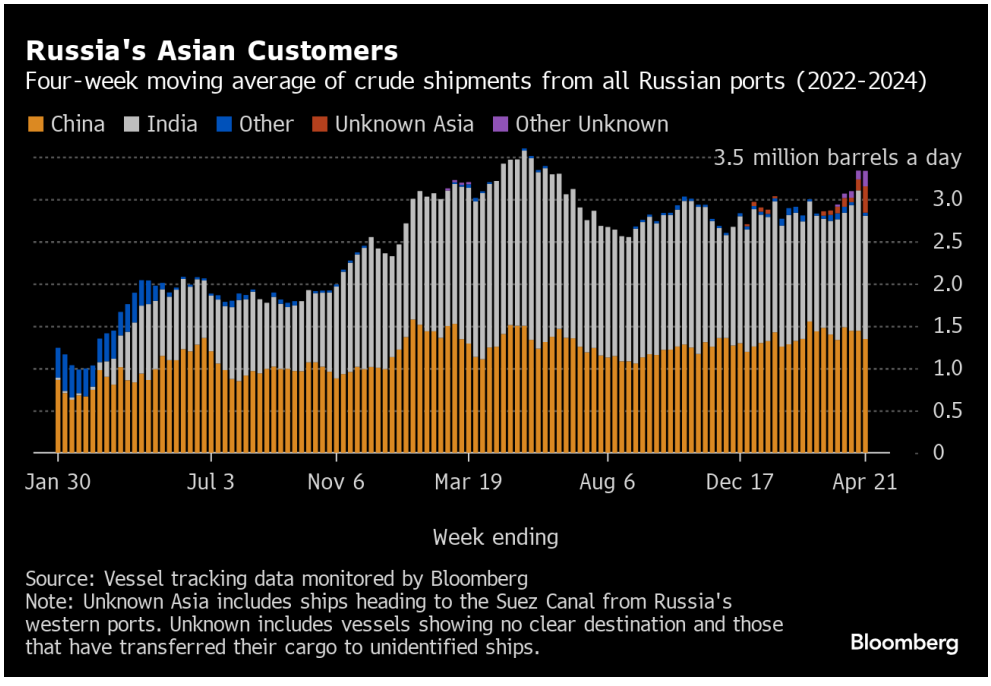
About 1.35 million barrels a day of crude was loaded onto tankers heading to China. The Asian nation's seaborne imports are boosted by about 800,000 barrels a day of crude delivered from Russia by pipeline, either directly, or via Kazakhstan.

Flows on ships signaling destinations in India averaged about 1.46 million barrels a day.

Both the Chinese and Indian figures are likely to rise as the discharge ports become clear for vessels that are not currently showing final destinations.

The equivalent of about 310,000 barrels a day was on vessels signaling Port Said or Suez in Egypt. Those voyages typically end at ports in India or China and show up in the chart below as "Unknown Asia" until a final destination becomes apparent.

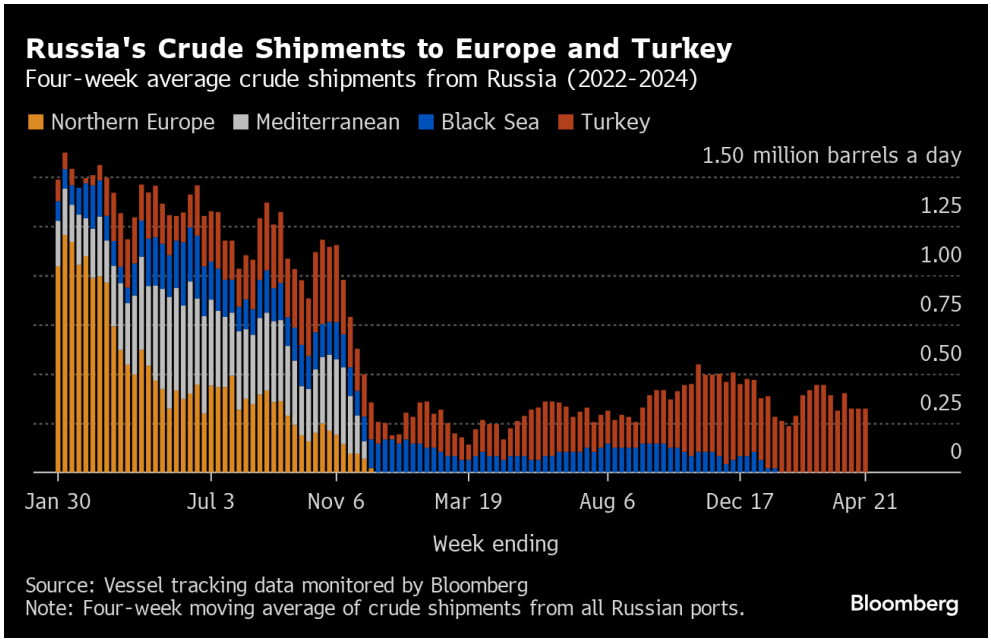
The “Other Unknown” volumes, running at about 180,000 barrels a day in the four weeks to April 21, are those on tankers showing no clear destination. Most of those cargoes originate from Russia’s western ports and go on to transit the Suez Canal, but some could end up in Turkey. Others could be moved from one vessel to another, with most such transfers now taking place in the Mediterranean, off the coast of Greece, or more recently off Sohar in Oman.



Europe and Turkey

Russia’s seaborne crude exports to European countries have ceased.

With flows to Bulgaria halted at the end of last year, Turkey is now the only short-haul market for shipments from Russia’s western ports.



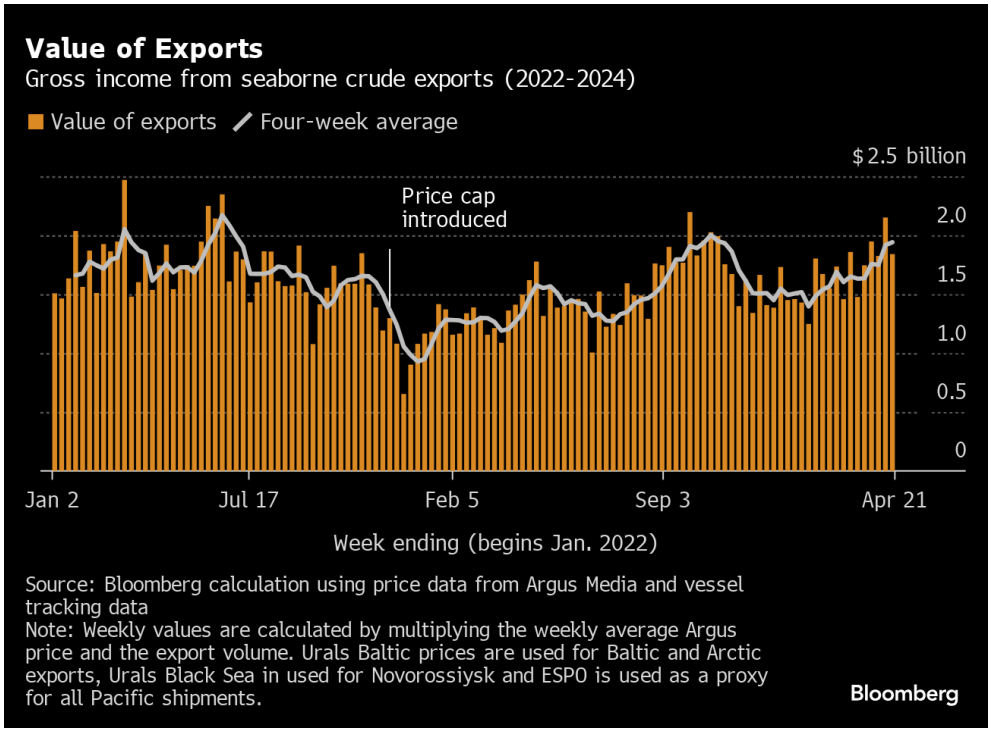
Exports to Turkey were stable at 323,000 barrels a day in the four weeks to April 21.

Export Value

Following the abolition of export duty on Russian crude, we have begun to track the gross value of seaborne crude exports, using Argus Media price data and our own tanker tracking.

The gross value of Russia's crude exports fell back to $1.84 billion in the seven days to April 21 from $2.15 billion in the period to April 14. However, four-week average income was up, rising by about $24 million to $1.94 billion a week, aided by higher oil prices. The four-week average is still below its peak of $2.17 billion a week, reached in the period to June 19, 2022. The highest it reached last year was $2 billion a week in the period to Oct. 22.

During the first four weeks after the Group of Seven nations' price cap on Russian crude exports came into effect in early December 2022, the value of seaborne flows fell to a low of $930 million a week, but soon recovered.



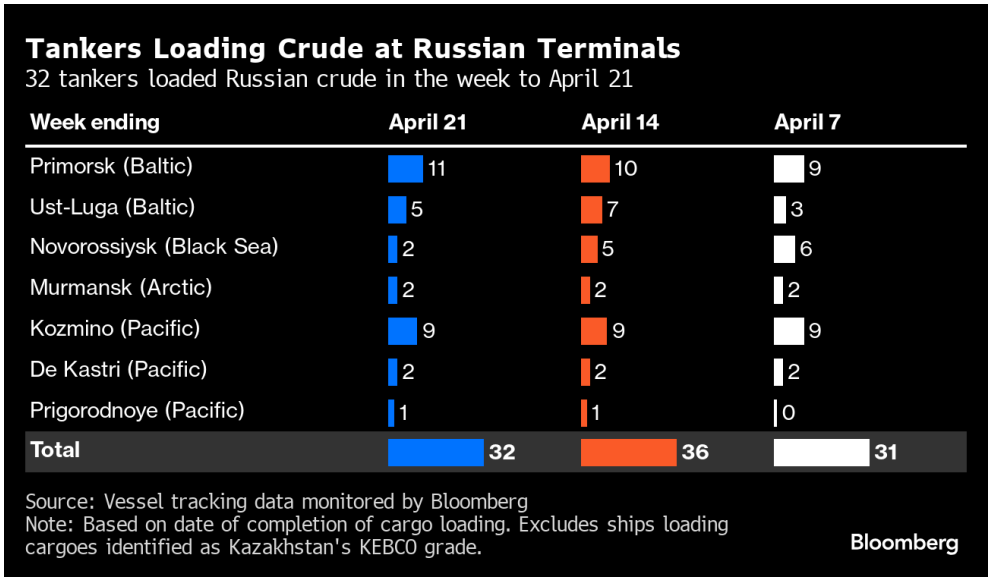
The chart above shows a gross value of Russia's seaborne oil exports on a weekly and four-week average basis. The value is calculated by multiplying the average weekly crude price from Argus Media Group by the weekly export flow from each port. For shipments from the Baltic and Arctic ports we use the Urals FOB Primorsk dated, London close, midpoint price. For shipments from the Black Sea we use the Urals Med Aframax FOB Novorossiysk dated, London close, midpoint price. For Pacific shipments we use the ESPO blend FOB Kozmino prompt, Singapore close, midpoint price.

Export duty was abolished at the end of 2023 as part of Russia's long-running tax reform plans.

Ships Leaving Russian Ports

The following table shows the number of ships leaving each export terminal.

A total of 32 tankers loaded 24.1 million barrels of Russian crude in the week to April 21, vessel-tracking data and port agent reports show. That was down by about 3.5 million barrels, reversing almost all of the previous week's gain.



In addition to the Russian barrels, one cargo of KEBCO was loaded at Ust–Luga and two at Novorossiysk during the week.

NOTES

Note: This story forms part of a weekly series tracking shipments of crude from Russian export terminals and the gross value of those flows. Weeks run from Monday to Sunday. The next update will be on Tuesday, April 30.

Note: All figures exclude cargoes owned by Kazakhstan's KazTransOil JSC, which transit Russia and are shipped from Novorossiysk and Ust–Luga as KEBCO grade crude.

If you are reading this story on the Bloomberg terminal, click here or a link to a PDF file of four–week average flows from Russia to key destinations.

––With assistance from Sherry Su.

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https://www.saba.ye/en/news3324044.htm

Revolution Leader confirms endeavor to expand & strengthen Yemeni operations in Indian Ocean

[25/April/2024]

SANA'A April 25. 2024 (Saba) - The revolution leader , Sayyed Abdul-Malik Badr al-Din al-Houthi, affirmed the endeavor to expand and strengthen Yemeni military operations in the Indian Ocean in a way that was not in the minds and calculations of the Americans, the British, the Israelis, and perhaps all countries of the world.

Sayyed Abdulmalik Badr al-Din al-Houthi said in his speech today,Thursday, about the latest developments in Palestine and regional developments, "There is a continuous effort to expand and strengthen Yemeni military operations in its new theater, which it extended to in the Indian Ocean, opposite the Gulf of Aden, in a way that was never in the minds and calculations of the Americans, the British, and the Israelis and perhaps all countries of the world."

He called on the Yemenis to go out in their millions tomorrow, Friday, in the squares in the capital, Sana'a, and the provinces, according to the approved arrangements, in response to God, in loyalty to the Palestinians in Gaza , the occupied territories, and in support of the nation's central and primary cause.

He added, "What we hope from our dear people, with their faith, loyalty, and piety to God Almighty, is to continue with great momentum in the squares, and to continue the mobilization, considering that the chanting of millions of Yemeni people for Gaza is the chanting of the throats of honest and patient men with the slogan, 'You are not alone,' with determination and not just a chant in Air, rather, they are words that express a position and a decision, and he is with you until victory."

He continued, "Millions going out in the squares is appropriate for our people because it embodies the credibility of faith affiliation," stressing the necessity of going beyond the enemies' view of free peoples to witness a reality that does not accept weakness, retreat, or boredom. He pointed out that "the enemies' assessment of our peoples is that they suffer from boredom and weak memory." "Tame the events and do not react again except to harsher and more difficult events."

He added, "In the face of the war of genocide, systematic starvation, and siege in Gaza, it is not appropriate for us to put down flags, sit in houses, and refrain from even attending in the squares, simply because of boredom, laziness, or inappropriate apathy that has no place at all in bearing faith and human values."

Sayyed Leader went on to say, "The values of our people are authentic and have been carried by generation after generation, and this is evident in what we see in the squares from people up to the age of eighty, carrying great interaction, determination, patience, a great desire , motivation to attend and participate in support of Palestine and Gaza."

He continued, "There is a continuous presence in the countryside despite the difficulty of the rough roads, but citizens are keen to attend and participate effectively , go out to participate in marches and demonstrations."

The Yemeni exit was considered to embody the faith affiliation to raise the banner of jihad for the sake of God and the comprehensive movement at all levels of boycotting American, Zionist , European goods , products, the continuation of donations and weekly exit.

Sayyed Leader urged everyone to bear the responsibility to maintain their stance in supporting the Palestinians in Gaza and the occupied territories, stressing that the scenes of genocide in Gaza are enough for anyone who has a shred of conscience left to go out to the squares, even every day, not just on Friday.

The revolution leader explained that the million-man protest last week took place in 173 marches, despite the rainfall in the capital, Sana'a, and some provinces.

The Yemeni people had never demonstrated such a million-man protest at this level, week after week, continuously.

He stressed the continuation of mobilization activities in military preparation, training and military rehabilitation at the level of suffering of the Palestinians, and it is important to continue following the events in Palestine and not ignore them as if they are events that do not concern us.

He added, "There are children who participate with responsibility, a sense of humanity, and an unparalleled readiness. If our people were allowed to go to Palestine , safe roads and corridors were opened for them, our people would move in the hundreds of thousands to the battle fronts.

Likewise, if the Americans were involved and opened a ground battle, thousands, tens, and hundreds of thousands of those who belong to the faith and are fortunate would be seen moving." With the honor of the Prophet's Medal for their loyalty, patience, determination, steadfastness, masculinity, chivalry, pride, stance, and presence where the situation and responsibility require attendance in the arenas."

He reviewed the ongoing Yemeni front facing the American-British Zionist enemy, stressing that the number of ships targeted by the Yemeni armed forces reached 102 ships during 202 days of the American-Zionist-European aggression against Gaza, and the rate of Yemeni operations in targeting ships linked to the Israeli enemy reached one ship every two days. .

He reiterated the inability of the American , British enemy and those cooperating with them, despite continuous and intensive monitoring, to provide protection for the movement of ships linked to the Zionist enemy. He considered targeting 102 ships linked to the enemy an important achievement, a large number, and evidence of the extent of effectiveness and success with the support and assistance of God Almighty, granting him victory and empowerment.

Sayyed Abdul-Malik Badr al-Din al-Houthi stated that the port of Umm al-Rashrash (Eilat) was completely disrupted, as acknowledged by the person who describes himself as the executive director of that Israeli port, and the enemy's exports shrank by 22 percent and its imports by more than 40 percent due to the effects of the port's complete disruption, with the Zionists themselves admitting that activity had stopped. The port of Eilat due to its closure by the Houthis, as they are called.

He said, "The Zionists confirm that Eilat cannot live without the Red Sea, and they acknowledge the impact of the missile attacks and marches."

He discussed the effects of the American and British aggression on Yemen on both America and Britain in terms of the level and nature of military deployment in the Red Sea, adding, "Over the past decades, the American has been roaming the seas, safe and reassured that no one will dare to target him."

He also confirmed that the American was accustomed to intimidating others through scenes of his military battleships, but he was met with a different attitude by the Yemeni people and their armed forces. He pointed out that the American naval presence had shrunk, and many of its warships had disappeared and were scattered on the outskirts of the Red Sea.

Sayyed Abdul-Malik stated that the movement of American ships that were passing through the Red Sea decreased by 80 percent, and this is a great victory and achievement, with God's help, because the American changed its movement to distant routes such as the Indian Ocean, and despite that, it faces an increasing danger day after day.

He pointed out that the Americans resorting to distant sea routes affects their economy through delayed goods, the cost of shipping, maritime transport insurance, and high prices. He pointed out that insurance operations per ship for some companies in America amounted to 50 million dollars, and this is unprecedented and represents a real problem for the United States of America.

He added, "American and British battleships do not dare to settle in areas expected to be targeted by missiles," considering the naval confrontation with the American and British forces as a major victory for the Yemeni people.

The revolution leader stated that the Americans had come to depend in their movement at sea on concealment and shielding themselves from the Europeans and pushing them into areas where they did not dare to be present, expressing the hope that the remaining European naval vessels would withdraw from the Red Sea after some of them withdrew.

He pointed out that the American aggression against Yemen is draining Washington financially and affecting it economically in the context of our naval operations, which have not decreased as the American claims to present this as an achievement, but rather the movement of its naval ships is what has decreased by 80 percent.

He reviewed the British's continuing losses in the interception without results, as is the case with the American, stressing that there was a significant decline in the maritime movement of the British, who built their economy at the expense of people's wealth by plundering, seizing, and controlling them.

He stated that the British economic losses are mounting, and his reports inside Britain reveal the level of escalating losses, and the British Chamber of Commerce revealed that the Yemeni operations led to damage affecting 55 percent of exporters in Britain, and this is a major victory because of the British foolishness.

Sayyed Abdulmalik Badr Al-Din Al-Houthi confirmed that Yemen operations led to a 300 percent increase in container shipping costs in Britain and significant delays in the delivery of goods, and affected cash flow difficulties in Britain, according to the British Chamber of Commerce.

He stated that Britain, along with the United States, has proven a miserable failure in trying to stop or limit Yemeni attacks, with senior British naval officers admitting to their media outlets that it is difficult to confront deadly and fast Yemeni weapons.

He pointed out that the Americans and Europeans depend on unjustly plundering the wealth of others and impose economic policies that are destructive and harmful to other peoples. He also pointed out that the American seeks to implicate others when he talks about what is happening in the Red Sea. The world should not deal with the Americans, the British, and the Israelis as if they depend on Lying and slander.

He said, "We seek to reassure the rest of the countries as long as they do not support the Zionist enemy and are not involved in the aggression against our country," stressing that there is no point in the American-British aggression against Yemen to support the Israeli enemy and the continuation of genocide crimes in Gaza.

The revolution leader reiterated that the solution for the Americans and the British is to stop the genocide crimes in Gaza and end the siege against the Palestinians.

He also stressed that the enemies are starving the Palestinians in Gaza Strip and are trying to prevent the necessary bread and food from reaching them to satisfy their hunger. He explained that the prolonged aggression and siege on Gaza will have an impact on the enemies' economic situation.

He said, "Insisting on an aggressive policy is not in the interest of the enemy peoples, but rather for the sake of the Zionists, and it is also an injustice to the Palestinian people." He stressed that the Yemeni operations in support of the Palestinian people are effective, influential, important, and useful participation in the battle with the Zionist-American enemy.

Sayyed Abdul-Malik Badr al-Din al-Houthi recalled the crimes and genocidal wars that the Palestinian people have been exposed to for 202 days, indicating that the percentage of martyrs and wounded in Gaza reached six percent of the Gaza Strip's population, which is a high percentage and may be one of the highest percentages in the current era in terms of killing and war occurring genocide.

He considered the barbaric Zionist aggression against the Palestinians in Gaza Strip an aggression that targeted the Gaza Strip community in general, indicating that the Israeli enemy targeted the Palestinians with all means of genocide through killing, starvation, and spreading epidemics.

He explained that the Israeli enemy is getting creative with its means , methods to kill people in Gaza Strip every day, and has used audio recordings such as "Catch us," "Help us," and children's screams from drones to lure the people of Gaza to target them and commit more brutal massacres.

The revolution leader pointed out that the Zionist enemy has turned hospitals into mass graves and is carrying out cold-blooded executions of health personnel and patients. He said, "We have not heard of crimes among the events in any country of the world with the level of horrific crime practiced by the usurping enemy."

He reviewed the brutal crimes committed by the Zionists, including mutilating corpses and stealing their organs in the mass graves that were discovered in the Nasser Medical Complex, and their continuation of the widespread method of starvation, and Kamal Adwan Hospital receiving 50 children daily due to drought and lack of food.

He reported that the Zionist enemy's attacks in the West Bank are daily, including killing, kidnapping, destroying, burning houses, and displacing people, describing the robberies, seizures, and usurpations of lands by the Israeli enemy as unprecedented in the West Bank over a period of 30 years.

Sayyed Abdulmalik Badr Al-Din Al-Houthi reported that the Zionist enemy is trying to take advantage of his so-called holidays to storm Al-Aqsa Mosque, desecrate it, and attack the worshipers.

He stressed that the American is a partner of the enemy entity in all its horrific crimes against the Palestinians, just as it is a partner in the siege, starvation, killing, destruction, genocide crimes, and what the Israeli enemy is doing is with the full and comprehensive support of the American.

He also stated that the recent American support for the Zionist enemy is support for the continuation of the crimes of murder, bulldozing , comprehensive destruction in Gaza, and with the massive American support with weapons and money, the usurping enemy entity continues to move extensively in all paths of support at all levels.

The revolution leader promised the American role in the aggression against Palestine as if the battle were his battle... explaining that the American is pressuring the brothers in Qatar in an attempt to push them, through their mediation, to adopt the American Zionist vision and to put pressure on the Hamas movement.

He stated that the negative American role has reached the extent of supporting the Zionist enemy to targeting any activity within America itself, when some of the American people move to object to the crimes of genocide, and they are dealt with with complete cruelty.

He pointed out that the American does not respect its laws, its constitution, or any titles it raises and brags about, such as democracy and freedom of opinion and expression. He added, "Once there is a demand within America to stop the crimes of genocide against the Palestinian people, the American cannot bear to listen to these voices."

He continued, "With the demonstrations and sit-ins at prominent American universities, the American role with the Israeli enemy became clear, and the authorities dealt with the demonstrations and protests at American universities in a bad manner that goes beyond all considerations."

Sayyed Abdulmalik Badr al-Din al-Houthi touched on the criticism of the American President and American officials of the protesters in American universities to the point of threatening their presidents , officials with dismissal and expulsion, indicating that the American tended to militarize the universities with large numbers of police and arrest their students in an abusive manner.

He stressed that the titles and rights that the American raised for university students ended in the face of the demand to stop the genocide crimes in Gaza, and the voices accepted by the official authorities in America became those who support the crimes of genocide and call for the extermination of the Palestinian people.

He denounced the emergence of voices that supported the bombing of the Palestinian people with nuclear bombs from within the US House of Representatives, noting that European countries raise the label of anti-Semitism against those who demand an end to the crimes of genocide against the Palestinian people.

The revolution leader pointed out that there is a tendency in Germany to adopt a law that considers mere criticism of the Israeli enemy to be anti-Semitism, and the title of anti-Semitism is not raised in the West except when the issue relates to the Zionist enemy, and within a Zionist vision of confiscating the rights of the Palestinians.

He considered the American and European effort to ban claims under the pretext of anti-Semitism a scandal to the Americans , the followers of Zionism and their addresses. He pointed out that the movement in more than 100 Western and European cities is of great importance even though it is facing a major propaganda and media campaign.

He said, "There is an American-Western effort to prevent the conscious movement that has begun to awaken to the horror of what is happening in Palestine, but it is growing , expanding, and the talk of some European countries with the term 'the right of the Palestinian people to establish a Palestinian state' remains according to Western standards."

Sayyed Abdulmalik Badr al-Din al-Houthi added, "When the West talks about the right of the Palestinian people to have a state, it assumes that it is based on a small part of the Palestinian people's land and most of it is confiscated for the benefit of the Zionist enemy."

He explained that the West relies in fighting the Palestinian people on their right, and that the headlines of “establishing a Palestinian state” are merely deceptive headlines. He added, “Some European countries have been greatly embarrassed by the scale of what is happening in Gaza and have a fair political position.”

He pointed out that despite the failure of most Islamic countries, the Palestinian people in Gaza and their mujahideen are steadfast, and stressing that the continuation of the mujahideen operations in the north and center of the Gaza Strip is a great, legendary and unparalleled steadfastness and an honorable and great page in the pages of jihad, sacrifices and struggle of the Palestinian people.

He continued, "The continuation of missile attacks on enemy settlements clearly indicates the extent of the cohesion of the resistance and the extent of its effectiveness." He pointed out that the steadfastness of the Palestinian people in the face of the crimes of genocide is great steadfastness.

The Revolution Leader praised the great cohesion of the Palestinian people and their Mujahideen, which is an important and essential factor in confronting the Zionist enemy supported by America and Europe.

He stressed that the Zionist enemy is in a state of clear failure, and its media describes it as a scandal, a defeat, and a failure, for the enemy entity and its American partner... Pointing out that the enemies failed to achieve any image of an actual victory in Gaza, as they neither recovered their prisoners nor eliminated the Palestinian resistance.

He praised the state of cohesion of the Mujahideen factions in Gaza Strip and their adaptation to the tactics and methods of the enemy, which is suffering huge losses in its strength and personnel, explaining that the phenomenon of mentally ill people within the enemy entity is a striking phenomenon, and they are in the position of the criminal aggressor.

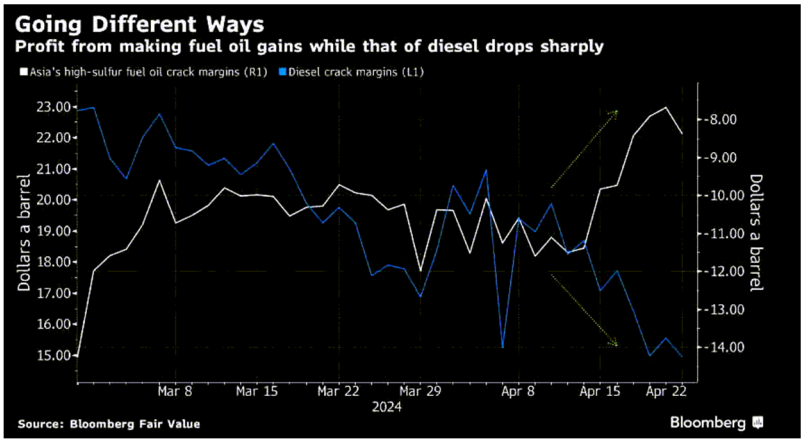
He touched on the effects of the psychological state that is expanding among the enemy to the point that one of them describes his soldiers as ducks in the line of fire, and a quarter of Israelis have sought help from a mental health specialist since October 7, according to companies operating in health care services.

Sayyed Abdul-Malik Badr al-Din al-Houthi referred to reports about the intention of senior officers in the enemy army to resign after the resignation of the head of the Zionist intelligence service, in addition to the continuation of demonstrations by the families of prisoners from the enemy after his failure to expel them through his aggression and crimes.

He considered the opposing immigration of the Zionists to be one of the strategic effects of the steadfastness of the Palestinian people in Gaza Strip, adding, “The thinking of half the Zionists about immigrating and leaving Palestine reflects an existential crisis and an admission that they are mere usurpers and occupiers.”

He touched on the Lebanese front, where there is a major escalation and intense operations by Hezbollah on its important and direct front, where it is harassing the Zionist enemy, describing Hezbollah’s operations as precise, purposeful, effective, and devastating to the occupying enemy gangs.
The revolution leader stated that hundreds of thousands of usurping occupiers in northern Palestine face a very big problem in fear of being present in northern Palestine, and there is an unprecedented disruption to factories and companies in northern occupied Palestine, and this has a major impact on the economy of the Zionist enemy.
He confirmed that the impact of Hezbollah's operations had increased significantly, as they had become very annoying to the Zionist enemy, and no Israeli means were useful to stop the Hezbollah front or dissuade it from continuing its large and great role in supporting the Palestinian people.

Dirty and Sludgy Oil Is Having Its Moment as Demand Shifts (1)
2024-04-22 09:27:34.546 GMT
By Sharon Cho
(Bloomberg) -- Oil that's more sulfurous and dense is gaining popularity in the Asian physical market in a rare shift away from the usual pattern as global crude flows change and rewards from refining move in its favor.
Middle Eastern varieties that have medium-density and higher sulfur such as Oman and Upper Zakum are now fetching bigger spot premiums than grades like Murban. That's unusual as the latter is a lighter oil, typically regarded as better quality since it has a rich yield of refined fuels such as diesel.



The new pattern reflects underlying changes in supply and demand that span the global crude market. OPEC+ supply cuts have crimped flows of dirtier crudes, while at the same time, US producers have been boosting exports of lighter varieties.
Vortexa Ltd. estimates that daily supplies of medium and heavy-sour crude into Asia have declined by 920,000 barrels on-year in the first three months.
On the demand side, meanwhile, margins on high-sulfur fuel oil — made more from medium-sour grades — have risen just as profits in Asia from producing diesel fell, according to Bloomberg Fair Value data.
"Medium- and heavy-sour crude supplies have been on a decline, and this has pushed up prices of these crudes," said Serena Huang, lead Asia analyst at Vortexa. "Middle distillate cracks — mainly diesel — have been coming under pressure from ample supplies, a result of robust refinery runs over the past months that have surpassed demand."
Other factors have also been at work, according to traders. While diesel has been showing signs of weakness globally, fuel oil — made from the heavier barrels — has seen a boost driven by seasonal demand, with the Middle East consuming more for power generation in the summer months, they said.
In addition, Abu Dhabi has been shipping more lighter oil, while curbing flows of its denser Upper Zakum variety to process that domestically. Elsewhere, Mexico's halt to some exports has also reduced flows of sour heavy crude.

From here, the outlook depends on “what OPEC+ does at the next meeting and also how gasoline demand evolves over the coming quarters,” said Giovanni Staunovo, commodity analyst at UBS Group AG. That’s expected to offer some support, driving a reversal of the current trend in the coming months.

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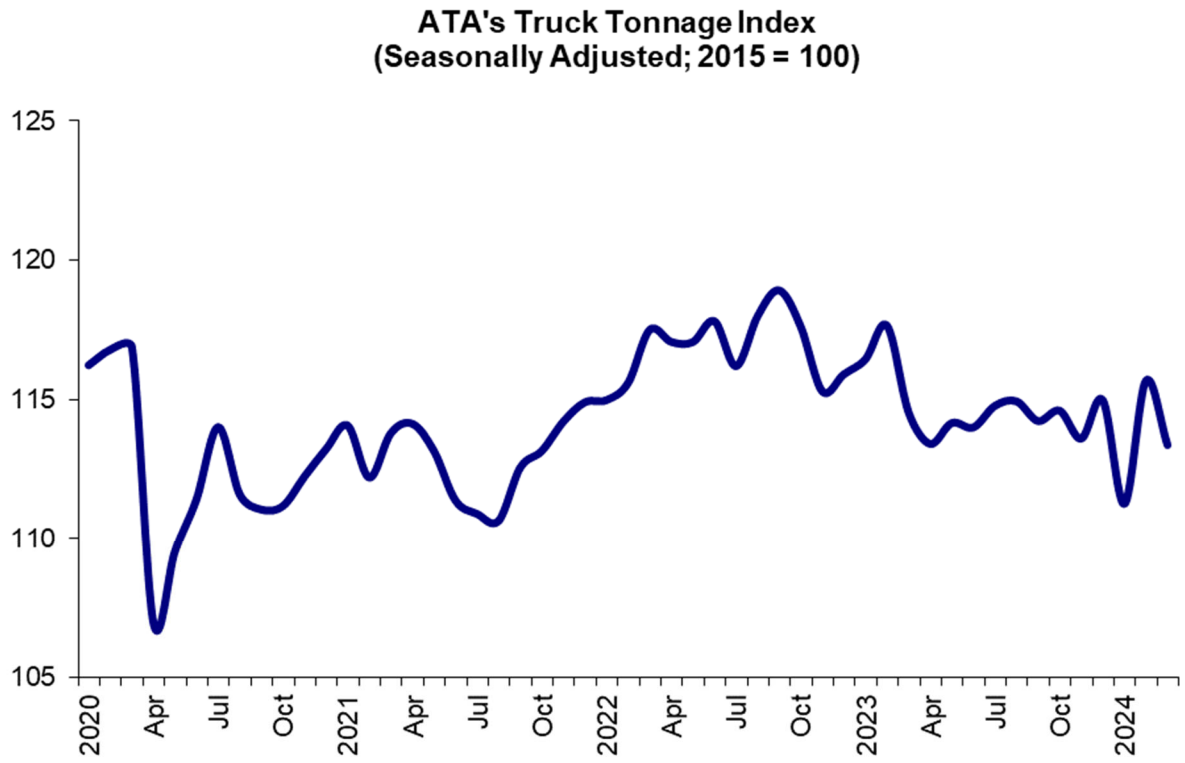
https://www.trucking.org/news-insights/ata-truck-tonnage-index-decreased-2-march

Apr 23, 2024

ATA Truck Tonnage Index Fell 1% from March 2023

Washington--American Trucking Associations' advanced seasonally adjusted For-Hire Truck Tonnage Index declined 2% in March after increasing 4% in February. In March, the index equaled 113.4 (2015=100) compared with 115.7 in February.

Image



"Tonnage in March suggests that truck freight volumes remain lackluster, and it is clear the truck freight recession continued through the first quarter," said **ATA Chief Economist Bob Costello.** "In the first three months of 2024, ATA's tonnage index contracted 0.8% from the previous quarter and declined 2.4% from a year earlier, highlighting ongoing challenges the industry is navigating."

February's increase was revised down slightly from our March 19 press release.

Compared with March 2023, the index fell 1%, which was the thirteenth straight year-over-year decline, but the second smallest over that period. In February, the index was down 1.7% from a year earlier.

The not seasonally adjusted index, which represents the change in tonnage actually hauled by the fleets before any seasonal adjustment, equaled 114.4 in March, 4.7% higher than in February. ATA's For-Hire Truck Tonnage Index is dominated by contract freight as opposed to spot market freight.

In calculating the index, 100 represents 2015.

Trucking serves as a barometer of the U.S. economy, representing 72.6% of tonnage carried by all modes of domestic freight transportation, including manufactured and retail goods. Trucks hauled 11.46

billion tons of freight in 2022. Motor carriers collected $940.8 billion, or 80.7% of total revenue earned by all transport modes.

ATA calculates the tonnage index based on surveys from its membership and has been doing so since the 1970s. This is a preliminary figure and subject to change in the final report issued around the 5th day of each month. The report includes month-to-month and year-over-year results, relevant economic comparisons, and key financial indicators.

due to tight supply chains and busy shipyards. We expect these are only timing delays and see no impact to our overall outlook for OFSE this year.

In line with our previous commitments, we continue to enhance returns to our shareholders. During the quarter, we increased our quarterly dividend by $0.01 to $0.21, which represents an 11% increase year-on-year. We purchased $158 million of shares and remain firmly on-track to deliver 60% to 80% of free cash flow to shareholders.

Turning to the macro on Slide 5. Since bottoming in December of last year, oil prices have rallied significantly. A resilient global economy, steeper than expected seasonal decline in US oil production to start the year and the roll-forward of OPEC+ production cuts have helped to keep global oil markets more balanced. OPEC+ timing on restarting idled oil production, the trajectory of global economic activity and the geopolitical risk will be key factors in determining the oil price path for the remainder of the year.

We reiterate our 2024 North America and international drilling and completion spending outlooks as we see potential offsets to higher oil prices. In North America, our outlook remains for a year-over-year decline in the low to mid-single-digit range. We continue to anticipate declining activity in US gas basins, partially offsetting modest improvement in oil activity during the second-half of the year.

Across international markets, we maintain our expectations for high single-digit growth. This contemplates extended OPEC+ cuts through the end-of-the year as well as any potential timing differences between the transitioning of rigs from oil to gas in Saudi Arabia. Looking out beyond 2024, we expect continued upstream spending growth despite the recent MSC target reduction in Saudi Arabia, although at a more moderate pace than we have experienced in recent years. We expect growth to be led by offshore markets in Latin America and West Africa as well as the Middle East.

As we move into the next phase of the upstream spending cycle, we anticipate increasing focus on optimizing production from existing assets. At our Annual Meeting in January, we launched Mature Asset Solutions, an emerging business that maximizes the health and value of our customers' mature fields. It leverages our decades of experience, deep domain knowledge and industry leading technologies, including Lucida and coveted franchises in both upstream chemicals and artificial lift. We continue to experience strong customer demand for Lucida as this differentiated digital solution is driving next level efficiencies for our customers through automation, digital optimization and workflow orchestration.

Turning to global natural gas and LNG on Slide 6. The long-term demand outlook for both remains very encouraging. Through 2040, we expect natural gas demand to grow by almost 20%, representing a 1% CAGR driven growth in underlying energy demand and the desire to drive towards a net zero energy ecosystem. Looking at non-OECD Asia, coal still accounts for about 60% of power generation, which is 3 to 4 times the level utilized in the United States and Europe. As this region increasingly

focuses on reducing and abating emissions, we expect coal-to-gas substitution to be more pervasive, helping to drive a mid-single-digit CAGR for both India and China natural gas demand through 2040, while the rest of Asia will grow at solid low-single digit rate.

Strong underlying natural gas demand will spur robust growth in LNG over the coming decades. Through the end of this decade, we expect demand to increase by mid-single digits annually. We believe this will support an installed nameplate capacity of 800 MTPA by 2030. Looking out to 2040, we expect LNG demand growth to continue, requiring further capacity additions beyond 800 MTPA.

While there could be periods of price volatility driven by temporary dislocations in supply and demand over this time period, we see these as opportunities for accelerated demand creation. LNG consumers who tend to be very price sensitive typically respond to lower prices with stronger demand. We have seen evidence of this recently. Global LNG demand is up 4% year-to-date against the backdrop of an approximate 50% decline in LNG prices over the same period.

As shown on Slide 7, we expect global LNG FIDs of about 100 MTPA over the next three-years. This view, supported by customer dialogue and our internal LNG demand expectations, would result in our installed capacity increasing by 70%. This growing installed-base brings significant opportunities for Baker Hughes across the lifecycle of the equipment.

Like our industrial peers, our Gas Tech businesses typically generates more profitability on the less cyclical aftermarket services. For LNG equipment specifically, this accounted for less than 10% of our total company EBITDA last year. On the new energy front, we continue to see good momentum with a number of positive developments across our five focused areas of CCUS, hydrogen, geothermal, clean power and emissions abatement.

As mentioned, we booked $239 million of new energy orders during the first quarter, including a Climate Technology Solutions award from Snam for compression trains driven by hydrogen ready NovaLT12 turbines. This equipment will support a new gas compressor station in Italy that will eventually transport additional hydrocarbons from Azerbaijan, Africa and the Eastern Mediterranean region to Northern Europe.

CTS also secured an order to supply ICL zero-emissions integrated compressor technology to be deployed by TotalEnergies for a process plant in the Vaca Muerta region of Argentina. We continue to expand our relationship with a key Middle Eastern industrial company, securing a CTS order for the refurbishment of steam turbines and centrifugal compressor trains. This upgrade drives process efficiency improvement and 5% estimated CO2 emissions reduction as part of the customer's energy transition roadmap.

As we look out across the rest of the year, we remain confident in achieving new energy orders between $800 million and $1 billion, which would amount to a tripling

of new energy orders since 2021. Longer-term, we continue to be encouraged by increasing opportunities to support growing energy demand and decarbonization efforts, giving us confidence in achieving our $6 billion to $7 billion new energy orders target in 2030.

Turning to Slide 8, I wanted to take a moment to reflect on some of the emerging themes within the energy sector. It has been a busy quarter with several industry events including our own Annual Meeting in Florence, where we hosted over 2,000 customers, partners and industry leaders in January. Firstly, it is becoming clearer just how complex the undertaking is to transition the world's energy ecosystem. This complexity is driving a slower than expected expansion of renewable energy capacity and leading to record levels of coal demand. Consequently, we are seeing more pragmatism towards a pathway for decarbonization.

With growing urgency to affect this trend, there is mounting consensus that there is no possible route to decarbonize the energy system without driving greater efficiency and significantly increasing gases weighting within the overall energy mix. Energy providers face the multifaceted challenge of providing secure, sustainable and affordable energy against the backdrop of increasing energy demand. Gas is abundant, lower emission, low-cost and the speed to scale is unrivaled. This is the age of gas.

Whether it be the super majors, the NOCs or the independent companies, all of our customers are messaging that they plan to increase their exposure to gas in the coming years. Baker Hughes is extremely well-positioned to facilitate this through our upstream capabilities in OFSE and expertise in LNG and gas infrastructure in IET. An excellent example of this is the reallocation of capital in Saudi Arabia, primarily towards gas. Following the recent announcement to not pursue an increase to its maximum sustainable capacity, the country is shifting focus towards natural gas where production is now expected to increase by more than 60% through 2030, will require significant investment in gas infrastructure. This represents a sizable opportunity for our IET business as highlighted by our MGS3 award.

Considering this transition towards gas as well as increasing investments in new energy and chemicals, we see this announcement as a long-term net positive for Baker Hughes, given our exposure to all free markets. In addition, we are seeing a number of gas infrastructure projects emerge around the world. These midstream opportunities, along with solid first quarter bookings give us confidence that non-LNG Gas Tech Equipment orders will be up more than 50% this year.

Adding further impetus to this growth theme is an increasing demand for artificial intelligence, which is expected to be a key enabler in driving significant productivity and efficiency improvement across the entire energy value chain and could enhance decarbonization efforts. At Baker Hughes, we have been utilizing AI within our digital solutions for a number of years. We continue to make great progress with our Lucida production optimization solution in OFSE and drive greater efficiencies and reliability with our Cordant solutions platform in IET, which both leverage AI.

The efficiency and productivity benefits of AI will be balanced by the increased need for energy-intensive data centers. AI will likely drive substantial electrical load growth, therefore increasing both the challenge and opportunity to provide clean, reliable and firm power solutions. Given the requirement for continuous power supply, the demand for distributed power systems will be substantial with gas the likely dominant fuel source. Baker Hughes is again well positioned to participate in this market through our clean power solutions, particularly our NovaLT fleet of turbines, which can run on natural gas and hydrogen.

As the market scales, the size of data centers and power needs will also likely grow, which would benefit our larger-scale solutions that include steam turbines for SMR solutions and net power. With the growing realization that we need and all of the above approach to the energy transition, the focus is shifting towards the emissions rather than the fuel source. I have spoken about this important shift for several years now and we are pleased to see it taking hold in our customer's operations and policy initiatives.

The market's increasing alignment towards the view is spawning stronger momentum, in particular, for CCUS. This is very encouraging to see and provides tailwinds for our technology solutions that play across the entire CCUS value chain. Specifically, on the capture side, we continue to make progress across our portfolio, where we are developing a suite of solutions that have applications across various scales and purities of CO2. Complementing our capture portfolio are the decades of experience we have in CO2 compression and storage.

For CO2 compression, we have experienced a strong increase in demand, both for off-shore and on-shore applications while we are also involved in several CO2 storage projects. In summary, all of these themes play to the strengths of Baker Hughes and continue to heighten our conviction in our strategy. With our expansive portfolio, capabilities and solutions offerings, we are uniquely positioned to deliver value for our diverse set of energy and industrial customers. This is what differentiates Baker Hughes and enables us to deliver durable earnings and free cash flow across our free time horizons.

With that, I'll turn the call over to Nancy.

Nancy Buese {BIO 7531362 <GO>}

Thanks, Lorenzo. I'll begin on Slide 10, with an overview of our consolidated results and then speak to segment details before outlining our second quarter outlook.

We are very pleased with our first quarter results, above the midpoint of our EBITDA guidance. Orders remain solid as the diversity of IET's end markets continue to support a strong level of orders. We continue to make progress on driving operational improvements across the business to enhance margins and returns, highlighted by the consistent improvement in EBITDA margins and ROIC. We remain confident in our full-year guidance that points to another strong year for Baker Hughes.

margins in the second half or is the high-end of the range for full-year revenues and EBITDA looking more likely now for IET?

A - Lorenzo Simonelli {BIO 15243700 <GO>}

Yeah, Scott, first of all, very strong quarter for the company. And as you said, led by also IET, but overall, very pleased by both segments. And IET, a very strong solid quarter. And as we said, we've been committed to our journey in IET towards the 20% EBITDA and you're starting to see some of those levers coming through. As you look at first quarter and as you look at the rest of the year, again you've got a strong backlog conversion in Gas Tech Equipment as you can see in the first quarter, revenue up nearly 50% year-over-year and that helped Gas Tech Equipment. From a margins' perspective, EBITDA was up nearly 200 basis points.

And you're seeing the better backlog margin coming through as well as productivity in the factories. Our bright spot was in IET from an Industrial Solutions perspective, as you look at the revenue side, but also when you look at the projects and the services revenue, which was up 20% year-over-year and margins also improving in the Bently Nevada with some of the supply chain constraints that we've discussed before that have been alleviated now. And also Gas Tech Services, revenue increasing. As we went through the first quarter, we continue to see that for the rest of the year, even though we're still constrained by some of the supply chain headwinds. So as you look at IET for the rest of the year, we continue on the basis that we set and the journey that we've laid out with continued margin expansion and improvement towards that 20% as we go forward as we continue the journey.

Q - Scott Gruber {BIO 6761975 <GO>}

Got it. And then turning to the production side of OFSE, we recently saw one of your big competitors move to enhance their position. How do you see the market evolving for the production vertical where you have a strong position? Does the growth rate for production start to rival the growth rate for drilling and completion spend in '25 and beyond? And how do you think about the competitive dynamics in the market? Your team was quite excited by your production optimization solutions at your Annual Meeting.

A - Lorenzo Simonelli {BIO 15243700 <GO>}

Yeah, Scott, it's very good point. And for us, what's happening from the external perspective and the dynamics doesn't change the strategy and we've been firmly focused on a strategy around production solutions for some time. As you know from the comments that I made at the Annual Meeting, 70% of the world's production comes from mature assets and a mature asset being a well that's produced 50% of its reserves or has been in production for over 25 years.

And when we look at the future, there's a tremendous focus on improving that optimization. And we've got some great capabilities with the largest global installed base of ESPs, 44,000 pumps and we're moving about 80 million barrels of fluid daily. And again, as you look at the continued chemicals that are being applied and a 1% improvement just in mature asset production can give two to three years of global consumption. So, as we go forward, no change and we continue to see this as

a space where between our RTS, our ESPs and chemical solutions and also the digital, automation and AI that we can deliver through Lucida being a great opportunity for our customers and an increasing area of focus for our company.

Q - Scott Gruber {BIO 6761975 <GO>}

Appreciate the color, Lorenzo. Thank you.

Operator

Thank you. One moment for our next question. Our next question comes from the line of Arun Jayaram from J.P. Morgan Securities LLC.

Q - Arun Jayaram {BIO 5817622 <GO>}

Yeah, good morning, Lorenzo and Nancy. Lorenzo, I want to start with the Saudi MSC reduction. I wanted to get your perspective on the potential impacts to Baker from the changing mix of activity with the higher mix of onshore versus offshore. And perhaps you could just comment on what -- on the gas side of the equation with higher infrastructure spend, chemicals and new energy spend, what that means for Baker's as we think about rest of this year and into next year?

A - Lorenzo Simonelli {BIO 15243700 <GO>}

Yeah, sure, Arun. We remain confident in the international market outlook. We expect E&P spending to be up high single digits this year. And, as we look at, in particular, the MSC reduction, as we said in the last call, we don't anticipate any real changes. And in fact, when we look at Saudi, we see it as opportunities outside of just the upstream area given our presence. As you know, natural gas production is set to grow by 60% through 2030 and it's going to benefit our IET business. You saw the announcement that was made in 1Q relative to the Master Gas System free, the pipeline project. There's going to be more opportunities down the road. Also, this shift of CapEx is also across new energy and chemicals. We recently opened our new chemicals facility in the kingdom. We're also, as you know, from a new energy perspective, participating in hydrogen on Neom. So overall, this CapEx shift for us is a long-term net positive for Baker Hughes and doesn't change the outlook that we laid out at the beginning of the year.

Q - Arun Jayaram {BIO 5817622 <GO>}

Great. That's helpful. Maybe a follow up, maybe for Nancy. Nancy, I want to get your take on some of the puts and takes around the 2Q guide, looks to be about 3% above our model and looks like just slightly better margins. And so just wondering if you could talk about some of the puts and takes and just the fact that you kept the back half, maybe a follow up to Scott's question. You did the full year the same. Are you getting a little bit more confidence on the full year outlook given what's transpiring in the first half of the year?

A - Nancy Buese {BIO 7531362 <GO>}

And the diversification of Baker Hughes is across the two major segments. We play obviously within the Oilfield Services and the Equipment side, but then the gas infrastructure side, the hydrogen, when we think of Neom and the facilities associated with hydrogen, the infrastructure that's going to be required when we think of power generation, distributed power generation. And as you think of also the opportunity for productivity and also with digital capabilities and solutions. So across-the-board, I think what makes us unique is again the ability to play at the full value chain of the energy ecosystem within the kingdom through local capabilities. And that's a strategy that we've also put into place in other Middle Eastern countries as well with facilities in the UAE and Qatar and likewise it's a region that's very important to us.

Q - J. David Anderson {BIO 1541318 <GO>}

Much appreciated. Thank you.

Operator

Thank you. One moment for our next question. Our next question comes from the line of James West from Evercore ISI.

Q - James West {BIO 7351884 <GO>}

Hey, good morning, Lorenzo and Nancy.

A - Lorenzo Simonelli {BIO 15243700 <GO>}

Hi, James.

Q - James West {BIO 7351884 <GO>}

Lorenzo, I wanted to touch back on carbon capture because it sounded like there was a bit of a shift in your tone there with respect to projects starting to move forward and to scale. So I want to know, one, is that accurate? Two, have you seen any change or have you put any change in your CCUS strategy? And how about an update on your kind of commercialization of some of the newer technologies in carbon capture?

A - Lorenzo Simonelli {BIO 15243700 <GO>}

Yeah, definitely, James. And as we look at what's happening and we've been discussing for some time the continued increasing demand for energy and the realization that we need an all of the above approach to the energy transition, it means there's a shifting focus towards emissions rather than the fuel source. And that puts the forefront CCUS. And as you know, we've been playing and participating in CCS [ph] for many decades. But we've also been investing in CCUS capabilities. And so as we go forward, we think CCUS is going to be a first mover. And as you look at our order intake also on the new energy front, you can see from last year also that a large portion of our orders was associated with carbon capture, utilization and storage.

And we've got a wide array of capabilities that we've been developing. We've got the chilled ammonia process, which is for large-scale applications like power generation. We've got the mixed salt process and compact carbon capture, which is rotating bed solution, which is suitable for a smaller footprint of industrial applications. And then we're also testing and piloting mosaic materials for direct air capture technology. And complementing all of this is the compression capability that we have and also storage and the knowledge of the reservoir and how to store and maintain the CO2 and compress it. So this is a theme that we see and projects that are going-forward and we think that's increasing as the year progresses and also going into the next few years as people appreciate that it is an all of the above and we're going to need to focus more on emissions as opposed to fuel source.

Q - James West {BIO 7351884 <GO>}

Great. And then maybe a follow up on the -- all the above comment, Lorenzo, wouldn't you have relationships with all the major tech companies and they're trying to scale datacenters and that's being supercharged by AI. It seems to me that renewable deployment is not going to be able to keep up with that. So they're going to have to go towards some type of fossil fuels and it sounds like gas is the one they're targeting, but are these datacenter providers beginning to at least acknowledge that reality that for some period of time we're going to have to build-out potentially more gas infrastructure to support this because the power generation needs are running well ahead of renewable or cleaner fuel sources.

A - Lorenzo Simonelli {BIO 15243700 <GO>}

Yes, I'd agree with you that there is a growing realization that there is a growing demand for energy and that's being driven by some of the datacenters. And look, AI provides huge benefits both internally and also from an external perspective to us internally to drive optimization for our customers, but also externally to drive growth for our equipment and the services that we provide.

And that's why we like the ready gas turbines that go on natural gas today, but then can switch to hydrogen. That's also why we like the solutions that we're offering with regards to other clean power solutions. And as we talk to our customers, that's what they're looking for. And when you look at the datacenter developers, they're all coming to a realization that there is going to be a growing need for off-grid solutions as well as distributed power generation with a view to continuing the aspect of reducing emissions. So there's also opportunities for geothermal and others where we play and we look at it as being a growing element of our equipment portfolio and a nice segment that again diversifies us versus others because of the portfolio that we have.

Q - James West {BIO 7351884 <GO>}

Right. Thanks, Lorenzo.

Operator

Thank you. One moment for our next question. Our next question comes from the line of Luke Lemoine from Piper Sandler.

Q - Luke Lemoine {BIO 15190258 <GO>}

Hey, good morning, Lorenzo, Nancy. The IET orders you had in 1Q put you on a nice pathway to hit the midpoint of the annual guide with GTE being the largest component. I'm sure most of the variability resides here. And you talked about some of the non-LNG awards outlook within GTE. But can you just talk about some of the puts and takes within the annual order guidance for IET?

A - Lorenzo Simonelli {BIO 15243700 <GO>}

Yeah, I'll kick it off here, Luke. And we remain very confident in the orders range that we provided for 2024. If you look at the start of the year, very positive from the orders front, booking over $2.9 billion of orders, including large awards again from Aramco, but also from Black & Veatch and Cedar LNG. And LNG equipment will still be a portion of the orders outlook as we go through the year. And again, it was significant last year.

But it's also outside of LNG. It's onshore, offshore production. It's the gas infrastructure and also coupled with the new energy. And as you look at the guidance that we've given of new energy orders between $800 to $1 billion and stable growth in services and industrial tech. So very confident in the $11.5 billion to $13.5 billion orders range and a strong pipeline of activity. And when you look at what's being heard from our customers and also what's being seen, I think growing confidence on the elements of gas infrastructure and the opportunities that we have in the multiple sectors that we play in.

Q - Luke Lemoine {BIO 15190258 <GO>}

Okay. And then Nancy, on getting to the 20% OFSE margins next year, there were some finer points, but the broad buckets had kind of been on productivity cost, price volume. Could you just refresh us on the drivers here and maybe the confidence around the individual pieces?

A - Nancy Buese {BIO 7531362 <GO>}

Yeah, absolutely. We absolutely remain confident in hitting those 20% EBITDA margins and you're starting to see some traction with a lot of the activities that have been done in this segment and continuing actions. And we do still see strength in international markets this year. We're also maintaining our outlook for high single digit E&P CapEx. So those are good drivers as well. I would also just note that hitting that margin target does not require an acceleration of growth compared to where we already are. So that's all baked into it.

Alongside that, we do have a cost out program that we've announced with Q4 earnings and that's really helping to reset the cost structure within the segment, reducing further duplication and becoming more efficient. I would say the team is also focused on continuing to drive more cost efficiencies around the business and we'll see more of that come to play as 2024 unfolds. The other piece of it is on the SSPS side, we have higher-margin activity in that backlog and you'll see that drive up margins in '24 and '25. So overall, I would say that 20% margin target remains in

Upstream growth to continue

Pace moderating, but strong fundamentals support continued international growth

THEMES

2024 international outlook unchanged
Continue to expect high single-digit growth in '24. Contemplates OPEC+ cuts remaining for FY'24

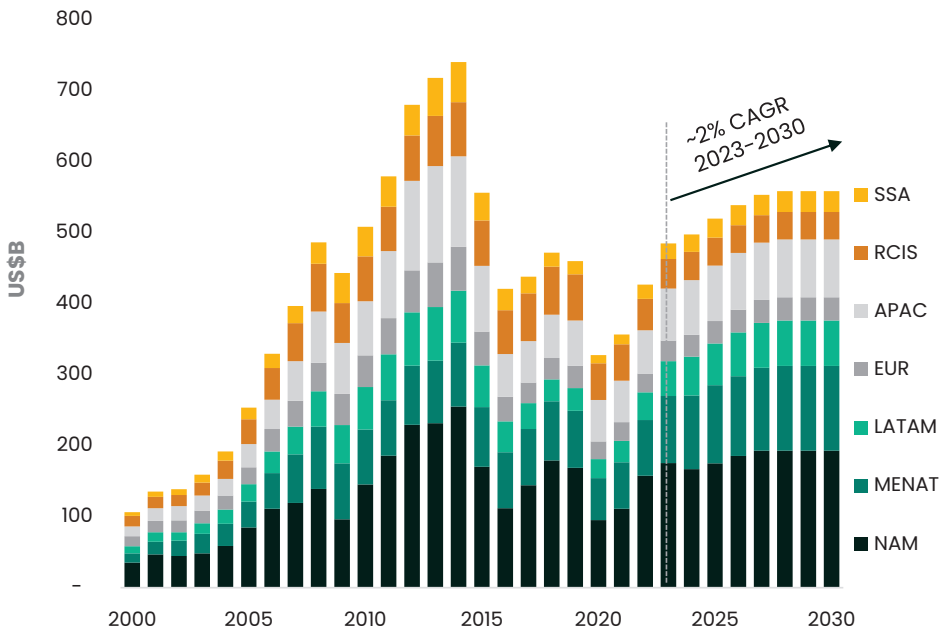
Saudi MSC reduction
Main impacts in 2025 / 2026 – BKR set to benefit from increased gas infrastructure, chemicals & new energy spend

North America remains subdued
Continue to expect market to be down low-to-mid-single digits in '24 – sharp declines in gas activity offset a modest oil recovery in second half oil activity

Robust offshore activity to continue
Expect >300 subsea tree awards annually for the next 2-3 years

Increasing focus on Mature Assets Solutions
Enhancing production from existing assets will drive OPEX spend growth as CAPEX growth moderates

BKR UPSTREAM CAPEX OUTLOOK[1]



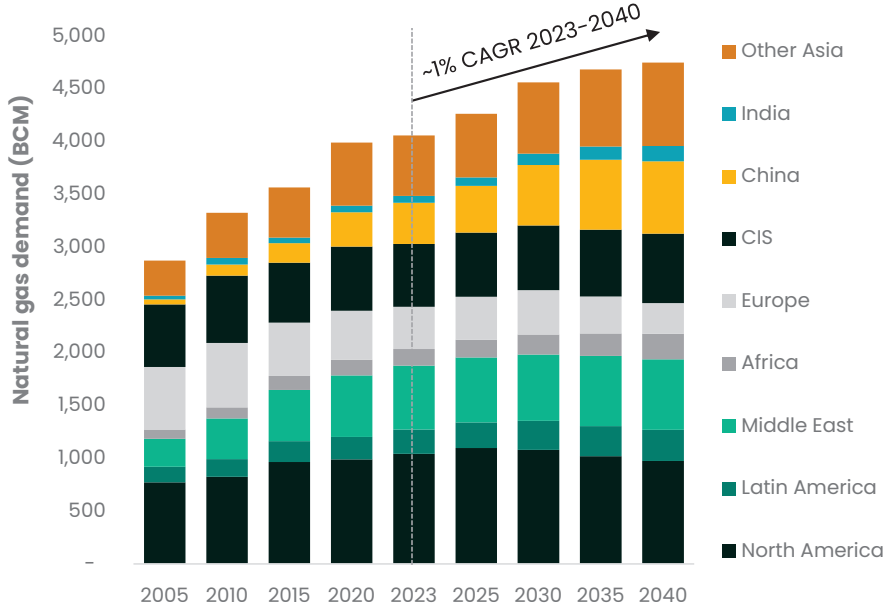
1. Source: Historical Data - Wood Mackenzie Upstream Capex: Lens Direct. Forecast Data - Baker Hughes Company Estimates. Note CAGR impacted by rebasing to 2023 vs. 2022 and adjustments to regional outlooks.

Strong global gas & LNG demand growth anticipated

Supported by accelerating demand in Asia and resiliency in developed economies

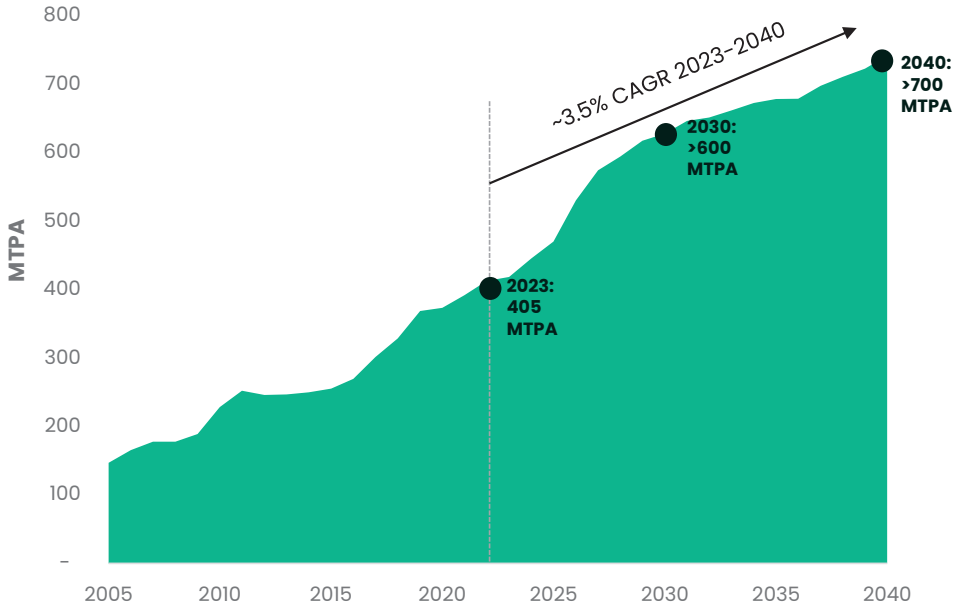
BKR GLOBAL GAS DEMAND OUTLOOK BY REGION[1]

Upside to outlook driven by accelerated switching from coal & renewables failing to meet capacity expansion expectations



BKR LNG DEMAND OUTLOOK (DES)[2]

Expect ~800 MTPA of capacity required to service LNG demand of >600 MTPA in 2030



1. Source: Energy Institute Statistical Review of World Energy & Baker Hughes company estimates
2. DES = Delivered ex Ship. Source: Energy Institute Statistical Review of World Energy & Baker Hughes company estimates

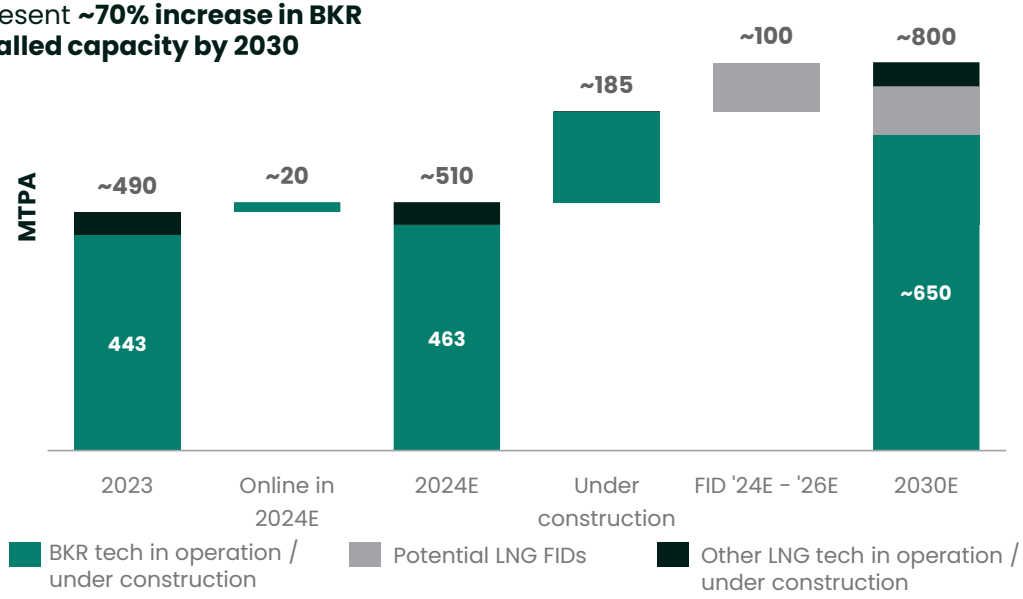
Baker Hughes

On track for 800 MTPA of LNG capacity by 2030

FID outlook remains healthy despite moratorium and oversupply concerns

LNG CAPACITY OUTLOOK[1]

~100 MTPA of FIDs and 205 MTPA of projects under construction would represent **~70% increase in BKR installed capacity by 2030**



- Near-term project FID sequencing disrupted by the U.S. moratorium
- Expect most impacted U.S. projects to proceed in 2025 / 2026
- Seeing appetite to accelerate international projects in the Middle East, Africa & LATAM
- Early signs of demand response to softening prices in key Asian growth markets
- Anticipate about 100 MTPA of FIDs between 2024 & 2026

1. Source: S&P Global Liquefaction Database & Baker Hughes company estimates

Growing acknowledgment of energy transition complexities

Driving more pragmatism and increasing alignment on the path forward

Renewables growing pains

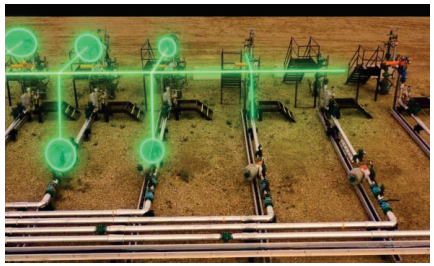
Hurdles to scale renewables are becoming more evident; significant challenges on permitting, technology and project economics

Despite all the support and progress, still burning record levels of coal

The Age of Gas

Natural gas' abundance, lower emission profile, low cost and scalability are unrivaled

Growing consensus that gas will play a pivotal role in decarbonizing the energy ecosystem, with many of our customers indicating ambitious expansion plans



The AI Revolution

Insatiable demand for AI to have significant ramifications on the energy ecosystem

Substantial opportunity to drive more efficiency and higher productivity across the entire energy value chain that is balanced by significant power requirements

CCUS is starting to scale

Growing consensus that CCUS is a vital technology in enabling the decarbonization of the energy ecosystem

Operators are progressing at pace to start-up and scale projects

Strengthening our conviction on Baker Hughes' unique portfolio of technologies and solutions

Baker Hughes

Now, I'll turn the call over to Jeff.

Jeffrey A. Miller {BIO 20672888 <GO>}

Thank you, David, and good morning, everyone. Halliburton delivered solid first-quarter results that again demonstrated the power of our strategy and the strength of our execution. Here are the quarter highlights. We delivered total company revenue of $5.8 billion and operating margin of 17%. Both divisions demonstrated margin improvement year-over-year. International revenue was $3.3 billion and grew 12% year-over-year, led by Latin America, which delivered a 21% increase.

North America revenue was $2.5 billion, a 5% increase over the fourth quarter of 2023. Finally, during the first-quarter, we generated $487 million of cash-flow from operations, $206 million of free-cash flow and repurchased $250 million of our common stock.

Let me begin today's discussion with my views on the strength of the oilfield services market. Global energy use is on the rise with crude oil demand projected to grow between 1.2 million and 2.3 million barrels per day in 2024. This demand growth is greatest in non-OECD countries where we expect more per-capita energy consumption, not less as they develop their economies and improve their quality-of-life. Globally, secure, reliable hydrocarbon production powers industries, moves people and advances economies.

In the US, after stable electricity demand for nearly two decades, we now expect it to grow more than 15% by 2030. Today, over 40% of United States electricity is supplied by natural gas and we expect strong demand for natural gas as a base fuel well into the future. The world requires more energy, not less, and I'm more convinced than ever that oil and gas will fill a critical role in the global energy mix for decades to come. My outlook is confirmed by our customers' multiyear activity plans across multiple markets and asset types. Everything I see points towards long-term growth for Halliburton's services.

My outlook for the industry is not new and it drives our focus on oilfield services and sets our strategy. This focus is the base's for our technology investment, capital allocation and culture. This multi-year upcycle, together with our successful strategy execution make this a great time for Halliburton.

Now let's turn to international markets where Halliburton's strategy of profitable growth delivered another solid quarter. International revenue grew 12% year-over-year with growth demonstrated by each region. This marks the 11th consecutive quarter of year-on-year growth in our international business. For 2024, I expect full-year revenue growth in the low-double-digits. Equally important, the international market remains tight for equipment and people and therefore, we expect to see margin expansion over last year.

One of the many things that excites me about our international business is our technology that creates meaningful value for our customers and drives above-

market growth for Halliburton. In the Drilling and Evaluation division, our leading formation evaluation tools such as the EarthStar X while drilling system and our Reservoir Examiner formation sampling service both see strong adoption and increasing levels of demand. The advanced measurements these systems provide create unique insights for our customers and drive profitable growth for Halliburton.

In the Completion and production division, our artificial lift technology continues to generate profitable growth throughout each of our international regions. Our electric submersible pump portfolio proved to be a market-leader in the competitive North American market and we expect to deliver similar results over-time in the international markets. Our complete solution, which includes downhole motors, pumps and surface systems with remote monitoring and automation provides an end-to-end solution and the ability to operate at-scale.

A great example is in Kuwait, wherein less than three years, we captured a nearly 20% market-share with over 700 ESP installs. Before we move on, I want to share an observation. I'm consistently seeing more global interest in unconventional. I can recall over a decade ago the global scramble to find unconventional with limited success. Today, two significant markets outside of North America achieve scale, which serves as a proof point for what is possible and drives interest by others. As global markets grow, the technologies and processes Halliburton developed as the leader in North America over the last three decades have broad applications to unconventional reservoirs throughout the world, which makes this a fantastic long-term opportunity for Halliburton.

I am confident in the duration of this international upcycle in 2024 and beyond.

Turning to North America. Our first-quarter revenue grew 5% over last quarter. As expected, North America land completion activity bottomed in the fourth quarter of last year and rebounded in the first-quarter as our customers quickly resumed operations after the holidays Looking ahead for the rest of 2024 in North America, we expect steady activity levels for Halliburton. Our customers are planning for the long-term and I expect they will execute work throughout the year as planned. This is consistent with a more industrialized approach to asset development in North America. And while we expect an eventual recovery in natural gas activity driven by demand from LNG expansions, our 2024 plan does not anticipate this recovery. Overall, we expect that full-year North America revenue and margins will be flattish compared with 2023 levels. Clearly, our strategy is to maximize value in North America. We do it in multiple ways. Today, I want to talk about two of them. The first is the Zeus platform and the second is our new North America focused directional drilling system. The Zeus platform, its electrification, automation and subsurface diagnostics continue to advance. This quarter, we introduced Sensory[ph], which is the latest generation of our subsurface measurement technology. Sensory[ph] provides an easy-to-deploy, cost-effective and automated system for real-time subsurface measurement of fracturing operations. Additionally, our automation technologies are at the heart of our highly efficient simul frac and trimal frac operations and they continue to expand their capabilities, creating value for Halliburton and our customers. The Zeus platform demonstrates its uniqueness every

day. And importantly, it's deployed at-scale. Our scale allows for rapid technology innovation. Each technology improvement to the Zeus platform widens the moat around our leading position in the fracturing market. This creates outsized value for Halliburton and our customers. I am pleased with the results we see in North-America from our drilling services product-line, which late last year launched a new version of our iCruise rotary steerable system specifically engineered for the North-America unconventional market. The new iCruise CX system is designed for the challenging curve and lateral applications in North-America. The system's performance is driving strong uptake and this quarter, our iCruise footage drilled in North-America more than doubled over last year. We also coupled this high-performing system with an asset-light sales and rental model that increases the addressable market when compared to a full-service model. This is how iCruise CX both participates in new market segments and increases its speed of market penetration. The key trend that I see in North-America drilling is the move to longer laterals and more complex wells, which customers drill to improve economics. iCruise CX is specifically designed for these applications and its performance is why I am excited about Halliburton's growth in the North America drilling market. To close out, I'd like to thank our employees. I regularly hear from our customers about the work you do, how much it means to them and how your execution of our value proposition differentiates Halliburton from our competitors. Well done. I'm excited about the business outlook for Halliburton. Energy demand growth is strong and so is demand for our services. I expect that our focus on oilfield services and execution of our strategy will generate strong free-cash flow and shareholder returns. This quarter, Halliburton repurchased $250 million of our common stock, a solid start to the year and a good benchmark for our expectations going-forward. Now, I'll turn the call over to Eric to provide more details on our financial results. Eric?

Eric J. Carre {BIO 20081246 <GO>}

Thank you, Jeff, and good morning. Our Q1 reported net income per diluted share was $0.68. Adjusted net income per diluted share was $0.76. Total company revenue for the first-quarter of 2024 was $5.8 billion. Operating income was $987 million and operating margin was 17%, flat compared to Q1 2023.

Beginning with our Completion and Production division, revenue in Q1 was $3.4 billion, down slightly from Q1 2023. Operating income was $688 million, up 3% when compared to Q1 2023, and operating income margin was 20%. Compared to-Q1 of last year, these results were primarily driven by reduced pressure pumping services in US land, partially offset by higher activity in international markets.

In our Drilling and Evaluation division, revenue in Q1 was $2.4 billion, an increase of 7% compared to Q1 2023. Operating income was $398 million, up 8% and operating margin was 16%, an increase of 10 basis-points over Q1 last year. These results were primarily driven by higher drilling related services in the Middle East and North America as well as improvements across multiple product lines in Latin-America.

Now let's move on to geographic results. Our Q1 international revenue increased 12% year-over-year. Europe Africa revenue in the first-quarter of 2024 was $729 million, an increase of 10% year-over-year. This increase was primarily driven by

higher completion tool sales in the region and fluid services in Norway and the Caspian area. Middle East Asia revenue in the first-quarter of 2024 was $1.4 billion, an increase of 6% year-over-year. This increase was primarily related to improved activity in multiple product service lines in Kuwait, Saudi Arabia and Oman.

Latin America revenue in the first-quarter of 2024 was $1.1 billion, an increase of 21% year-over-year. This improvement was primarily related to higher drilling-related services and increased software sales in Mexico, improved pressure pumping service and fluid services in Argentina and increased activity in multiple product service lines in Brazil and Ecuador. In North America, revenue was $2.5 billion, representing an 8% decrease year-over-year, but a 5% increase from the last quarter. This year-over-year decline was primarily driven by lower pressure pumping services in US land as well as lower wireline activity.

Moving on to other items. In Q1, our corporate and other expense was $65 million. For the second-quarter of 2024, we expect our corporate expenses to be approximately flat. Our SAP deployment remains on-budget and is on-schedule to conclude in 2025. In Q1, we spent $34 million or about $0.04 per diluted share on SAP for migration, which is included in our results. For the second-quarter, we expect SAP expenses to be approximately flat. Net interest expense for the quarter was $92 million. For the second-quarter 2024, we expect net interest expense to be roughly flat.

Other net expense for Q1 was $108 million, higher-than-expected, primarily due to impairment of an investment in Argentina and currency devaluation in Egypt. For the second-quarter 2024, we expect this expense to be approximately $35 million. Our adjusted effective tax-rate for Q1 was 21.5%. Based on our anticipated geographic earnings mix, we expect our second-quarter 2024 effective tax-rate to increase approximately 75 basis-points.

Capital expenditures for Q1 were $330 million. For the full-year of 2024, we expect capital expenditures to remain approximately 6% of revenue. Our Q1 cash-flow from operations was $487 million and free-cash flow was $206 million. During the quarter, we repurchased $250 million of our common stock. For the full-year 2024, we expect free-cash flow to be at least 10% higher than 2023.

Now let me provide you with some comments on our expectations for the second-quarter. In our Completion and Production division, we anticipate sequential revenue to be up 2% to 4% and margins to increase by 25 basis-points to 75 basis-points. In our Drilling and Evaluation division, we expect sequential Revenue to increase 1% to 3% and margins to increase by 25 basis-points to 75 basis-points. I will now turn the call-back to Jeff.

Jeffrey A. Miller {BIO 20672888 <GO>}

Thanks, Eric. Let me summarize our discussion today. Halliburton delivered solid first-quarter results. I am confident in the strength and duration of this upcycle. We expect our North-America business to deliver flattish revenues and margins year-on-

year despite lower activity levels. We also expect our international business revenue to grow at low-double-digits year-on-year. I'm excited about the outlook for Halliburton and expect Halliburton to deliver strong free-cash flow and shareholder returns.

And now let's open it up for questions.

Questions And Answers

Operator

Thank you. (Operator Instructions) One moment for our first question. And it comes from the line of David Anderson with Barclays. Please proceed.

Q - David Anderson {BIO 6875231 <GO>}

Thanks. Good morning, Jeff. I want to ask you about a couple of things that you talked about in your prepared remarks. And the first is on the Zeus fleet. You had an impressive 5% sequential increase in North-America this quarter despite the flat rig count. I have to think it's probably attribute to these e-fleets being rolled-out, it's pretty clear to see a big step-change in efficiency for your customer and demand seems to be exceeding supply at least for the next couple of years. But I guess the question is what prevents the industry from building out? And can you talk about your competitive advantage today and how you maintain that? You were first-to-market, established leadership, but is there differentiated technology, Is it more about relationships? I guess the question is really on the moat on this business as you see it over the next few years.

A - Jeffrey A. Miller {BIO 20672888 <GO>}

Yeah. Thank you, Dave. Look, the most important point is this is a comprehensive platform. Zeus has a platform. Clearly, it's electric. Yes, it drives efficiency, but the embedded automation actually really changes the dynamics of how it performs. And then also the subsurface measurements with Sensory[ph] that are embedded in this system and uniquely embedded. And so that widens the moat. And I think equally important is being at-scale. So it's one thing to do a research project around a thing. But when we're working at-scale, these are solutions that can be pushed to the platform at any point in time.

So it's really the ability to grow the moat on existing equipment as well as any new turns on science as it goes forward. So I'm super excited about it. Obviously, lowest TCO, but it's the technology differentiation as well that widens the moat.

Q - David Anderson {BIO 6875231 <GO>}

And then just to touch on something else you had talked about some unconventional field international markets. Clearly, one of the big stories this year it has been the Saudi ship[ph] CapEx from offshore towards those unconventional, specifically around Jafura[ph]. You have a toehold in that field of that liquid mud

plant facility, but it's just starting development. My understanding is there's a bunch of tenders on the way more coming. Can you talk about sort of the opportunity set for Halliburton on this field in the near-term, maybe incremental growth you see in '25?

And how do you support these build-outs? You said capacity is really tight in the market. Is this a market maybe you bring some diesel fleets in there? Is there other equipment in the region or how do you think about the tightness in the capacity as it relates to building out some conventional fuel?

A - Jeffrey A. Miller {BIO 20672888 <GO>}

Well, look, thank you, David. And I'm really excited about it and there's a lot of opportunity for Halliburton around unconventionals, as you know, how we address it, we've got a lot of ways to address it, including some of the technology we've talked about today., we've got a good position in there, but I think with even more opportunity to grow, particularly with drilling technology that continues to advance. You mentioned mud, but also other aspects of that where we'll be very competitive.

So I think that's a big move forward. And I think more broadly, so good for Halliburton. But I think that more broadly, just the discussion around unconventionals internationally, what can you see today or two markets at least outside the US that are truly at-scale. And I think that serves as a bit of a template for how that can be done because it was really unclear a decade ago, as you recall, but I think we're in a different place with unconventionals today. And so we do hear more discussion around, hey, this is possible and how Halliburton would play a more meaningful role in that in additional markets.

So super encouraged.

Q - David Anderson {BIO 6875231 <GO>}

Great. Thank you, Jeff.

A - Jeffrey A. Miller {BIO 20672888 <GO>}

Thank you.

Operator

Thank you. One moment for our next question, please. One moment comes from the line of Neil Mehta with Goldman Sachs. Please proceed.

Q - Unidentified Participant

Good morning, Jeff and team. Jeff, you've talked about wanting to drive your free-cash flow per share higher. And so it's great to see the share repurchases for a couple of quarters run rating at this $250 million mark. Can you talk about why you think that's the right number to use going-forward and how does share repurchase fit-in the (inaudible) of capital or capital allocation?

you talk about your current leverage to OpEx and production and is this an area strategically you'd like to grow either organically or inorganically over-time.

A - Jeffrey A. Miller {BIO 20672888 <GO>}

Yeah. Well, I want to answer the second part of that first-in terms of organically, yes. So we don't see a change to our strategy or approach to markets. So yes, we do see quite a bit of organic growth for us in the OpEx part of the market. We're in that business today. We've got strong -- I mean, strong lift business today. We're in the chemicals business today and we're in the intervention business today in a pretty big way.

And we continue to develop technology similar to as we've done in the past. And so it's my outlook for OpEx cycle, we've got plenty of exposure to that and have had. Now I want to be careful and say the D&C[ph] cycle is very strong and continues to grow. And I suspect that it continues to grow also. So I think we're well-balanced across really all elements of this, whether it's exploration, development drilling and OpEx today. Some of the things we've done in the past. Again, we bought smaller businesses that we've grown into bigger businesses and so again, a Strategy that works for us and it delivers the organic growth that we believe is really good for our shareholders.

Q - Unidentified Participant

Great. Jeff, a second question is, I wanted to see if you could give us your perspective on any potential impacts to how from the changing mix of activity in Saudi Arabia, which looks to be a little bit more onshore versus shallow-water. And maybe you could just talk about the year-over-year growth in MENA[ph], which at 6% seemed a little bit lower than we were expecting.

A - Jeffrey A. Miller {BIO 20672888 <GO>}

Let me take the first part of that in terms of Saudi growth, '24 is still growing, by the way, and we expect growth in Saudi in '24 and the rebalancing the gas and unconventionals is very good for Halliburton. We've got a very strong onshore business in Saudi Arabia. We participate in all aspects of that market. And that market remains tight for equipment. So I feel-good about that market and I'm very confident in the long-term growth of that market. And the rebalancing again to gas is and we're meaningful players in that part of the market and expect that will only be good for Halliburton.

Pivot to growth, look, a couple of things. Number-one, international business grew 12% overall. So I want to start there. Clearly, I'd expect more growth in the region, but here's what we're doing. I don't want to be really clear that profitable growth has been our primary focus. We see a good pipeline of opportunities. We expect to continue to see growth in MENA. But at the same time, we want to make certain we're building a foundation for growth that means that we are delivering the technology.

Thanks for that. And then just to pivot back real quick to North-America, you mentioned not really anticipating or certainly not built into the expectations for a recovery in gas this year. Presuming that that's kind of a well completions way you're thinking about it, at what point of the year would you have to see an increase maybe in activity spending rig count in gas to think that there was a chance that you could outperform, I'd say you, but the market could outperform your expectation. Like if we get to the third quarter and we haven't seen an improvement, we should close the books on '24 having any improvements to think about '25.

A - Jeffrey A. Miller {BIO 20672888 <GO>}

Yeah. Look, thanks. I think the -- that's the next big leg of growth in North America. It's a question of timing, but it is no question going to drive a lot of growth in North-America. And I expect it will drive market growth '25 and beyond. And I think what's overlooked -- look-through the current timing and look-forward to what's coming, attrition has really shrunk the fleet. The fleet for the market is shrinking to meet the demand that's there today and that happens every day.

Equipment is not being built, new equipment. So when we get to that point in time, it will be an incredibly tight market. And so I'm actually quite excited and confident about what gas means to the North American market. Just saying, yeah, the leading indicators of that will be well construction. It will be offtake contracts for LNG. There'll be a number of things that sort of happen, but it will happen. Just given the capital has been invested on the export side, there's no question that the gas will be developed to meet that.

Q - Unidentified Participant

Great. Thank you.

A - Jeffrey A. Miller {BIO 20672888 <GO>}

Thank you.

Operator

Thank you. One moment for our next question, please. And it's from the line of James West with Evercore ISI. Please proceed.

Q - Unidentified Participant

Hey, good morning, Jeff, good morning, Eric.

A - Jeffrey A. Miller {BIO 20672888 <GO>}

Good morning, James.

A - Eric J. Carre {BIO 20081246 <GO>}

Good morning, James.

Q - Unidentified Participant

So Jeff, one of the areas that we haven't discussed in detail yet in the Q&A is really deep water where you guys have an advantaged position this cycle. I think relative to prior cycles, even though you've been strong there for a while, but the technology enhancements that have happened at Halliburton puts you in a unique position to have more share, better profitability. And I'm curious kind of where you're seeing right now the biggest growth. And I think we know kind of Brazil and some other places, but where do you think we're going to be surprised as we go into kind of probably '25 and '26.

A - Jeffrey A. Miller {BIO 20672888 <GO>}

Look, I think the surprise will be West Africa and North Sea in terms of '25 and beyond. I think really we're planning work now. There are great opportunities today that are being planned by clients with the full expectation that we see a meaningful step-up as we go into '25 and beyond. And these are all long-term type projects that will, you know will extend into the end-of-the decade. So -- but I do think that's where we'll see a lot of activity.

Q - Unidentified Participant

Okay. That makes sense. And then maybe just back to North America to pivot back there. Again, I don't want to beat it dead horse, but you guys are dramatically outperforming some of the peers in North America. And where do you hold the line I guess on kind of pricing and where do you sacrifice utilization in a market that may be down a little bit? Is it -- we just will give up some utilization to keep our pricing or are you willing to give some discount to keep utilization high?

A - Jeffrey A. Miller {BIO 20672888 <GO>}

Look, James. Do we see some pressure? Yes. But does that affect our strategy? Absolutely not. We've got a strategy, value North America, you know, 40% of our equipment is contracted under long-term contracts and we're not terribly exposed where we do see that pressure. And I think -- maybe more answer than you want, but I think it's important that we keep central is our strategy is delivering unique technologies that create real value for customers. And so that's what lowest TCO looks like and that's why we're also solving for recovery with Zeus platform and Sensory[ph]. We think those two things along create significant value for customers. And so we keep that central.

Q - Unidentified Participant

Right. Totally get it. Thanks, Jeff.

A - Jeffrey A. Miller {BIO 20672888 <GO>}

Thank you, James.

Operator

Thank you. One moment for our next question, please. And it comes from the line of Scott Gruber With Citi Group. Please proceed.

Q - Unidentified Participant

Yes, good morning.

A - Jeffrey A. Miller {BIO 20672888 <GO>}

Good morning, Scott.

A - Eric J. Carre {BIO 20081246 <GO>}

Morning, Scott.

Q - Unidentified Participant

Well, it's getting later in the call, so I'll give you a chance to mention AI a few times, not that it's needed. But are global customers starting to discuss additional demand from power for data centers? And do you think this has the potential to pull-forward additional gas developments over the next few years around the world or is this still off the horizon?

A - Jeffrey A. Miller {BIO 20672888 <GO>}

I'd say gas is a critical fuel. And look, yes, I think we mentioned in the prepared remarks that the growth in-demand for gas or gas and electricity and that being the most effective way to deliver power, certainly today and the most reliable. So I think that this is almost becoming it's one of those things that you don't see it until it's on-top of you and I think that right now that demand is on-top of us. And so I think that can only be additive to demand. I have no question that will be additive.

And clearly AI consumes more power than traditional data centers. So I think all of that combined, there's almost -- it's not almost, it is a secular trend towards demanding more power and that can only be good for our industry and for Halliburton.

Q - Unidentified Participant

Yeah, it will be interesting to watch. Just turning back to the near-term Latin America was a big outperformer versus our expectation. Can you just provide some more color on the details of what drove the outperformance in Latin America and overall, what type of growth would you anticipate from the market this year?

A - Jeffrey A. Miller {BIO 20672888 <GO>}

Look, Latin-America performed very well. It's broad-based growth in Latin-America. So really it's several geographies and types of markets, whether Argentina, Mexico, Caribbean, Ecuador. So we saw strong growth all over. And important to say, our team in Latin-America is doing an exceptional job. I'm very appreciative and pleased with the work that team does.

And I think it also demonstrates how oil and gas is critical to economies. Those are economies that require oil and gas, that view oil and gas is critical to both security and economic growth, things that are important in Latin-America. And so I expect there's more to come.

Q - Unidentified Participant

Got it. Appreciate it, Jeff. Thank you.

A - Jeffrey A. Miller {BIO 20672888 <GO>}

Thank you.

Operator

Thank you. One moment for our next question, please. And it comes from the line of Luke Lemoine with Piper Sandler. Please proceed.

Q - Unidentified Participant

Hey, good morning. Jeff, you've reiterated your full-year international up low-double-digits with margins expanding this year. But could you maybe talk more specifically about how you see the D&E[ph] margins unfolding on a full-year basis? And then also, as we kind of look over the next couple of years as international continues to unfold, you roll-out new products and services like iStar and iCruise, what are kind of the aspirational targets here in D&E?

A - Unidentified Speaker

Yeah. Look, I like the trajectory that we're seeing in D&E. And I say that because we're growing the business, but we're growing the business at a pace that's profitable. And building the kind of foundation that we can use the technology in-markets where we know we've got solid growth and profitability and then be able to reach-out from there. But it clearly it is a balance of growing margins while opening, for example, new businesses. So we've opened a few new markets while growing profitably. And I think that's sort of the foundational part of our D&E trajectory.

So I expect to continue to see it aspirationally, continue to expect it to go up and expand quarter-over-quarter, quarter-over-quarter year-on-year. And in the first-quarter, we actually saw flooding in some markets. We saw weather and some others maybe more than we would have expected, though I expect that we continue on the trajectory in-spite of all of the things that sort of come along in businesses that are open. So I should expect to continue to see that moving up.

Q - Unidentified Participant

Okay. Thanks, Jeff.

A - Jeffrey A. Miller {BIO 20672888 <GO>}

Thank you.

Hey, good morning. Good morning, everybody. Thanks for slotting me in here. So Jeff, you've been at this a long-time. You referenced a more than one occasion, not just today, but in other calls about increasing level of visibility, especially on the international front and talking about opportunities that could extend out to the decade to the end-of-the decade. I think a lot of investors are wanting to kind of get inside the room with you, if you will, and try to get the same sort of conviction you have with respect to that duration.

So just kind of curious if you could give us some perspectives and insights on how your -- what -- how those conversations are taking place, how much lead-time your customers are asking for and effectively what two or three things are you seeing that continue to underpin this confidence and conviction that this cycle is going to extend through the end-of-the decade?

A - Jeffrey A. Miller {BIO 20672888 <GO>}

Yeah. Thanks. Look, some of its work that will begin in '25 that is planned to go through the end-of-the decade. So I feel very confident about that. Others are work that we're working on planning with clients that again are the types of projects that extend that far. I think the price of the commodity and the tightness and the rising demand for oil and gas gives me confidence and it gives our clients confidence.

And clearly, we've seen a bit of a return to oil and gas and its importance in a lot of places. But the type of work that we're starting, the type of offshore work that we're starting is takes time to get started and it takes a long-time to do. And so very confident about that broadly. And I would include -- anyway, the outlook for North America is similar in terms of duration. I mean, this is the kind of investments that we've seen in North America that are not for a quarter or two. These are decade long investments that we've seen happen.

And the next leg on gas and the demand for gas that's already been talked about on this call. I feel very confident in the resilience of this cycle.

Q - Unidentified Participant

That's great. I appreciate that. So the other dynamic you referenced was improving margins, right? So you've booked contracts that tend to last, I don't know, two to three years on average in the international market. So those will roll-through this year into next year and so on. Just curious in the context of that margin improvement from here, right? If you were to try to kind of rank order it, you know is -- how much of is the pricing, how much is it volume, how much of it is the technology value proposition? Just can you give us some additional sense on how you see that -- what's driving that margin improvement?

A - Jeffrey A. Miller {BIO 20672888 <GO>}

Look, I think it's a combination of those. Some of it is certainly tightness in the market and pricing. But at the same time, we've talked about our R&D investment over the last eight years has all been directed at better capital efficiency and that drives margin also and that drives margins in our drilling business that drives margin in our

are based on current information and management's expectations as of this date and are not guarantees of future performance. Forward looking statements involve certain risks, uncertainties and assumptions that are difficult to predict. As such, our actual outcomes and results could differ materially. You can learn more about these risks in our annual report on form 10-K, our quarterly reports on form 10-Q, and our other SEC filings. You should not place undue reliance on forward looking statements and we undertake no obligation to publicly update these forward looking statements.

We also make reference to certain non-GAAP financial measures such as segment operating income, direct margin, and other operating statistics. You'll find the GAAP reconciliation comments and calculations in yesterday's press release. With that said, I'll now turn the call over to John Lindsay.

John W. Lindsay {BIO 15019770 <GO>}

Thank you Dave. Good morning everyone. In light of the choppy market conditions in the US, Helmerich & Payne is pleased with our second fiscal quarter results. Even with these shifting market conditions, our margins remain strong, reflecting our continued focus on maintaining commercial economics commensurate to the value we're delivering to customers.

We're also encouraged to see evidence that there's an ongoing and necessary shift in the industry's fiscal behavior, which is moving it toward a more sustainable and investable future. In the US market contractual churn is still prevalent and while we achieved our average planned rig count for the second quarter, our exit rig count for the quarter was just below what was projected mark will give more rig count details during his remarks. But let me summarize by saying that part of this churn continues to be a product.

Operator

Of the volatilit

John W. Lindsay {BIO 15019770 <GO>}

Y created by a weaker natural gas market and is reminiscent of the volatility experienced this time last year. However, we believe the impact on our overall activity will be less this year going forward.

ENP consolidations and a variety of other factors have also contributed to churn, and while we expect many of these underlying factors will persist, we are also projecting a relatively stable outlook for our rig count through the third fiscal quarter. We expect our total projected North America solutions direct margin for the third fiscal quarter to be down slightly on a sequential basis due to a lower average rig count. But it's important to note that we also expect resiliency in our per day direct margins.

operating expense, consisting of $2.5 million of expense per rig for inspection and repair in fiscal Q3, with final recommissioning expense expected in Q4 of approximately $5 million. Also included in the Q3 cost guidance is local office setup in Saudi Arabia of approximately $2 million.

In the third quarter, we expect an overall direct margin range of a $2 million earnings to a $2 million loss aside from any foreign exchange impacts in the international segment. Finally, to our Gulf offshore Gulf of Mexico segment, we have three of our seven.

Seven offshore platform rigs contracted. We also have management contracts on three customer owned rigs, one of which is on active rate. The offshore segment generated a direct margin of about $3 million during the quarter, which was below our guidance range as one rig was delayed in resuming full rate operations. As we look toward the third quarter of fiscal '24 for the offshore Gulf of Mexico segment, we expect to return to previous run rate levels and generate between $5 million to $8 million of direct margin.

Let me update full fiscal year 2024 guidance capital expenditures for the full 2024 year are now expected to be at the top end of our original $450 million to $500 million range. During our November earnings call describing initial fiscal 2024 guidance, we stated that approximately 14 walking conversions would occur in Galena Park. Seven were completed and are in the US fleet, with the remaining seven committed to the Saudi Rig award.

As further discussed on our last call in January, international growth capital for the seven rig Saudi award also includes recertifying certain equipment to light new, conducting required modifications and purchasing specific equipment for Middle East contracts. What was previously estimated timing for maintenance CapEx across the US fleet together with refined international growth CapEx is now pinpointed to the top end of the original range with more supply chain clarity with our placed orders.

It is worth repeating what we have said on prior calls that we are marketing our super spec flex rigs internationally for the work they were designed for and have excelled at in the US and exporting these idle super spec flex rigs to international fit for purpose opportunities increases our fleetwide utilization, exposes HP to markets with longer term contract profiles and starts to reduce US concentration while alleviating long idle US supply. Depreciation for fiscal 2024 is now revised up from $390 million to $405 million million for the full year due to the acceleration of depreciation related to excess capital spares created via the walking rate conversion program.

Our expectations for general and administrative expenses for the full fiscal year are revised up from original guidance of $230 million to $240 million. This increase is due to IT project costs as well as some other unrelated professional services and consulting fees. Research and development costs are revised up for fiscal 2024 from

$30 million to $35 million due to one time expenditures in Q2 to acquire certain intellectual property. We still estimate our annual effective tax rate to be in the range of 24% to 29%.

With a variance above the US statutory rate of 21% attributed to permanent book to tax differences and state and foreign income taxes. We continue to project an FY '24 cash tax range of $150 million to $200 million. We had cash and short term equivalents at H&P of approximately $277 million in March 31, versus an equivalent $298 million at December 31, 2023.

The sequentially decreased cash balance is largely attributable to the previously mentioned cash tax timing in Q2. There is, quote noise unquote from quarter to quarter based on timing of various payments, receipts and receipts, and movement of asset and liability balances. But overall, we are still align with what we projected for the full fiscal year and are still comfortable with our overall cash flow projections for fiscal 2024. That said, based on the quarter's results and our projections for the remainder of the fiscal year, we still forecast that we will be generating ample cash flow to cover our capital expenditures, the base dividend and the fiscal 2024 supplemental dividend plan.

That concludes our prepared comments for the second fiscal quarter. Let me now turn the call over to Abby for questions.

Questions And Answers

Operator

(Operator Instructions). Our first question comes from the line of Doug Becker from Capital One. Please go ahead.

Q - Doug Becker {BIO 23198804 <GO>}

Thank you. John. If you allow me to dream a little bit, it does seem like the rig counts as stabilizing, but was just hoping to get an update on how you see supply and demand for the super spec market in particular and when conceptually we could see pricing power again if the outlook for next year, higher oil prices a little bit better, natural gas price outlook. Just want to get a sense for where the lay of the land is and what a little bit of bull cases.

A - John W. Lindsay {BIO 15019770 <GO>}

Sure, Doug, good morning. You know, I think if you just look at the activity set over the last several years, the super spec segment of the market continues to grow on the percent on a percentage basis. Obviously, we've had a pull back in activity, both H&P and the general industry in general primarily as a result of natural gas prices like we've talked about. But I think it's you know, I think the outlook is very positive. I think the ability to continue to drive efficiencies and reliability do it in a safe fashion and. Leverage technologies are really those key things that are going to be needed.

That's what customers are looking for. So I feel good about overall the super spec space in the US in terms of trying to pick the timing. As you know, that's very challenging to do, but obviously oil prices are strong, but the gas basins, we've had quite a bit of pullback in activity. But again, I think we'll see some improvements here in the future.

Q - Doug Becker {BIO 23198804 <GO>}

Now, fair enough. And Mark, I know you expressed comfort with the cash flow outlook. Just wanted to try and reconcile a lot of the moving parts. My assumption would be that free cash flow would be below the say $235 million that previous guidance implied just given, most notably the higher CapEx. Is that fair or am I missing a factor?

A - Mark W. Smith {BIO 17498884 <GO>}

It's in the ballpark.

Q - Doug Becker {BIO 23198804 <GO>}

Got it. Thank you very much.

A - Mark W. Smith {BIO 17498884 <GO>}

Thanks, Doug.

Operator

Our next question comes from the line of Derek Podhaizer from Barclays. Please go ahead.

Q - Derek Podhaizer {BIO 19729121 <GO>}

Hey, good morning. Maybe just to continue the line of questioning you talked about in your prepared remarks, you're seeing signs of leveling off in the rig count. Can you maybe just expand on that, what you're seeing, is it customer conversations, is it [ph]duck counts, just any way you can help us with the signs that you're seeing as far as leveling off on the rig count?

A - John W. Lindsay {BIO 15019770 <GO>}

Well, Derek, it's really a function of conversations that we have ongoing with you know with customers. You know there's obviously this continued churn that we described, but there are examples where you know customers have you know rig opportunities where they're picking up. There's also some high grading that is ongoing, you know really continually as we move forward.

You know, If you just look at our count in general, the H&P count, we've been in a five rig range since June of last year and again, we all know what the challenges have been with natural gas. So really, our outlook and our expectation is really derived from conversations that we've had with customers and what their expectations are.

You've heard me say before, it's very hard to forecast out much past a quarter. You know, it's there's a lot of things that can.

A - Unidentified Speaker

Happen in a short period of time. But based on what we know right now, the feedback we're getting, that's the estimate that we've put together.

Q - Unidentified Participant

Great. Now that's really helpful. Color. I wanted to dig into the performance based contract. So one of your customers announced their company record five (inaudible), all four mile laterals last night. Is this a good read through of how you capture value in generating efficiencies for your customers? Maybe describe the mechanics of an example like that.

A - Unidentified Speaker

Well, that's definitely a great example. At the end of the day, what we're doing is we're having conversations with customers you've heard us talk about before. This is a partnership, and we work very closely in trying to understand what their deliverables are, what makes for them, looking, seeing what would be a positive outcome, and whatever that metric is, that's the focus that we have. At the end of the day, we've got to deliver wells more efficiently, we've got to save days, we've got to improve wellbore, quality, consistency. The technology solutions that we have really help deliver that.

So if you can put together a performance based construct that really rewards the service provider, in this case, H&P, and aligns it with the outcomes that the customer is wanting, then that's a true win win outcome, and that's the best that you can hope for. And as you've heard us say, at the end of the day, we're making big investments. This is capital intensive business and we're making big investments. And those investments are designed to enhance the quality and the performance. At the same time, we have to get returns above our cost of capital. Otherwise, it's very challenging for us to be investable today and into the future.

Q - Unidentified Participant

Great. Thanks for the color, John. I'll turn it back.

A - John W. Lindsay {BIO 15019770 <GO>}

Thanks, Derek.

Operator

Our next question comes from the line of Saurabh Pant from Bank of America. Please go ahead.

Q - Saurabh Pant {BIO 22671962 <GO>}

Hi. Thanks. Good morning, John and Mark.

A - Unidentified Speaker

Good morning, Saurabh.

Q - Saurabh Pant {BIO 22671962 <GO>}

Mark, maybe I'll start with one clarification for you. You did give a good color on CapEx, and you have better line of sight from a supply chain perspective. But if I recall your messaging from last quarter, I think there was a part $35 million, you said, in additional CapEx related to the Saudi rigs that was expected next year. So is there an element of that being pulled forward to your FY '24 CapEx? Going from 450 to 500

Q - Unidentified Participant

Or is that still expected to be incurred in FY '25?

A - Unidentified Speaker

Thanks for the questions, Saurab. No, that's still anticipated to be incurred in 2025, I think I had said, or if I didn't, I'll say it now. We're approximately $27 million CapEx, all in for each of these Saudi Arabia rigs. And that's no different than the number we were giving in building our models around this time last quarter. What I will say, though, is we always have a range, and it's really hard, quarter to quarter, to know exactly how the timing is going to fall when you're working with a very wide supply chain and 150 active rigs in the US and trying to catch up, as we've said on previous calls for maintenance CapEx, for componentry, even going back to the cannibalization we experienced in 2021 coming out of the pandemic.

So as we're two quarters into a four quarter year, we have a little more certainty around that maintenance CapEx timing. And that is really one of the largest components of driving up towards the top end of the range.

Q - Saurabh Pant {BIO 22671962 <GO>}

Okay, no, that's helpful, Mark. And then, John, maybe one for you. Just the narrative over the past three months, internationally, particularly in the Saudi market, seems to be that there's a lot more emphasis on gas. And clearly, that's where you are going with your rigs. And just based on discussing with market participants there, it seems like there might be more tenders coming for more rigs in the Saudi market for unconventional gas. Is there something you can share with us, John, in terms of what you are seeing out there, in terms of opportunity for growth and further rig additions for Helmerich & Payne?

A - John W. Lindsay {BIO 15019770 <GO>}

Saurabh, that's a great question, and really, I can't add anything more than what you probably already read out there in the market. We've read the same thing and heard similar rumors about the potential for additional tenders for unconventional gas

going forward. We're hopeful that that is, in fact, the case. But, like, you will be standing by and waiting to see if that is in fact the case, because we don't have any direct information on that.

Q - Saurabh Pant {BIO 22671962 <GO>}

Right. Okay, perfect. Okay, John, Mark, thank you. I'll turn it back.

A - Unidentified Speaker

Thank you.

Operator

Our next question comes from the line of Keith Mackey from RBC Capital Markets. Please go ahead.

Q - Keith Mackey {BIO 19833215 <GO>}

Hi, good morning. Just like to start with your comment there about increasing service intensity. Can you just expand a little bit on what that means for Helmerich & Payne in terms of specific revenue or cost opportunities? And secondarily, is it leading customers to want to use the performance based. Model more or want to use the day rate model more, or are there just other factors in there that are driving whatever decision might happen?

A - Unidentified Speaker

Okay, Keith, I think. Try to summarize when we think about service intensity. We talked about, I think, on our last call, that laterals have more than doubled over the last five to seven years, and we're drilling those wells in far fewer days. And of course, the end result is more exposure to the resource, better outcomes, better returns for our customers. At the same time, our equipment continues to work harder. You just heard Mark talking about maintenance CapEx. And so maintenance CapEx continues to go up, on a per rig basis. And that's largely. And a large part of that is. Has to do with that service intensity.

So what we're doing is, yes, the performance based contracts are important because it helps you align with the outcomes that your customer is wanting to achieve, and you're creating a value proposition that you're getting paid for in the process. So without going into great detail, that's really the concept behind it. And it's not just drilling rigs. I mean, it's pressure pumping. It's across the board. All of the equipment in OFS is really working harder in these more challenging well designs, longer laterals, and much, much faster cycle times.

Q - Keith Mackey {BIO 19833215 <GO>}

Okay, that's helpful. Thank you. Can we just talk a little bit more about the Saudi rigs? It looks like there's a batching process of them being sent over once the OpEx portion or the startup costs are spent that mark outlined. Do you expect there to be more costs, similar costs in fiscal 2025, or should that be it? And then when roughly,

do you think that these rigs will get up to their appropriate run rate for revenue and margin profile?

A - Unidentified Speaker

Well, thanks for the question, Keith. But, most of this recommissioning expense will be largely incurred in the fiscal '24 that we're in. As I mentioned in the prepared remarks, $10 million to $12 million is expected in fiscal Q3, and then another $5 million for that recommissioning.

In fiscal Q4, and then they start being readied to put on boats and mobilize to the Middle East. And when that happens, there will be a cash expenditure of $2 million for mobilization per rig, which will be deferred and recognized over the contract term, together with the corresponding mobilization revenue once the operation is commenced. So that stuff is largely at 2025 and then through the life of the contract as the recognition. We think that these rigs will mostly be exported through this calendar year and commence turning to the right and operations is budding and the beginning of calendar '25.

Q - Unidentified Participant

Perfect. Thanks very much.

A - Unidentified Speaker

Thank you.

Operator

Our next question comes from the line of Scott Gruber from Citigroup. Please go ahead.

Q - Scott Gruber {BIO 6761975 <GO>}

Good morning.

A - Unidentified Speaker

Good morning, Scott.

Q - Scott Gruber {BIO 6761975 <GO>}

I want to stay on the Saudi rig topic. I want to ask about the cost structure in country. How do you think about your ability to lessen that over time? Did you gain experience operating in the country?

A - Unidentified Speaker

I'll take a stab at that, John, and then please add in there are several different things. Obviously, most of our daily costs are related to the labor. We're certainly starting with what will be. We have some costs that we're incurring in country now as we've

set up an office and are beginning to hire people. And we'll be starting with a large complement from our North America solutions segment so that we ensure safe and efficient and effective startups.

But through time, we will begin to have local crews and transfer knowledge. I think a prime example of demonstrates how we can do that is Argentina. You know, today, and for some time there's not been a single us expat in that country while we're operating eight or nine super spec rigs and have a similar market share position in the guacamole to what we have in the US, albeit a smaller scale. There's also supply chain benefits through time that we'll get. We've obviously are doing all this work at our facility in Galena Park to do the equipment recertification, recommissioning, etcetera. But once we're in country, we'll have a couple of things that will be helpful. One, because these rigs are quote unquote, like new in their five year contract term, we expect minimal maintenance CapEx through the initial five years. Two, we'll be developing through that time. Our supply chain apparatus in the country, as we look to have.

Country in kingdom value spend. And that will also make us more efficient, we believe, locally with not only maintenance CapEx, but materials and supplies, inventory consumption as well. So we're working on a lot of these efforts and we're excited about the opportunity to put all these ideas to work.

Q - Scott Gruber {BIO 6761975 <GO>}

Got it. Appreciate the color. And then turning back to the US, the customer consolidation in the obviously should be beneficial for HP. You guys have highlighted that. I'm just wondering now that we're starting to see some deals close, at least from the recent wave, are you having conversations that suggest some consolidation driven share pickup, the distinct possibility for HP in the near future?

A - Unidentified Speaker

Scott, I really don't want to get into those details. I mean, again, I think when you look at consolidation over time, I think when I look back at H&P and we've been, we've come out on the good end on many of the consolidations over the years. And our expectation is that we'll continue. I mean, at the end of the day, it comes back to no surprise what we've said before, and that is the ability to deliver safe, efficient and reliable performance. And I think as long as we can continue to do that and have strong partnerships with our customers, that it will come out in a great place over time.

Q - Scott Gruber {BIO 6761975 <GO>}

Got it. Understand the sensitivity. Appreciate the color. Thank you.

A - Unidentified Speaker

Thank you, Scott.

Operator

Our next question comes from the line of Marc Bianchi from Cowen. Please go ahead.

Q - Marc Bianchi {BIO 18339369 <GO>}

Hi. Thanks. Hey, guys. I wanted to go back to the Saudi margin opportunity there because I think you previously outlined it as more than $25 million for the seven rigs, which would compute to something just below $10,000 a day. It sounds like there's a fair bit of overhead. But when I look back at the international business for H&P, over time, the margins don't seem to really get up above $10,000 a day. And I know it's different geographies and such, but you made the comment about historically Argentina operating.

So I'm just curious, where do you see the opportunity in margin for Saudi? Should this ultimately look more like what we see in North America, or are there just factors that we've seen with international historically that would keep this. Closer to $10,000 a day.

A - Unidentified Speaker

Marc, thanks for the question. And let me just say on one hand, no, the $10,000 a day that you're coming up with is not a marker for 2025 or thereafter. Having said that, there's certain details we're not going to get into for competitive reasons here. As was previously stated on this call, we do expect future tenders in a competitive bit tender environment going forward. We've done our internal modeling for returns that get us to our IRR hurdles on the $27 million investment per rig.

That's one thing to note. Another thing to note is your reference to my comment on Argentina this morning. We've only recently gotten to that no US expat status with our focus on cost management the last couple of years. And I will say historically in our business, not just H&P, but the onshore drilling industry. For us drillers moving internationally, we did not do a great job of scale.

We would go into countries with one or two rigs and we would set up an entire SG&A apparatus to support it. And we have said for a couple of years on these calls, that is exactly the opposite of what we will do going forward. We started with one rig last August. We've just added seven to get eight. We will begin to see benefits of scale as we get local content, both in terms of people and supply chain, and we will continue to add to that scale.

We will also be leveraging more of a supply chain, back office support for the corporation, and are excited about things we can do for this that are very different than that historical experience you just outlined.

A - John W. Lindsay {BIO 15019770 <GO>}

And this is John. And I think just to add to Mark's comments, you know, specifically in Saudi, obviously it's unconventional. We have a lot of experience with unconventional. Again, our, there was a question earlier about additional tenders. You know, my assumption is over the next several years, there'll be more tenders.

And our expectation is that we would, we would be successful and we would be successful because we're going to be providing and adding value for Aramco. So that's my hope. The other factor that we haven't really talked much about is the technology aspect of our offering, and there's some opportunity there. Again, as you think back, as you think about what we're doing in the US and the unconventional play and how we've been doing this work in the US all these years, and yet we continue to have year-over-year improvements that in a lot of cases are driven by technology. So that's the other upside component to this? With H&P.

Q - Marc Bianchi {BIO 18339369 <GO>}

That's great color. Thanks, guys. Mark, I wanted to ask one more on the maintenance CapEx. I think previously we go back and it was like $1 million a rig per year that was increased to like a $1 million, $3 million. And then the latest comment was it was maybe between $3 million and $5 million, if I remember correctly. And now it sounds like maybe there's some upward bias to that. Can you talk about how much of that is sort of just this hangover from the cannibalization period versus what could be sustainably a higher run rate over time?

A - Unidentified Speaker

Sure. Marc, if you think about fiscal '23. So go back a year and look at our maintenance. Look at our CapEx. Maintenance CapEx specific guidance for fiscal '23 at the beginning of the year. And when we ended '23 September 30, we did not spend that amount. So we had revisions downward and we had a lot of supply chain constraints. What we've seen this year is the supply chain finally responding with more throughput so that we can do this catch up we've been talking about for quite some time. So what you see is transitory amounts here as we've been able to nail down the supply chain.

The componentry in question, it's all sorts of stuff. Seven year top drive, it's five year BOP, it's engine work, it's mud pump work, you know, etcetera. So it's across the full stack of componentry on the rig. And I would say as I look at the list of components and work with our US operations and maintenance teams, we're starting to see where we're turning the corner on some of these components. So the volume that we've had to get through should start to tick down, I would hope in 2025 and then. But I will say we do have some inflation that will be sticky. So will we ever get to under a million?

I don't see that necessarily, but I think the 1.4 that we started this year with and 1 somewhere between those two and another year or two looks to be a good zip code.

Q - Marc Bianchi {BIO 18339369 <GO>}

Great. Thanks so much.

A - Unidentified Speaker

Thank you.

Operator

Our next question comes from the line of Waqar Syed from ATB Capital Markets. Please go ahead.

Q - Waqar Syed {BIO 1958105 <GO>}

Good morning. A couple of questions here. First of all, John, with oil prices in the 80's and the permian duck inventory relatively low, I know you mentioned you see kind of a flattish market, but do you see any hope of any pickup in activity in the permian for H2 and perhaps for next year?

A - John W. Lindsay {BIO 15019770 <GO>}

Good morning Waqar. Well, we're always hopeful.

A - Unidentified Speaker

And I did mention that the longer term outlook, the fundamentals are strong. Obviously oil prices are strong. You know the activity set that we're experiencing, this correction and activity as you know, is a function of natural gas, not oil. And so I do think the Permian has a lot of potential. Obviously we're the, you know, we're the largest driller, have the most rigs running in the Permian. And quite frankly I think the rig count we have today is essentially the same as it was when we had close to 170 - 180 rigs running. So we've done very, very well in terms of maintaining, you know our market share actually growing it a little bit in that basin.

So I think the outlook is good. The big question, as we all say, is well when is that? When is that that opportunity to add back units. And you know, again, our hope is we'll start to see some improvement in the back half of this year. But again, at this stage it's just a hope because we don't really have any additional information than you or anybody else does.

Q - Unidentified Participant

We do hear that with some of these big E&P consolidations. Once they're consummated, you may see. Or you're seeing some geoscientists come out from these consolidated companies or become redundant and some private capital is chasing them and new companies are being formed. And that you may see private activity maybe pick up in the second half or maybe in 2025. Are you seeing any early signs of that? Are you having any conversations in that respect?

A - Unidentified Speaker

Well, as you probably know, most of, I think 80% of our active fleet today is with large public companies. However, we do have nice partnerships with the private. And there are some examples where here recently, just recently in the past quarter, we put a rig to work for various small private companies. So I definitely think that that's an opportunity. Clearly, the consolidation that we see usually in the first period of time there's some slowdown in activity. But at the end of the day they're going to

want to keep their production levels up. And in many cases that means keeping the same amount or even adding some rigs.

And then the additional private companies. We could sure see that happening. It's happened in the past and maybe it will happen in the future, but hard to say much more about that.

Q - Waqar Syed {BIO 1958105 <GO>}

And then just one final question, that as the service intensity continues to increase, now going to these four multipolaterals, some companies, are you seeing the super spec rig specifications kind of change again or step out again or the rig of choice? Super spec rig of choice for the last year or two years ago is still pretty relevant.

A - Unidentified Speaker

Very relevant. We have been able to handle these 3 and four 4 laterals with the kit that we have. There are, you know, times where you may need to upside the setback capacity or something like that. But in general, the flex rig is very well suited for the work that is, that is required and ongoing. So we feel really good about where we are. Like I said earlier, we think there'll be more demand for super spec, not less. It's going to be harder and harder for the lower tier rigs to be competitive because of the length of the lateral and the performance that's required. And then just finally, on the technology side, it's very, very difficult for a human to keep up with what a computer or the technology is going to do.

So, this is 24/7 work and the ability to have apps and algorithms that are doing the work, making the decisions, as opposed to it being done by a human, 24/7 it's night and day difference. So the technology opportunity set is huge. And whether that's a 2 mile lateral or a 4 mile lateral, we're going to see more and more of that adoption, I believe, as we go forward.

Q - Waqar Syed {BIO 1958105 <GO>}

Great. Well, thank you very much.

A - Unidentified Speaker

Thank you.

Operator

Our next question comes from the line of Kurt Hallead from Benchmark. Please go ahead.

Q - Kurt Hallead {BIO 23251258 <GO>}

Hey, good morning, everybody.

A - Unidentified Speaker

Hi, Kurt. Morning.

Q - Kurt Hallead {BIO 23251258 <GO>}

Hey, John. I'm curious, right, what your take might be on your conversations with your customer base, your customer base looking out beyond 2024. A lot of hope and opportunity with respect to exporting gas for these LNG facilities that are scheduled to come online. And then on top of that, a lot of discussion of late around the data centers and AI and the need to get know power, that dynamic and that needing more grid capacity and that needing more natural gas. Long winded way of asking a question is, are any of these topics on the front of mind of your customer base? And how do you think about how that's going to translate into incremental drilling activity, first for LNG going into next year, and then potentially looking at the dynamics related to the data center?

A - John W. Lindsay {BIO 15019770 <GO>}

Well, Kurt, it's a great question, and it's a question on everybody's mind, and no doubt there's a lot of opinions out there. Our opinion, our hope is that it's going to be sooner as opposed to later. I think at some point in time it's definitely going to happen on the gas side. It's just that natural gas is just a great energy source for lots and lots of reasons. And there's a huge opportunity ahead, obviously, the unconventional gas that opportunities that we see in the Middle East. So there's a market out there, and I think there's a huge opportunity ahead for us. It's just as I said earlier, Kurt, it's hard to say when that's going to be. I think we're going to play, H&P will play a very large role in that when that recovery takes off, just like we were playing previously before the correction in the natural gas activity.

Q - Kurt Hallead {BIO 23251258 <GO>}

That's fair enough. Thanks. And just follow up on. I noticed here that you had very minimal share repurchase activity during the course of the March quarter relative to the December quarter. Just kind of curious as to what those dynamics were driven by. Was it related to the Saudi contract or anything else you guys had to put the polis on?

A - Unidentified Speaker

Kurt, thanks for the question. In our original capital allocation guidance in October for our supplemental plan, we outlined the fiscal '24 supplemental dividend of $68 million plus, quote, an allocated cash of $68 million to date. In this fiscal year, we repurchased 52 million of shares, primarily in fiscal Q1. That said, we have further projected free cash flow as well as cash on hand in excess of our previously stated target of $200 million.

We slowed calendar Q1 repurchases as the rig count looked to soften a bit. And as previously discussed this morning, and due to macro uncertainties in the market overall, we will continue to be opportunistic while maintaining our longstanding financial stewardship.

Global EV Outlook 2024

Moving towards increased affordability

International Energy Agency

Executive summary

Growth in electric car sales remains robust as major markets progress and emerging economies ramp up

Electric car sales keep rising and could reach around 17 million in 2024, accounting for more than one in five cars sold worldwide. Electric cars continue to make progress towards becoming a mass-market product in a larger number of countries. Tight margins, volatile battery metal prices, high inflation, and the phase-out of purchase incentives in some countries have sparked concerns about the industry's pace of growth, but global sales data remain strong. In the first quarter of 2024, electric car sales grew by around 25% compared with the first quarter of 2023, similar to the year-on-year growth seen in the same period in 2022. In 2024, the market share of electric cars could reach up to 45% in China, 25% in Europe and over 11% in the United States, underpinned by competition among manufacturers, falling battery and car prices, and ongoing policy support.

Growth expectations for 2024 build on a record year: in 2023, global sales of electric cars neared 14 million, reaching 18% of all cars sold. This is up from 14% in 2022. Electric car sales in 2023 were 3.5 million higher than in 2022, a 35% year-on-year increase. This indicates robust growth even as many major markets enter a new phase, with uptake shifting from early adopters to the mass market. Over 250 000 electric cars were sold every week last year, more than the number sold in a year just a decade ago. Chinese carmakers produced more than half of all electric cars sold worldwide in 2023, despite accounting for just 10% of global sales of cars with internal combustion engines.

The pace at which electric car sales pick up in emerging and developing economies outside China will determine their global success. The vast majority of electric car sales in 2023 were in China (60%), Europe (25%) and the United States (10%). By comparison, these regions accounted for around 65% of total car sales worldwide, showing that sales of electric models remain more geographically concentrated than those of conventional ones. While electric car sales in emerging economies have been lagging those in the three big markets, growth picked up in 2023 in countries such as Viet Nam (around 15% of all cars sold) and Thailand (10%). In emerging economies with large car markets, shares are still relatively low, but several factors point to further growth. Policy measures such as purchase subsidies and incentives for electric vehicle (EV) and battery manufacturing are playing a key role. In India (where electric cars have a 2% market share), the Production Linked Incentives (PLI) Scheme is supporting domestic manufacturing. In Brazil (3% share), Indonesia, Malaysia (2% share

each), and Thailand, cheaper models, mainly from Chinese brands, are underpinning uptake. In Mexico, EV supply chains are rapidly developing, stimulated by access to subsidies from the US Inflation Reduction Act (IRA).

Policy support is boosting industry investment, building confidence that rapid electrification will continue

Every other car sold globally in 2035 is set to be electric based on today's energy, climate and industrial policy settings, as reflected in the IEA's Stated Policies Scenario. This has significant impacts on the car fleet. As soon as 2030, almost one in three cars on the roads in China is electric in this scenario, and almost one in five in both the United States and European Union. The rapid uptake of EVs of all types – cars, vans, trucks, buses and two/three-wheelers – avoids 6 million barrels per day (mb/d) of oil demand in the Stated Policies Scenario in 2030, and over 10 mb/d in 2035. This is equivalent to the amount of oil used for road transport in the United States today. Recent policy developments continue to reinforce expectations for swift electrification, such as new emissions standards adopted in Canada, the European Union and the United States over the past year. Industrial incentives – such as those in the US IRA, the EU Net Zero Industry Act, China's 14th Five-Year Plan, and India's PLI scheme – also encourage adding value and creating jobs across EV supply chains in those economies. If all the national energy and climate targets made by governments are met in full and on time, as in the Announced Pledges Scenario, two-thirds of all vehicles sold in 2035 could be electric, avoiding around 12 mb/d of oil.

Expectations of strong growth are bolstering investment in the EV supply chain. Recent reporting shows that from 2022 to 2023, investment announcements in EV and battery manufacturing totalled almost USD 500 billion, of which around 40% has been committed. Over 20 major car manufacturers, representing more than 90% of global car sales in 2023, have set electrification targets. Taking the targets of all the largest automakers together, more than 40 million electric cars could be sold in 2030, which would meet the level of deployment projected under today's policy settings.

Enough battery manufacturing capacity has reached a final investment decision to deliver on announced pledges from automakers and governments globally. Thanks to high levels of investment in the past 5 years, global EV battery manufacturing capacity far exceeded demand in 2023, at around 2.2 terawatt-hours and 750 gigawatt-hours, respectively. Demand is likely to grow quickly: up seven times by 2035 compared with 2023 in the Stated Policies Scenario, nine times in the Announced Pledges Scenario, and 12 times in the Net Zero Emissions by 2050 Scenario, which lays out a pathway to reach net zero energy sector emissions by mid-century. Manufacturing capacity appears capable of keeping pace with demand: committed and existing battery manufacturing

capacity alone are practically aligned with the needs in a net zero pathway in 2030. Such prospects are opening significant opportunities across the supply chain for battery and mining companies, including in emerging markets outside China, although surplus capacity has been hurting margins and may lead to further market consolidation.

The pace of the transition to electric vehicles hinges on their affordability

Electric cars are getting cheaper as competition intensifies, particularly in China, but they remain more expensive than cars with internal combustion engines in other markets. A rapid transition to EVs will require bringing to market more affordable models. In China, we estimate that more than 60% of electric cars sold in 2023 were already cheaper than their average combustion engine equivalent. However, electric cars remain 10% to 50% more expensive than combustion engine equivalents in Europe and the United States, depending on the country and car segment. In 2023, two-thirds of available electric models globally were large cars, pick-up trucks or sports utility vehicles, pushing up average prices. When exactly price parity is reached is subject to a range of market variables, but current trends suggest that it could be reached by 2030 in major EV markets outside China for most models.

The pricing strategies of car manufacturers will be crucial for improving affordability, as will the pace of EV battery price decline. Turmoil in battery metal markets in 2022 led to the first price increase for lithium-ion packs, which became 7% more expensive than in 2021. In 2023, however, the prices of the key metals used to make batteries dropped, leading to a near-14% fall in pack prices year-on-year. China still supplies the cheapest batteries, but prices across regions are converging as batteries become a globalised commodity. Lithium-iron-phosphate batteries – which are significantly cheaper than those based on lithium, nickel, manganese and cobalt oxide – accounted for over 40% of global EV sales by capacity in 2023, more than double their share in 2020. Looking ahead, technological innovation will remain important for scaling up novel designs and chemistries such as sodium-ion batteries, which could cost as much as 20% less than lithium-based batteries without requiring any lithium.

In developing economies outside China, more affordable electric car models are arriving, and the future of electric two- and three-wheelers already looks bright. In 2023, 55% to 95% of the electric car sales across major emerging and developing economies were large models that are unaffordable for the average consumer, hindering mass-market uptake. However, smaller and much more affordable models launched in 2022 and 2023 have quickly become bestsellers, especially those by Chinese carmakers expanding overseas. Affordable electric two- and three-wheelers are also already available, helping deliver immediate

benefits such as improved air quality and emissions reductions. Around 1.3 million electric two-wheelers were sold in India and Southeast Asia in 2023, accounting for 5% and 3% of total sales, respectively. One in five three-wheelers sold globally in 2023 was electric, and nearly 60% of those sold in India, boosted by the Faster Adoption and Manufacturing of Electric Vehicles (FAME II) subsidy scheme.

As electric vehicle markets mature, second-hand electric cars will become more widely available. In 2023, the market size for used electric cars was around 800 000 in China, 400 000 in the United States, and over 450 000 across France, Germany, Italy, Spain, the Netherlands and the United Kingdom. The prices of used electric cars are falling quickly and becoming competitive with combustion engine equivalents. Looking ahead, international trade of used electric cars is also expected to increase, including to emerging and developing economies outside of China.

The battery recycling industry is getting ready for the 2030s. Recycling and reuse are needed for supply chain sustainability and security. Many technology developers are seeking to position themselves in EV end-of-life markets, but planned locations do not always align with where EV retirement may occur. Global battery recycling capacity reached 300 gigawatt-hours in 2023. If all announced projects materialise, it could exceed 1 500 gigawatt-hours in 2030, of which 70% would be in China. Globally, announced recycling capacity is more than three times the supply of batteries that could potentially be recycled in 2030, as EVs reach their end of life in the Announced Pledges Scenario. However, EV battery retirement is expected to grow rapidly from the second half of the 2030s.

The roll-out of public charging needs to keep pace with EV sales

The global number of installed public charging points was up 40% in 2023 relative to 2022, and growth for fast chargers outpaced that of slower ones. In major EV markets, the deployment of charging points is continuing apace thanks to targeted policies. Broad, affordable access to public charging infrastructure will be needed for a mass-market switch to electric transport and to enable longer journeys – even if most charging continues to take place privately in residential and workplace settings. To reach EV deployment levels in the Announced Policies Scenario, public charging needs to increase sixfold by 2035.

As more electric heavy-duty vehicles such as trucks and large buses hit the road, dedicated and flexible charging is needed. In 2023, electric buses accounted for 3% of total bus sales. Electric truck sales jumped 35% compared with 2022, accounting for about 3% of truck sales in China and 1.5% in Europe. Under today's policy settings, the stock of electric buses increases sevenfold by 2035 and that of electric trucks around thirtyfold, supported by tougher emissions

standards in the United States and European Union. This level of deployment could require a twentyfold jump in charging capacity by 2035 – not only in depots, but also along main transit routes to enable long-distance trucking. Increasing heavy-duty charging has important implications for expanding and operating electrical grids, with opportunities for greater flexibility and renewables integration. Policy support, careful planning and co-ordination will be essential to ensure a secure, affordable and low-emissions supply of electricity with limited strain on local grids.

1. Trends in electric cars

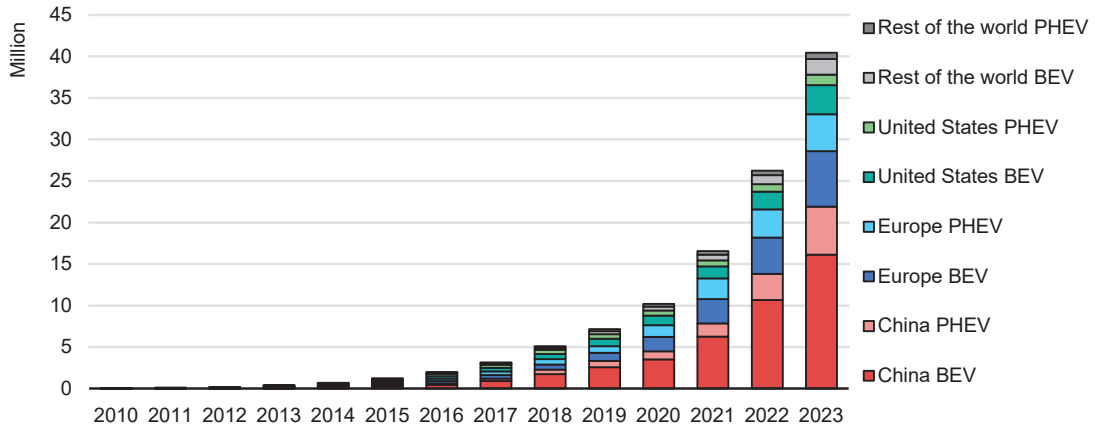
Electric car sales

Nearly one in five cars sold in 2023 was electric

Electric car sales neared 14 million in 2023, 95% of which were in China, Europe and the United States

Almost 14 million new electric cars[1] were registered globally in 2023, bringing their total number on the roads to 40 million, closely tracking the sales forecast from the 2023 edition of the Global EV Outlook (GEVO-2023). Electric car sales in 2023 were 3.5 million higher than in 2022, a 35% year-on-year increase. This is more than six times higher than in 2018, just 5 years earlier. In 2023, there were over 250 000 new registrations per week, which is more than the annual total in 2013, ten years earlier. Electric cars accounted for around 18% of all cars sold in 2023, up from 14% in 2022 and only 2% 5 years earlier, in 2018. These trends indicate that growth remains robust as electric car markets mature. Battery electric cars accounted for 70% of the electric car stock in 2023.

Global electric car stock trends, 2010-2023



Notes: BEV = battery electric vehicle; PHEV = plug-in hybrid vehicle. Includes passenger cars only.
Sources: IEA analysis based on country submissions and data from ACEA, EAFO, EV Volumes and Marklines.

[1] Throughout this report, unless otherwise specified, "electric cars" refers to both battery electric and plug-in hybrid cars, and "electric vehicles" (EVs) refers to battery electric (BEV) and plug-in hybrid (PHEV) vehicles, excluding fuel cell electric vehicles (FCEV). Unless otherwise specified, EVs include all modes of road transport.

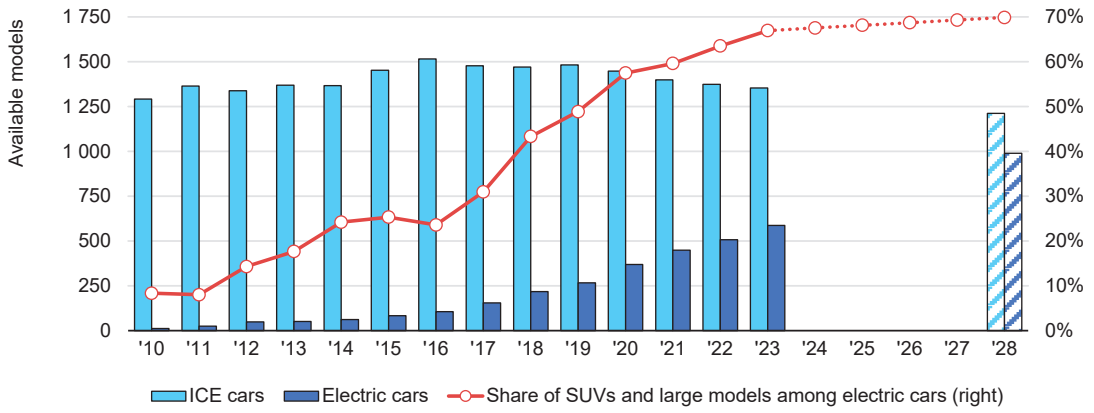
Electric car availability and affordability

More electric models are becoming available, but the trend is towards larger ones

The number of available electric car models nears 600, two-thirds of which are large vehicles and SUVs

In 2023, the number of available models for electric cars increased 15% year-on-year to nearly 590, as carmakers scaled up electrification plans, seeking to appeal to a growing consumer base. Meanwhile, the number of fully ICE models (i.e. excluding hybrids) declined for the fourth consecutive year, at an average of 2%. Based on recent original equipment manufacturer (OEM) announcements, the number of new electric car models could reach 1 000 by 2028. If all announced new electric models actually reach the market, and if the number of available ICE car models continues to decline by 2% annually, there could be as many electric as ICE car models before 2030.

Car model availability by powertrain over 2010-2023 and in 2028 based on announced launches, and share of SUVs and large models among electric cars



Notes: ICE = internal combustion engine. SUVs = sports utility vehicle. ICE does not include hybrids. Electric cars include BEV and PHEV cars. Analysis based on models for which there was at least one new registration in a given year; a model on sale but never sold is not counted, and as such actual model availability may be underestimated. Large cars include E and F segments, multi-purpose vehicles and B segments with SUV body type. The SUV category encompasses segments C to F with SUV body type. The two columns for 2028 are based on electric model announcements, which are available only until 2028, and on a sustained decrease in the number of ICE models based on the trend over 2020-2023.

Source: IEA analysis based on data from EV Volumes and Marklines.

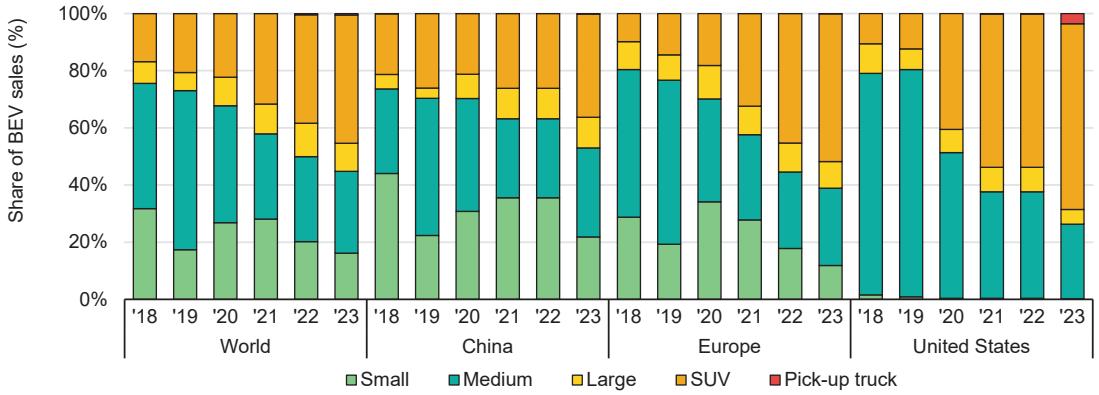
As reported in GEVO-2023, the share of small and medium electric car models is decreasing among available electric models: in 2023, two-thirds of the battery-electric models on the market were SUVs,[5] pick-up trucks or large cars. Just 25% of battery electric car sales in the United States were for small and medium models, compared to 40% in Europe and 50% in China. Electric cars are following the same trend as conventional cars, and getting bigger on average. In 2023, SUVs, pick-up trucks and large models accounted for 65% of total ICE car sales worldwide, and more than 80% in the United States, 60% in China and 50% in Europe.

Several factors underpin the increase in the share of large models. Since the 2010s, conventional SUVs in the United States have benefited from less stringent tailpipe emissions rules than smaller models, creating an incentive for carmakers to market more vehicles in that segment. Similarly, in the European Union, CO_2 targets for passenger cars have included a compromise on weight, allowing CO_2 leeway for heavier vehicles in some cases. Larger vehicles also mean larger margins for carmakers. Given that incumbent carmakers are not yet making a profit on their EV offer in many cases, focusing on larger models enables them to increase their margins. Under the US IRA, electric SUVs can qualify for tax credits as long as they are priced under USD 80 000, whereas the limit stands at USD 55 000 for a sedan, creating an incentive to market SUVs if a greater margin can be gathered. On the demand side, there is now strong willingness to pay for SUVs or large models. Consumers are typically interested in longer-range and larger cars for their primary vehicles, even though small models are more suited to urban use. Higher marketing spend on SUVs compared to smaller models can also have an impact on consumer choices.

The progressive shift towards ICE SUVs has been dramatically limiting fuel savings. Over the 2010-2022 period, without the shift to SUVs, energy use per kilometre could have fallen at an average annual rate 30% higher than the actual rate. Switching to electric in the SUV and larger car segments can therefore achieve immediate and significant CO_2 emissions reductions, and electrification also brings considerable benefits in terms of reducing air pollution and non-tailpipe emissions, especially in urban settings. In 2023, if all ICE and HEV sales of SUVs had instead been BEV, around 770 Mt CO_2 could have been avoided globally over the cars' lifetimes (see section 10 on lifecycle analysis). This is equivalent to the total road emissions of China in 2023.

[5] SUVs may be defined differently across regions, but broadly refer to vehicles that incorporate features commonly found in off-road vehicles (e.g. four-wheel drive, higher ground clearance, larger cargo area). In this report, small and large SUVs both count as SUVs. Crossovers are counted as SUVs if they feature an SUV body type; otherwise they are categorised as medium-sized vehicles.

Breakdown of battery electric car sales in selected countries and regions by car size, 2018-2023



Notes: BEV = battery electric vehicle; SUV = sports utility vehicle. Analysis based on sales-weighted registrations. Small cars include A and B segments. Medium cars include C and D segments and A segments with SUV body type. Large cars include E and F segments, multi-purpose vehicles and B segments with SUV body type. SUV category in figure encompasses segments C to F with SUV body type.

Source: IEA analysis based on data from EV Volumes.

Nevertheless, from a policy perspective, it is critical to mitigate the negative spillovers associated with an increase in larger electric cars in the fleet.

Larger electric car models have a significant impact on battery supply chains and critical mineral demand. In 2023, the sales-weighted average battery electric SUV in Europe had a battery almost twice as large as the one in the average small electric car, with a proportionate impact on critical mineral needs. Of course, the range of small cars is typically shorter than SUVs and large cars (see later section on ranges). However, when comparing electric SUVs and medium-sized electric cars, which in 2023 offered a similar range, the SUV battery was still 25% larger. This means that if all electric SUVs sold in 2023 had instead been medium-sized cars, around 60 GWh of battery equivalent could have been avoided globally, with limited impact on range. Accounting for the different chemistries used in China, Europe, and the United States, this would be equivalent to almost 6 000 tonnes of lithium, 30 000 tonnes of nickel, almost 7 000 tonnes of cobalt, and over 8 000 tonnes of manganese.

Larger manganese also require more power, or longer charging times. This can put pressure on electricity grids and charging infrastructure by increasing occupancy, which could create issues during peak utilisation, such as at highway charging points at high traffic times.

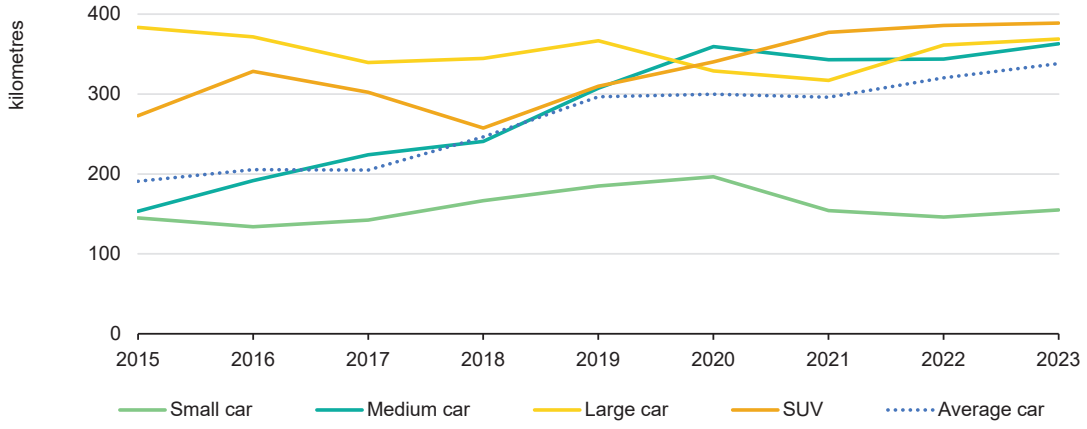
In addition, larger vehicles also require greater quantities of materials such as iron and steel, aluminium and plastics, with a higher environmental and carbon footprint for materials production, processing and assembly. Because they are heavier, larger models also have higher electricity consumption. The additional

date. In February 2024, a referendum held in Paris resulted in a tripling of city parking fees for visiting SUVs, applicable to ICE, hybrid and plug-in hybrid cars above 1 600 kg and battery electric ones above 2 000 kg, in an effort to limit the use of large and/or polluting vehicles. Other examples exist in Estonia, Finland, Switzerland and the Netherlands. A number of policy options may be used, such as caps and fleet averages for vehicle footprint, weight, and/or battery size; access to finance for smaller vehicles; and sustained support for public charging, enabling wider use of shorter-range cars.

Average range is increasing, but only moderately

Concerns about range compared to ICE vehicles, and about the availability of charging infrastructure for long-distance journeys, also contribute to increasing appetite for larger models with longer range.

Sales-weighted average range of battery electric cars by segment, 2015-2023



Notes: SUV = sports utility vehicle. Range in kilometres calculated using global weighted average fuel economy (Worldwide Harmonised Light Vehicle Test Procedure [WLTP]) and battery capacity by size segment. Fuel economy reflects on-road conditions by applying a factor of 1.1. Small cars include A and B segments. Medium cars include C and D segments and A segments with SUV body type. Large cars include E and F segments, multi-purpose vehicles and B segments with SUV body type. SUV category in figure encompasses segments C to F with SUV body type.

Source: IEA analysis based on data from EV Volumes.

With increasing battery size and improvements in battery technology and vehicle design, the sales-weighted average range of battery electric cars grew by nearly 75% between 2015 and 2023, although trends vary by segment. The average range of small cars in 2023 – around 150 km – is not much higher than it was in 2015, indicating that this range is already well suited for urban use (with the exception of taxis, which have much higher daily usage). Large, higher-end models already offered higher ranges than average in 2015, and their range has stagnated through 2023, averaging around 360-380 km. Meanwhile, significant improvements have been made for medium-sized cars and SUVs, the range of

7. Outlook for electric mobility

Scenario overview

In this part of the report, we focus on pathways to electrify road transport over the period to 2035, expanding the time horizon by five years compared with previous editions of the Global EV Outlook. A scenario-based approach is used to explore the outlook for electric mobility, based on recent market trends, policy drivers and technology developments.

The purpose of the scenarios is to assess plausible futures for global electric vehicle (EV) markets and their potential implications. The scenarios do not make predictions about the future. Rather, they aim to provide insights to inform decision-making by governments, companies and other stakeholders about the future of EVs.

The projections in the Stated Policies Scenario (STEPS) and Announced Pledges Scenario (APS) consider historical data through the end of 2023, as well as stated policies and ambitions as of the end of March 2024. The Net Zero Emissions by 2050 Scenario (NZE Scenario) is consistent with the 2023 update to the IEA Net Zero Roadmap and the World Energy Outlook 2023.

Deployment of electric vehicles is projected by road transport mode and by region. Regional results are presented for the STEPS and APS, while the discussion of the projections in the NZE Scenario focuses on global results. These projections are then compared to announcements by original equipment manufacturers (OEMs) and battery manufacturing capacity expansion announcements. These scenario projections incorporate GDP assumptions from the International Monetary Fund and population assumptions from the United Nations.

Stated Policies Scenario

The Stated Policies Scenario (STEPS) reflects existing policies and measures, as well as firm policy ambitions and objectives that have been legislated by governments around the world. It includes current EV-related policies, regulations and investments, as well as market trends based on the expected impacts of technology developments, announced deployments and plans from industry stakeholders. The STEPS aims to hold up a mirror to the plans of policy makers and illustrate their consequences.

Announced Pledges Scenario

The Announced Pledges Scenario (APS) assumes that all announced ambitions and targets made by governments around the world are met in full and on time. With regards to electromobility, it includes all recent major announcements of electrification targets and longer-term net zero emissions and other pledges, regardless of whether these have been anchored in legislation or in updated Nationally Determined Contributions. For example, the APS assumes that countries that have signed on to the Conference of the Parties (COP 26) declaration on accelerating the transition to 100% zero emissions cars and vans will achieve this goal, even if there are not yet policies or regulations in place to support it. In countries that have not yet made a net zero emissions pledge or set electrification targets, the APS considers the same policy framework as the STEPS. Non-policy assumptions for the APS, including population and economic growth, are the same as in the STEPS.

The difference between the APS and the STEPS represents the "implementation gap" that exists between the policy frameworks and measures required to achieve country ambitions and targets, and the policies and measures that have been legislated.

Net Zero Emissions by 2050 Scenario

The Net Zero Emissions by 2050 Scenario (NZE Scenario) is a normative scenario that sets out a narrow but achievable pathway for the global energy sector to achieve net zero CO_2 emissions by 2050. The scenario is compatible with limiting the global temperature rise to 1.5°C with no or limited temperature overshoot, in line with reductions assessed by the Intergovernmental Panel on Climate Change in its Special Report on Global Warming of 1.5°C. There are many possible paths to achieve net zero CO_2 emissions globally by 2050 and many uncertainties that could affect them. The NZE Scenario is therefore a path and not the path to net zero emissions.

The difference between the NZE Scenario and the APS highlights the "ambition gap" that needs to be closed to achieve the goals under the 2015 Paris Agreement.

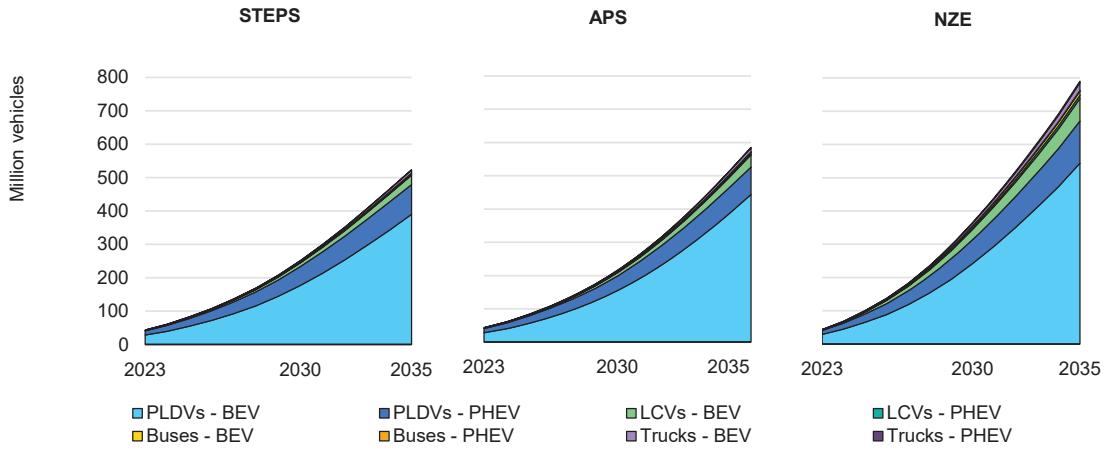
Vehicle outlook by mode

The global electric vehicle fleet is set to grow twelve-fold by 2035 under stated policies

In the STEPS, the stock of EVs across all modes except for two/three-wheelers (2/3Ws),[23] grows from less than 45 million in 2023 to 250 million in 2030 and reaches 525 million in 2035. As a result, in 2035, more than one in four vehicles on the road is electric. On average, the EV stock grows by 23% annually from 2023 to 2035.

In the APS, the stock of EVs (excluding 2/3Ws) reaches 585 million in 2035, over 10% higher than in the STEPS, and 30% of the vehicle fleet (excluding 2/3Ws) is electric. Compared to the STEPS, the average annual growth in the EV fleet is only slightly higher, with an average 24% growth between 2023 and 2035. In the NZE Scenario, the fleet of EVs grows even more quickly, at an average annual rate of 27% to 2035, reaching 790 million (excluding 2/3Ws).

Electric vehicle stock by mode and scenario, 2023-2035



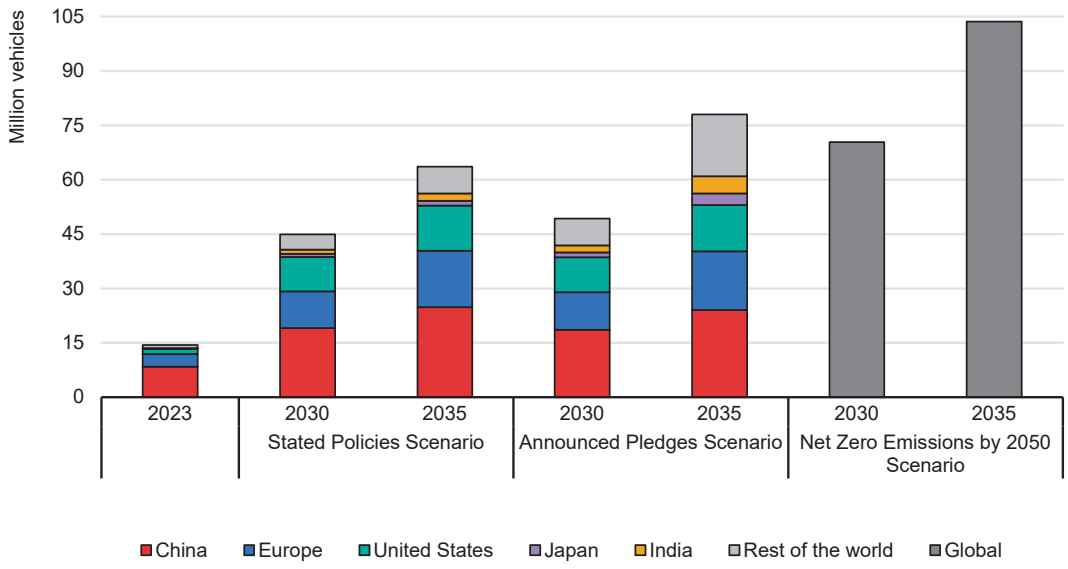
Notes: STEPS = Stated Policies Scenario; APS = Announced Pledges Scenario; NZE = Net Zero Emissions by 2050 Scenario; BEV = battery electric vehicle; PHEV = plug-in hybrid electric vehicle; PLDV = passenger light-duty vehicle; LCV = light commercial vehicle.

In the STEPS, EV sales (excluding 2/3Ws) reach almost 45 million in 2030 and close to 65 million in 2035, up from around 14 million in 2023. The sales share of EVs grows from around 15% in 2023 to almost 40% in 2030 and over 50% in 2035 in the STEPS. In the APS, the sales shares are higher, approaching 45% in 2030

[23] In this report, "two/three-wheelers" refer to vehicles aligned with the following UNECE classifications: L1, L2, L3, L4 and L5.

and two-thirds in 2035. In the NZE Scenario, EV sales shares accelerate over the next few years, reaching about 65% in 2030 and 95% in 2035.

Electric vehicle sales by region and scenario, 2030 and 2035



Note: Regional EV sales projections can be explored in the interactive Global EV Data Explorer.

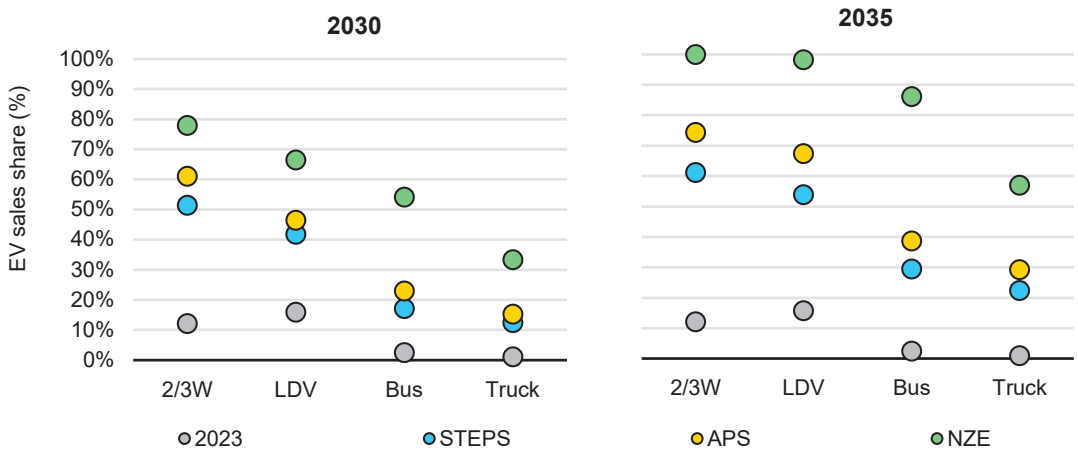
The global sales shares of electric light-duty vehicles (LDVs), buses and trucks are fairly similar in both the STEPS and APS to 2030, suggesting that the gap between policy implementation and announced ambitions is small over the near term. This gap grows to 2035, given that many policies are focused on the near- to medium term, while strategy documents outlining ambitions tend to be longer-sighted.

Further, the gap between announced ambitions and a global trajectory to achieving net zero emissions by 2050 is larger than the policy implementation gap. In the NZE Scenario, 100% of light vehicle sales, including 2/3Ws, cars and vans, are zero-emission vehicles by 2035. This compares to an EV sales share of only around 75% of 2/3Ws and 70% of LDVs in the APS. Ambition for heavy-duty vehicles (HDVs), in particular, is lagging behind the net zero by 2050 pathway.

There are, however, differences by region. China, Europe and the United States, – the largest vehicle and EV markets today – all have both ambitious targets and ambitious policies to achieve those targets. This is well illustrated by the extremely small gap between electric car sales in the STEPS and in the APS in 2030. In fact, electric car sales in 2030 in the STEPS in China, Europe and the United States together reach a sales share of over 60%, close to the global electric car sales share in the NZE Scenario. For other countries with less developed markets, the

gap between projected sales in 2030 under the STEPS, APS and NZE Scenario is larger (with less than 20% electric car sales in aggregate in the STEPS and 30% in the APS), suggesting a need to both further expand the EV industry and to share policy learnings on implementation.

Electric vehicle sales share by mode and scenario, 2030 and 2035



Notes: 2/3W = two/three-wheeler; LDV = light-duty vehicle; STEPS = Stated Policies Scenario; APS = Announced Pledges Scenario; NZE = Net Zero Emissions by 2050 Scenario.

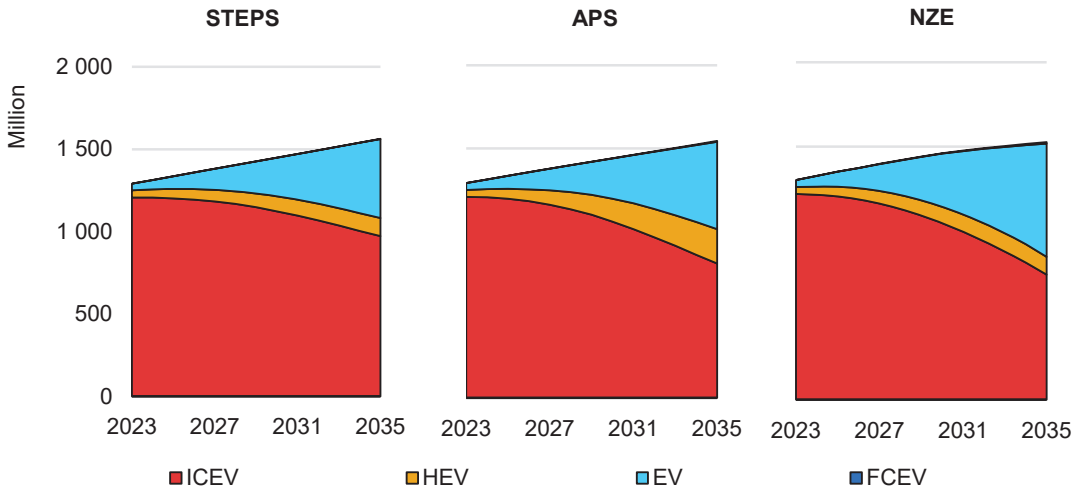
Global electric light-duty vehicle sales are set to reach 40% in 2030 and almost 55% in 2035 based on current policy settings

Light-duty vehicles (LDVs), including passenger light-duty vehicles (PLDVs) and light commercial vehicles (LCVs), are expected to continue to make up the majority of EVs (excluding 2/3Ws) through 2035. This is a result of strong policy support, including light-duty vehicle fuel economy and CO_2 standards, as well as the availability of EV models and, more generally, the sheer size of the LDV market. For example, over the past year, Canada and the United Kingdom implemented policies to increase zero-emission vehicle (ZEV) sales in 2030, targeting 60% and 80% of PLDVs, respectively.

As a result, electric LDV sales are projected to triple to over 43 million in 2030 in the STEPS, accounting for 40% of total LDV sales. By 2035, sales reach 60 million, representing a share of almost 55%.

In this scenario, the number of internal combustion engine (ICE) cars on the roads worldwide is set to decline over time as the number of electric cars grows. The stock of electric LDVs reaches about 245 million in 2030, meaning that almost one in six LDVs on the road is electric. In 2035, electric LDV stock increases to 505 million: approximately one out of three LDVs on the road.

Passenger light-duty vehicle stock by powertrain and scenario, 2023-2035



Notes: STEPS = Stated Policies Scenario; APS = Announced Pledges Scenario; NZE = Net Zero Emissions by 2050 Scenario; ICEV = internal combustion engine vehicle; HEV = hybrid electric vehicle; EV = electric vehicle (including battery electric and plug-in hybrid electric vehicles); FCEV = fuel cell electric vehicle.

In the APS, sales of electric LDVs reach 47 million in 2030 and 75 million in 2035, representing two-thirds of sales in 2035. This reflects government electrification ambitions and net zero pledges, such as the Zero Emission Vehicles Declaration to achieve 100% zero-emission LDV sales by 2040, and by 2035 in leading markets, which has been signed by 40 national governments spanning six continents. The fleet of electric LDVs reaches more than 565 million in 2035, representing one in three LDVs. Of these, 525 million are electric PLDVs, with only 7% being LCVs.

China is set to remain the leading region for electric LDV sales in the STEPS, though its share in global sales is expected to shrink from almost 60% in 2023 to around 40% in 2030 and 2035. The relative decline in China's global share is due in part to the United States nearly doubling its share of global electric LDV sales to around one-fifth in both 2030 and 2035, thanks to a combination of policy efforts and industry ramp-up (see below). Despite strong growth in electric LDV sales in the STEPS, Europe's share of global sales remains broadly stable through 2035, at around 25%.

Full electrification of two/three-wheelers is within reach but requires more policy support

The stock of 2/3Ws is currently the most electrified among all road transport segments, with around 65 million electric 2/3Ws on the road today, representing

about 8% of the fleet. In the STEPS, the number of electric 2/3Ws reaches 210 million by 2030 and 360 million in 2035, over one-third of the total fleet.

This trend has been supported by policy measures such as purchase subsidies in countries including India and Indonesia, and targets for electrifying the 2/3W fleet, predominantly in emerging and developing economies, which represent 90% of the global conventional 2/3Ws stock today. For example, the Dominican Republic aims for 5% of the private motorcycle fleet to be electric by 2030, Pakistan targets 50% electric 2/3W sales by 2030, and Rwanda targets a 30% fleet share of electric 2/3Ws. In the APS, the stock grows to 430 million in 2035, meaning 40% of all 2/3Ws on the roads are electric. The sales share of electric 2/3Ws in 2035 reaches 60% in the STEPS and 75% in the APS. China is the front-runner, with a sales share of around 90% by 2035 in both scenarios.

In the NZE Scenario, the global electric 2/3W sales share reaches close to 80% by 2030 and 100% by 2035. Getting on track with the NZE Scenario is achievable with no technological breakthroughs or major market adaptations. Given the light weight and limited daily driving distance of 2/3Ws, electrification is relatively easy and already makes economic sense on a total cost of ownership basis in many countries. However, unlike for cars, vans and HDVs, there are currently no global initiatives to reach 100% zero-emission 2/3W sales. Strengthening regulations on emissions (or even noise pollution) from 2/3Ws can play a key role in increasing the adoption of electric 2/3Ws, along with purchase subsidies to ease any barriers for lower-income households presented by higher purchase prices compared to ICE 2/3Ws.

Electric buses are projected to represent 30% of buses sold globally by 2035 based on existing policies

In recent years, a number of governments have announced new funding for electric and zero-emission buses. For example, the United Kingdom has launched a second iteration of its zero emission bus programme that will provide GBP 129 million (almost USD 160 million) to support deployment over the next few years. As announced in late 2023, India is targeting 50 000 electric buses on its roads by 2027. There are also longer-standing programmes, such as the Zero Emission Bus Rapid-deployment Accelerator partnership that was launched in 2019 to accelerate the deployment of zero-emission buses in major Latin American cities.

Funding programmes of this kind, and heavy-duty vehicles regulations, including the European Union's revised CO_2 emission standards for HDVs and California's Advanced Clean Fleets, are expected to increase the sales shares of electric buses. In the STEPS, electric bus sales increase fourteen-fold from 2023 levels, to about half a million in 2035, representing 30% of bus sales. The stock reaches 4.5 million in 2035 in the STEPS, or 20% of the total.

There are also ambitious targets for electrifying bus fleets, including Chile (100% zero-emission vehicle sales for public transport by 2035), Colombia (100% zero-emission bus sales by 2035), Chinese Taipei (full conversion of the urban bus fleet to electric by 2030), Ecuador (100% electric new public transport vehicles by 2025), and Israel (all new municipal buses to be electric by 2025). Further, the Philippines and Solomon Islands recently joined countries including the Dominican Republic, Nepal, Pakistan and Panama in setting specific targets for decarbonising their bus fleets.[24] Perhaps the biggest push for electric buses in emerging markets and developing economies (EMDEs) has been at the city level. Jakarta, Indonesia, aims to electrify its fleet of 10 000 buses by 2030, with the first 100 purchased in late 2023. Uzbekistan aims to purchase 300 electric buses in its capital Tashkent and in Samarkand. Buenos Aires is targeting a 50% zero-emission bus fleet by 2030, and a wider study of 32 Latin American cities expects that 25 000 electric buses will be deployed by 2030, and 55 000 by 2050.

Such targets mean that in the APS, sales of electric buses in 2035 are almost 40% higher than in the STEPS, reaching almost 1 million sales. One in four buses on the road in 2035 is electric. In the NZE Scenario, electric bus sales reach significantly higher levels: by 2035, almost 90% of bus sales are electric.

Trucks continue to be slowest to electrify, but country commitments could help boost progress

Zero emissions vehicles could achieve total cost of ownership parity in many HDV applications this decade, including long-haul trucks, according to recent research. And the adoption of stringent emissions standards could also help to make electric options more attractive by increasing the cost of ICE buses and trucks. Nevertheless, medium- and heavy-duty trucks may prove more difficult to electrify than other segments, in part due to the size and weight of their batteries, as well as charging requirements.

Recent emissions standards in the United States and European Union will support electric HDV adoption in the coming years. In the STEPS, sales increase more than 30-fold by 2035, albeit from around 54 000 in 2023. As a result, more than 20% of medium- and heavy-duty truck sales are electric in 2035.

At COP 28, six countries[25] joined the Global Memorandum of Understanding on Zero-Emission Medium- and Heavy-Duty Vehicles (Global MOU), bringing the total to 33 nations[26] committed to reaching 100% zero-emission sales in 2040 and 30% by 2030. In aggregate, these signatories currently represent almost 25% of

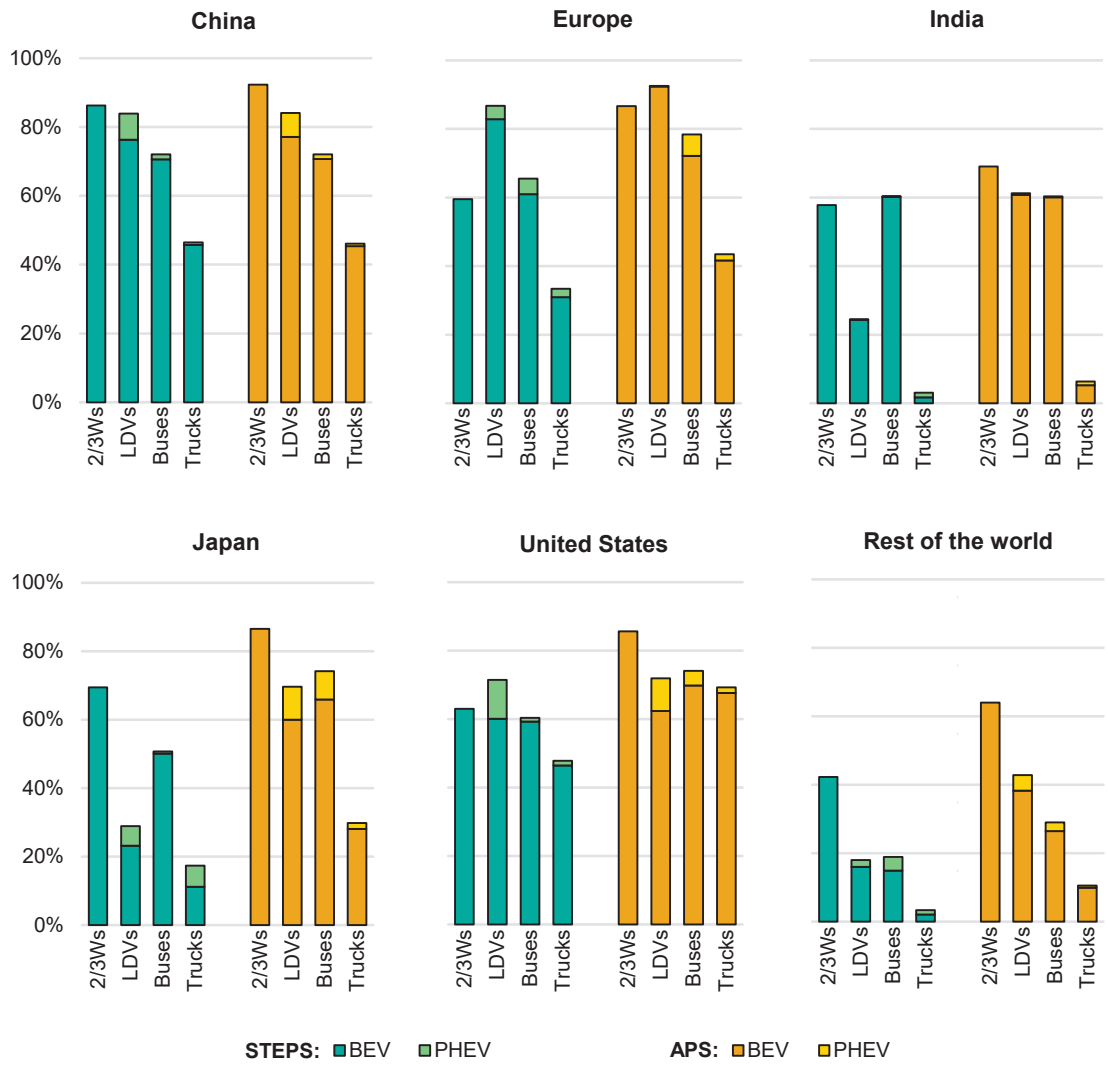
[24] See the Global EV Policy Explorer for a more comprehensive list of countries and policies.
[25] New signatories were Cape Verde, Colombia, Ghana, Iceland, Israel and Papua New Guinea.
[26] Previous signatories comprise Aruba, Austria, Belgium, Canada, Chile, Croatia, Curaçao, Denmark, Dominican Republic, Finland, Ireland, Liechtenstein, Lithuania, Luxembourg, Netherlands, New Zealand, Norway, Portugal, Scotland, Sint Maarten, Switzerland, Türkiye, Ukraine, United Kingdom, United States, Uruguay and Wales.

the global medium- and heavy-duty truck market. This brings the global electric truck sales share in the APS close to 30% in 2035.

In the NZE Scenario, electric truck sales represent over 55% of total medium- and heavy-duty truck sales in 2035.

Vehicle outlook by region

Electric vehicle sales share by mode and region, 2035



Notes: STEPS = Stated Policies Scenario; APS = Announced Pledges Scenario; NZE = Net Zero Emissions by 2050 Scenario; 2/3Ws = two/three-wheelers; LDVs = light-duty vehicles; BEV = battery electric vehicle; PHEV = plug-in hybrid electric vehicle. See the annex for regional groupings. Regional projected EV sales and sales shares data can be explored in the interactive Global EV Data Explorer.

the UK aim to phase out the sale of any heavy goods vehicles weighing 26 tonnes and under that are not zero emissions by 2035. As a result, in Europe in the APS, electric bus sales reach around 80% in 2035 and electric truck sales almost 45%.

In Europe, the EV sales share across all modes (excluding 2/3Ws) is 85% in 2035 in the STEPS. In the APS, Europe has a combined EV sales share of over 90% in 2035 (for electric LDVs, buses and trucks), which is in line with the global trajectory in the NZE Scenario.

In the United States, new emissions standards will boost electric car and truck sales

Electric car sales are expected to continue growing in the United States, thanks to successive policies that are driving up adoption. The Corporate Average Fuel Economy Standards for Model Years 2024-2026 Passenger Cars and Light Trucks requires fuel economy improvements that are likely to increase the share of EV sales in just the next few years. From 2026, California's Advanced Clean Cars II regulations, which have been adopted by twelve other states and Washington DC,[27] will begin to further increase zero-emission PLDV sales, with the stated aim of reaching 100% by 2035. Combined, these states represent around one-third of light-duty vehicle sales in the United States, with a significant impact on overall electric car sales and, therefore, on OEM strategy. This could create a ripple effect across the wider market, as OEMs harmonise around the regulations in order to bring down production costs through standardisation. In addition, in March 2024, the US Environmental Protection Agency (EPA) also released the final rulemaking for Multi-Pollutant Emissions Standards for Model Years 2027 and Later Light-Duty and Medium-Duty Vehicles, which it estimates could bring electric PLDV sales to around 70% of total sales in 2032.

The United States is also supporting an expansion of charging infrastructure to support increased EV adoption. At the end of 2023, construction of the first EV chargers funded under the National Electric Vehicle Infrastructure programme had begun, with around USD 100 million already awarded to projects. There is now around USD 2.5 billion available to states to be allocated to EV charging projects (about 60% of the total programme funding).

The policy landscape in the United States, combined with already-committed industry investments (see below), is boosting confidence in EV market expansion. As a result, electric LDV sales reach approximately 55% in 2030 in the STEPS,

[27] The California Air Resources Board has requested a waiver from the US Environmental Protection Agency for the regulation to be enforceable; a waiver has not yet been granted. Given that such a waiver was granted for the previous Advanced Clean Cars regulation, this regulation is included in the STEPS. Note also that three states have only partially adopted the Advanced Clean Cars II regulation, keeping the ZEV sales shares targets only through 2032 without including the 100% sales target for 2035.

higher than the Administration's previously announced target, and hit more than 70% in 2035. Due to the recent policy developments, the electric LDV sales in the STEPS match government ambition and thus are the same as in the APS.

Funded by the Bipartisan Infrastructure Law, the US EPA has awarded almost USD 2 billion to fund approximately 5 000 school bus replacements, with another USD 3 billion to be provided to 2026, as part of the Clean School Bus Program. Under stated policies, the US electric bus sales share is expected to increase from around 1% in 2023 to 35% in 2030 and 60% in 2035. With respect to trucks, 11 states, representing around one-quarter of HDV sales in the country, have adopted California's Advanced Clean Trucks regulation, which sets ZEV sales requirements for trucks that range from 40-75% in 2035. Bringing the national standards more in line with the Californian regulation, the US EPA finalised GHG standards for HDVs for model years 2028-2032, which aims to reduce emissions from trucks and heavy buses by 25-60% in 2032 compared to 2026. In the STEPS, the electric truck sales share across the United States reaches around 50% in 2035.

The United States is also a signatory of the Global MOU, which targets 30% zero-emission M/HDV sales shares by 2030 (on aggregate, across bus and truck sales) and 100% by 2040. In the APS, the US electric bus sales share reaches around 75% in 2035 and the electric truck sales share reaches almost 70% in 2035.

The EV sales share across all modes (excluding 2/3Ws) reaches more than 70% in both the STEPS and the APS in 2035.

Japan's policies in support of electric vehicles remain unchanged

Japan has fuel economy standards for both light- and heavy-duty vehicles, and offers purchase subsidies for EVs. Historically, Japan has also had a relatively high sales share of hybrid (non-plug-in) vehicles, as one way to reduce emissions from cars and improve the average fuel economy.

In the STEPS, the electric LDV sales share increases from about 3% in 2023 to around 20% in 2030, and 30% in 2035. In Japan's Green Growth Strategy, the government sets a target for 100% of new car sales to be electrified by 2035 – for which their definition includes BEVs, PHEV, FCEV and hybrid electric vehicles (HEVs). In the APS, which reflects this target, about 70% of LDV sales in 2035 are electric (BEV or PHEV).

With respect to HDVs, electric bus sales reach about 25% in 2030 and increase to 50% in 2035 in the STEPS. In the APS, electric bus sales increase to 75% in

The industry outlook

The ten largest carmakers are set to sell over 20 million electric cars in 2030, exceeding current policy targets

As of 2023, the ten largest global automakers all have established clear electrification targets. Together, these automakers sold over 40 million cars in 2023, representing about 55% of global sales. Although some manufacturers have missed or postponed near-term targets – often pointing to underwhelming consumer demand – they have not scaled back their longer-term ambitions. If each company in the top ten meets their target, over 20 million new electric cars could be sold in 2030. Notable examples include BMW's target of 50% of deliveries in 2030 to be BEVs; Toyota's 3.5 million BEV sales target in 2030; Stellantis's 5 million BEV sales target in 2030; and GM's target of a global EV manufacturing capacity of 2 million per year by 2025. In addition, Tesla is targeting production of 20 million electric cars in 2030, which – combined with the targets of the top ten – would be roughly equivalent to the projected sales in the STEPS in that year.

In total, more than 20 OEMs, together representing over 90% of car sales in 2023, have set some sort of target for future EV deployment. The global electric car sales envisaged in announcements by manufacturers have increased by several percentage points based on developments over the past year. If all manufacturers' targets on vehicle electrification are combined, between 42% and 58% of car sales in 2030 could be electric. This range encompasses the sales share for cars in the STEPS (almost 45%) and the share implied by government ambitions in the APS (almost 50%).

Regional examples include:

- In China, major carmakers, including incumbents, have increased their electrification ambitions. For example, SAIC and Geely are targeting 50% NEV sales by 2025.
- In Europe, more ambitious targets announced by majors such as Volkswagen, Ampere (a spin-out of Renault), Nissan and Suzuki have increased the overall OEM electrification targets relative to last year's range. For example, Volkswagen increased its BEV delivery target from 70% to 80% by 2030. On the other hand, Mercedes-Benz has delayed its goal of 50% electrified car sales by 5 years, to 2030.
- In the United States, both Ford and GM missed their 2023 targets or abandoned those for 2024, citing profitability concerns, though they are maintaining longer-term targets. Ford missed its targeted manufacturing rate of 600 000 EVs per year in 2023, but now aims to achieve that in 2024. GM had previously planned to manufacture 400 000 electric cars in North America by mid-2024, but has now

dropped that target, and yet has retained a US manufacturing capacity target of 1 million electric cars by 2025. Meanwhile, Volkswagen increased their BEV delivery target in the United States from 50% to 55% by 2030. As a result of missed near-term targets but robust longer-term ambition, the outlook for the United States based on OEM targets has remained stable over the past year.

- In Japan too, new announcements have increased the aggregate OEM target range. Suzuki aims to reach 20% BEV sales in 2030. Subaru announced a new and more ambitious target of 50% BEV sales out of a total of 1.2 million car sales in 2030, with a production capacity of 400 000 BEVs in Japan and even a new BEV production line in the United States before 2030. Subaru plans to introduce a total of 8 new BEV models, and to sell 400 000 BEVs in the United States by 2028.
- In India, Tata is targeting a 50% EV sales share by 2030 and net zero GHG emissions by 2045.

Newly announced and updated electrification targets for light-duty vehicles

Automaker	Target	Region	Group / Brand
Volkswagen	Increased BEV delivery target from 50% to 55% in 2030	United States	Brand
Volkswagen	Increased BEV delivery target from 70% to 80% in 2030	Europe	Brand
Ampere	Announced target of 300 000 BEV sales in 2025 and 1 million in 2031	Europe	Brand
Togg	Targets delivery of 1 million electric cars by 2030	Europe	Brand
Toyota	Accelerated production target to 20% EV by 2026	Europe	Brand
Nissan	Announced 100% BEV sales from 2030	Europe	Group
Suzuki	Presented strategy to reach 80% BEV sales share in 2030	Europe	Group
Suzuki	Presented strategy to reach 15% BEV sales share in 2030	India	Group
Suzuki	Presented strategy to reach 20% BEV sales share in 2030	Japan	Group
Subaru	Announced more ambitious target of 50% BEV sales in 2030	Global	Group

Automaker	Target	Region	Group / Brand
Hyundai	Raised ambition to sell 2 million EVs annually by 2030	Global	Brand
Kia	Increased 2030 EV sales target to 1.6 million	Global	Brand
Tata	Announced plan to sell 50% EVs by 2030	Global	Brand
SAIC	Increased ambition from 40% to 50% ZEV sales by 2025	Global	Group
Geely	Increased ambition from 40% to 50% ZEV sales by 2025	Global	Group

Note: Data on targets announced or updated since the publication of GEVO-2023.
Source: IEA analysis based on company announcements as linked in the automaker column.

Several important car makers have also announced a phase-out date for ICE vehicle sales. For example, ICE phase-outs have been announced by Jaguar from 2025, Mini and Rolls-Royce from the beginning of the 2030s, Lexus from 2035, Land Rover from 2036, and Honda from 2040.[28] Combined, these brands represented over 5% of global car sales in 2023. Even more automakers have pledged to phase out ICE vehicle sales in the European market specifically, including include Ford, Volkswagen, Stellantis, Lancia, Renault and Nissan.

Policy is boosting investment in manufacturing capacity, building confidence for a rapid electrification pathway

Battery and EV manufacturers have faced new challenges and opportunities as major markets including the United States and the European Union introduced new industrial policies. Domestic content requirements introduced by these policies have supported the expansion plans of major battery and EV manufacturers, with billions in investments already committed as of early 2024. Worldwide, reported investment announcements from 2022 and 2023 alone exceed USD 275 billion in EVs and USD 195 billion in batteries, with around USD 190 billion of the total already committed. The level of investments observed in the past 2 years boosts confidence in the electrification of road transport.

In **China**, committed battery manufacturing capacity is well above what is needed to supply domestic electric car sales in 2030. In fact, just two-thirds of the already-committed battery cell manufacturing capacity would be sufficient to cover 100% of electric car sales in China in 2030. This excess capacity, which is today driving

[28] Mercedez-Benz had previously announced the end of ICE car sales this decade but has recently delayed that target.

down margins, implies that battery producers are banking on export markets, at least in part. This will bring both opportunities and challenges. Countries that have electrification targets but lack sufficient battery manufacturing capacity could reach these targets through imports from China, whereas companies outside of China will see increased competition from the arrival of Chinese manufacturers. Governments will seek to find the right balance between supporting local producers at the same time as ensuring consumers can benefit from the low prices offered by Chinese manufacturers, which would accelerate road electrification.

In the **United States**, the Inflation Reduction Act (IRA) revised the requirements for the Clean Vehicle Tax Credit. Now, to qualify for the tax credit of up to USD 7 500, vehicle assembly must take place in North America and meet the critical minerals and battery components requirements.[29] In December 2023, guidance was released defining the "Foreign Entities of Concern" as part of the tax credit exclusions: vehicles with batteries containing components manufactured or assembled by a foreign entity of concern (which includes China) cannot qualify for the tax credit. The number of eligible electric car models has therefore fallen from more than 40 in the second half of 2023 to around 27 from the beginning of January 2024.[30] In 2025, restrictions may be expanded such that EVs cannot qualify if their batteries contain any critical minerals that were extracted, processed, or recycled by a foreign entity of concern.

From September 2022 to the end of 2023, after the IRA was signed into law, investments of more than USD 60 billion were announced to support the EV industry, in EV manufacturing, charging and batteries in the United States.[31] The vast majority – about 80% – of these investments are for batteries; with just around USD 5 billion announced for EVs, though there are, of course, strong links between battery manufacturing and EV manufacturing. For example, in February 2024, Volkswagen-backed Scout Motors started building a USD 2 billion electric sports utility vehicle (SUV) manufacturing plant in South Carolina. In mid-2023, BMW broke ground on their high-voltage battery manufacturing plant (USD 700 million) to supply batteries for their announced EV production lines (USD 1 billion) in South Carolina. Hyundai-Kia, which in 2023 overtook GM and Ford in terms of electric car sales share, plans to manufacture EVs in the state of Georgia by October 2024 to qualify for IRA benefits.

Announced battery manufacturing expansions in the United States, in part resulting from signals sent by the IRA, would be more than enough to satisfy carmaker electrification targets and government ambitions in 2030. Of course, the

[29] The critical minerals requirement refers to minimum percentages of critical mineral extraction or processing (by values) in the United States or in a country which has a free trade agreement with the United States. The battery component requirement refers to minimum percentages of battery component manufacturing or assembly (by value) that takes place in North America.
[30] Based on model trim eligibility from the US government website.
[31] Another USD 5 billion has been invested in battery manufacturing in Canada since the IRA was passed.

announced investments in battery manufacturing will first need to be realised, and we estimate that it would require around USD 100 billion in capital expenditures[32] to reach the level of battery manufacturing capacity necessary to meet demand for electric cars in 2030 in the APS. According to the Clean Investment Monitor, actual expenditures in EV battery manufacturing from 2020 to 2023 totalled around USD 45 billion. Around 45% of the capital expenditure (CAPEX) needed for battery manufacturing has therefore already been spent.

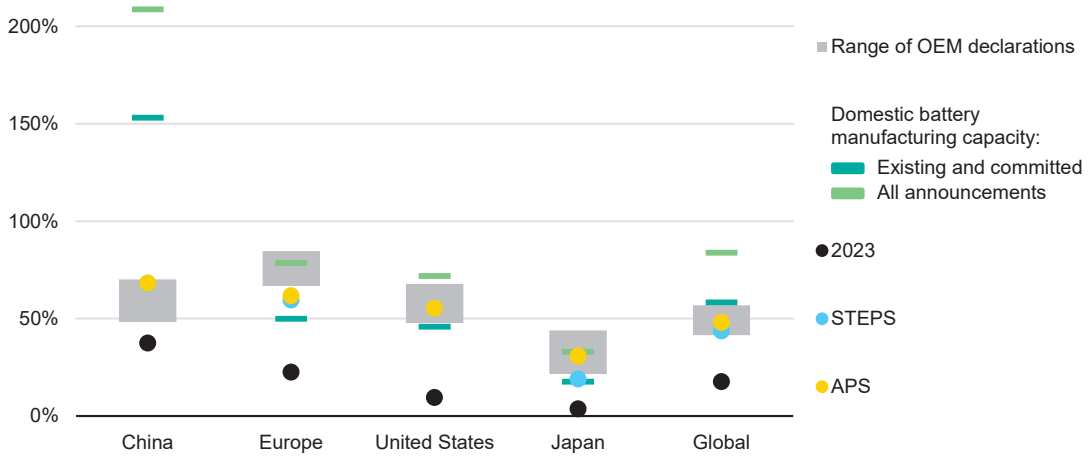
In the **European Union**, the Net Zero Industry Act and the subsequent relaxing of state aid rules in March 2023 are boosting public support for road transport electrification. For example, in January 2024, Swedish battery maker Northvolt received approval for EUR 700 million in direct grant and EUR 200 million in guarantee from Germany, which was described as "proportionate and limited to the minimum necessary to trigger the investment in Europe". Northvolt's project is expected to require a total investment of EUR 4.5 billion, creating 3 000 jobs and starting battery manufacturing in 2026. The company also secured a USD 5 billion green loan – touted as the largest green loan in Europe to date – with the support of European and Korean banks and export credit agencies. The loan will enable further expansion for the production of cathodes, cell manufacturing and a recycling plant in northern Sweden.

As of 2024, the market signals provided by the Net Zero Industry Act have been sufficient to attract enough committed investments in battery manufacturing capacity in the European Union to satisfy government electrification targets out to 2030. Across the whole of Europe, committed investments come close to meeting these targets.

While investments that are already committed today tend to be more heavily geared towards battery than to EV manufacturing, it is important to note that battery manufacturing and EV expansion plans typically go hand in hand, often being situated close to demand centres to create integrated supply chains. This close collaboration is important in order to deliver on targets, avoid bottlenecks and decrease costs. In addition, in the event that committed EV battery manufacturing capacity outpaces demand from EV manufacturers, it is unlikely that it would find alternative outlets, as other key battery markets such as consumer electronics are already well supplied and have different technical specifications. Failure to deliver on EV manufacturing capacity and sales therefore creates a risk of massive sunk investment in battery manufacturing, if manufacturers are unable to export significant quantities.

[32] CAPEX of 2023 USD 107 million per GWh of battery manufacturing capacity is assumed.

Equivalent electric car sales shares targets by battery and car manufacturers, and electric car sales shares in the Stated Policies and Announced Pledges Scenarios, 2030



Notes: OEM = original equipment manufacturer; STEPS = Stated Policies Scenario; APS = Announced Pledges Scenario. OEM pledges cover the European Union and the European Free Trade Association (i.e. Iceland, Liechtenstein, Norway and Switzerland). Committed refers to plants that have reached a final investment decision and are starting or have already started construction works. Battery manufacturing capacity refers to the mobility sector only and assumes utilisation factors of 85%.

Sources: IEA analysis based on companies announcements and data from Benchmark Mineral Intelligence, Bloomberg New Energy Finance and EV Volumes.

For example, in Europe, Volkswagen benefits from close co-operation with two of the biggest regional battery manufacturers, LG Energy Solutions and Samsung, which together provide batteries for 95% of Volkswagen's European electric car sales. In China, on the other hand, Volkswagen works with CATL, which provides almost all the batteries for its Chinese electric car sales. Similarly, Tesla works with Panasonic's Nevada plant in the United States, but with CATL and LG Energy Solutions in China. When considering expansion plans, battery manufacturers often seek to bring operations closer to the production facilities of partner OEMs. CATL is currently developing manufacturing facilities in Hungary to provide regional car makers like Stellantis, which sources nearly 50% of its European EV batteries from CATL and the other half from LG and Samsung SDI. A similar trend is already observable outside of the biggest EV markets, such as in Türkiye, where the Turkish brand Togg and Farasis Energy created a joint venture in April 2023. During 2023 the Togg T10X model reached almost 20 000 registrations in Türkiye, becoming the fourth most sold car model in November 2023.

Continued co-operation between EV and battery makers is expected to continue to support road transport electrification into the future. As of early 2024, half of the committed battery manufacturing capacity in the United States will be delivered by joint ventures between an EV and a battery manufacturer (e.g. LG-GM, LG-

Honda, LG-Hyundai, Samsung-GM, Samsung-Stellantis, Panasonic-Tesla, LG-Toyota, SKI-Ford, SKI-Hyundai). Many similar joint ventures are seen in Europe (e.g. Northvolt-Volvo, Envision-Nissan). There are even joint ventures for battery components, such as between Volkswagen and Umicore to produce battery cathodes.

Globally, on the basis of industry announcements, committed battery manufacturing capacity in 2030 would be sufficient to support the electric car sales share reaching more than 55%, higher than the sales shares implied by automaker targets and both the STEPS and APS projections. In fact, the committed and existing battery manufacturing capacity would meet over 90% of the EV battery demand in the NZE Scenario in 2030.

Heavy-duty original equipment manufacturers are most ambitious in the European market, driven by proposed CO_2 standards

A few new announcements on zero-emission vehicle strategies have been seen in the HDV market, such as the agreement signed by Hino Motors Sales USA that could result in the delivery of up to 10 000 electric trucks by 2030. For the United States, the range of OEM targets in 2030 encompasses the zero-emission vehicle sales shares in the STEPS (around 20%).

Chinese OEM Foton has also announced a target of 50% NEV sales by 2030. Similarly, BAIC Trucks also plans to sell 50% new energy trucks by 2030 and 80% by 2035. On aggregate, OEM targets would imply that zero-emission truck sales represent 13-32% of Chinese truck sales in 2030.

There have been no big announcements from truck makers in Europe over the past year, but OEM targets for this market still exceed what would be necessary under the EU HDV CO_2 standard, as reflected in the STEPS sales share.

Share of electricity consumption from electric vehicles relative to final electricity consumption by region and scenario, 2023 and 2035

Country/region	2023	Stated Policies Scenario 2035	Announced Pledges Scenario 2035
China	0.7%	6.8%	6.9%
Europe	1.1%	13.7%	14.5%
United States	0.6%	14.2%	15.6%
Japan	0.1%	3.1%	5.5%
India	0.2%	6.0%	8.7%
Global	0.5%	8.1%	9.8%

Note: Non-road electricity consumption is taken from the World Energy Outlook 2023.

China remains the largest consumer of electricity for EVs in the STEPS, despite its share of global EV electricity demand decreasing significantly from about 45% in 2023 to less than 30% in 2035. In the APS, this share falls further, to just over 20% in 2035, as a result of strong EV growth in Europe, the United States and other countries. In 2035, the United States ranks first, ahead of China and Europe in terms of EV electricity demand in the APS.

The size of the EV fleet becomes an important factor for power systems in both the STEPS and APS, with implications for peak power demand, transmission, and distribution capacity. As the fleet grows, careful planning of electricity infrastructure, peak load management and smart charging should be priorities for near-term decision-making. Effective management of fast charging, in particular, will be needed to allow for optimal planning and resilience of power systems and to mitigate peak power demand. In both the STEPS and APS, over 80% of the electricity demand for electric LDVs in 2035 is met with slow chargers.

To support policy-making and help countries prioritise charging strategies according to the size of their EV fleet and power system configuration, the IEA has developed a guiding framework and online tool for EV grid integration.

Oil displacement

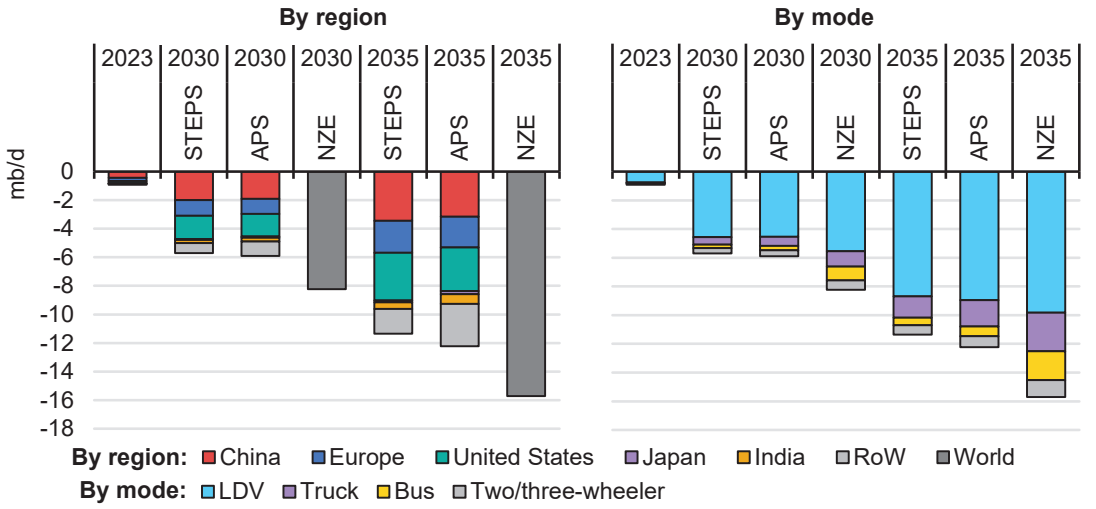
Electric vehicle uptake means oil demand for road transport is set to peak around 2025 and displace 12 mb/d by 2035

Growing EV stocks reduce the need for oil. Globally, the projected EV fleet displaces 6 million barrels per day (mb/d) of diesel and gasoline in 2030, a sixfold increase on displacement in 2023. By 2035, even less oil is needed for road

transport, with displacement reaching 11 mb/d in the STEPS and 12 mb/d in the APS. In fact, we expect global demand for oil-based road transport fuels to peak around 2025.

Displacement is largely attributed to electric LDVs, followed by trucks, buses and 2/3Ws.[37] In particular, it will be important to closely track the uptake of electric 2/3Ws and their role in oil displacement: electric 2/3Ws may displace active modes of travel such as walking or cycling, rather than just fossil-powered transport, which is the assumption underpinning the STEPS and APS. This highlights that while EVs are an important component of transport decarbonisation, they are far from being the only one.

Oil displacement by region and mode in the Stated Policies, Announced Pledges and Net Zero Emissions by 2050 Scenarios, 2023-2035



Notes: STEPS = Stated Policy Scenario; APS = Announced Pledges Scenario; NZE = Net Zero Emissions by 2050 Scenario; RoW = Rest of the world; LDV = light-duty vehicle. Oil displacement is based on internal combustion engine (ICE) vehicle fuel consumption to cover the same mileage as the EV fleet. Oil displacement is calculated by assuming that the distance (total kilometres) travelled by EVs by segment each year would have been otherwise travelled by ICE vehicles or hybrid electric vehicles (HEVs). In the case of PHEVs – where the powertrain uses both oil-based fuel and electricity, only the distance covered by electricity is included. This method of estimation assumes that EVs replace ICE or hybrid vehicles of the same segment, and that these vehicles follow the same driving behaviour. The accuracy of this assumption is uncertain. There is some evidence to suggest that EVs are driven further than their ICE counterparts, for example.

Tax reforms will be needed to ensure government revenues can be sustained as EV adoption grows

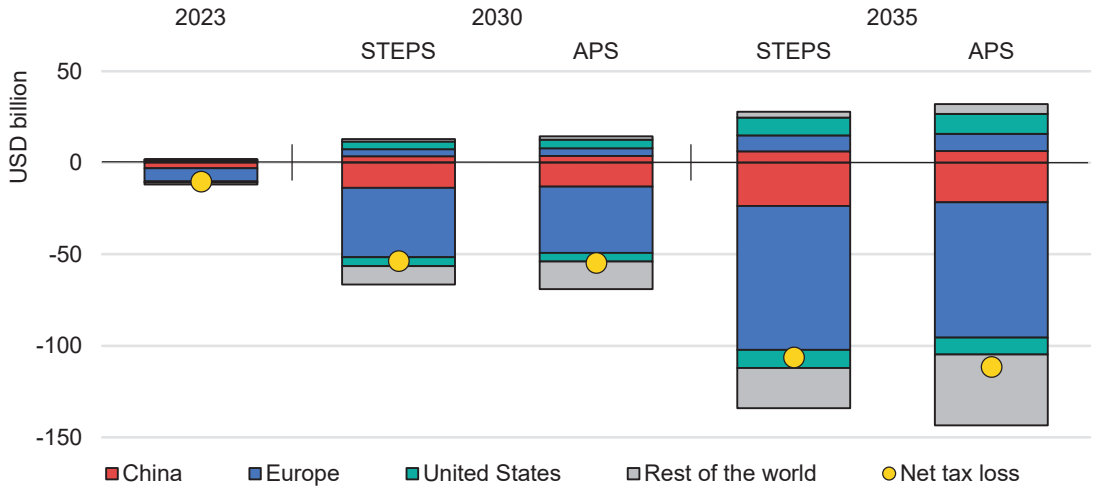
Fossil fuel excise taxes can represent a major source of income for governments, and they are often used to fund road infrastructure. The shift to EVs may

[37] As reported in the Global EV Outlook 2023, assumptions about which mode(s) of transport are displaced by electric 2/3W trips can greatly impact the resulting oil displacement. In IEA analysis, they are assumed to replace trips otherwise made with internal combustion engine 2/3Ws.

significantly reduce revenues under current schemes, as additional revenue from electricity taxes tends to be insufficient to cover the loss. Indeed, the rates of taxation per kilometre driven by EVs are lower than for their fossil fuel equivalents.

In 2023, EVs displaced almost USD 12 billion in gasoline and diesel tax revenues globally. Meanwhile, the use of EVs generated close to USD 2 billion in electricity tax revenue, resulting in a net loss of USD 10 billion. As the stock of EVs (including 2/3Ws) is projected to grow globally to 460 million by 2030 in the STEPS and nearly 500 million in the APS, net tax revenue losses are set to increase by more than 5 times in the STEPS and APS. By 2035, net tax loss reaches USD 105 billion in the STEPS and USD 110 billion in the APS, doubling from 2030 levels as road transport electrification accelerates.

Net tax implications of electric vehicle adoption by region in the Stated Policies and Announced Pledges Scenarios, 2023-2035



Notes: STEPS = Stated Policies Scenario; APS = Announced Pledges Scenario. Fuel tax rates are assumed to remain constant. Only federal tax rates are included.

Source: Analysis based on tax rates from IEA Energy Prices.

Although China leads global EV stock uptake, 60% of current revenue losses are in Europe, because the taxes for gasoline and diesel are far greater. For example, the gasoline tax rate in France, Germany, and Italy is more than six times that in China. In Europe, fuel tax revenue drops by nearly USD 70 billion by 2035 in the STEPS. In China, tax revenue losses reach USD 17 billion, and they remain under USD 300 million in the United States due to low federal taxation of gasoline and diesel (though greater impacts could be seen at the state level).

However, for oil-importing countries, lost tax revenues could be balanced by reduced fuel import costs. For example, a 2020 study estimated that a total shift

from ICE to electric 2Ws in Rwanda could reduce government revenue from fuel taxes by RWF 6.1 billion (Rwandan francs), but would save around RWF 23 billion (around USD 25 million) on fuel imports.

Longer-term measures to stabilise tax revenues will be needed in the transition to electromobility. Policy strategies could involve more wide-ranging tax reforms, such as coupling high taxes on carbon-intensive fuels with distance-based charges. For example, Israel recently approved a new usage tax on kilometres travelled, which will apply to EVs as a way to compensate for lost revenues from excise duty on gasoline and diesel. Road tolls could charge users of road infrastructure. When used in city areas, tolls could also reduce traffic congestion, noise pollution and road infrastructure damage, while encouraging the uptake of alternative modes such as public transport, walking and cycling.

Further, the EV transition can also bring monetary benefits due to health improvements associated with reductions in air pollution, for example by reducing health expenditures, preventing premature deaths and avoiding workdays lost due to illness. A study of the benefits of electric cars in Shanghai estimated that benefits exceed USD 6 000 per EV when replacing an average Chinese ICEV. About 40% of this monetary benefit is attributed to health benefits, and the remainder to climate benefits.

https://www.wsj.com/business/energy-oil/air-conditioning-and-ai-are-demanding-more-of-the-worlds-powerrenewables-cant-keep-up-987a58f3?mod=energy-oil_news_article_pos4

Air Conditioning and AI Are Demanding More of the World's Power—Renewables Can't Keep Up

Renewables can't keep up with growth, which means more coal and more emissions

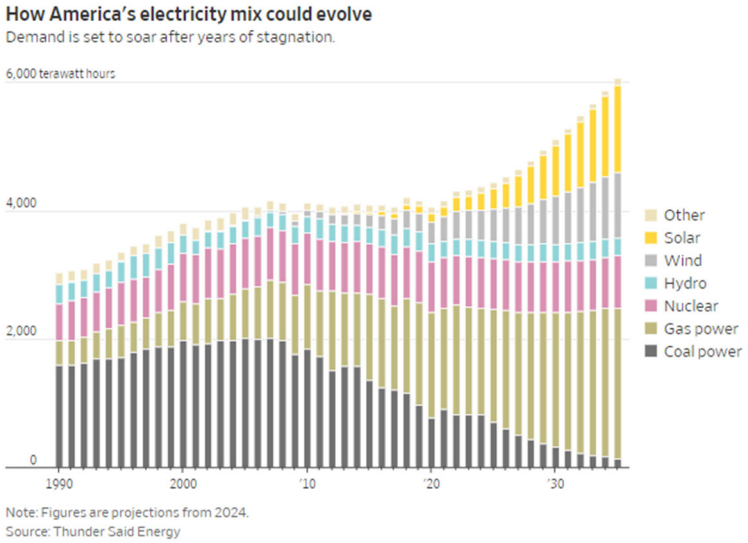
Renewable electricity is growing fast. The trouble is, it can't keep up with growing power demand.

In the U.S., the new driver is energy-guzzling artificial intelligence. Demand was already on the rise to power electric vehicles, heat pumps and other devices designed to reduce fossil fuel use.

In the developing world, the boom is driven by industrialization and basics like lights and air conditioning. That means more fossil fuels, including coal, the worst emissions offender.

"The reality is we can keep adding renewables until we're blue in the face and it won't be enough," said Sumant Sinha, chief executive of ReNew, one of India's biggest renewable energy companies.

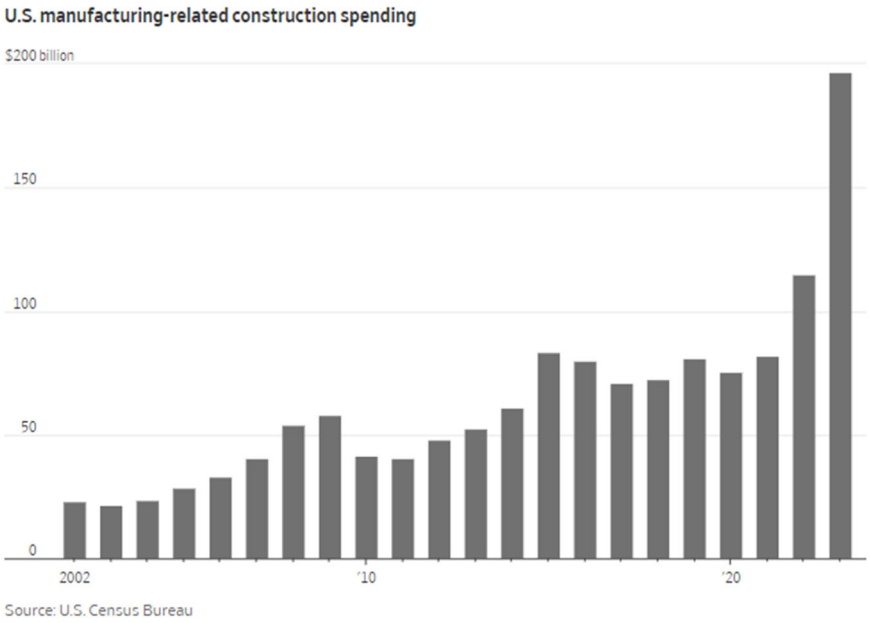
Here's the state of play.



America's power-sector emissions have declined as natural gas and renewables supplanted coal. But renewable electricity that is soaked up by new drivers of demand can't be used to clean up polluting sectors such as transportation and industry.

Factories producing microchips, electric vehicles and batteries are fueling demand growth. That shows little sign of slowing. Samsung will more than double its semiconductor investment in Texas to $44 billion, The Wall Street Journal reported this month.

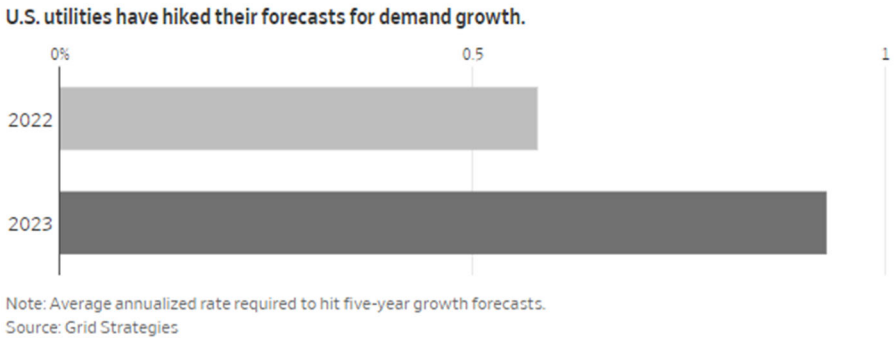
U.S. manufacturing-related construction spendingSource: U.S. Census Bureau



The wild card is AI, which uses more energy than conventional computing.

Precise data on AI's power usage is scant, and it isn't clear how the technology will evolve. But a 2023 paper by data scientist Alex de Vries estimated that AI servers worldwide could use about as much power as a midsize economy such as the Philippines or Sweden by 2027.

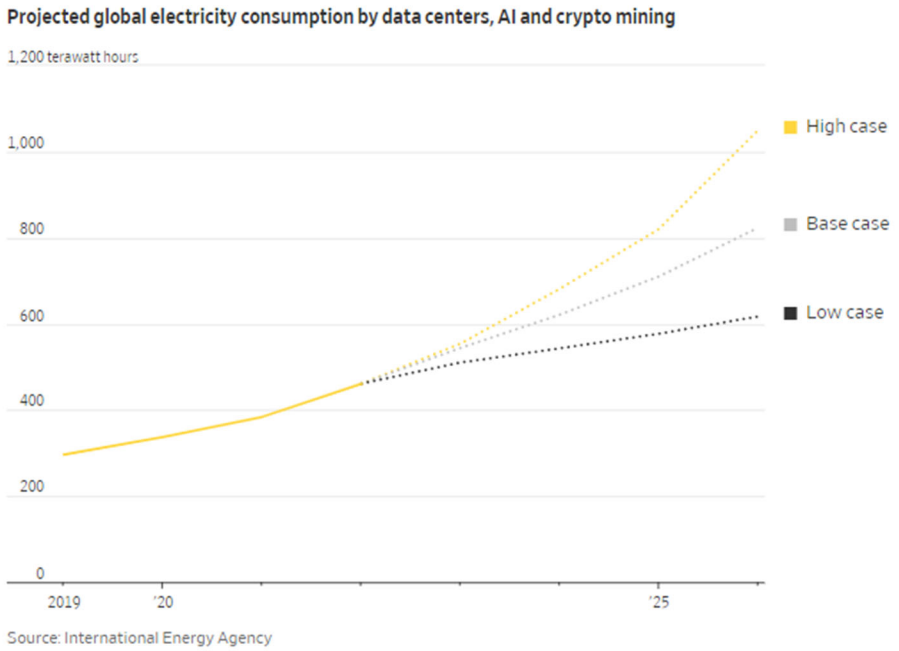
U.S. utilities have hiked their forecasts for demand growth.Source: Grid StrategiesNote: Average annualized rate required to hit five-year growth forecasts.



In the U.S., with the most data centers, their share of electricity consumption could rise from 4% in 2022 to 6% in 2026, the International Energy Agency says.

AI could add 8% to U.S. natural-gas demand by 2030, according to research firm Thunder Said Energy, with backup generators burning more diesel too.

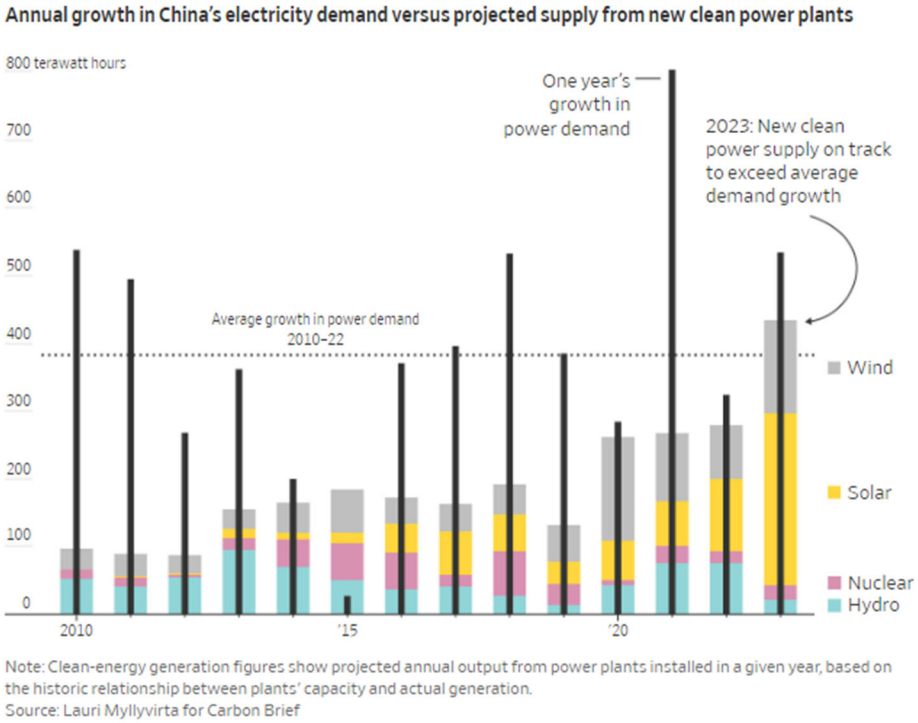
"I think we're going to need every little bit of renewables and natural gas we possibly can," Murray Auchincloss, chief executive of oil major BP, said of the growth of AI on a recent earnings call.



In Asia, renewables can't keep up.

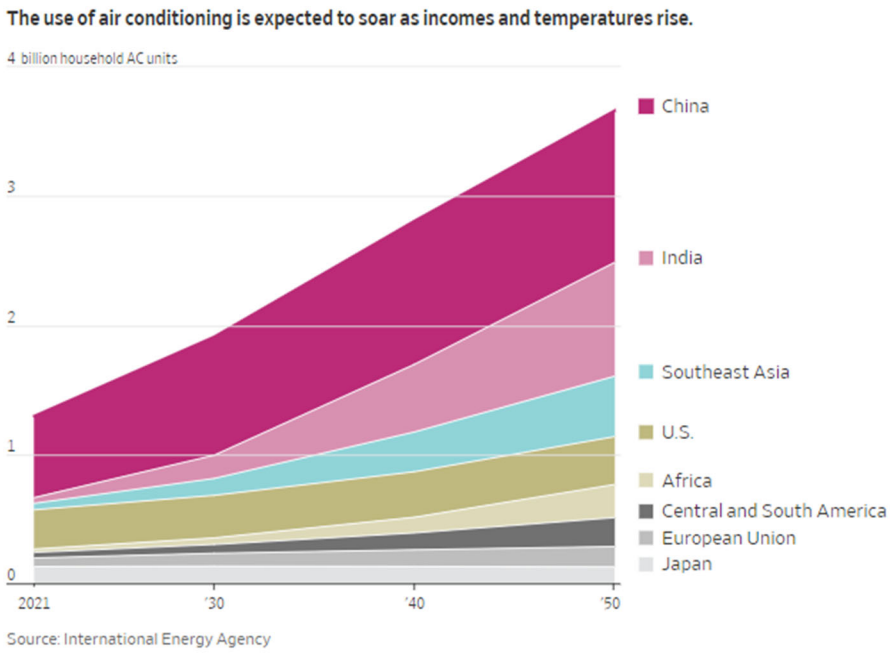
China installed more solar panels last year than the U.S. ever has, and India plans to more than triple renewables in the next six years. That growth hasn't kept pace with demand, leaving coal to close the gap.

With its big build-out last year, China did cross an important threshold—growth of renewables exceeded the long-term growth of power demand, according to Lauri Myllyvirta, a senior fellow at the Asia Society Policy Institute.



But 2023 was an unusual year. Beijing was trying to stimulate the economy via exports, so the manufacturing sector used more electricity, and a heat wave meant more air conditioning. Power demand stayed one step ahead of renewables.

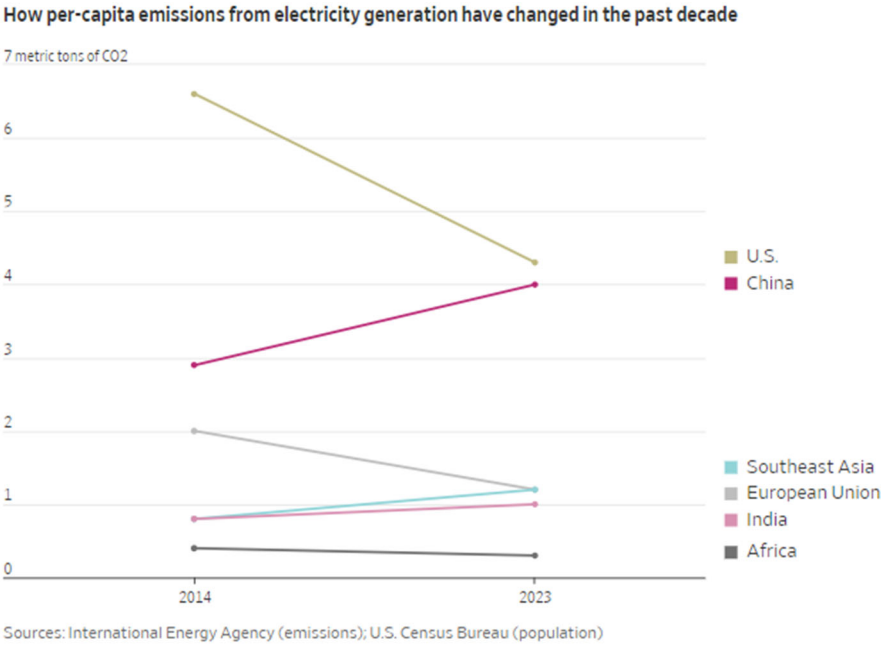
The use of air conditioning is expected to soar as incomes and temperatures rise.Source: International Energy Agency



Everyone is watching China because it is trying to address renewables' reliability problem with grid upgrades, batteries and hydropower. The goal is to go green while keeping power prices low.

"If China succeeds in doing that, that could be replicated in other markets like India and Southeast Asia," said Alex Whitworth, head of Asia Pacific power research at Wood Mackenzie.

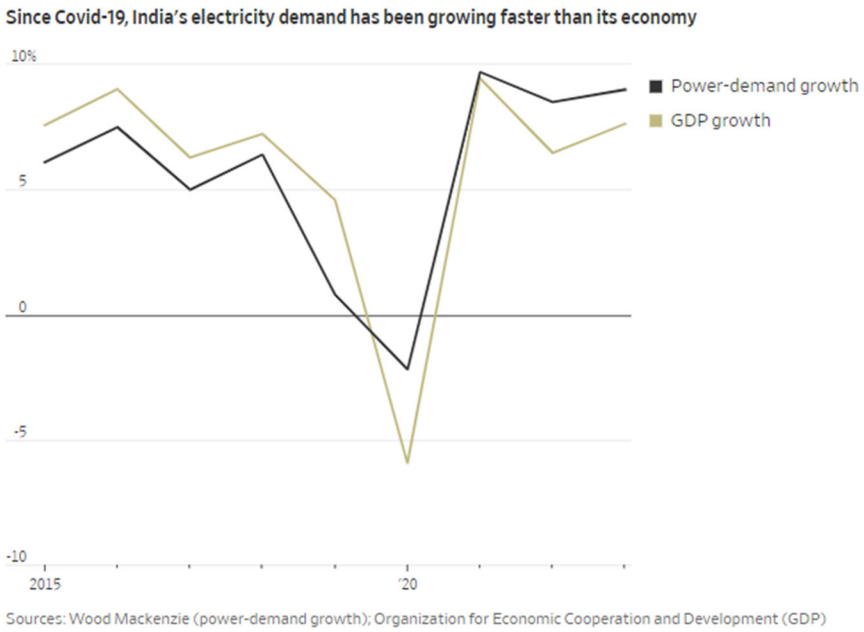
How per-capita emissions from electricity generation have changed in the past decadeSources: International Energy Agency (emissions); U.S. Census Bureau (population)



India encapsulates the challenge. Power-demand growth has been running above 8% a year, outpacing gross domestic product growth, as industrial activity explodes.

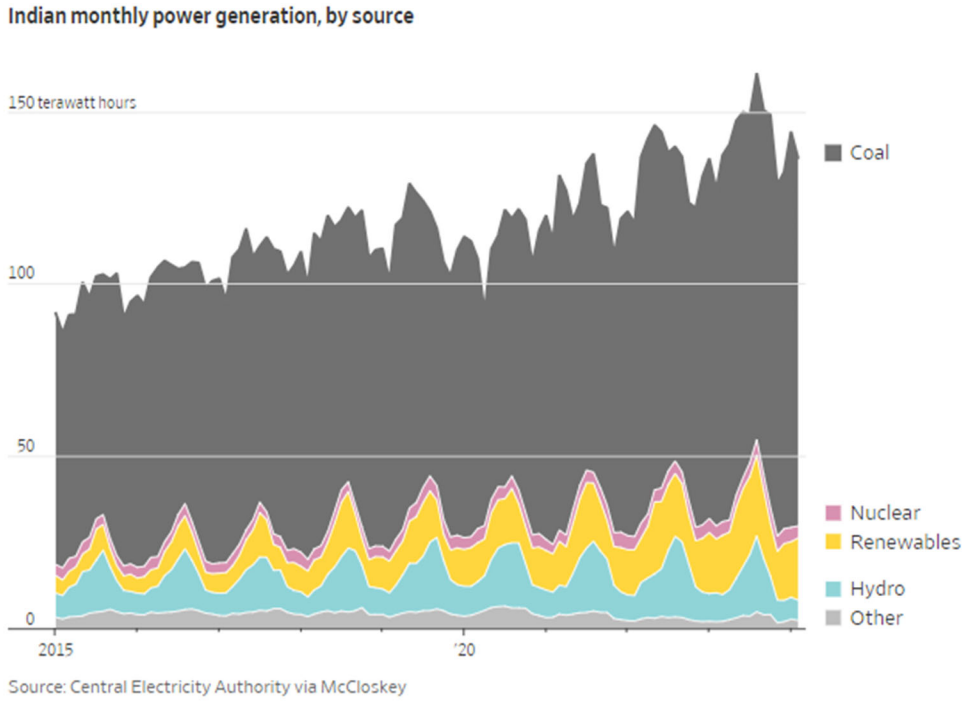
Hundreds of millions of Indians whose homes have been connected to the grid this century are also buying appliances. By 2050, Indians' air conditioners could use more power than Africa currently consumes, the International Energy Agency says.

Since Covid-19, India's electricity demand has been growing faster than its economySources: Wood Mackenzie (power-demand growth); Organization for Economic Cooperation and Development (GDP)



The government's renewables push is part of a broader effort to keep up with demand. India has 30 gigawatts of coal plants under construction, with more in the pipeline, according to Global Energy Monitor.

Moving coal to power plants is straining India's infrastructure. The government said last year it envisions adding 100,000 railcars to India's congested railroads by 2030—a fourth of the existing stock—just for coal.



To slow the coal rush, the government would have to coax private investors to fund grid improvements and nurture a green manufacturing sector to compete with the wealth created by coal, said Karthik Ganesan, a power-market expert at India's nonprofit Council on Energy, Environment and Water.

"If anybody was expecting India's coal to peak anywhere before the mid-2030s, they were probably unrealistic," he said.

Turning to another area of strong commitment that shows up every quarter is our focus on functional excellence, a core competitive advantage and a key pillar of our strategy.

In Guyana, it's delivering unprecedented success and value creation reflected in the startup of the Prosperity FPSO last November, ahead of schedule and below cost. As with our two previous developments, this cost and schedule performance was industry leading.
The excellence in execution demonstrated in delivering the project, continued into its operation. With Prosperity, we reached nameplate capacity of 220 Kbd in January, just two months after start-up and well ahead of the industry average of 15 months.

Once our projects are up and running, we continually look for debottlenecking opportunities to increase production. All three FPSOs are now producing above their funding basis, helping to drive record gross production in the first quarter, all with an emissions intensity amongst the lowest in our Upstream portfolio. Looking ahead, we're pleased that our sixth project, Whiptail, has now reached FID with a planned start-up by year-end 2027. It's remarkable to think that within eight years of first oil, Guyana will have a production capacity of more 1.3 million barrels per day.

Our work in Guyana is delivering tangible benefits for the Guyanese people. The development of Guyana's energy economy drove the highest real GDP growth in the world in 2022. The oil and gas industry is directly supporting thousands of local suppliers and Guyanese workers. And our gas-to-energy project will feed a new government-owned power plant with the potential to significantly increase reliability and reduce both the cost of electricity and its greenhouse gas

emissions. As I said at CERAWeek last month, I believe Guyana will go down as one of the most successful deepwater developments in the history of the industry.

The final point I'd make about our Upstream business this morning involves our Canada operations. With the Transmountain pipeline expansion scheduled to come online May 1st, our production from Kearl will have better access to markets in Asia and the U.S. West Coast, which we expect will improve margins and drive higher earnings in future quarters.

Product Solutions also demonstrated excellence in execution this quarter. Overall, we generated record first-quarter refining throughput during a period of peak turnaround activity. Thanks to the outstanding work of our team, we maintained strong turnaround cost and schedule performance.

The structural improvements made in turnarounds would not have been possible without our decision to create centralized organizations that are now critical elements of our success. We've been able to take our best thinking and experience from across the corporation and apply it to some of our biggest challenges, like these very large maintenance events. We've eliminated silos, consolidated expertise, and narrowed our focus to the challenges and opportunities with the highest value.

Our turnaround performance is translating into both structural cost savings and higher throughput, helping us capture more value from the market than peers, especially at a time of historically high refining margins.

Finally, our commitment to execution excellence is delivering significant improvements in our environmental performance. Our methane emissions intensity is down more than 60% since 2016. One of the many steps we took included replacing all 6,000-plus natural-gas-driven pneumatic devices in our Permian unconventional operated assets.

While short-term market conditions are an important context for quarterly results, it's how we position ourselves to leverage the long-term fundamentals that drives sustained shareholder value.

I'd like to turn to this for a moment now and plan to spend more time over the year reminding everyone of our attractive growth opportunities that extend well beyond this year and our plan period.

I know there's a view that we're in a declining industry. That view is wrong. People don't fully appreciate the scale of the global energy system. It took many tens of trillions of dollars to build, and today, takes more than $2 trillion a year to sustain. This doesn't mean we shouldn't address the emissions challenge. In fact, the world needs to do more, in a far more serious way, to meet society's emission-reduction ambitions. But it also means that oil and natural gas will play a much greater role than the market thinks.

By 2050, the world is expected to add nearly 2 billion people, and the size of the global economy is expected to double from roughly $90 trillion to $180 trillion. Scenarios, like IEA Net Zero, that see oil demand falling from more than 100 million barrels per day now to 25 million barrels per day in 2050 are not realistic. Even if demand for transportation fuels declines significantly with greater penetration of electric vehicles, the market for petrochemicals is expected to double. While the transition to a lower-emissions future will be long, there's no denying it's happening. The question is who will capture the value.

We believe the same competitive advantages that have underpinned ExxonMobil's success for more than a hundred years will serve as the foundation for building a range of world-class

businesses in a lower-emissions world. As I've said many times, we're a technology company at our core. We transform molecules at scale to meet society's needs. The notion that the world can electrify everything is misguided. Molecules will play a dominant role in the energy, materials, and products the world needs in 2050 and beyond.

At our Low Carbon Solutions spotlight last year, we walked you through the opportunity we saw in carbon capture and storage, hydrogen, and biofuels. Since that time, we've also entered the market for lithium. The total addressable market in these areas going forward is potentially in the trillions of dollars. Today I'd like to mention some of the additional areas we're exploring that have tremendous potential. We discussed each of these opportunities in detail with our Board of Directors during a visit to our Baytown complex in March.

The world has become increasingly focused on the challenge of mismanaged plastic waste. The solution requires sound policy, responsible manufacturing, expanded waste-management infrastructure, and new technologies like those that underpin our Advanced Recycling projects. We have 12 projects in our plans to help us meet the growing demand for processing plastic waste. Our first project, at Baytown, is one of the largest in North America with the ability to process 80 million pounds per year of plastic waste that would otherwise end up in a landfill. By breaking down plastic waste into its constituent molecules, our technology significantly widens the range of plastics that can be processed, including hard-to-recycle materials such as potato chip bags and AstroTurf. We are planning to develop more than 1 billion pounds per year of plastic-waste processing capacity by 2027.

Another growth area is Proxxima™, which we showcased at our Product Solutions Spotlight last September. With Proxxima™, we transform lower-value gasoline molecules into a high-performance, high-value resin with numerous commercial applications. In short, Proxxima™ is a new chemistry for an enduring challenge - making materials that are lighter, stronger, and more durable - with lower GHG emissions. Proxxima™ is up to four times stronger than steel and seven times lighter, making it an excellent replacement for rebar. As a protective coating, it takes one application and five minutes to cure, versus 2-3 applications with eight hours in between. It has multiple lightweighting applications in the automotive sector. And it has half the life-cycle emissions of traditional thermoset resin systems. For us, Proxxima™ is an advantaged "fuels-to-performance-chemicals" business that we plan to scale and build into a global brand. We see an addressable market of up to 5 million tons per year, growing faster than GDP, with earnings potential of $1 billion a year by 2040 and returns above 15%.

We are also exploring opportunities in materials made from carbon, which as the world decarbonizes, will become an increasingly advantaged feedstock. We launched a technology venture about two years ago to assess attractive new markets for carbon products. We see opportunities to transform the molecular structures of low-value, carbon-rich feeds from refining and petrochemical processes to create high-value products for growing markets. Some of these markets include carbon fiber, polymer additives, battery materials, and electrodes for steel production. We are specifically focused on high-value segments with margins of several thousand dollars per ton and growth rates more than double GDP.

One potential opportunity is the carbon materials used in batteries and energy storage solutions. With demand for this segment growing above 10% per year, these carbon materials are expected to be in short supply. Additionally, as the needs for storage solutions evolve, there will be an increasing demand for higher performance carbon materials. The carbon-rich feedstock available in ExxonMobil's existing businesses, coupled with our core technology capabilities and complementary lithium offering, positions us to meet the growing demand and deliver product performance improvements required for the battery and energy storage solutions of the future.

The last technology I'll touch on today is Direct Air Capture, or DAC. For the world to reach net zero, negative emissions technologies are going to be needed. None holds greater long-term promise than DAC. The challenges, however, are as big as the opportunity. Atmospheric CO_2 is extremely dilute at about 425 parts per million. A massive amount of air has to be processed to remove a single ton of carbon dioxide.

Today, many technologies are competing to crack the code and make DAC scalable and affordable. Our scientists and engineers are hard at work on this problem. We've launched a pilot project at Baytown that has demonstrated feasibility with the use of a proprietary capture process. Our initial goal is to cut the cost in half, which will still be too expensive, but will help move us down the cost curve. The current market for DAC is tiny at less than 10,000 tons per year of CO_2 captured, but the long-term potential is huge.

We are excited that dozens of companies and universities are chasing direct-air capture solutions. We wish them all success. Irrespective of where the breakthrough occurs or who achieves it, ExxonMobil will have an important role to play. As we've demonstrated, there are few, if any, companies better positioned than us to globally deploy a molecule technology at scale, with attractive returns.

People who limit our future to the products and markets we are in today, have lost sight of our past and don't understand our core capabilities or advantages, or the future potential they hold.

Consider our Baytown low-carbon hydrogen project, which is entering advanced stages of engineering and development. We are not only focused on building the supply side of this new market for low-carbon hydrogen but are also making strong progress in building large-scale demand, as demonstrated in our MOUs for offtake of low-carbon ammonia with SK of South Korea and JERA of Japan.

The last piece required to bring this project and market to life is government policy that maintains a level playing field across all methods of hydrogen production. Without this, we cannot and will not move forward. On the other hand, if incentives are developed to establish a viable, technology-neutral market, our advantages will allow us to generate attractive returns and invest more, accelerating customers' emissions reduction.

And so we were out of the market for a period of time. We did about $3 billion in share repurchases. A run rate to hit the $17.5 billion, which is what we've kind of guided to this year, would be more like $4.4 billion, right? So our program will naturally dial up our execution so that we're on track to complete the $17.5 billion share repurchase program on a standalone basis. And then I would remind you that we said we anticipate taking that program pace up to $20 billion annually after we close the pioneer acquisition.

So we feel really good about where our balance sheet is at and our consistent capital allocation strategy and that that will drive long-term returns for shareholders.

A - Darren W Woods {BIO 17692013 <GO>}

And I would just add to Kathy's points that, and just remind everybody, if you look at where we stand today, and Jason made the point that we're deviating from our peers in terms of continuing to generate cash and drive down net debt, that's anchored in the strategy that we've put in place in 2018, which is find advantaged projects and invest in those to grow the earnings power of the business. And that's now beginning to manifest itself. And so I think you got to have a long-term view on this, having a robust balance sheet to make sure that we're positioned.

When opportunities come along and we see clear advantages to invest, that we have the capability to do that. Thanks for the question.

Q - Jason Gabelman {BIO 18730121 <GO>}

Yep, got it, thanks.

Operator

The next question is from Ryan Todd of Piper Sandler.

Q - Ryan Todd {BIO 15158570 <GO>}

Thanks. Maybe one on chemicals. I mean, your chemicals businesses, the two segments continue to show kind of modestly better than expected recovery along the bottom or off the bottom here. Is this more of a feedstock tailwind that we're seeing in the near term? Are you seeing any improvements that are noticeable in terms of demand and overall global supply demand? And I guess in the meantime, while things are weak, what are you managing to do with your product mixer operations to drive relative performance there in chemicals?

A - Darren W Woods {BIO 17692013 <GO>}

Yeah, sure, Ryan, I'll take that.

First thing I would say is if you look at the chemical business and kind of the margin indicators that we use to judge to judge the health of the chemical businesses. We are at a historic kind of bottom-of-cycle number, and so I think it's a very challenging chemical market today, as I know many of you know. But even in that very

challenged market, we are continuing to deliver very good results. And I think if you compare similar markets that were even close to these bottom-of-cycle conditions, we were in a very different place in the past with respect to earnings than we find ourselves today, where we delivered close to $800 million of earnings this quarter, despite the very difficult market conditions.

Those market conditions are driven more by supply than demand, frankly. We're continuing to see growth in demand, not as high as we've seen historically, but continued good growth. And frankly, in the first quarter, saw some of that pick up. The challenge has been the supply that's come on to meet that growth.

And so that is depressing overall industry margins. As you know the investments that we make and the way we run our business is to make sure that we're advantaged versus the average chemical player. And so even in these markets that are set by other capacity, the work that we've done to position ourselves in a more advantaged position than competition continues to deliver a value we can see that with the growth, not only in the high-value products, which are coming on with our projects, and frankly, that growth is in line with what we had expected. So we're continuing to see the demand for the high-value products that we've invested in.

But we're also seeing it in our base volume, value in those with respect to how we've positioned ourselves. And we're seeing advantages in the structural cost reduction. So I would tell you, every part of what we've been doing to improve the earnings power of the organization is manifesting itself in our chemical business and showing up in differentiating earnings. And feed, to your point, feed advantages play an important role in that.

So that's, yet again, another advantage that we have versus the typical industry player. But that is reflective of the broader strategy that we have. So I think we feel good about where we're at in a very difficult market. Our view is that those market conditions are going to be with us for a little while here going forward.

But we also feel like we're well-positioned to be successful there. And as that shakes out, and some of the less able competitors have no success in this space, we'll see growth continue to move, and eventually, we'll see margins pick back up, and we'll be very well-positioned.

A - Kathryn A Mikells {BIO 3743077 <GO>}

And just the other thing I'd add to that is I think if you look at our chemical business's performance and compare that to peers and other players, you see the differentiation and the excellent execution execution really coming through. We're in clearly bottom-of-cycle conditions right now, and yet we're still generating pretty good earnings and cash flow in our chemical business.

And then I would just mention that, as Darren noted, our footprint tends to be North American weighted, and so if you just look at our PE and PP footprint, we're heavily North American weighted and relatively lightly weighted to Asia compared to the rest of industry. And Asia is especially at very, very bottom-of-cycle conditions.

Q - Ryan Todd {BIO 15158570 <GO>}

Great. Thanks, both of you.

Operator

The next question is from Steven Richardson of EverCore ISI .

Q - Steven Richardson {BIO 15036459 <GO>}

Good morning. Darren, I was wondering if you could talk a little bit about the Baytown project, and maybe just if you could give us a little bit more on what your view of adequate incentives there would be. If the PTC on green hydrogen was extended to blue, would that be sufficient to sanction the project? And then, , sorry, just as a follow-on to that, as you talk about a level playing field across a technology neutrality, is your view that, a new, gray hydrogen ATR should get some sort of incentive? Maybe you could just give us the context of how you're thinking about that project and what it needs to move forward.

Thank you.

A - Darren W Woods {BIO 17692013 <GO>}

Yeah, sure. I'm happy to do that, Steve. What I would say is, , it's a-- that work we're doing to develop it is, I think, demonstrating the difficulty of starting brand-new businesses and value chains where none exist, in that we're kind of simultaneously trying to build demand, trying to build supply, and then trying to, in the early days of this market, establish financial incentives to do that.

And those are the three core key variables to a successful business, all kind of basically being generated for the first time in this space along this value chain. So I just put that out there as it's a challenging construct, but, frankly, one that plays to our strengths and the ability to look along the entire value chain. And we are uniquely situated to manage each piece of that. There are very few, if any, companies out there that have a portfolio and capabilities that extend end-to-end along this value chain.

So I feel good about what we're doing there and the work that we've put in place. And, frankly, it looks to me like a very viable project. We are continuing to progress that. But it will require that the necessary incentives are in place with respect to what's required with incentives.

I would say the IRA and the incentives that were developed as part of the IRA are enough to do that. The challenge is taking the IRA, which I believe rightly focused on carbon intensity and incentivizing carbon intensity, translating that legislation into regulation. And if the regulation reflects the intent of that legislation and writes the rules focused on carbon intensity, that will be enough to justify and to incentivize and give us a return on this investment. That's--we don't focus so much on the green, the blue, and, color schemes.

We instead focus on how can we meet what is ultimately the objective here, which is to reduce the CO2 associated with the production of these products. And we think all the work we've been doing in our facilities, in our feedstock, and decarbonizing those contributes to that. And so we feel like we're well-positioned with the existing set of incentives as long as those incentives are fairly reflected in the regulations. In a level playing field, what I mean by that is staying focused on carbon intensity and ignoring colors.

Q - Steven Richardson {BIO 15036459 <GO>}

Very clear. Thank you.

A - Darren W Woods {BIO 17692013 <GO>}

Okay.

Operator

The next question is from John Royall of JP Morgan.

Q - John Royall {BIO 17723205 <GO>}

Hi. Good morning. Thanks for taking my question. So I just had a question about the refinery sale in France.

I know you have a very ambitious program for growth in the downstream business, but you have been trimming and high-grading a bit with some asset sales. Other majors are also reducing their European footprint in refining. Can you just speak to how strategic the remaining European portfolio is? And could we see some more assets shake out in European downstream?

A - Darren W Woods {BIO 17692013 <GO>}

Yeah, sure. I would tell you what you're seeing with the sale in France is really the latest in what's been a fairly long trend with us focused on high-grading refineries, too.

Refineries that have the capability to address a broad suite of products and high-value products. And so integrated facilities that make not only petroleum products but also make chemicals and lubricants and basically a broad array of high-value products. And so we've been, over time, focused on that. They need to be advantaged sites.

They need to be-- We have a cost-to-supply curve. I think you all have heard me talk about this many times across all of our businesses, but we look around the world and make sure make sure that our facilities are on a low cost of supply so that as the margins move up and down that we never become the marginal supplier. And having an integrated facility helps with that, but it also acts as a hedge to make sure that we're not dependent on any one sector for the success of one of our manufacturing facilities. The reorganizations that we put in place have helped greatly

we're working on bringing that gas to shore. Our expectation is we'll have that, brought up sometime end of 2024.

Obviously, the government's working on the receiving end of that gas and responsible for putting in the power station. That's an independent project that's developing. We're also working on the distribution system, and so it's really-- I think the impact of that will come when we get both pieces together and get that linked up and effectively delivering power to the market.

Operator

The next question is from Paul Cheng of Scotiabank.

Q - Paul Cheng {BIO 17337436 <GO>}

Thank you. Hi. Good morning. Darren, in the presentation, you talked about the direct air capture.

Can you give us some idea the-- And you're saying that you aim to reduce the cost by half, and that won't be sufficient. So what will be needed in order. How much is the actual cost reduction from the current level in order for that to be competitive or that to be a real business for you? And also, can you talk about how your approach or technology is different than what's currently in the market, especially one of your competitors in the US.? They already have a-- they said that they have a commercial operation ready, and it's going to come on stream very soon.

Thank you.

A - Darren W Woods {BIO 17692013 <GO>}

Yeah. Sure. Good morning, Paul.

Yeah. What I would say with--Oo, may I start with the last point of your comment, which is, yeah, there are alternatives out there today versus what we're working on. The issue is the cost associated with them, and we're not looking at what we can commercialize in the short term based on what I would say is a very narrow market of limited customers who are willing to pay a very high price to demonstrate a level of decarbonization. We're focused on how we can make this technology broadly applicable at a cost that society can afford.

So that's we are very focused on the long term, not the short term, and our view is the available technologies today don't meet the cost requirements, and that's, somewhere between the $600,000 per ton of CO2 removed, and our view is if you try to apply that across the emissions challenge the planet has, the world won't be able to pay for that. So we've got to find a reduction. Our cost -- we've set an initial target of cutting the cost in half just because that is a significant step change, recognizing it won't be enough, but if we can get the technology-- If we can develop the technology to a point that we're successful there, that gets us on this path and

demonstrates the value of the concepts that we're developing to keep on going and drive further down. With respect to the technology and how it compares to what's commercially available out there, I would say part of the reason why this is proprietary technology is today it's proprietary, and so I'm going to keep it that way.

I would say it is a brand-new approach. There are others who are out there working on new approaches as well, which, frankly, we're happy about. This is a tough challenge to break, and I'm not pretending like we're going to be the ones to solve it, but I am confident that we will give it our all, applying our capabilities. Others are doing that.

As I said in my prepared remarks that we posted, if there's a breakthrough, it doesn't so much matter who has the breakthrough. I think we're going to have a role to play, because once we have a technology that gets to the right cost level, you're going to need global deployment at scale. And my suspect that the technology that will be required for the future, lower-cost direct air capture, will be different than what we've got today and will require some of the technical capabilities that we have. So I see a role for us in the future if this nut gets cracked.

We feel good about what we've seen so far, but we're very early into it, and we're hopeful that we'll make the progress that we're aspiring to and continue to drive the cost down. To your last point, you asked, I think, to me, if it's going to be affordable, you've got to get into the $100-ish a ton of CO2 to start talking about broad deployment around the world. I think that's ultimately where we need to get to.

A - Unidentified Speaker

Thank you, everybody, for joining the call and for your questions today.

We will post the transcript of our Q&A session on our investor website next week. Additionally, we look forward to connecting again on May 29th for our annual shareholders meeting. Now, let me turn it back to the operator to close the call.

Operator

This concludes today's call.

We thank everyone again for their participation. The Event has Ended

https://fortune.com/2024/02/27/exxon-ceo-darren-woods-interview-pay-the-price-for-net-zero/

Exxon Mobil CEO on the ‘dirty secret’ of Net Zero: ‘People who are generating the emissions need to be aware … and pay the price’

BY**JANE THIER**

February 27, 2024 at 1:17 PM MST

“The dirty secret nobody talks about is how much all this is going to cost and who’s willing to pay for it,” Exxon Mobil CEO Darren Woods said.

ANDREW CABALLERO-REYNOLDS—AFP/GETTY IMAGES

As it stands, we’re not on the path to net-zero emissions by 2050, Exxon Mobil CEO Darren Woods said. And maybe that’s not Big Oil’s fault.

“The dirty secret nobody talks about is how much all this is going to cost and who’s willing to pay for it,” Woods, who replaced Rex Tillerson at the helm of Exxon Mobil in January 2017, said. “If you look at the policies [governments] are putting out, the cost is very implicit. It’s not an explicit cost.”

Most objective analyses would suggest that “we’ve waited too long to open the aperture on the solution sets in terms of what we need, as a society, to start reducing emissions,” Woods told *Fortune* CEO Alan Murray and editor-at-large Michal Lev-Ram on a recent episode of the *Leadership Next* podcast. Plus: “We’re not investing nearly enough in the technology.”

Exxon Mobil is No. 3 on the Fortune 500 and the largest gas and oil corporation in the U.S., having posted a $36 billion profit in 2023. The firm has “tabled proposals” with governments worldwide, Woods said, “to get out there and start down this path using existing technology.” But it’s been hamstrung by a need for cost transparency—and the fact that everyday people are responsible for generating the emissions too.

“People who are generating the emissions need to be aware of [it] and pay the price,” Woods said. “That’s ultimately how you solve the problem.”

The cost of climate activism could be on consumers’ shoulders

Woods, though the head of a fossil fuel giant, has some ground to stand on; he was the first oil and gas CEO to appear at a UN climate summit when he attended COP28 late last year, advocating for reducing emissions and investing in clean energy. In 2022, Exxon Mobil invested $17 billion in its lower-emission initiatives. It has long maintained that greenhouse gas emissions, not fossil fuels, are behind climate change—claims over which it is now being sued.

The main issue, in any case, is that fixing the problem is currently too expensive, Woods told Murray and Lev-Ram. “People can’t afford it, and governments around the world rightly know that their constituents will have real concerns,” he went on. “So we’ve got to find a way to get the cost down to

grow the utility of the solution, and make it more available and more affordable so that you can begin the [clean energy] transition."

Society is not currently on that path to 2050, in Woods' view. "The policies that are being put in place aren't aggressive enough, and don't incentivize the right kind of actions to be successful."

To have any chance of achieving carbon neutrality within the next 25 years, civilians must "be willing to pay for carbon reduction, because today we have opportunities to make fuels with lower carbon, but people aren't willing to spend the money to do that," he said. Businesses aren't keen on shelling out, either. "We could, today, make sustainable aviation fuel for the airline business, but the airline companies can't afford to pay."

The onus is both political and the personal

The challenge, in Woods' mind, is reframing the cost as necessary on both a corporate and personal level, rather than a nice-to-have. It's anyone's guess how long that would take. "I can't predict if we'll be successful in that space or not." A popular suggestion for passing the cost off to consumers is carbon taxes or a built-in charge on purchased goods, though many experts nonetheless encourage the most offending firms to shoulder the cost burden, not individuals.

It's larger society, in Woods' mind, that has fallen short of its own expectations. "Frankly, society, and the activist—the dominant voice in this discussion—has tried to exclude the industry that has the most capacity and the highest potential for helping with some of the technologies," he said. "How quickly will innovation come? How quickly can we scale [it]? How low can we get the cost? I, frankly, can't answer that."

Much work is left to be done—obviously. Woods points to one particular example: direct air capture, an advancement in which Exxon Mobil has invested heavily. "We just built a pilot plant prototype that we're working on to try and cut the cost in half—which by the way, will still be too expensive," he said. "But we want to get down on that curve. And there are a lot of companies out there trying to advance the technology in this space. How quickly will they succeed? I don't know the answer to that."

Murray pointed out the subsidies Exxon Mobil has received through the 2022 Inflation Reduction Act that are geared at encouraging low-carbon energy solutions. But Woods said that too is a Band-Aid solution. "The way that the government is incentivized and trying to catalyze investments in this space is through subsidies," he said. "Driving significant investments at a scale that even gets close to moving the needle is going to cost a lot of money."

The U.S. government is trying to "get things moving" through those subsidies, he added. "But I would tell you building a business on government subsidy is not a long-term sustainable strategy—we don't support that." Exxon Mobil has committed to using its IRA subsidies to advance its low-carbon energy solutions, "but at the same time, we're advocating to move to market forces, either through regulation and prices on carbon."

The challenge with all those solutions, he said, "is the cost ultimately, explicitly bears itself in the price of products out there." And nobody wants to pay up.

https://newsroom.sunpower.com/2024-04-24-An-Update-on-SunPowers-Business

An Update on SunPower's Business

Earlier today, Tom Werner shared the following note with all SunPower employees.

Team,

I'm writing to share difficult news with you as we implement changes across our organization in the days and weeks to come. To position SunPower for the future, we need to achieve financial viability, which includes simplifying our business structure, transitioning away from areas where we have been unable to sustain profitable operations, and improving financial controls.

As such, we are moving to a low fixed-cost model that we believe we will be able to better flex when the market is up or down. Specifically, we are winding down our SunPower Residential Installation (SPRI) locations and closing SunPower Direct sales. We are also reducing our workforce to better align our business with our new focus. With this shift, we will reduce our workforce by approximately 1,000 people in the coming days and weeks.

While we worked hard to avoid this outcome, the market has been slower to recover than we initially expected. Additionally, we have dedicated resources to improving our financial controls, and will continue to do so. We believe this shift in our strategy is necessary to safeguard the company's future.

What this means for you

We will inform those of you who are impacted via your personal emails starting at 6:15am PT via an email from AskHR. In some cases, we will host subsequent team meetings to provide more clarity on next steps and what's ahead.

Some of our impacted team members will depart today, and others will remain on with us for a period of time to help facilitate the transition for our customers. For those talented and devoted colleagues who are departing, we are deeply grateful for your lasting contributions. We are offering a competitive separation package to assist our former colleagues in their transition.

For those staying at SunPower, we recognize this is hard news to receive and will take some time to process. Your ELT members will meet with you today, and we will host an all-employee meeting later this week to provide time for more discussion and questions.

Our path ahead

Through these transitions, we remain committed to delivering high-quality, affordable clean energy systems that meet the unique needs of families across the country. We are dedicated to doing this in a manner that aims to ensure a positive experience for our customers on their solar journey.

After a short transition period, all pipeline operations from pre-installation through system activation will be handled by Blue Raven Solar, full-service installation partners, and our trusted network of SunPower-certified dealers — all who meet our standards of integrity, design, quality, and customer service. As we make this transition over the next month, we are dedicated to handling our customer experience with the highest levels of care and with minimal impact on timelines.

Moving forward, SunPower will focus our efforts on serving our best-in-class Dealer Network and installation partners. We plan to continue to invest in our New Homes business, which continues to grow. We will still manage ongoing customer service needs, including operations and maintenance (O&M), and will continue to honor our Complete Confidence warranty.

We appreciate the ongoing support from our employees, partners and customers as we move SunPower into its next era. Even on our toughest days, I know together we can change the way our world is powered.

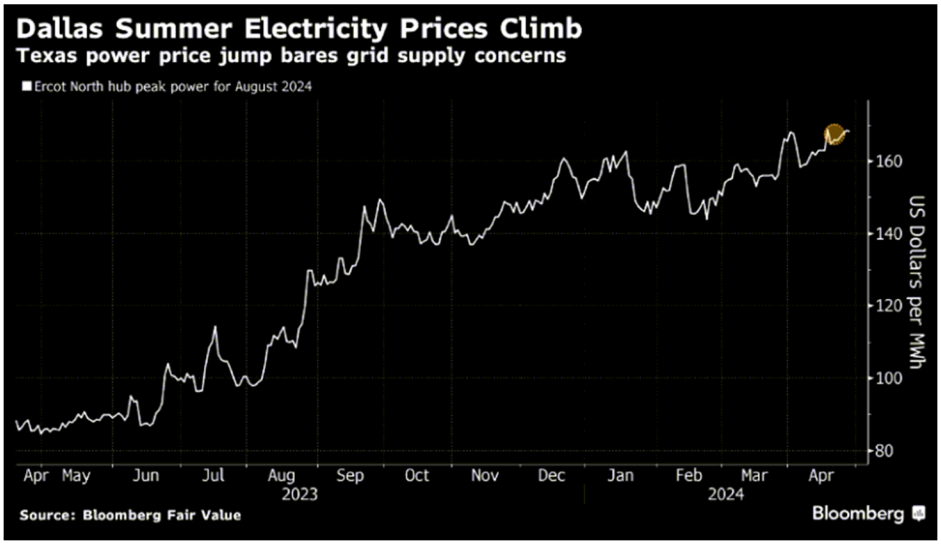
Regards,

Tom Werner

Principal Executive Officer

Texas Power Prices Signal Grid Stress in Long, Hot Summer Repeat
2024-04-27 13:30:00.0 GMT

By Naureen S. Malik
(Bloomberg) -- A surge in Texas power prices for August suggests another summer of heavy electricity demand — and potential grid strain — to meet air-conditioning needs.
Traders start looking at prices months in advance to gauge the outlook for demand.
Already in mid-April, August power prices for Dallas soared to $168.70 a megawatt-hour, which was the highest level in five years for this time of the year, according to Bloomberg Fair value data. Prices were still hovering around that level on Friday, an 82% premium versus a year earlier.
The state's grid operator warned the same day of possible deficient power reserves from April 29 through May 1.
The Texas grid repeatedly has suffered from tight electricity supplies in the past two years as extreme weather and surging power demand stress aging infrastructure. As the state becomes more reliant on renewable energy that hinges on the whims of the sun and the air, there's a rising concern about potential electric scarcity as solar power plunges at dusk. At those times — often when demand is still very strong — natural gas-fired plants and batteries need to ramp up quickly to keep the power flowing.
"That's a lot of scarcity priced in," Terry Embury, head of trading and marketing operations at AES Corp.'s clean energy unit, said at the Gulf Coast Power Association conference in Houston earlier this month. "Uncertainty is always a driver," and for now these prices appear to be stable and fairly factors in the summer risk, he said.



Power usage on the state grid rose to all-time highs nearly two dozen times in the previous two summers combined and is expected to rise even further this summer, according to the Electric Reliability Council of Texas, or Ercot, the state's grid operator.

“If we get a summer like last summer, I think we are underpriced,” said Luis Luego, head of Ercot trading at Mercuria Energy America, at the same conference where power prices in the state were a trending topic.

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https://www.theguardian.com/inequality/2024/apr/25/ministers-of-germany-brazil-south-africa-and-spain-why-we-need-a-global-tax-on-billionaires

Ministers of Germany, Brazil, South Africa and Spain: why we need a global tax on billionaires

Svenja Schulze, Fernando Haddad, Enoch Godongwana, María Jesús Montero and

Carlos Cuerpo

Finance chiefs say higher taxes for the super-rich are key to battling global inequality and climate crisis

- Billionaires should pay minimum 2% wealth tax, say G20 ministers
-

Thu 25 Apr 2024 06.00 BST

When the governors of the World Bank and the International Monetary Fund convened for the spring meetings last week, it was all about the really big questions. What can the international community do to accelerate decarbonisation and fight climate change? How can highly indebted countries retain fiscal space to invest in poverty eradication, social services and global public goods? What does the international community need to do to get back on track towards reaching the Sustainable Development Goals (SDGs)? How can multilateral development banks be strengthened to support these ambitions?

There is one issue that makes addressing these global challenges much harder: inequality. While the disparity between the richest and poorest countries has slightly narrowed, the gap remains alarmingly high. Moreover, in the past two decades, we have witnessed a significant increase in inequalities within most countries, with the income gap between the top 10% and the bottom 50% nearly doubling. Looking ahead, current global economic trends pose serious threats to progress towards higher equality.

The multidimensional character of inequality is undeniable. Basic services such as healthcare and education are not equally available to all. Often, this inequality of opportunity is handed down from generation to generation. Social origins, gender, race or where people live are some of the factors that play a role in reproducing inequalities. Furthermore, high inequality harms economic development because it inhibits innovation and prevents people from developing their full potential. It is corrosive to democracy and weakens social cohesion. And where social cohesion is weak, there is less support for the structural reforms we will need to undertake in the coming years, such as the necessary transformation towards a net zero economy.

Fortunately, there is a growing global awareness of the importance not only of growth, but of sustainable and equitable growth. Increasing prosperity while tackling inequality within and across countries and generations, including entrenched race and gender inequalities, should not be at odds. Achieving truly sustainable growth lies in balancing three fundamental concerns: economic, social, and environmental.

It is against this background that Brazil has made the fight against hunger, poverty and inequality a priority of its G20 presidency, a priority that German development policy also pursues and that Spain has ambitiously addressed domestically and globally. By directing two-thirds of total expenditure on social services and wage support, as well as by calibrating tax policy administration, South Africa continues to target a progressive tax and fiscal agenda that confronts the country's legacy of income and wealth inequality.

It is time that the international community gets serious about tackling inequality and financing global public goods. One of the key instruments that governments have for promoting more equality is tax policy. Not only does it have the potential to increase the fiscal space governments have to invest in social protection, education and climate protection. Designed in a progressive way, it also ensures that everyone in society contributes to the common good in line with their ability to pay. A fair share contribution enhances social welfare.

With exactly these goals in mind, Brazil brought a proposal for a global minimum tax on billionaires to the negotiation table of the world's major economies for the first time. It is a necessary third pillar that complements the negotiations on the taxation of the digital economy and on a minimum corporate tax of 15% for multinationals. The renowned economist Gabriel Zucman sketched out how this might work. Currently, there are about 3,000 billionaires worldwide. The tax could be designed as a minimum levy equivalent to 2% of the wealth of the super-rich. It would not apply to billionaires who already contribute a fair share in income taxes. However, those who manage to avoid paying income tax would be obliged to contribute more towards the common good.

The argument behind such tax is straightforward: we need to enhance the ability of our tax systems to fulfil the principle of fairness, such that contributions are in line with the capacity to pay. Persisting loopholes in the system imply that high-net-worth individuals can minimise their income taxes. Global billionaires pay only the equivalent of up to 0.5% of their wealth in personal income tax. It is crucial to ensure that our tax systems provide certainty, raise sufficient revenues, and treat all of our citizens fairly.

A coordinated global minimum levy on billionaires would constitute a significant step in this direction. It would boost social justice and increase trust in the effectiveness of fiscal redistribution. It would generate much-needed revenues for governments to invest in public goods such as health, education, the environment, and infrastructure – from which everybody benefits, including those at the top of the income pyramid. Estimates suggest that such a tax would potentially unlock an additional $250bn in annual tax revenues globally – this is roughly the amount of economic damages caused by extreme weather events last year.

Of course, the argument that billionaires can easily shift their fortunes to low-tax jurisdictions and thus avoid the levy is a strong one. And this is why such a tax reform belongs on the agenda of the G20. International cooperation and global agreements are key to making such tax effective. What the international community managed to do with the global minimum tax on multinational companies, it can do with billionaires.

Fighting inequality requires political commitment – a commitment to the objectives of inclusive, fair and effective international tax cooperation. Surely, it needs to go hand-in-hand with much broader approaches that reduce not only wealth inequality but also social and carbon inequalities. The challenges that lie ahead are huge, but we stand ready to engage in concerted multilateral action to tackle them.

- *Svenja Schulze is Germany's minister for economic cooperation and development; Fernando Haddad is the minister of finance in Brazil; Enoch Godongwana is the minister of finance in South Africa; María Jesús Montero is first vice president and minister of finance and Carlos Cuerpo is the minister of economy, trade and business in Spain*

https://www.g20.org/en/news/economist-gabriel-zucman-proposes-that-billionaires-pay-at-least-2-in-annual-taxes-on-their-fortunes

Economist Gabriel Zucman proposes that billionaires pay at least 2% in annual taxes on their fortunes

During a press conference this Thursday (29), Economist Gabriel Zucman, serving as Minister Fernando Haddad's special guest in the G20 debate on the taxation of large fortunes, advocated for the necessity of a globally coordinated minimum tax on substantial fortunes, set at a minimum of 2% annually.

03/01/2024 9:32 AM - Modified 2 months ago

A globally well-known reference on the issue, the economist declared that there is no need for everyone to agree for the taxation of the super-rich to be implemented. Credit: Kelly Fersan/MF

If implemented, the measure would potentially unlock an additional 250 billion American dollars in tax revenues. What is most impressive is that today, this extra amount would be generated with a minimum taxation of 2% applied to a restricted group of 3 thousand billionaires. This is an indicator of the concentration of wealth and the need to implement a more equitable system, which in Zucman's view would help strengthen social cohesion and democracy.

Zucman congratulated Brasil's Presidency of the G20 for bringing the issue to the negotiation table of the world's major economies for the first time. "Brasil's leadership in introducing this topic fosters a historical development," stated the 37-year-old economist, also the director of the EU Tax Observatory.

The best way to solve the issue of "regressivity at the top of the distribution," or in other words, the wealthiest people paying less taxes while the poorest proportionally pay more, is to create a minimum pattern to tax the super-rich, which would avoid a fiscal war among countries.

And why impose a tax over large fortunes when an Income Tax already exists? According to Zucman, the concept of income is not well-defined, while wealth is. In the Brazilian case, for example, a wage-earning citizen pays Income Tax monthly through withholdings from their paycheck while wealthier individuals can either reduce or simply avoid paying taxes by utilizing legal and/or tax advisory services.

According to Zucman, the concept of wealth, especially that of billionaires, is much more clearly defined. He emphasizes that there is good information about the value of the companies owned by the super-rich, many of which are listed on stock exchanges. And even when these companies are not publicly traded, it is possible to estimate their value simply by comparing them with companies of similar size and in the same industry that have shares traded on stock exchanges.

When questioned about the viability of the proposal, Zucman stated that believing that all countries will agree with one solution is likely utopic. At the same time, he declared that there is no need for all countries to agree for the taxation of the super-rich to be implemented. “We do not need a global consensus on the matter. We can advance with a coalition of agreements,” he said.

Zucman recalled the minimum taxation of 15% over the profits of multinational companies, proposed by the Organization for Economic Co-operation and Development (OECD); around 140 countries agreed with the measure, even though only 35 are currently implementing it.

When questioned about when the large fortunes taxation would start taking effect, Zucman said there is no deadline, but highlighted that the sooner it happens, the better. The economist stated that his proposal had received positive feedback, highlighting that the US Secretary of Treasure, Janet Yellen, mentioned that the Biden administration would have a similar project. “It is clear that there is room for ideas like this in key countries, such as the US. France is also highly in favor of it.”

Winner of the John Bates Clark medal in 2023, the second most important recognition in the field of Economics, second most significant in the field of Economics, surpassed only by the Nobel Prize, and author of impactful books such as “The Hidden Wealth of Nations”, Zucman said he is working on a study, at the request of minister Haddad, about issues such as the best destination for the resources obtained with the possible taxation of the super-rich.

THE INVESTMENT FUNDS INSTITUTE OF CANADA | L'INSTITUT DES FONDS D'INVESTISSEMENT DU CANADA

IFIC monthly investment fund statistics – March 2024

Mutual fund and exchange-traded fund (ETF) assets and sales

April 23, 2024 (Toronto) – The Investment Funds Institute of Canada (IFIC) today announced investment fund net sales and net assets for March 2024.

Mutual fund assets totalled $2.055 trillion at the end of March, up by $43.1 billion or 2.1 per cent since February. Mutual fund net sales were $0.2 billion in March.

ETF assets totalled $417.1 billion at the end of March, up by $13.4 billion or 3.3 per cent since February. ETF net sales were $4.0 billion in March.

March insights

- Mutual fund and ETF assets increased for the fifth consecutive month. For mutual funds, assets increased by 13.5 per cent, or by $244.4 billion since October 2023. ETF assets increased by 20.8 per cent or by $71.8 billion.
- Bond funds have been the largest source of mutual fund inflows and the best-selling asset category for the past four months. Prior to December, money market funds saw the highest inflows each month going back to March 2023.
- For ETFs, inflows remained concentrated in equity funds. Year to date, equity funds accounted for 74.1 per cent of total net sales.

Mutual fund net sales/net redemptions ($ millions)*

Asset class	Mar 2024	Feb 2024	Mar 2023	YTD 2024	YTD 2023
Long-term funds					
Balanced	(2,727)	(871)	(4,167)	(8,073)	(9,512)
Equity	722	1,548	(2,013)	1,212	(2,257)
Bond	1,688	1,768	480	7,198	6,307
Specialty	626	777	456	1,969	1,169
Total long-term funds	309	3,221	(5,244)	2,306	(4,293)
Total money market funds	(107)	(40)	1,800	340	4,118
Total	202	3,182	(3,445)	2,646	(175)

Mutual fund net assets ($ billions)*

Asset class	Mar 2024	Feb 2024	Mar 2023	Dec 2023
Long-term funds				
Balanced	938.3	923.4	903.7	904.4
Equity	784.3	760.8	682.9	714.7

Bond	250.4	247.2	233.6	242.4
Specialty	30.1	28.9	23.7	27.0
Total long-term funds	2,003.2	1,960.2	1,843.8	1,888.5
Total money market funds	52.1	52.0	39.0	51.0
Total	2,055.3	2,012.2	1,882.8	1,939.5

* Please see below for important information regarding this data.

ETF net sales/net redemptions ($ millions)*

Asset class	Mar 2024	Feb 2024	Mar 2023	YTD 2024	YTD 2023
Long-term funds					
Balanced	427	450	156	1,280	387
Equity	2,935	4,032	3,784	9,363	4,422
Bond	701	1,209	2,297	2,230	2,585
Specialty	(109)	22	(190)	(434)	615
Total long-term funds	3,953	5,713	6,047	12,440	8,010
Total money market funds	1	(207)	795	195	2,441
Total	3,954	5,506	6,842	12,634	10,450

ETF net assets ($ billions)*

Asset class	Mar 2024	Feb 2024	Mar 2023	Dec 2023
Long-term funds				
Balanced	17.3	16.5	13.0	15.1
Equity	261.1	250.6	209.3	233.0
Bond	95.9	94.8	84.4	94.6
Specialty	17.2	16.3	11.8	14.4
Total long-term funds	391.5	378.2	318.4	357.2
Total money market funds	25.6	25.6	18.7	25.3
Total	417.1	403.8	337.1	382.5

* See below for important information about data.

IFIC direct survey data (which accounts for approximately 87 per cent of total mutual fund industry assets and approximately 80 per cent of total ETF industry assets) is complemented by estimated data to provide comprehensive industry totals.

IFIC makes every effort to verify the accuracy, currency and completeness of the information; however, IFIC does not guarantee, warrant, represent or undertake that the information provided is correct, accurate or current.

*** Important information about investment funds data**

1. Mutual fund data is adjusted to remove double counting arising from mutual funds that invest in other mutual funds.
2. Starting with January 2022 data, ETF data is adjusted to remove double counting arising from Canadian-listed ETFs that invest in units of other Canadian-listed ETFs. Any references to IFIC ETF assets and sales figures prior to 2022 data should indicate that the data has not been adjusted for ETF of ETF double counting.
3. The balanced funds category includes funds that invest directly in a mix of stocks and bonds or obtain exposure through investing in other funds.
4. Mutual fund data reflects the investment activity of Canadian retail investors.
5. ETF data reflects the investment activity of Canadian retail and institutional investors.

About IFIC

The Investment Funds Institute of Canada is the voice of Canada's investment funds industry. IFIC brings together 150 organizations, including fund managers, distributors and industry service organizations, to

foster a strong, stable investment sector where investors can realize their financial goals. By connecting Canada's savers to Canada's economy, our industry contributes significantly to Canadian economic growth and job creation. Learn more about IFIC

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416-309-2313

https://press.aarp.org/2024-4-24-New-AARP-Survey-1-in-5-Americans-Ages-50-Have-No-Retirement-Savings

APR 24, 2024

New AARP Survey: 1 in 5 Americans Ages 50+ Have No Retirement Savings and Over Half Worry They Will Not Have Enough to Last in Retirement

AARP is Working to Turn the Tide at the State and Federal Levels, With at Least 19 States Taking Action to Date

WASHINGTON—A new AARP survey finds that 20% of adults ages 50+ have no retirement savings, and more than half (61%) are worried they will not have enough money to support them in retirement. The findings also reveal a decline in overall sense of financial security among men, 42% of whom describe their financial situation as "fair" or "poor," up from 34% in the beginning of 2022. However, roughly 40% of men who are regularly saving for retirement believe they are saving enough, compared to just 30% of women.

"Every adult in America deserves to retire with dignity and financial security. Yet far too many people lack access to retirement savings options and this, coupled with higher prices, is making it increasingly hard for people to choose when to retire," said Indira Venkateswaran, AARP Senior Vice President of Research. "Everyday expenses continue to be the top barrier to saving more for retirement, and some older Americans say that they never expect to retire."

Nearly one-third (30%) of older adults who carry over a credit card balance from month-to-month report carrying a balance of $10K or more, while 12% described their balance as $20K or more, up from 8% roughly a year ago.

Despite this, 33% of respondents ages 50+ believe their finances will be better 12 months from now, but the lingering effects of inflation and high costs are still apparent:

- More than one-third (37%) are worried about covering basic expenses, such as food and housing.
- More than a quarter (26%) are worried about covering family caregiving costs.
- Seven in 10 (70%) are worried about prices rising faster than their income.
- Over a quarter (26%) of people who are not yet retired say they expect to never retire.

"America is facing a serious retirement crisis. AARP has a long history of supporting legislation to expand access to retirement savings, but Congress must act more swiftly to provide the financial support older Americans need and deserve," said Nancy LeaMond, AARP Executive Vice President and Chief Advocacy & Engagement Officer. "We have worked with 19 states to create programs to make it easier for people whose employers don't offer a retirement plan to be able to save for their future. But about two-thirds of states have yet to act, and we await action from the federal government."

Americans are 15 times more likely to save for retirement when they have access to a workplace plan. Yet nearly 57 million people do not have access to a retirement plan at work.

Congress is currently considering different pieces of legislation that would expand retirement security, including the bipartisan Retirement Savings for Americans Act of 2023, which would provide retirement savings accounts to eligible workers without employer-sponsored retirement plans, and the Automatic IRA Act of 2024.

Eight states have auto-IRA programs up and running: California, Colorado, Connecticut, Illinois, Maine, Maryland, Oregon, and Virginia, while Massachusetts has a multiple employer plan in place. Ten other states have passed legislation and are at various stages of implementation, including Washington, where auto-IRA legislation was signed into law last month.

To view the full Financial Security Trends Survey and methodology, visit aarp.org/financialtrends. And learn more about AARP's ongoing efforts to make it easier for everyone to save for retirement.

# # #

About AARP

AARP is the nation's largest nonprofit, nonpartisan organization dedicated to empowering Americans 50 and older to choose how they live as they age. With a nationwide presence, AARP strengthens communities and advocates for what matters most to the more than 100 million Americans 50-plus and their families: health security, financial stability and personal fulfillment. AARP also works for individuals in the marketplace by sparking new solutions and allowing carefully chosen, high-quality products and services to carry the AARP name. As a trusted source for news and information, AARP produces the nation's largest circulation publications, AARP The Magazine and AARP Bulletin. To learn more, visit www.aarp.org/about-aarp/, www.aarp.org/español or follow @AARP, @AARPenEspañol and @AARPadvocates on social media.

For further information: Alex Guerin, aguerin@aarp.org, 202-710-0472

https://www.nippon.com/en/japan-data/h01967/

Japan Data

Japan's Population Declines Again: Seniors 75 and Over Top 20 Million for First Time

Society Apr 24, 2024

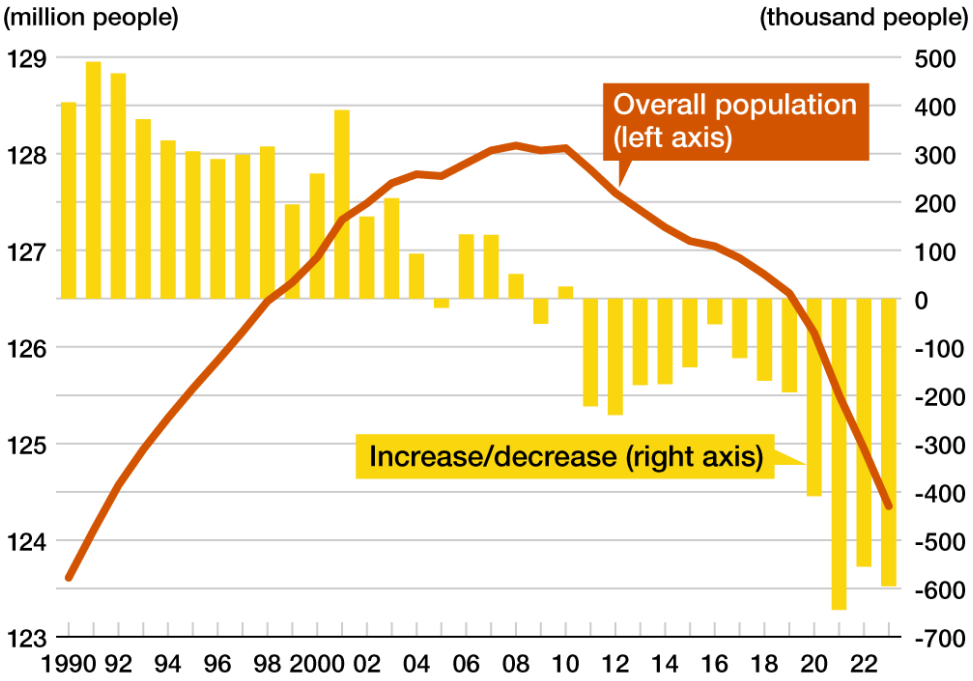
In 2023, Japan's overall population declined for the thirteenth consecutive year, but its population aged 75 and over rose above 20 million for the first time, as more of the baby boom generation joined this cohort.

- An estimate published by Japan's Ministry of Internal Affairs and Communications shows that the total population as of October 1, 2023, was 124,352,000. This was a drop of 595,000 (0.48%) from the previous year. It is the thirteenth consecutive year that the population decreased. The population of Japanese citizens was 121,193,000, for a record year-on-year decrease of 837,000, or 0.69%.

The natural population decline, calculated by subtracting births from deaths, reached a record high of 837,000, rising for the seventeenth year running. This decline was 414,000 for women and 423,000 for men. For the second straight year, there was a net increase in immigration, with 242,000 more people entering than leaving Japan.

By prefecture, the population only increased in Tokyo, with decreases in all the remaining 46 prefectures. The rate of population decline was more than 1% in 15 prefectures, including Akita (-1.75%), Aomori (-1.66%), and Iwate (-1.45%).

Population Change in Japan

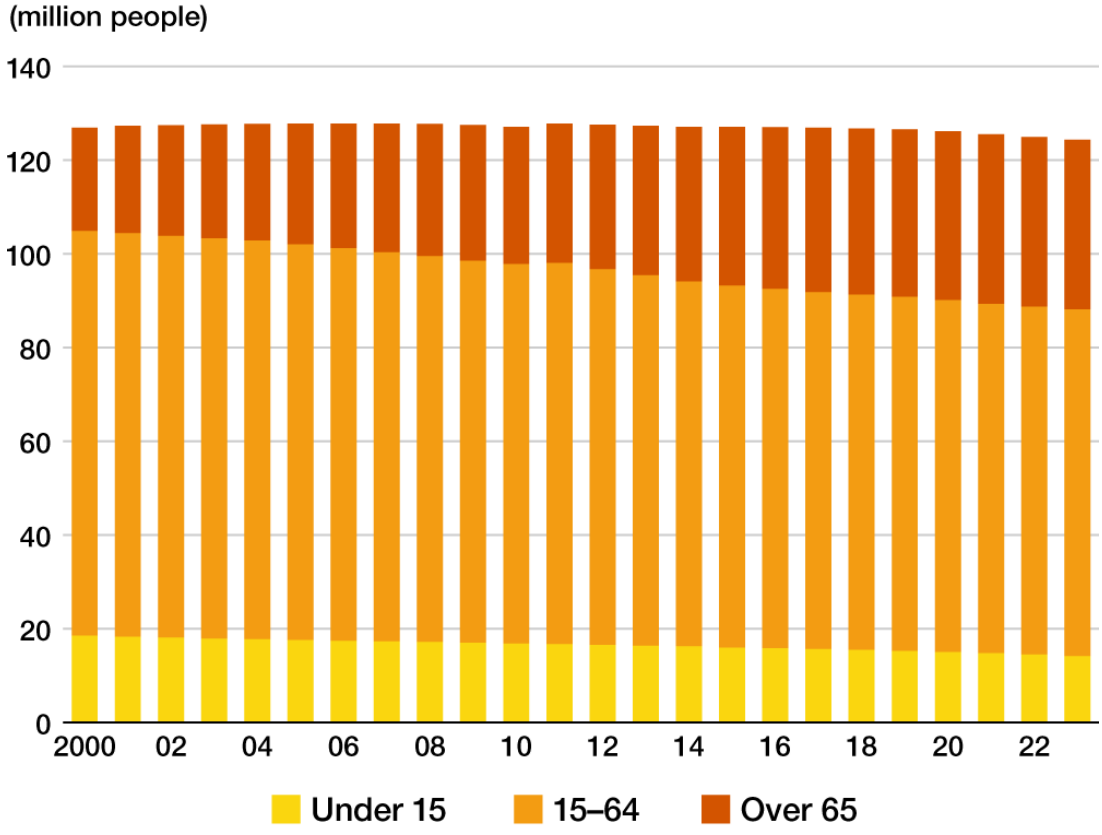


Created by *Nippon.com* based on data from the population estimate of the Ministry of Internal Affairs and Communications (as of October 1, 2023).

nippon.com

By age group, the working population, consisting of people aged 15 to 64, stood at 73,952,000; a year-on-year decrease of 256,000. The population 65 or older decreased by 9,000, to 36,227,000, marking the first year-on-year decrease since comparable records began in 1950. However, those 75 or older increased by 713,000, to 20,078,000, surpassing the 20-million mark for the first time. This age bracket now accounts for 55.4% of those aged 65 or older.

Population Changes for Three Key Age Groups



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(Translated from Japanese. Banner photo © Pixta.)

https://newsroom.aaa.com/2024/04/fast-on-the-freeway-can-lead-to-fury-on-the-side-streets-speed-limit/

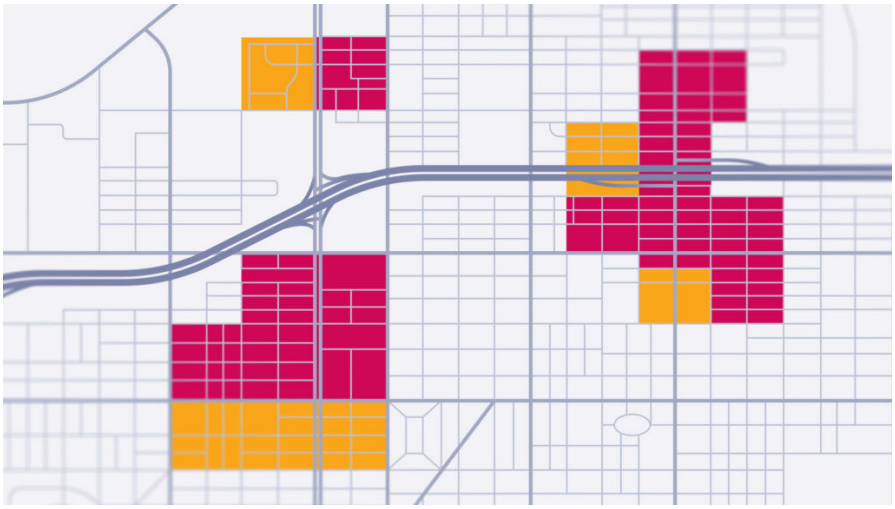
Fast on the Freeway Can Lead to Fury on the Side Streets

New AAA Research Exposes the Crash Danger of Spillover Speeding

Andrew GrossManager, AAA Public Relations

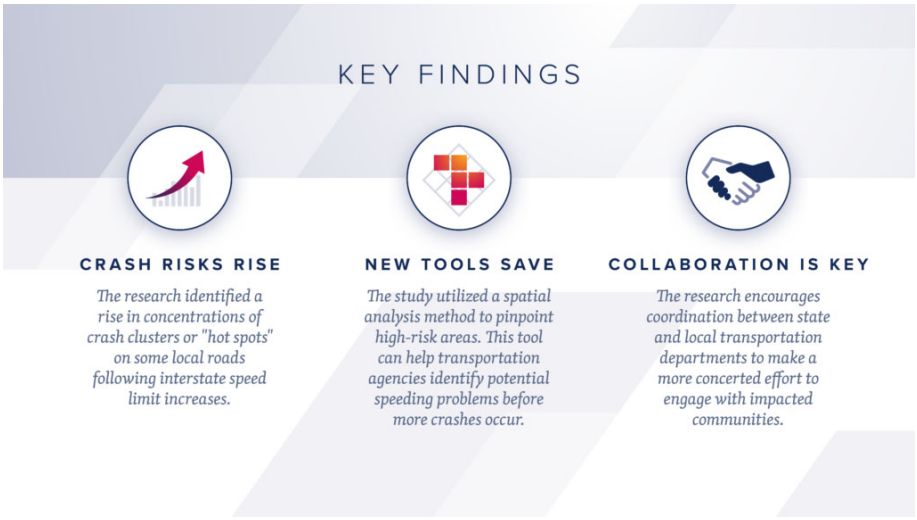
AGross@national.aaa.com

4/25/2024



Washington, DC (April 25, 2024) – Raising speed limits on highways could lead to more crashes on nearby roads, according to new research by the AAA Foundation for Traffic Safety. This "spillover effect" creates unintended safety hazards for local communities that might not be involved in the decision-making process to raise the posted speed limit on a nearby highway. According to NHTSA, speeding is a significant safety concern, contributing to almost one-third of road fatalities in the past 20 years.

AAA Foundation researchers investigated whether changes to posted speed limits on interstate highways could cause drivers to adopt risky speeding behaviors on local streets. The study looked at crash data before and after speed limit increases on interstates in Georgia, Michigan, and Oregon. Hot spot analyses were conducted on roads within a 1-mile radius of interstates. Researchers found many instances where speed-related crashes increased on nearby roads following the interstate speed limit change, suggesting that drivers exiting the highway continued their faster tendencies.



"Increasing posted speed limits on freeways may improve traffic flow but could also lead to safety concerns in adjacent communities once speeding drivers proceed to neighboring roadways," said Dr. David Yang, president and executive director of the AAA Foundation. Local streets around our homes are designed for slower speeds and diverse road users such as pedestrians and cyclists—not for speeding drivers."

AAA recommends a multi-pronged approach to combat speeding behavior:

By taking a proactive approach, transportation officials can create safer road networks for all communities. The AAA Foundation's research reinforces the importance of the Safe System Approach (SSA). The SSA is a strategic way of leveraging the engineering and behavioral countermeasures proven effective at preventing traffic crashes and the injuries that can result from them. Explore the Foundation's guide for implementing the SSA in your community HERE.

"This research has uncovered an unintended but potentially lethal consequence of raising highway speed limits," said Jake Nelson, AAA's director of traffic safety advocacy. "With the U.S. near a record-high traffic death toll, road authorities can use these findings and an effective tool to pinpoint lifesaving solutions to help ensure that we all get home safely each day."

Previous speeding research by the AAA Foundation found that raising posted highway speed limits is associated with increased crash frequencies in some situations. At the same time, changes in travel times were small in response to both raised and lowered speed limits.

About the AAA Foundation

Established in 1947 by AAA, the Foundation for Traffic Safety is a nonprofit, publicly funded 501(c)(3) charitable research and educational organization. The AAA Foundation's mission is to prevent traffic deaths and injuries by researching their causes and by educating the public about strategies to prevent crashes and reduce injuries when they do occur. This research informs the development of educational materials for drivers, pedestrians, bicyclists, and other road users.

About AAA

Started in 1902 by automotive enthusiasts who wanted to chart a path for better roads in America and advocate for safe mobility, AAA has transformed into one of North America's largest membership organizations. Today, AAA provides roadside assistance, travel, discounts, financial and insurance services to enhance the life journey of over 64 million members across North America, including over 57 million in the United States. To learn more about all AAA offers or become a member, visit AAA.com.

Dan Tsubouchi @Energy_Tidbits · 36m

Reality check!

"*The world now and the world in the future will require every molecule. Let's work together, comprehensively, to make sure these molecules will be clean*" Saudi Prince Abdulaziz.

Energy demand incl #Oil & especially #NatGas is going higher

Thx @staunovo.
#OOTT

My point, simply said, the world now and the world in the future will require every molecule. Let's work together, comprehensively, to make sure that these molecules will be clean molecules or electrons that will be also clean electrons. The world needs all of the above."
Saudi Energy Minister Abdulaziz

SAF Group created transcript of comments by Saudi Energy Minister Abdulaziz at WEF in Riyadh on Apr 28, 2024. Video posted by UBS Giovanni Staunovo https://twitter.com/staunovo/status/1784568163474059392

Items in "*italics*" are SAF Group created transcript.

Abdulaziz *"I just want to make sure that we depart with some hopefully with an idea or two. First of all, let's congregate on the principle that being green is not an ideology or demagoguery or a religion. There is a script for it and upon which people will be tested. Are you faithful or a believer or are you not a believer. So we have to take that out of our radar. Because what is going on now in today's environment is that it reminds me of the inquisition period. Are you a believer or non-believer. If you are a believer, you are a good boy. If you are not a believer, may God they send you to hell. And get you to be burned by hydrocarbon. Unabated hydrocarbon to make it worse. [chuckle]. But I honestly believe that being environmentally conscious is I think a humanistic view for all of us. Those who are incubating the Earth today and those that will incubate it afterward. In fact, our duty is to make sure that whatever we do today cannot bring any harm and cannot disturb the potential of any future commitment, future aspiration to these generations to come. Be it as it may, I think we should also be conscious of the fact that the energy challenge is so big because we still, now we talking about AI, data centers, the amount of electricity that will be required. The electrification itself, and the component of the electrification which would require also hydrocarbons including plastic and what have you.. My point, simply said, the world now and the world in the future will require every molecule. Let's work together, comprehensively, to make sure that these molecules will be clean molecules or electrons that will be also clean electrons. The world needs all of the above."*

Prepared by SAF Group https://safgroup.ca/news-insights/

> **Dan Tsubouchi** @Energy_Tidbits · Apr 27
>
> Energy Transition not working as planned = Increasing need for #NatGas. This is the age of natural gas! says $BKR CEO Simonelli
>
> The world needs reliable, affordable, 24/7 available #NatGas power especially with emerging data center/AI growth....

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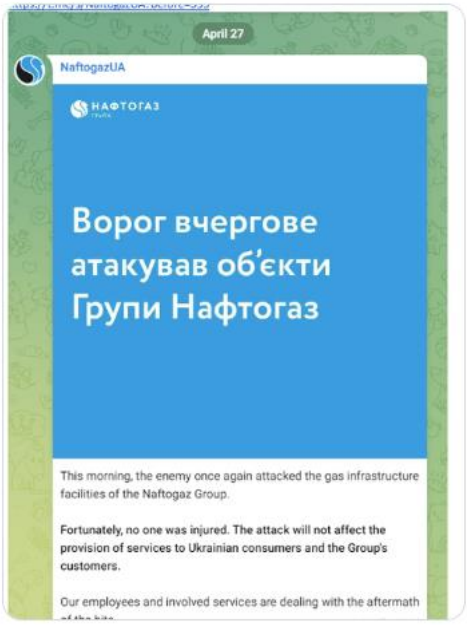
Dan Tsubouchi @Energy_Tidbits · 3h

ICYMI.

Naftogaz confirms multiple Russia ***"hits"*** on Ukraine #NatGas infrastructure at undisclosed locations with undisclosed damage.

However, Naftogaz says no one injured and "*attack will not affect the provision of services to Ukrainian consumers and the Group's customers*"....
Show more



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Dan Tsubouchi @Energy_Tidbits · 11h

UKMTO confirms #oil tanker Andromeda Star hit by Houthi missiles in Red Sea.

#OOTT

> **United Kingdom Maritime Trade Operations (UKM** @UK_MT(· 23h
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> UKMTO DAILY SUMMARY
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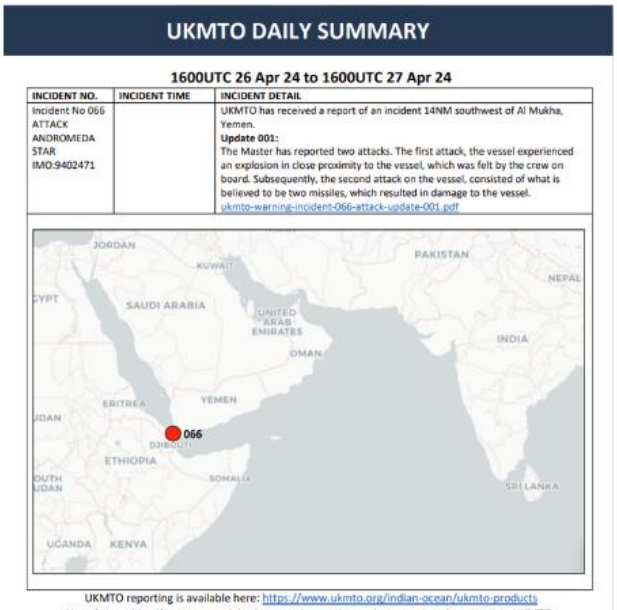


UKMTO DAILY SUMMARY

1600UTC 26 Apr 24 to 1600UTC 27 Apr 24

INCIDENT NO.	INCIDENT TIME	INCIDENT DETAIL
Incident No 066 ATTACK ANDROMEDA STAR IMO:9402471		UKMTO has received a report of an incident 14NM southwest of Al Mukha, Yemen. **Update 001:** The Master has reported two attacks. The first attack, the vessel experienced an explosion in close proximity to the vessel, which was felt by the crew on board. Subsequently, the second attack on the vessel, consisted of what is believed to be two missiles, which resulted in damage to the vessel. ukmto-warning-incident-066-attack-update-001.pdf

UKMTO reporting is available here: https://www.ukmto.org/indian-ocean/ukmto-products
Vessels transiting the area are advised to exercise caution and are requested to report to UKMTO.

4 3 2.9K

SAF

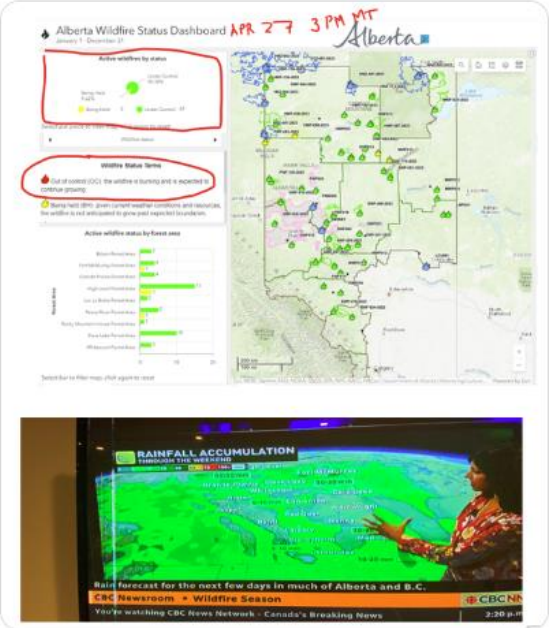
Dan Tsubouchi @Energy_Tidbits · 17h

Zero Out of Control Wildfires in Alberta as of 3pm MT.

Plus precipitation expected across the province this weekend.

Lets hope for more rain/snow to help the Being Held Wildfires

#OOTT



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Dan Tsubouchi @Energy_Tidbits · 20h

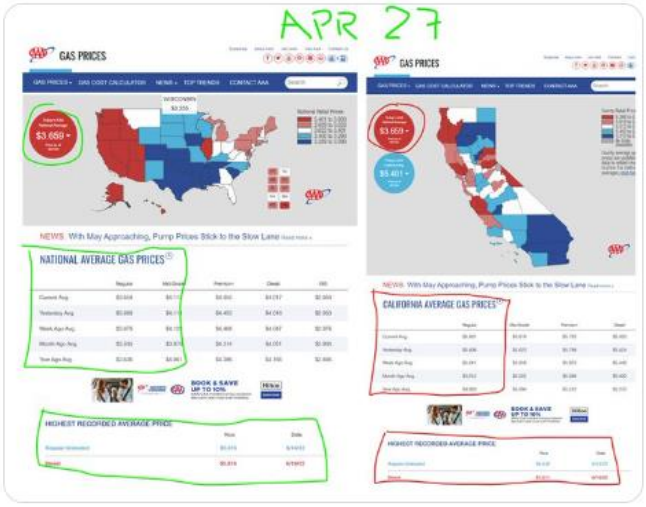
US gasoline prices down $0.02 WoW to $3.66. Now +$0.12 MoM and $0.02 YoY.

California -$0.04 WoW, +$0.39 MoM to $5.40.

Reminder US gas prices normally seasonally increase into June.

Biden doesn't want $4 gas in election year.

Thx @AAAnews #OOTT



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Dan Tsubouchi @Energy_Tidbits · 23h

Daily Europe air traffic still just below Covid.

7-day average got to -1.5% below Covid on Apr 22, but ended back at -3.2% below as of Apr 25.

Vs 3.2% below Apr 18, vs 3.7% below Apr 11, 6.2% below Apr 4 and 7.0% below as of Mar 28.

Thx @eurocontrol. #OOTT

3 2 1.8K

Dan Tsubouchi @Energy_Tidbits · Apr 27

WOW!

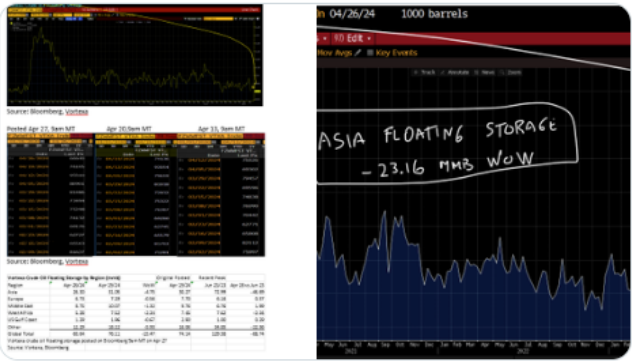
#Oil floating storage -32.67 in last 2 wks to 60.64 mmb Apr 26.

Incl Asia -23.16 mmb, is this Iran cutting prices to find customers in China or India?

Only been 11 wks in 60s/50s since Covid, IF not revised only behind 58.02 mmb on 10/20/23.

...

Show more



> **Dan Tsubouchi** @Energy_Tidbits · Apr 18
>
> 
>
> Vortexa seeing "l*ittle bit of weakness*" on China buying.
>
> Iranian crude oil floating storage +10 mmb in Mar.
>
> Iran offering wider discounts than normal but ...

2 6 31 5.2K

Dan Tsubouchi @Energy_Tidbits · Apr 27

Energy Transition not working as planned = Increasing need for #NatGas. This is the age of natural gas! says $BKR CEO Simonelli

The world needs reliable, affordable, 24/7 available #NatGas power especially with emerging data center/AI growth.

See 👇 Apr 24 tweet.

#OOTT

> **Dan Tsubouchi** @Energy_Tidbits · Apr 24
>
> " ***This is the age of gas"*** $BKR CEO.
>
> *"mounting consensus that there is no possible route to decarbonize the energy system without driving greater efficiency and* ***significantly increasing gases weighting*** *within the ...*
> Sh***ow more***
>
> 
>
> 
>
> 7 16 7.1K

Dan Tsubouchi @Energy_Tidbits · Apr 27

Post US aid deal, Ukraine resumes attacks on Russia's oil refineries, hitting Slavyansk refinery.

Russia retaliates, hits Burshtyn thermal power plant in western Ukraine.

Can't help think about 👇 03/31 Must Read from @CroftHelima on risks from rising RUS/UKR attacks.

#OOTT

> **Dan Tsubouchi** @Energy_Tidbits · Mar 31
>
> This 👇 Must Read from @CroftHelima looks even more relevant with the last 4 days, incl last night, of escalating Russia drone attacks on Ukraine energy/power infra.
>
> Will Ukraine expand its drone attacks to target RUS oil export facilities...
> Show more

1 2.2K

Dan Tsubouchi @Energy_Tidbits · Apr 27

Ukraine resumes attacks on Russia #Oil refineries.

TASS confirms Slavyansk refinery was hit by multiple drones. TASS previously noted Slavyansk was 60,000 b/d.

#OOTT

1 6 14 3.6K

Dan Tsubouchi @Energy_Tidbits · Apr 26

May not drive up #Oil prices but 321 crack spreads still positive support for WTI.

321 crack spreads widened $0.66 WoW to $28.96.

Crack spread $28.96 still provides big margin for refiners and incentive to buying crude to maximize runs.

#OOTT #Oil Thx @business

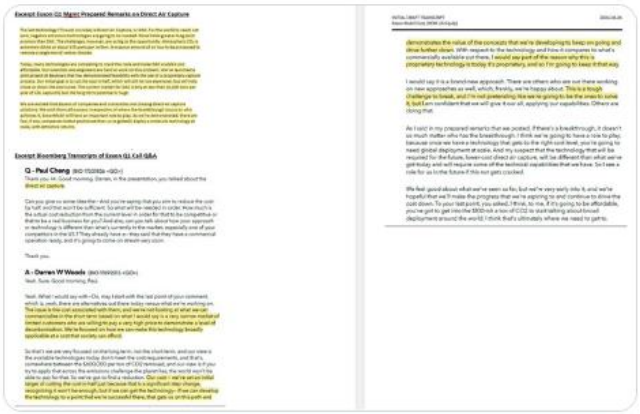
9 27 4.8K

Dan Tsubouchi @Energy_Tidbits · Apr 26

Same Reality check on Direct Air Capture as 👇 Mar 1 tweet!

$XOM Q1, CEO Woods "*our initial goal is to cut the cost in half, which will still be too expensive,..*"

Woods *"focused on how we can make this [DAC] technology broadly applicable at a cost that society can afford"*
#OOTT



> **Dan Tsubouchi** @Energy_Tidbits · Mar 1
>
> Reality check on Direct Air Capture!
>
> Exxon CEO Woods "*We just built a pilot plant prototype that we're working on to try and cut the cost in half—which by the way, will still be too expensive,*" reports @thier_jane ...

1 2 5 3.3K

Dan Tsubouchi @Energy_Tidbits · 11h

Houthis leader "*There is a continuous effort to expand and strengthen Yemeni military operations in its new theater, which it extended to in the Indian Ocean, opposite the Gulf of Aden*"

#OOTT

1 2 1K

Dan Tsubouchi @Energy_Tidbits · 14h

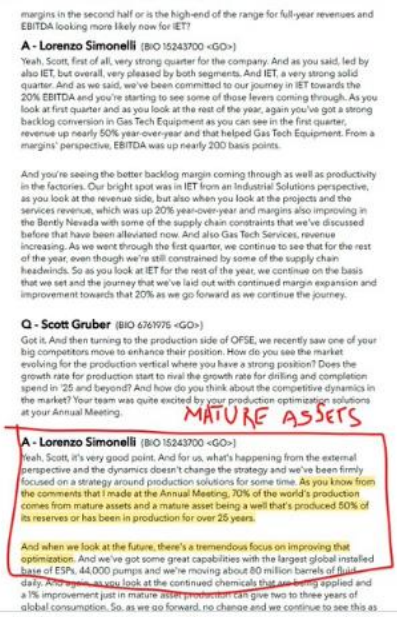
The 🇨🇦 Advantage!

The #1 challenge to squeezing more oil out of mature assets around the world is to arrest/offset natural decline rates.

The biggest global #Oil field or play that does not have this decline rate challenge is 🇨🇦 #OilSands

#OOTT

> **Dan Tsubouchi** @Energy_Tidbits · Apr 24
>
> Opportunity or risk for #Oil in 2020s.
>
> Can industry squeeze more or less oil out of old fields?
>
> $BKR "*70% of the world's production comes from mature assets and ...*
> Show more



margins in the second half or is the high-end of the range for full-year revenues and EBITDA looking more likely now for IET?

A - Lorenzo Simonelli (BIO 15243700 <GO>)

Yeah, Scott, first of all, very strong quarter for the company. And as you said, led by also IET, but overall, very pleased by both segments. And IET, a very strong solid quarter. And as we said, we've been committed to our journey in IET towards the 20% EBITDA and you're starting to see some of those levers coming through. As you look at first quarter and as you look at the rest of the year, again you've got a strong backlog conversion in Gas Tech Equipment as you can see in the first quarter, revenue up nearly 50% year-over-year and that helped Gas Tech Equipment. From a margins' perspective, EBITDA was up nearly 200 basis points.

And you're seeing the better backlog margin coming through as well as productivity in the factories. Our bright spot was in IET from an Industrial Solutions perspective, as you look at the revenue side, but also when you look at the projects and the services revenue, which was up 20% year-over-year and margins also improving in the Bently Nevada with some of the supply chain constraints that we've discussed before that have been alleviated now. And also Gas Tech Services, revenue increasing. As we went through the first quarter, we continue to see that for the rest of the year, even though we're still constrained by some of the supply chain headwinds. So as you look at IET for the rest of the year, we continue on the basis that we set and the journey that we've laid out with continued margin expansion and improvement towards that 20% as we go forward as we continue the journey.

Q - Scott Gruber (BIO 6761975 <GO>)

Got it. And then turning to the production side of OFSE, we recently saw one of your big competitors move to enhance their position. How do you see the market evolving for the production vertical where you have a strong position? Does the growth rate for production start to rival the growth rate for drilling and completion spend in '25 and beyond? And how do you think about the competitive dynamics in the market? Your team was quite excited by your production optimization solutions at your Annual Meeting.

MATURE ASSETS

A - Lorenzo Simonelli (BIO 15243700 <GO>)

Yeah, Scott, it's very good point. And for us, what's happening from the external perspective and the dynamics doesn't change the strategy and we've been firmly focused on a strategy around production solutions for some time. As you know from the comments that I made at the Annual Meeting, 70% of the world's production comes from mature assets and a mature asset being a well that's produced 50% of its reserves or has been in production for over 25 years.

And when we look at the future, there's a tremendous focus on improving that optimization. And we've got some great capabilities with the largest global installed base of ESPs, 44,000 pumps and we're moving about 80 million barrels of fluid daily. And again, as you look at the continued chemicals that we bring applied and a 1% improvement just in mature asset production can give two to three years of global consumption. So, as we go forward, no change and we continue to see this as

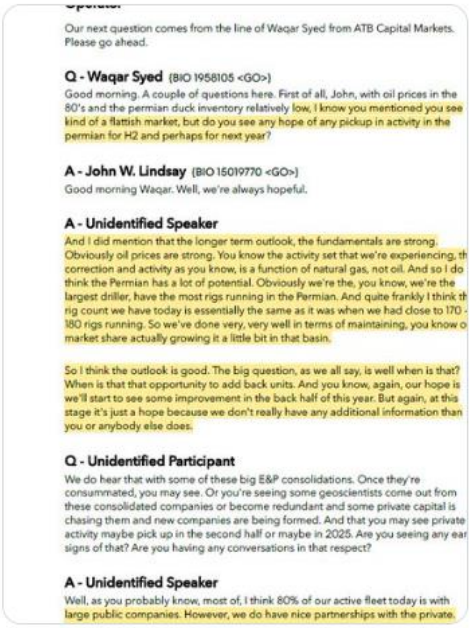
1 2 11 3.2K

Dan Tsubouchi @Energy_Tidbits · 16h

Why expect lower Permian #Oil growth in 2024!

"***at this stage it's just a hope because we don't really have any additional information than you or anybody else does***" $HP, the largest Permian rig operator on if they expect more Permian rigs added back in H2/24.

#OOTT



Our next question comes from the line of Waqar Syed from ATB Capital Markets. Please go ahead.

Q - Waqar Syed (BIO 1958105 <GO>)

Good morning. A couple of questions here. First of all, John, with oil prices in the 80's and the permian duck inventory relatively low, I know you mentioned you see kind of a flattish market, but do you see any hope of any pickup in activity in the permian for H2 and perhaps for next year?

A - John W. Lindsay (BIO 15019770 <GO>)

Good morning Waqar. Well, we're always hopeful.

A - Unidentified Speaker

And I did mention that the longer term outlook, the fundamentals are strong. Obviously oil prices are strong. You know the activity set that we're experiencing, th correction and activity as you know, is a function of natural gas, not oil. And so I do think the Permian has a lot of potential. Obviously we're the, you know, we're the largest driller, have the most rigs running in the Permian. And quite frankly I think th rig count we have today is essentially the same as it was when we had close to 170 - 180 rigs running. So we've done very, very well in terms of maintaining, you know o market share actually growing it a little bit in that basin.

So I think the outlook is good. The big question, as we all say, is well when is that? When is that that opportunity to add back units. And you know, again, our hope is we'll start to see some improvement in the back half of this year. But again, at this stage it's just a hope because we don't really have any additional information than you or anybody else does.

Q - Unidentified Participant

We do hear that with some of these big E&P consolidations. Once they're consummated, you may see. Or you're seeing some geoscientists come out from these consolidated companies or become redundant and some private capital is chasing them and new companies are being formed. And that you may see private activity maybe pick up in the second half or maybe in 2025. Are you seeing any ear signs of that? Are you having any conversations in that respect?

A - Unidentified Speaker

Well, as you probably know, most of, I think 80% of our active fleet today is with large public companies. However, we do have nice partnerships with the private.

1 · 1 · 8 · 3K

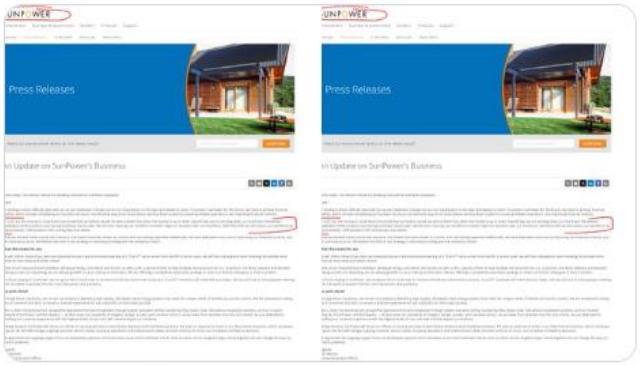
Dan Tsubouchi @Energy_Tidbits · 21h

More delays to growth in US residential solar.

SunPower cutting ~1,000 staff (>1/4 of total), "*Specifically, we are winding down our SunPower Residential Installation (SPRI) locations and closing SunPower Direct sales.*"

#NatGas will be needed for longer for power.

#OOTT



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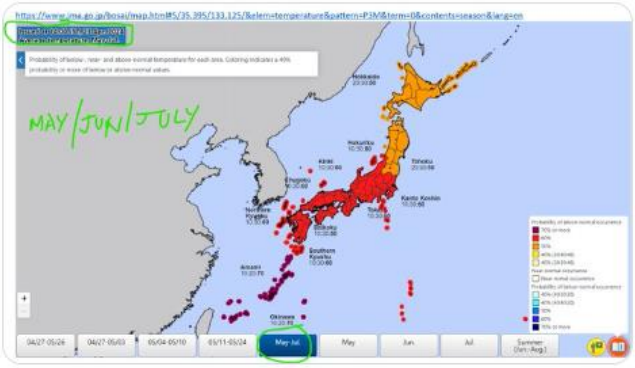
Dan Tsubouchi @Energy_Tidbits · 22h

JMA forecasts hot start (May/Jun/Jul) to summer for Japan.

Won't necessarily move up #NatGas #LNG price but a cool start to summer would keep JKM prices low.

May/Jun/Jul 2023 was also above average temps.

#OOTT



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Dan Tsubouchi @Energy_Tidbits · Apr 25

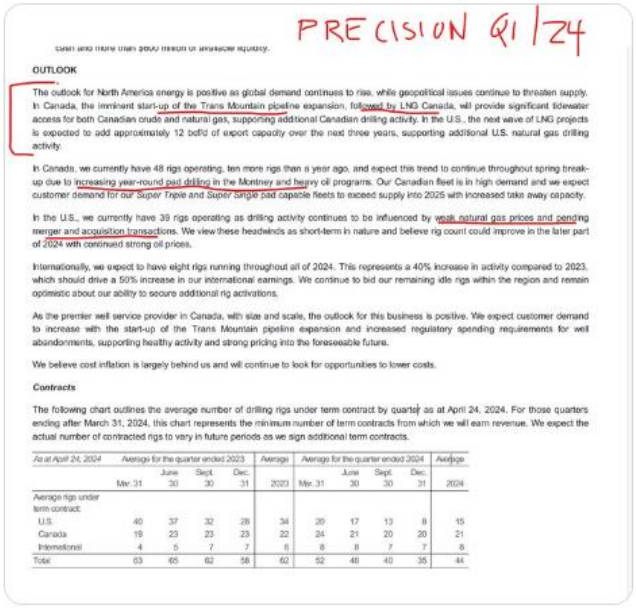
Precision Drilling Q1

Startup of #TMX #LNGCanada drive additional Cdn drilling.

More yr-round Montney pads = more Cdn rigs drilling thru spring break up

US rigs being hurt by weak #NatGas prices, also pending M&A transactions causes pull back in rigs.

#OOTT


PRECISION Q1/24

cash and more than $600 million of available liquidity.

OUTLOOK

The outlook for North America energy is positive as global demand continues to rise, while geopolitical issues continue to threaten supply. In Canada, the imminent start-up of the Trans Mountain pipeline expansion, followed by LNG Canada, will provide significant tidewater access for both Canadian crude and natural gas, supporting additional Canadian drilling activity. In the U.S., the next wave of LNG projects is expected to add approximately 12 bcf/d of export capacity over the next three years, supporting additional U.S. natural gas drilling activity.

In Canada, we currently have 48 rigs operating, ten more rigs than a year ago, and expect this trend to continue throughout spring break-up due to increasing year-round pad drilling in the Montney and heavy oil programs. Our Canadian fleet is in high demand and we expect customer demand for our *Super Triple* and *Super Single* pad capable fleets to exceed supply into 2025 with increased take away capacity.

In the U.S., we currently have 39 rigs operating as drilling activity continues to be influenced by weak natural gas prices and pending merger and acquisition transactions. We view these headwinds as short-term in nature and believe rig count could improve in the later part of 2024 with continued strong oil prices.

Internationally, we expect to have eight rigs running throughout all of 2024. This represents a 40% increase in activity compared to 2023, which should drive a 50% increase in our international earnings. We continue to bid our remaining idle rigs within the region and remain optimistic about our ability to secure additional rig activations.

As the premier well service provider in Canada, with size and scale, the outlook for this business is positive. We expect customer demand to increase with the start-up of the Trans Mountain pipeline expansion and increased regulatory spending requirements for well abandonments, supporting healthy activity and strong pricing into the foreseeable future.

We believe cost inflation is largely behind us and will continue to look for opportunities to lower costs.

Contracts

The following chart outlines the average number of drilling rigs under term contract by quarter as at April 24, 2024. For those quarters ending after March 31, 2024, this chart represents the minimum number of term contracts from which we will earn revenue. We expect the actual number of contracted rigs to vary in future periods as we sign additional term contracts.

As at April 24, 2024	*Average for the quarter ended 2023*				*Average*	*Average for the quarter ended 2024*				*Average*
	Mar. 31	June 30	Sept. 30	Dec. 31	2023	Mar. 31	June 30	Sept. 30	Dec. 31	2024
Average rigs under term contract:										
U.S.	40	37	32	28	34	20	17	13	8	15
Canada	19	23	23	23	22	24	21	20	20	21
International	4	5	7	7	6	8	8	7	7	8
Total	63	65	62	58	62	52	46	40	35	44

1 · 1 · 7 · 1.9K

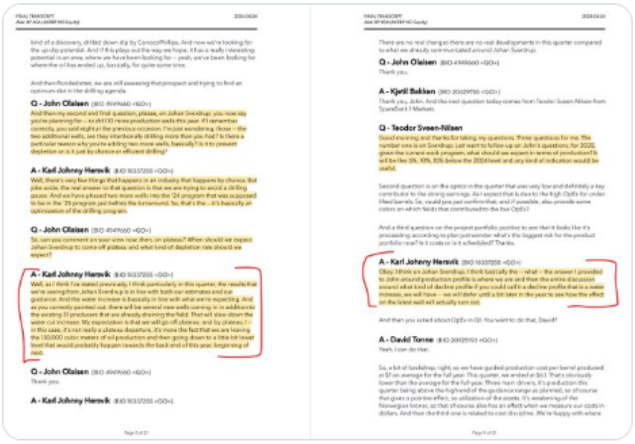
Dan Tsubouchi @Energy_Tidbits · Apr 25

Norway #Oil production on track to peak in 2025!

Aker BP Q1 call, confirmed view giant Johan Sverdrup oil field production should peak end of 24/beginning of 25.

See 👇 03/11/24 tweet Norway govt forecast for production to peak in 2025.

#OOTT



> **Dan Tsubouchi** @Energy_Tidbits · Mar 12
>
> ICYMI
>
> Norway forecasts it will hit peak #Oil production in 2025 & then decline therefrom. Jan 2024 was 1.8 mmb/d.
>
> ...

8 11 7.9K

Dan Tsubouchi @Energy_Tidbits · Apr 25

Everyone wants a Toyota Hybrid!

Toyota #HEV March sales.
Mar 24: 358,899, +14.9% YoY
FY 24: 3,557,609, +31.1% YoY

Its dominance in HEV looks to be helping grow its small EVs sales
Toyota #EVs March sales
Mar 24: 15,604, +84.5% YoY
FY 24: 116,654, +210.1% YoY ...
Show more

4 9 2.1K

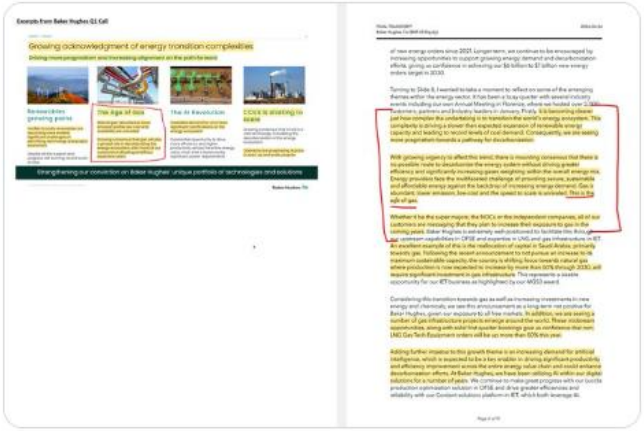
Dan Tsubouchi @Energy_Tidbits · Apr 24

" ***This is the age of gas"*** $BKR CEO.

"mounting consensus that there is no possible route to decarbonize the energy system without driving greater efficiency and ***significantly increasing gases weighting*** *within the overall energy mix"*

Energy providers need #NatGas!

#OOTT



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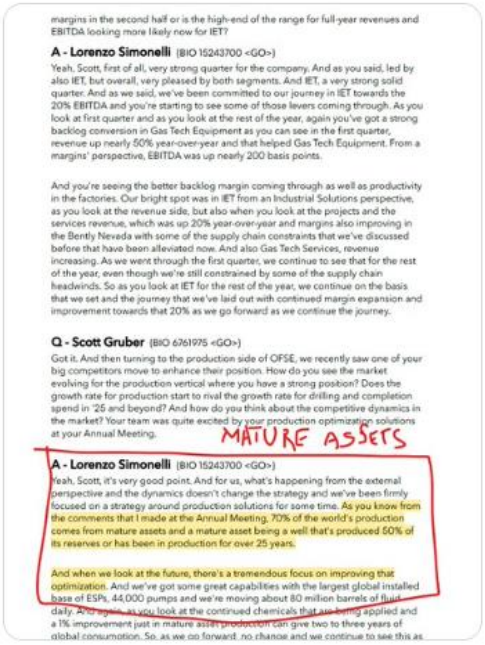
Dan Tsubouchi @Energy_Tidbits · Apr 24

Opportunity or risk for #Oil in 2020s.

Can industry squeeze more or less oil out of old fields?

$BKR "*70% of the world's production comes from mature assets and a mature asset being a well that's produced 50% of its reserves or has been in production for over 25 years.*"
#OOTT



margins in the second half or is the high-end of the range for full-year revenues and EBITDA looking more likely now for IET?

A - Lorenzo Simonelli (BIO 15243700 <GO>)

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Q - Scott Gruber (BIO 6761975 <GO>)

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MATURE ASSETS

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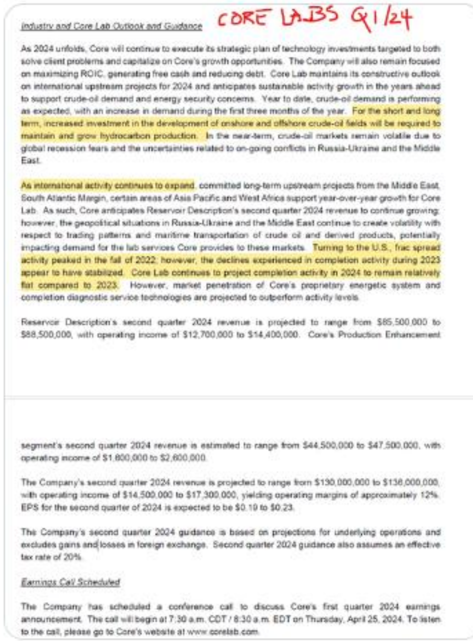
Dan Tsubouchi @Energy_Tidbits · Apr 24

Core Labs Q1.

"*U.S., frac spread activity peaked in the fall of 2022; however, the declines experienced in completion activity during 2023 appear to have stabilized. Core Lab continues to project completion activity in 2024 to remain* ***relatively flat*** *compared to 2023.*"

#OOTT



Industry and Core Lab Outlook and Guidance

As 2024 unfolds, Core will continue to execute its strategic plan of technology investments targeted to both solve client problems and capitalize on Core's growth opportunities. The Company will also remain focused on maximizing ROIC, generating free cash and reducing debt. Core Lab maintains its constructive outlook on international upstream projects for 2024 and anticipates sustainable activity growth in the years ahead to support crude-oil demand and energy security concerns. Year to date, crude-oil demand is performing as expected, with an increase in demand during the first three months of the year. For the short and long term, increased investment in the development of onshore and offshore crude-oil fields will be required to maintain and grow hydrocarbon production. In the near-term, crude-oil markets remain volatile due to global recession fears and the uncertainties related to on-going conflicts in Russia-Ukraine and the Middle East.

As international activity continues to expand, committed long-term upstream projects from the Middle East, South Atlantic Margin, certain areas of Asia Pacific and West Africa support year-over-year growth for Core Lab. As such, Core anticipates Reservoir Description's second quarter 2024 revenue to continue growing; however, the geopolitical situations in Russia-Ukraine and the Middle East continue to create volatility with respect to trading patterns and maritime transportation of crude oil and derived products, potentially impacting demand for the lab services Core provides to these markets. Turning to the U.S., frac spread activity peaked in the fall of 2022; however, the declines experienced in completion activity during 2023 appear to have stabilized. Core Lab continues to project completion activity in 2024 to remain relatively flat compared to 2023. However, market penetration of Core's proprietary energetic system and completion diagnostic service technologies are projected to outperform activity levels.

Reservoir Description's second quarter 2024 revenue is projected to range from $85,500,000 to $88,500,000, with operating income of $12,700,000 to $14,400,000. Core's Production Enhancement segment's second quarter 2024 revenue is estimated to range from $44,500,000 to $47,500,000, with operating income of $1,800,000 to $2,600,000.

The Company's second quarter 2024 revenue is projected to range from $130,000,000 to $136,000,000, with operating income of $14,500,000 to $17,300,000, yielding operating margins of approximately 12%. EPS for the second quarter of 2024 is expected to be $0.19 to $0.23.

The Company's second quarter 2024 guidance is based on projections for underlying operations and excludes gains and losses in foreign exchange. Second quarter 2024 guidance also assumes an effective tax rate of 20%.

Earnings Call Scheduled

The Company has scheduled a conference call to discuss Core's first quarter 2024 earnings announcement. The call will begin at 7:30 a.m. CDT / 8:30 a.m. EDT on Thursday, April 25, 2024. To listen to the call, please go to Core's website at www.corelab.com.

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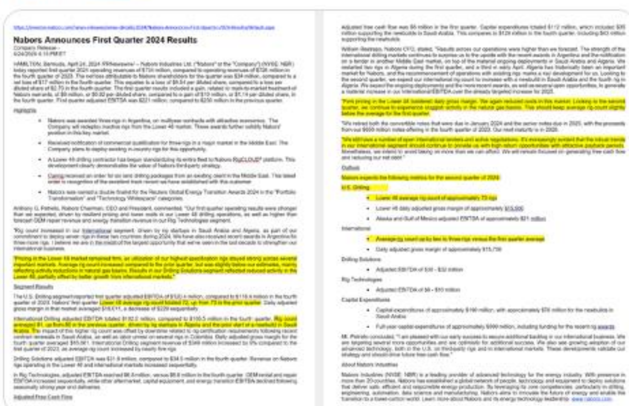
Dan Tsubouchi @Energy_Tidbits · Apr 24

Nabors Q1.

Lower 48 rig activity. "*Looking to the second quarter, we continue to experience sluggish activity in the natural gas basins. This should keep average rig count slightly below the average for the first quarter*"

#OOTT #NatGas



Nabors Announces First Quarter 2024 Results

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Dan Tsubouchi @Energy_Tidbits · 12m

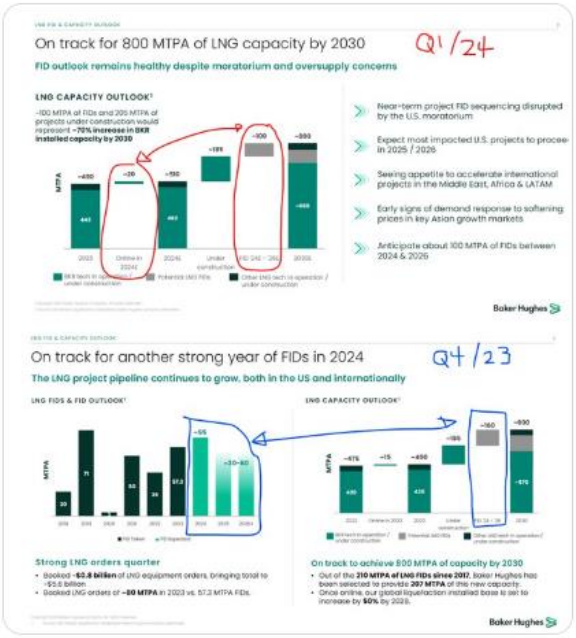
Less #LNG FIDs 24-26 in today's Baker Hughes Q1 call.

Q1: 120 MTPA FIDs 24-26

Q4: ~160 MTPA FIDs 24-26.

No change to ~800 MTPA installed capacity by 2030.

#NatGas #OOTT



284

Dan Tsubouchi @Energy_Tidbits · 5h

For those like me who weren't at their laptop, @EIAgov released #Oil #Gasoline #Distillates inventory as of Apr 19 at 8:30am MT. Table below compares EIA data vs @businessexpectations and vs @APIenergy yesterday. Prior to release, WTI was $83.09, now $82.62 at 11:35am MT. #OOTT

Oil/Products Inventory Apr 19: EIA, Bloomberg Survey Expectations, API

(million barrels)	EIA	Expectations	API
Oil	-6.37	2.00	-3.23
Gasoline	-0.64	-1.44	-0.60
Distillates	1.61	-1.75	0.72
	-5.40	-1.19	-3.11

Note: Oil is commercial. So excludes a +0.8 mmb build in SPR for the Apr 19 week
Note: Included in the oil data, Cushing had a 0.66 mmb draw for Apr 19 week
Source EIA, Bloomberg
Prepared by SAF Group https://safgroup.ca/news-insights/

1 1 1K

Dan Tsubouchi @Energy_Tidbits · Apr 23

Lower frac activity in 2024.

Frac leader Halliburton CEO on Q1 call today.

"*We expect our North-America business to deliver flattish revenues and margins year-on year* ***despite lower activity levels.***"

#OOTT

10 1.9K

Dan Tsubouchi @Energy_Tidbits · Apr 22

Brunello is exception with strong sales incl China.

"This year started with an expectation that the luxury markets would grow between 2 to 4%. My personal feeling is it will be much less than that, probably it will be flat.... China is still weak." **Valentino** Chair to @flacqua.

> ***"This year started with an expectation that the luxury markets would grow between 2 to 4%. My personal feeling is it will be much less than that, probably it will be flat.... China is still weak."*** **Valentino Chairman Rachid**
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> SAF Group created transcript of comments by Valentino Chairman Rachid Mohamed Rachid with Bloomberg's Francine Laqua on Apr 22, 2022 https://www.bloomberg.com/news/videos/2024-04-22/valentino-s-rachid-on-slowdown-luxury-spending-future-video
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> Items in "italics" are SAF Group created transcript
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> Rachid "*The last three years have been really exceptional for luxury products. Post the pandemic, there has been a very significant surge. The average was 7% when usually the luxury market grows around 3, 4%. We have seen three consecutive years of 7%. I think since second half last year, we have definitely seen a slowdown. Not only in Europe but also in US. And there was always a question mark on how fast China would recover. This year started with an expectation that the luxury markets would grow between 2 to 4%. My personal feeling is it will be much less than that, probably it will be flat. The reality is that Europe, US is still very flat at the moment. And China is still weak. And we have already seen some companies coming with some results and it is very clear that it is quite a challenging environment in 2024.*"
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> Prepared by SAF Group https://safgroup.ca/news-insights/

> **Dan Tsubouchi** @Energy_Tidbits · Apr 17
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> Ultra Quiet/Gentle Luxury Chinese buyers are spending!
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> Brunello Q1 sales: "*significant growth achieved in all major Asian areas incl China, Japan, South Korea & th...*

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"***We expect kind of modest growth [in oil demand in China] for the whole of 2024, about 1.1%.***" China based Victor Yang, JLC Network Technology on @gulf_intel Apr 22 podcast with @DyalaSabbagh_GI

See 👇 SAF Group transcript.

#OOTT

"We expect kind of modest growth [in oil demand in China] for the whole of 2024, about 1.1%." **Victor Yang, JLC Network Technology**

SAF Group created transcript of comments by Victor Yang, Senior Analyst JLC Network Technology on Gulf Intelligence's Daily Energy Markets Podcast on April 22, 2024 hosted by Dyala Sabbagh (Gulf Intelligence COO and Partner). [LINK]

Items in "italics" are SAF Group created transcript

On Chinese oil demand and crude imports, at 7:10 min mark Yang *"Well the country's crude imports grew by 0.75% in the first quarter, but imports from Russia surged by close to 13%. And in March, imports from Russia actually took record high share over 22%, and when we see why China's crude imports are growing, we see that demand, say for some fuel, gasoline, jet fuel is still growing. And the Country's refining capacity is on the rise too. But we are seeing much slower growth in 2024. As we mentioned just now, 0.75% in the first quarter, this [inaudible] is slow now. And we do not expect growth to be much larger for the whole year when crude prices are high. And domestic fuel demand is not growing as fast as [China] actually as production yet. So we expect kind of modest growth for the whole of 2024, about 1.1%. And for the second quarter, we see a lot of refinery maintenance, is imports will actually come down. And for now, the premium for Russian cargoes have strengthened this year, from -0.5 barrels to -0.3 barrels. And now it's flat to Brent, meaning 0 now. So this has dampened refiners, particularly independents, interest in Russian crude. Their margins for imported crude, including Russian crude, actually turned negative late last month and the beginning of this month. So it's now kind of [inaudible] slightly above the breakeven point. So the interest in this has been dampened too. So we are not expecting imports to grow much in the second quarter, yes."*

Prepared by SAF Group https://safgroup.ca/news-insights/

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Dan Tsubouchi @Energy_Tidbits · Apr 22

Continued solid #Oil #NatGas outlook $SLB Q1 call.

Oil and gas demand is trending upwards.

"*Even deeper focus on energy security*"

North America business down but more than offset by international.

Broad growth continues in offshore activity across international markets #OOTT

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Dan Tsubouchi @Energy_Tidbits · Apr 22

Good reminder #OPEC cuts are first to medium sour crudes, which typically leads to bigger spot premiums & refiner margins for these crudes.

Refiners that run on medium sour need medium sour, not light.

So medium sour crudes like Cdn WCS benefit.

Thx @iamsharoncho

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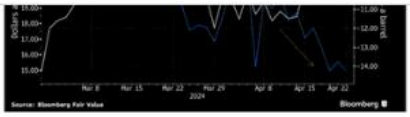

The new pattern reflects underlying changes in supply and demand that span the global crude market. OPEC+ supply cuts have crimped flows of dirtier crudes, while at the same time, US producers have been boosting exports of lighter varieties.

Vortexa Ltd. estimates that daily supplies of medium and heavy-sour crude into Asia have declined by 920,000 barrels on-year in the first three months.

On the demand side, meanwhile, margins on high-sulfur fuel oil — made more from medium-sour grades — have risen just as profits in Asia from producing diesel fell, according to Bloomberg Fair Value data.

"Medium- and heavy-sour crude supplies have been on a decline, and this has pushed up prices of these crudes," said Serena Huang, lead Asia analyst at Vortexa. "Middle distillate cracks — mainly diesel — have been coming under pressure from ample supplies, a result of robust refinery runs over the past months that have surpassed demand."

Other factors have also been at work, according to traders.

While diesel has been showing signs of weakness globally, fuel oil — made from the heavier barrels — has seen a boost driven by seasonal demand, with the Middle East consuming more for power generation in the summer months, they said.

In addition, Abu Dhabi has been shipping more lighter oil, while curbing flows of its denser Upper Zakum variety to process that domestically. Elsewhere, Mexico's halt to some exports has also reduced flows of sour heavy crude.

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Alberta Wildfire Watch

See 👇 maps.

Out-of-Control fire forces evacuation Saprae Creek, SE of Fort McMurray, the heart of Cdn #OilSands ie. Syncrude & Suncor.

Very little snowfall this winter.

Recall massive Fort McMurray fire was May 1, 2016....

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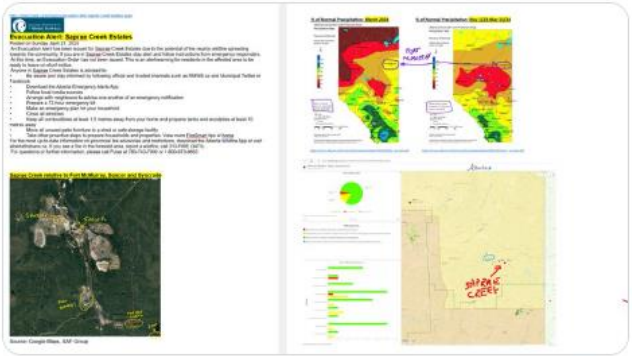

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Dan Tsubouchi @Energy_Tidbits · Apr 21

How can you not at least appreciate direct reality check on EV market by @elonmusk?

"*Tesla prices must change frequently in order to match production with demand*"

Lesser demand for EVs = Tesla cutting prices this weekend.

#OOTT

> **Elon Musk** @elonmusk · Apr 21
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> Replying to @iliketeslas and @WholeMarsBlog
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> Other cars change prices constantly and often by wide margins via dealer markups and manufacturer/dealer incentives. Only a fool thinks the “MSRP” is the real price.
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