Energy Tidbits

Vortexa: Iran Floating Oil Storage Up 10 mmb in March, Struggling to Find China Buyers Despite Deeper Discounts

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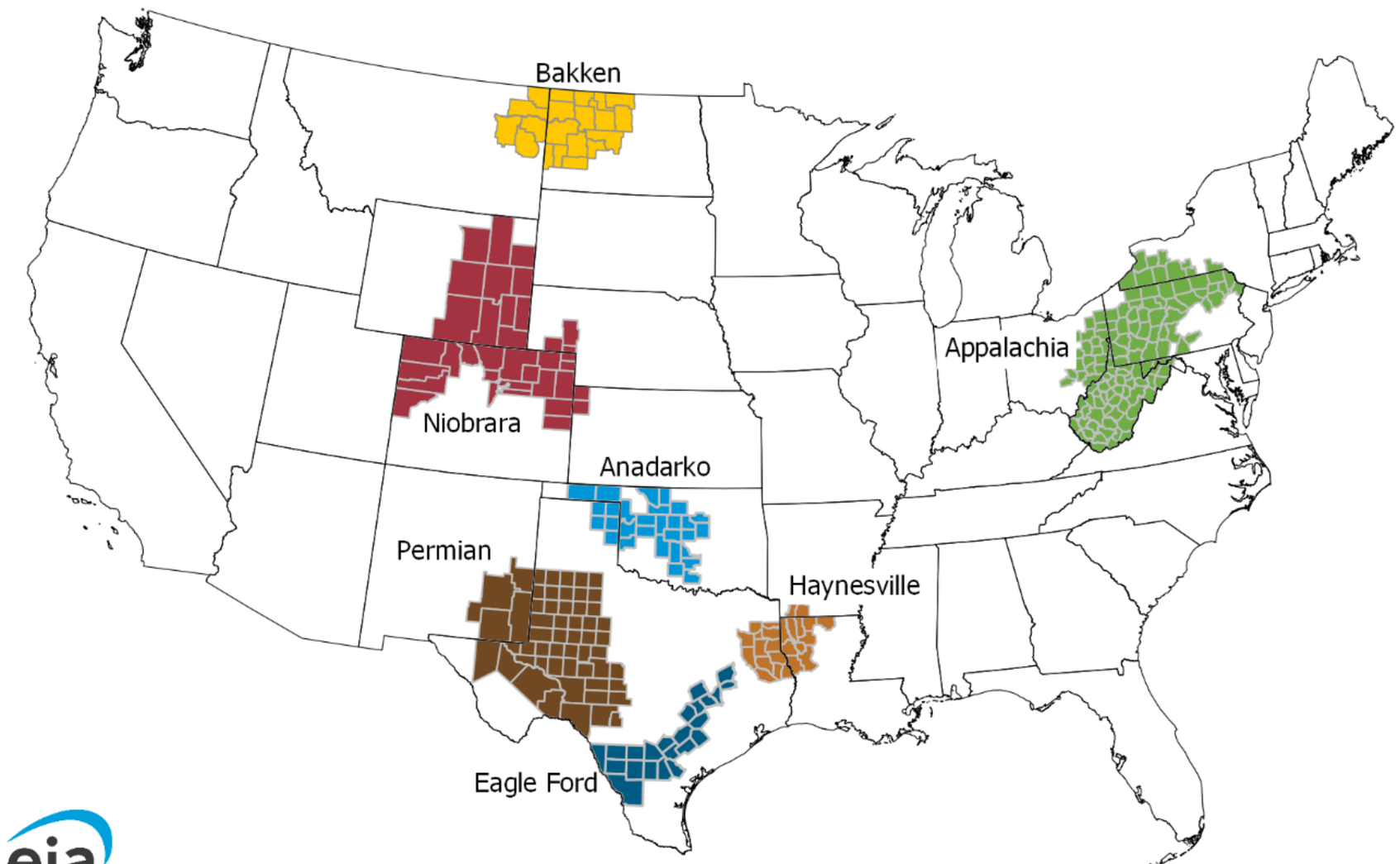
Independent Statistics & Analysis

U.S. Energy Information Administration

March 2024

Drilling Productivity Report

For key tight oil and shale gas regions



Data source: U.S. Energy Information Administration

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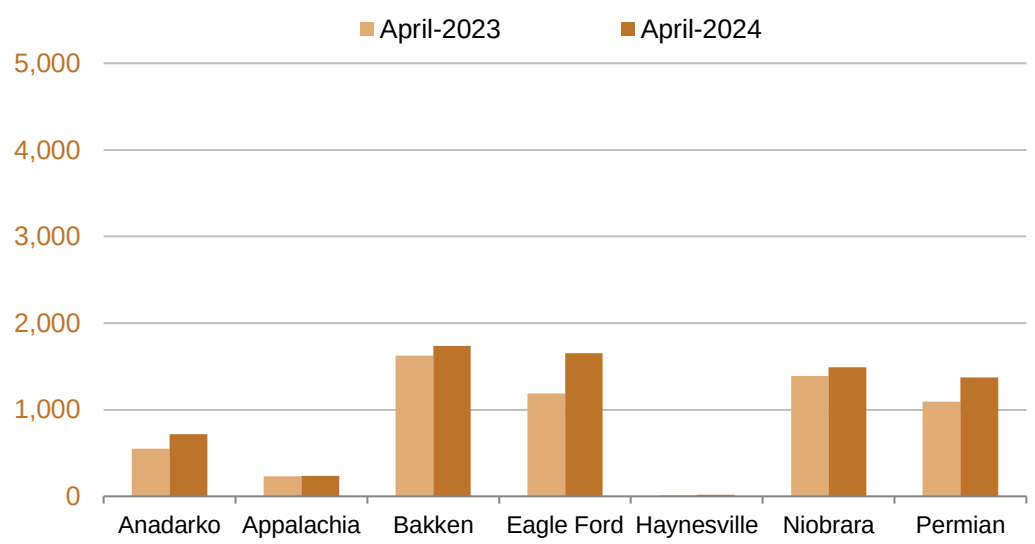
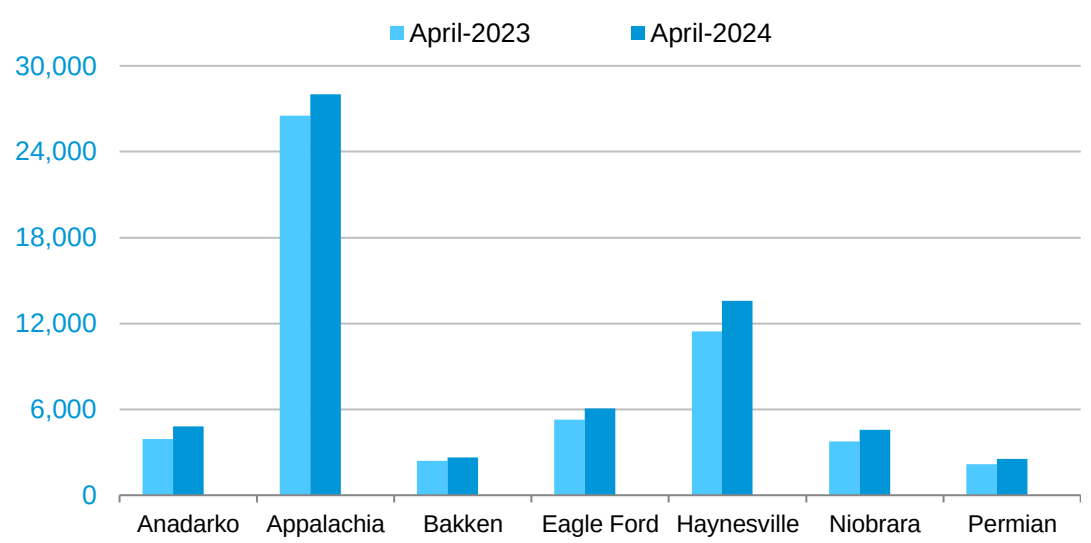
projected production through April

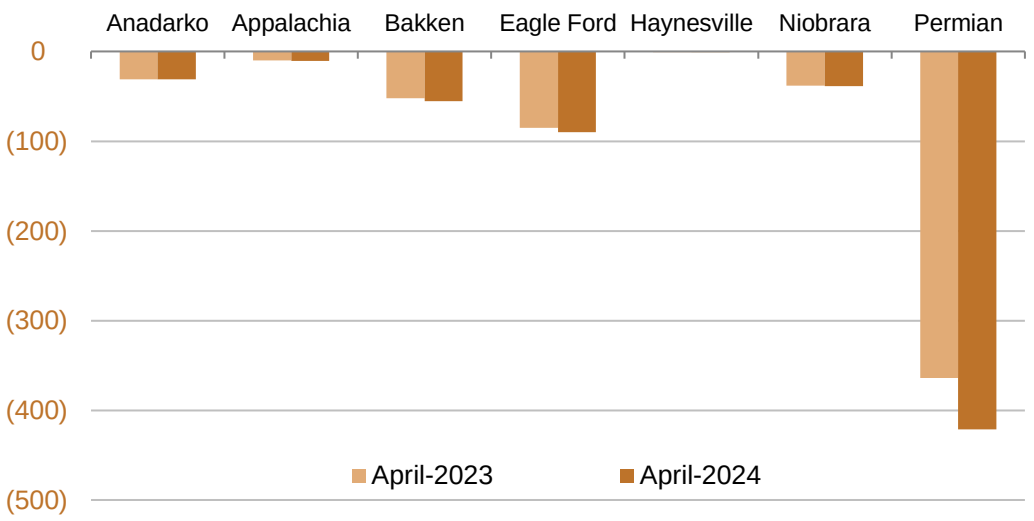
New-well oil production per rig
barrels/day



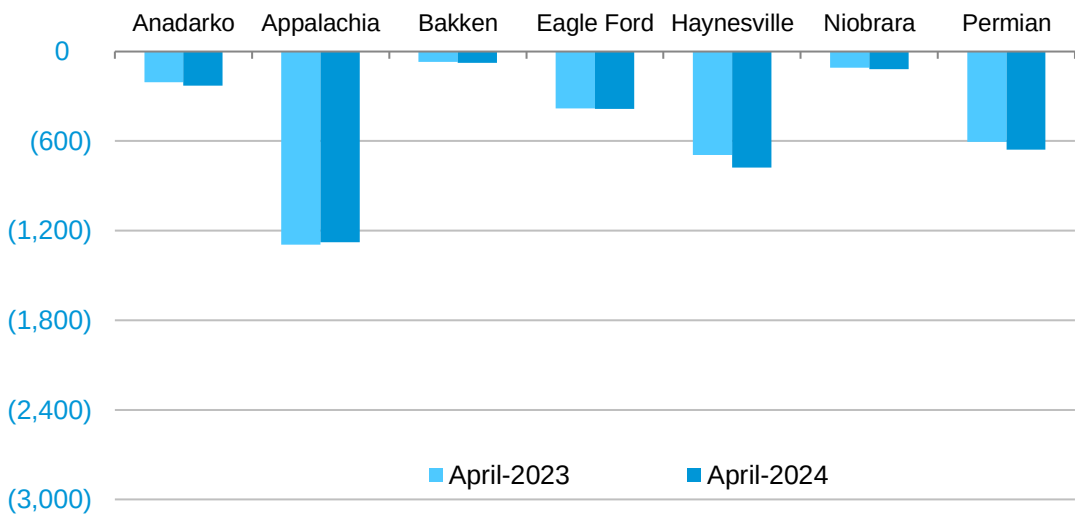
New-well gas production per rig
thousand cubic feet/day



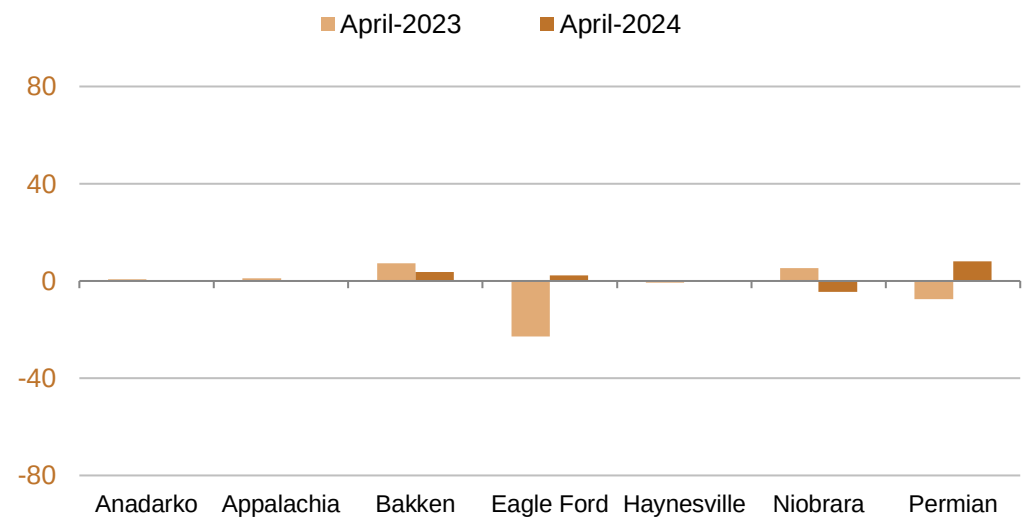
Legacy oil production change
thousand barrels/day



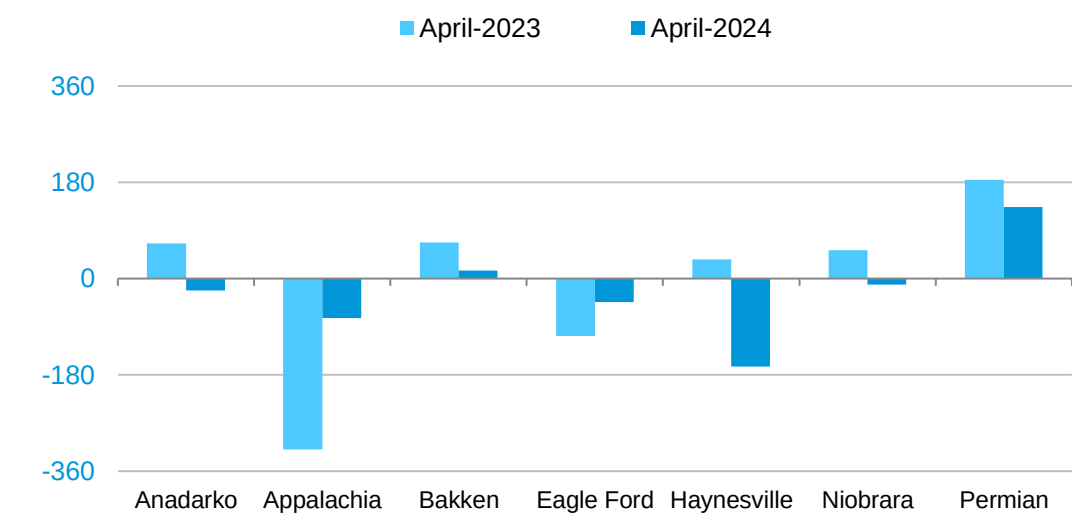
Legacy gas production change
million cubic feet/day



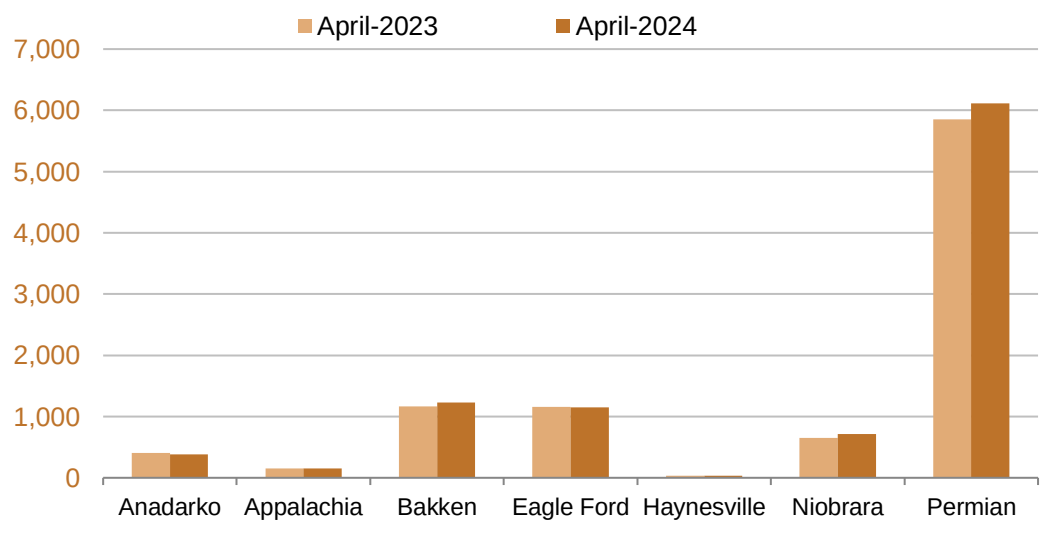
Indicated monthly change in oil production (Apr vs. Mar)
thousand barrels/day



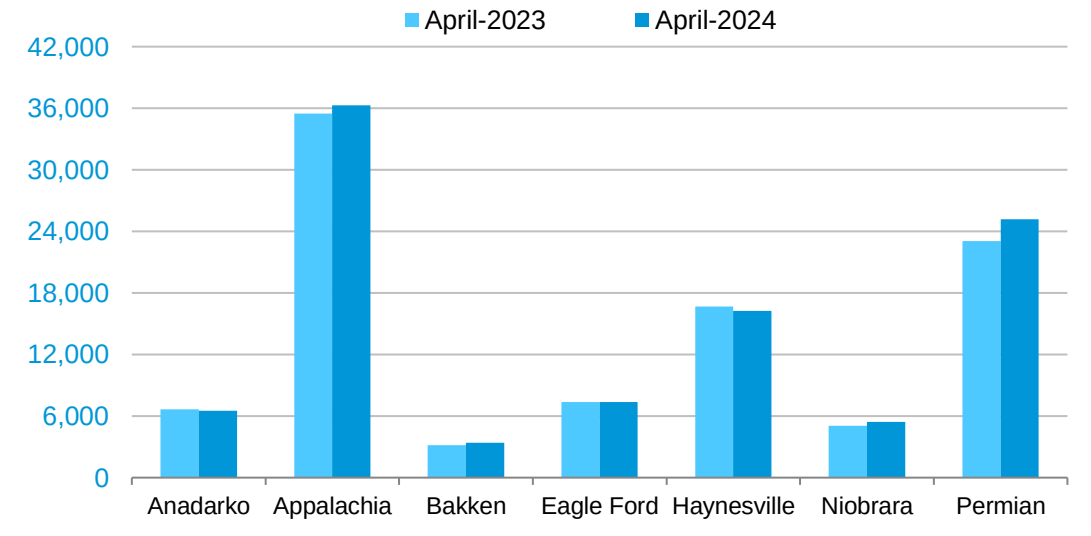
Indicated monthly change in gas production (Apr vs. Mar)
million cubic feet/day



Oil production
thousand barrels/day



Natural gas production
million cubic feet/day



Anadarko Region

Drilling Productivity Report

March 2024

drilling data through February
projected production through April

Oil +2 barrels/day month over month

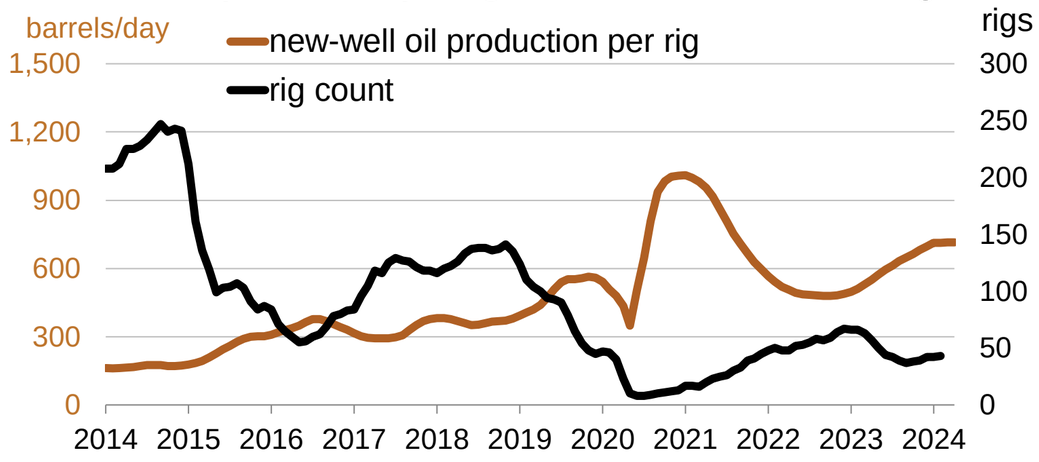
716 *April*
714 *March*
barrels/day

Monthly additions from one average rig

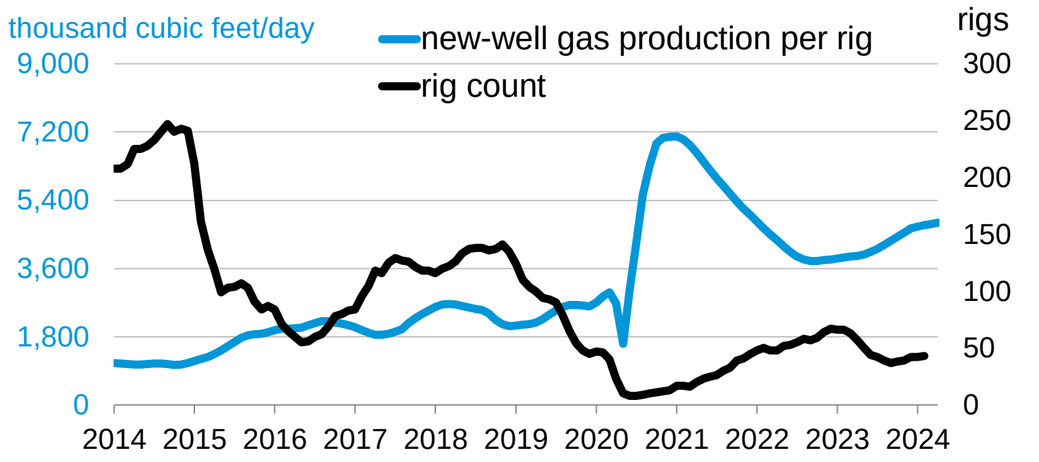
April **4,806**
March **4,772**
thousand cubic feet/day

Gas +34 thousand cubic feet/day month over month

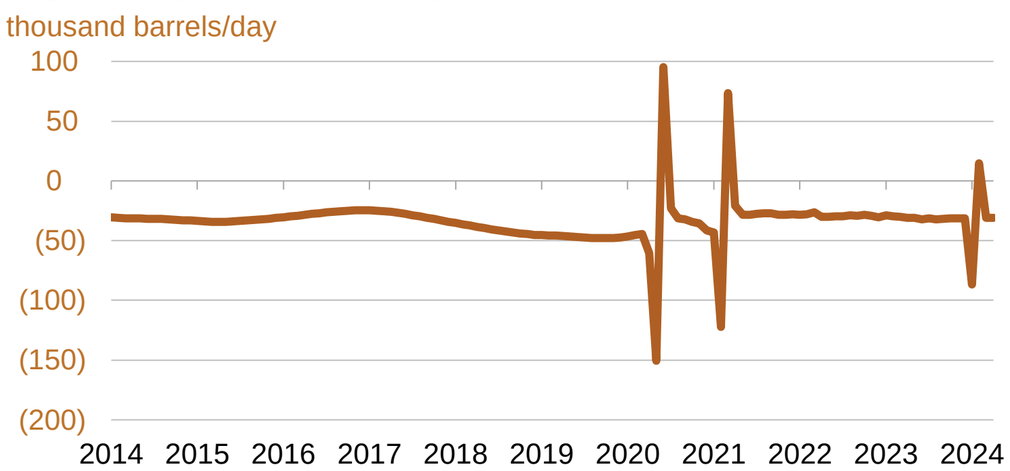
Anadarko Region
New-well oil production per rig



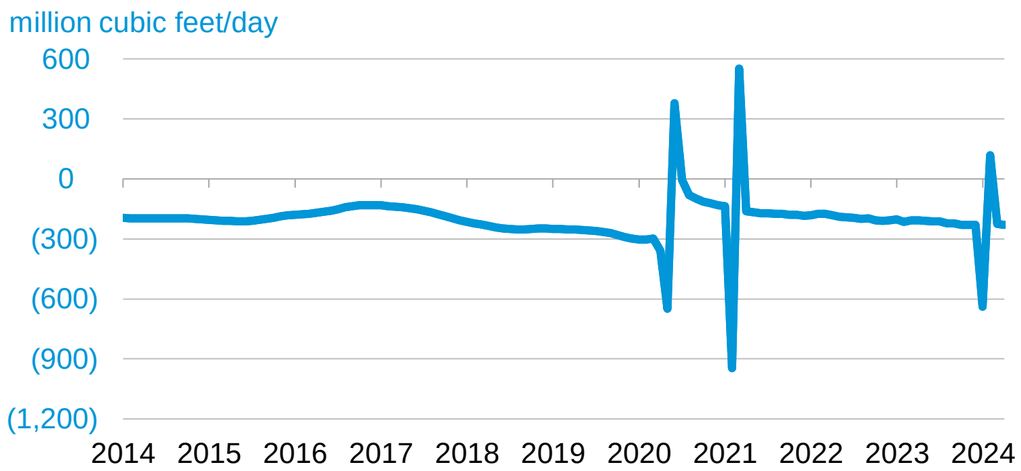
Anadarko Region
New-well gas production per rig



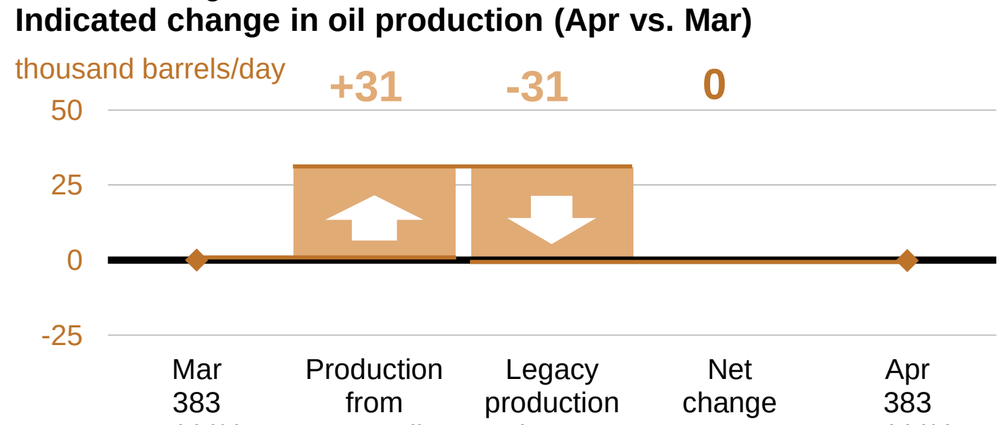
Anadarko Region
Legacy oil production change



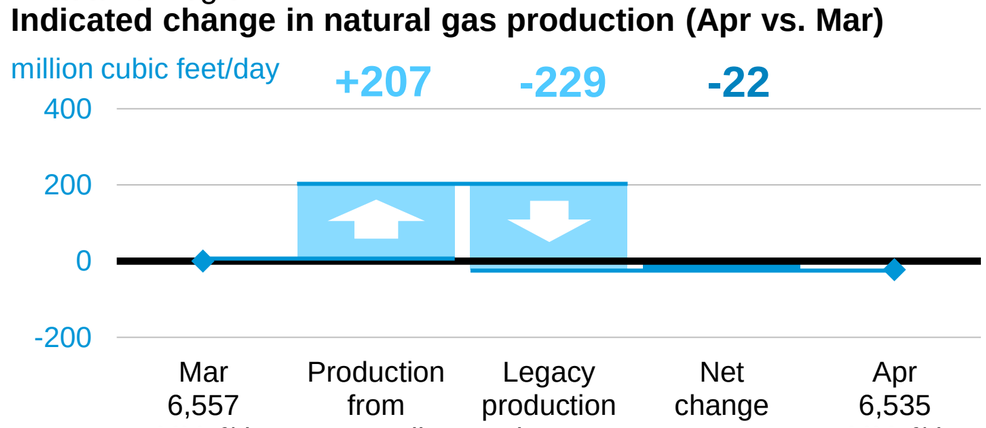
Anadarko Region
Legacy gas production change



Anadarko Region
Indicated change in oil production (Apr vs. Mar)



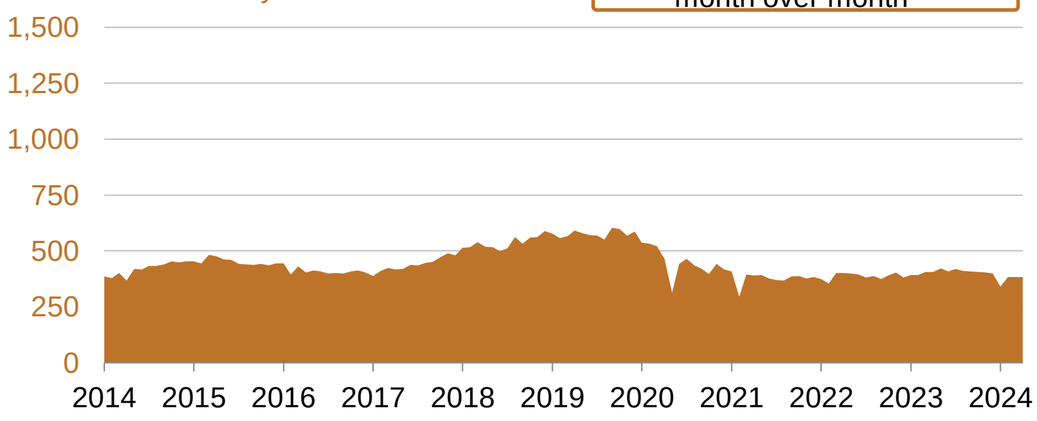
Anadarko Region
Indicated change in natural gas production (Apr vs. Mar)



Mar 383 Mbbl/d	Production from new wells	Legacy production change	Net change	Apr 383 Mbbl/d
Mar 6,557 MMcf/d	Production from new wells	Legacy production change	Net change	Apr 6,535 MMcf/d

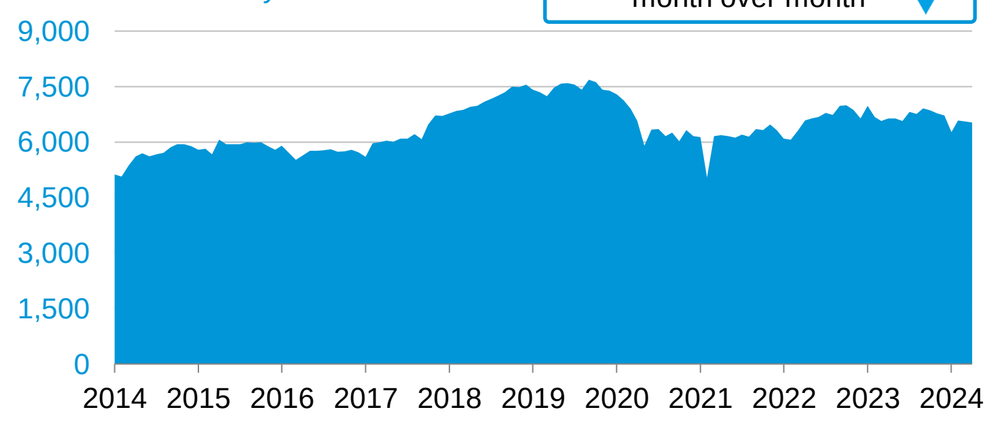
Anadarko Region
Oil production

Oil 0 thousand barrels/day month over month



Anadarko Region
Natural gas production

Gas -22 million cubic feet/day month over month



Appalachia Region
Drilling Productivity Report

March 2024

drilling data through February
projected production through April

Oil +1
barrels/day
month over month

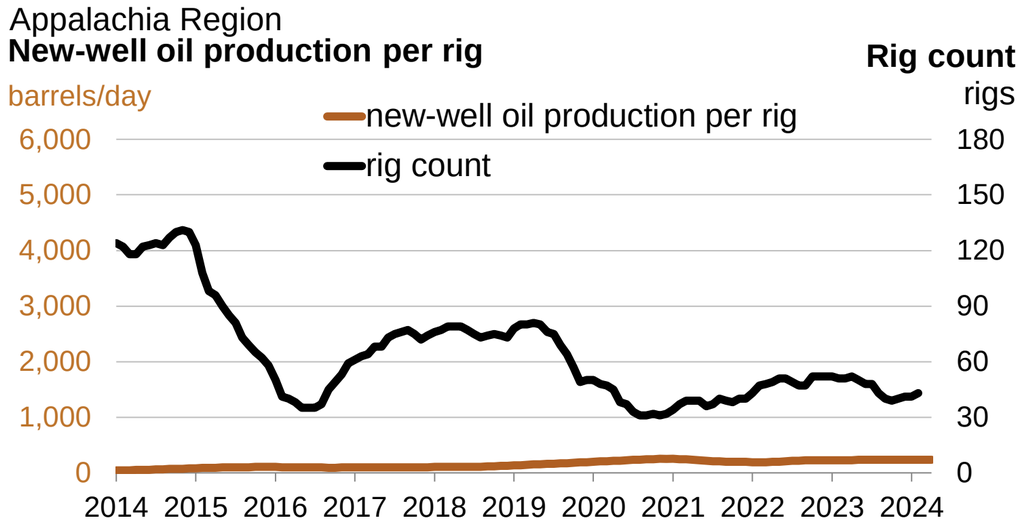
238 *April*
237 *March*
barrels/day

Monthly additions from one average rig

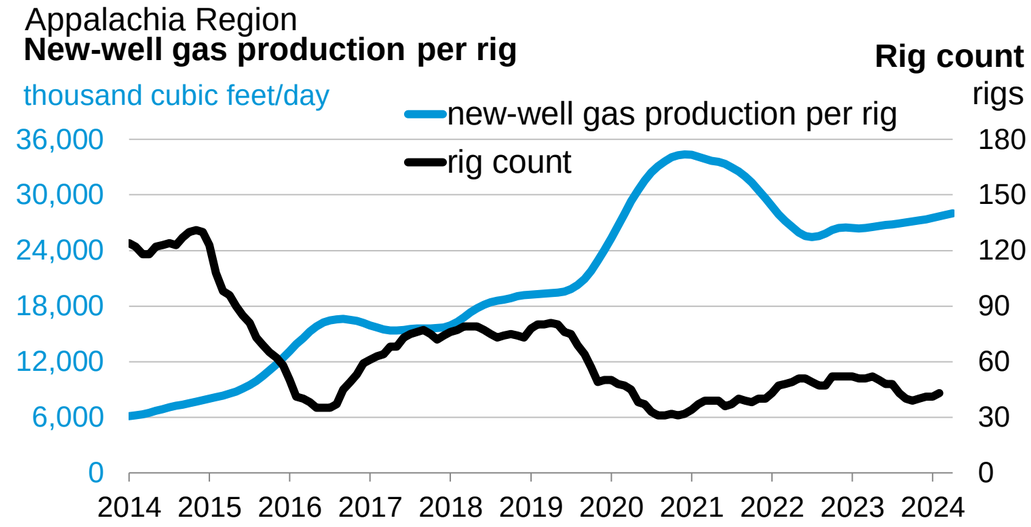
April **28,006**
March **27,832**
thousand cubic feet/day

Gas +174
thousand cubic feet/day
month over month

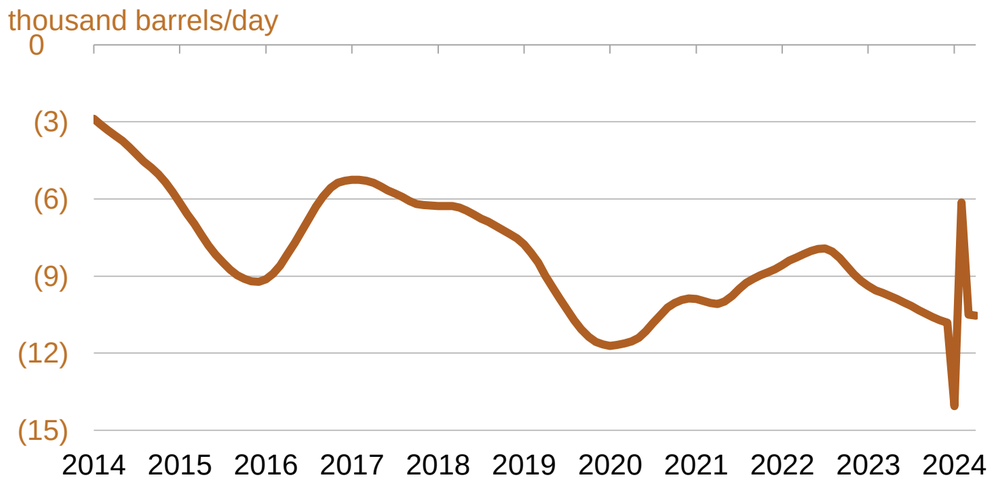
Appalachia Region
New-well oil production per rig



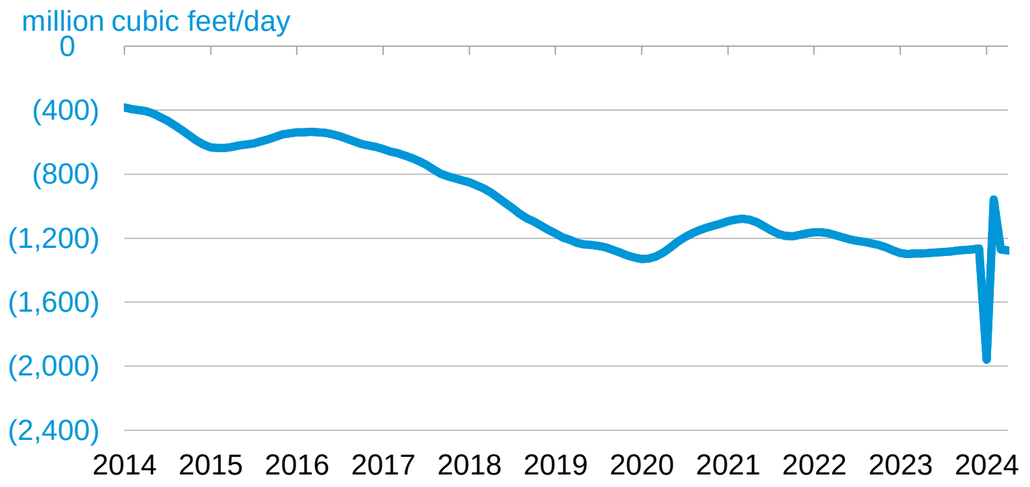
Appalachia Region
New-well gas production per rig



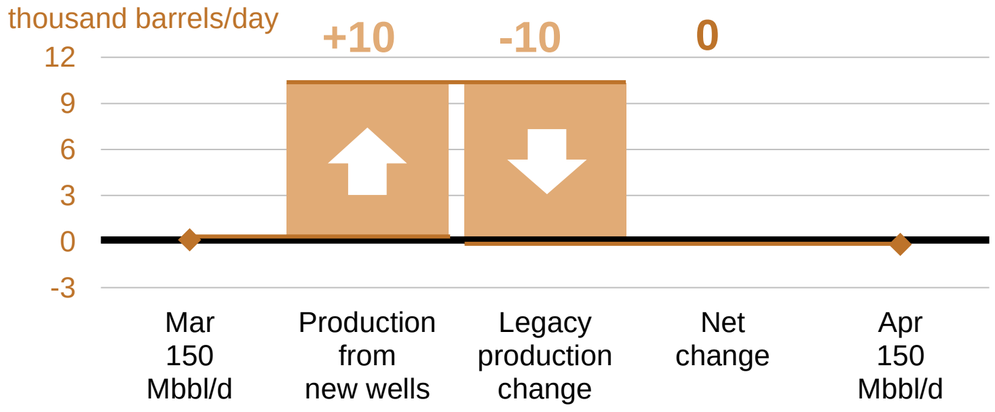
Appalachia Region
Legacy oil production change



Appalachia Region
Legacy gas production change

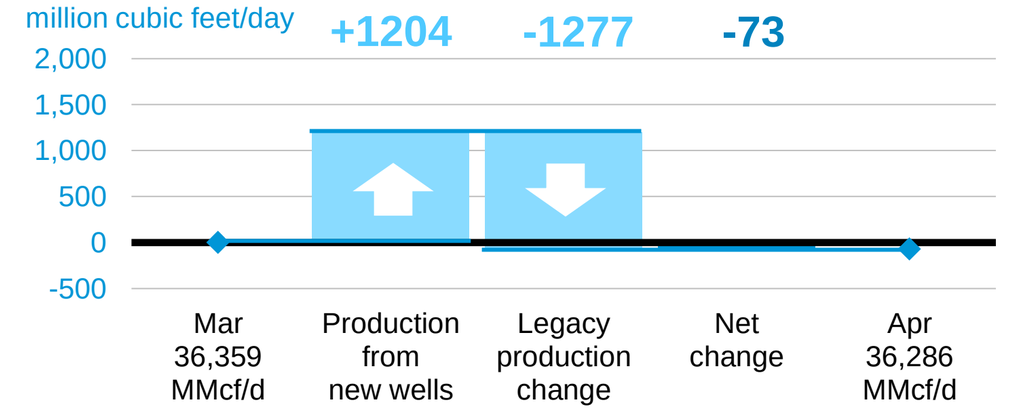


Appalachia Region
Indicated change in oil production (Apr vs. Mar)



Mar	Production from new wells	Legacy production change	Net change	Apr
150 Mbbl/d				150 Mbbl/d

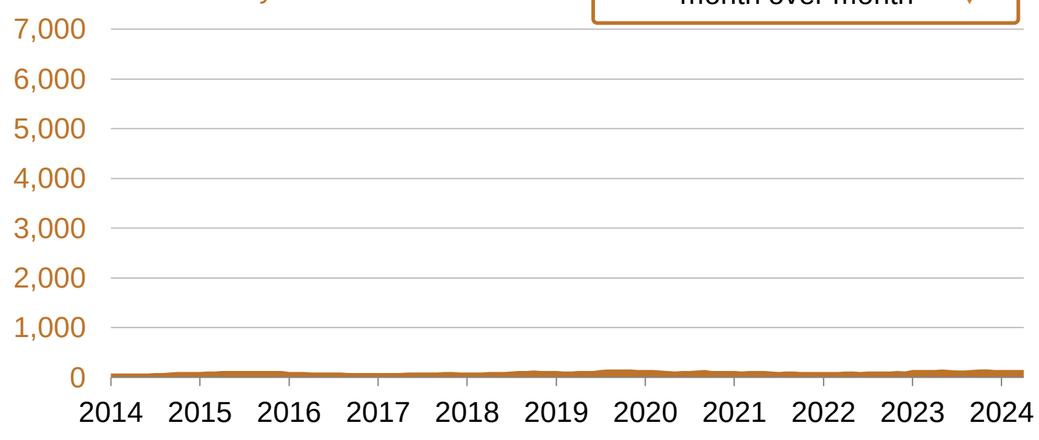
Appalachia Region
Indicated change in natural gas production (Apr vs. Mar)



Mar	Production from new wells	Legacy production change	Net change	Apr
36,359 MMcf/d				36,286 MMcf/d

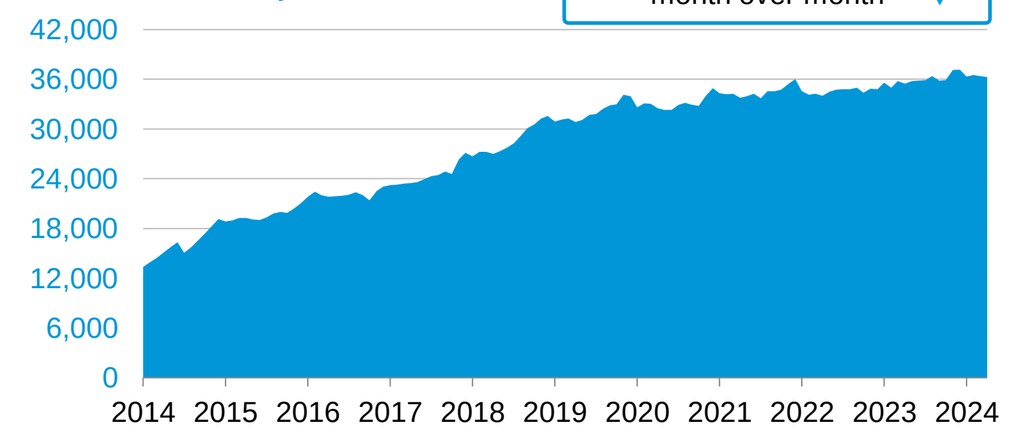
Appalachia Region
Oil production

Oil 0
thousand barrels/day
month over month



Appalachia Region
Natural gas production

Gas -73
million cubic feet/day
month over month



Bakken Region

Drilling Productivity Report

March 2024

drilling data through February
projected production through April

Oil +8 barrels/day month over month

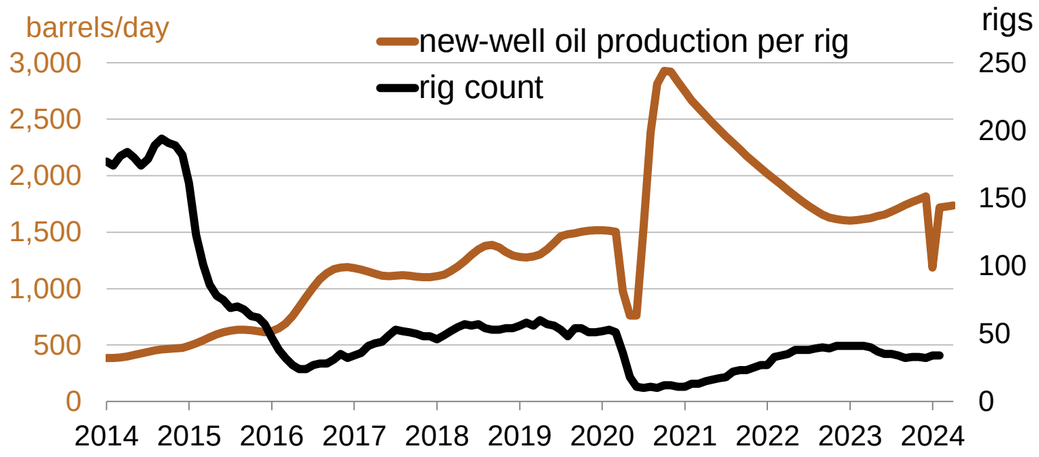
1,734 *April*
1,726 *March*
barrels/day

Monthly additions from one average rig

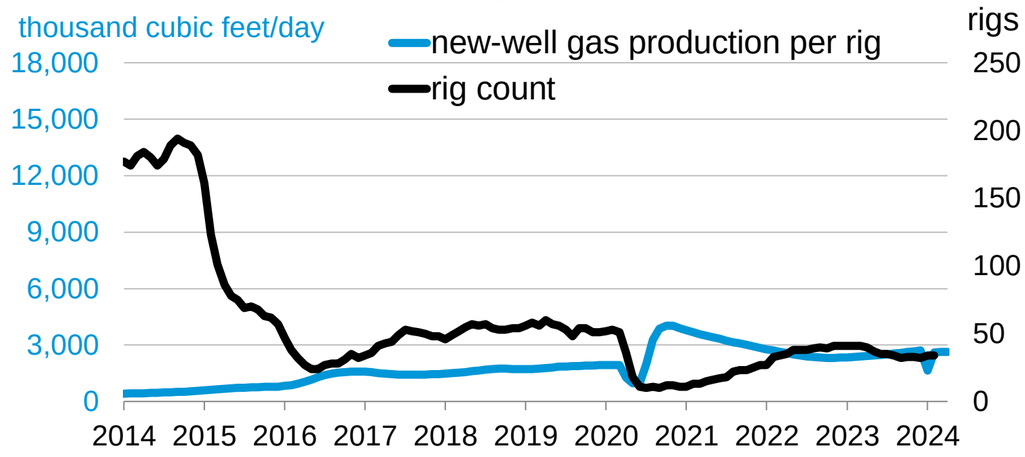
April **2,638**
March **2,624**
thousand cubic feet/day

Gas +14 thousand cubic feet/day month over month

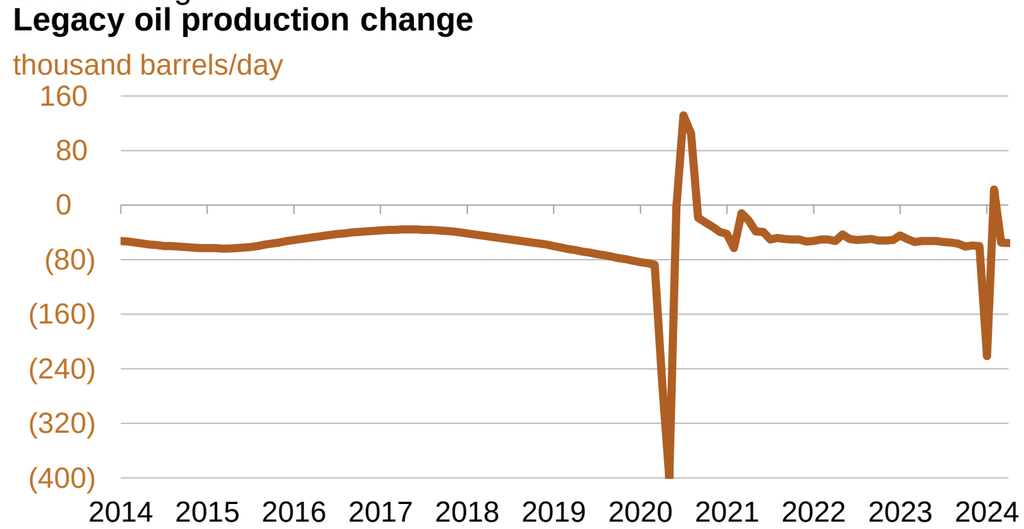
Bakken Region
New-well oil production per rig



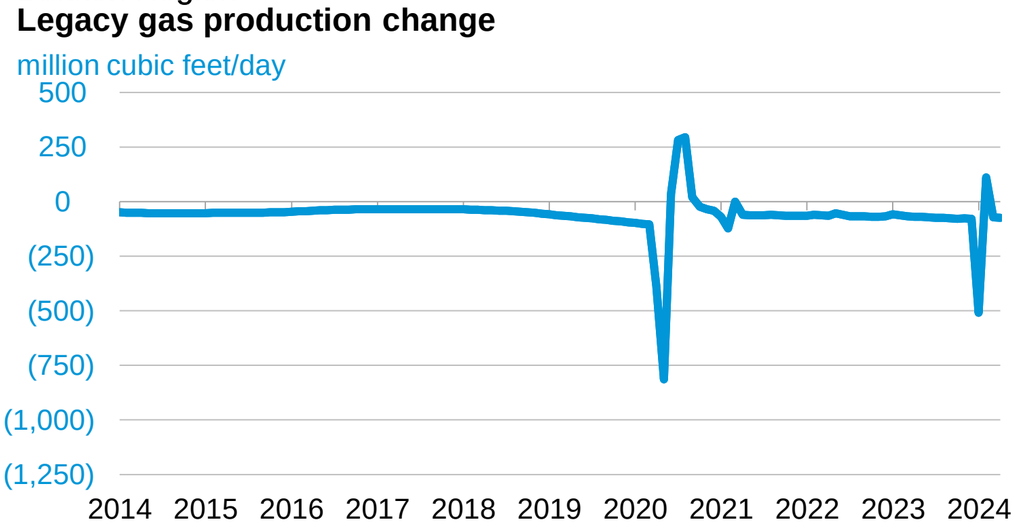
Bakken Region
New-well gas production per rig



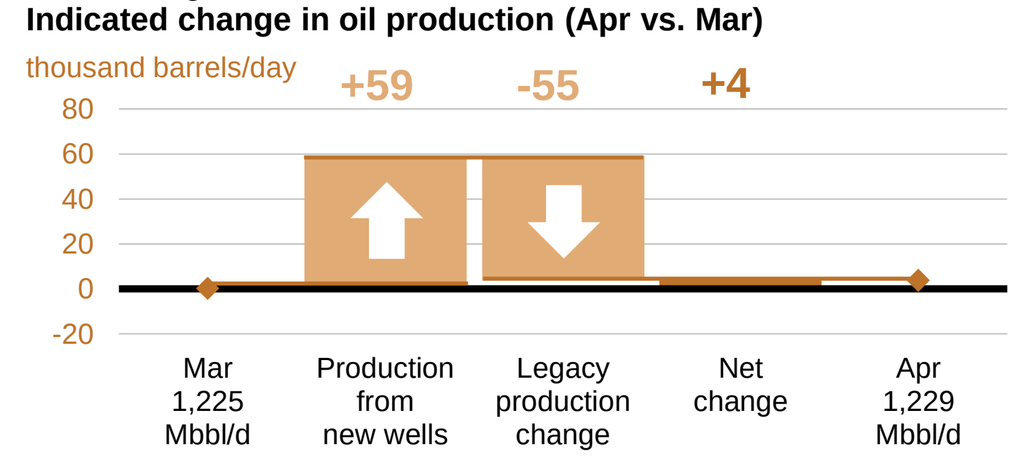
Bakken Region
Legacy oil production change



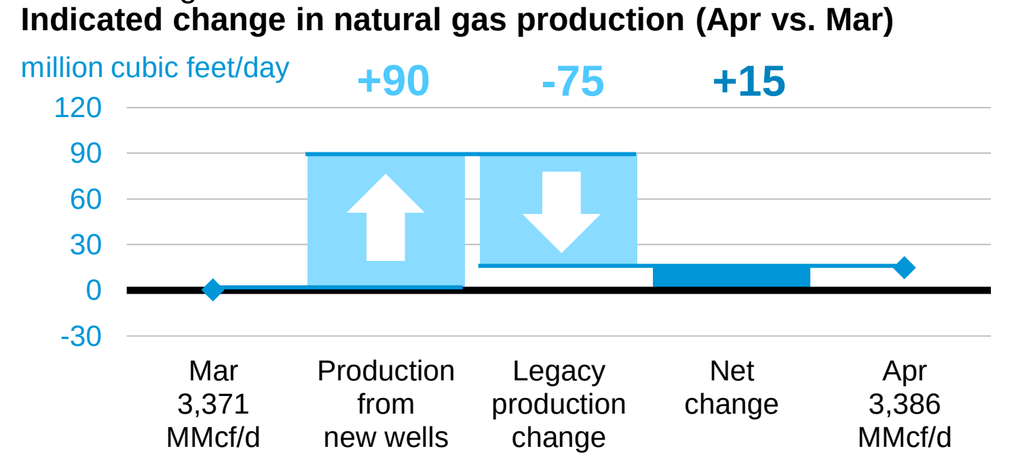
Bakken Region
Legacy gas production change



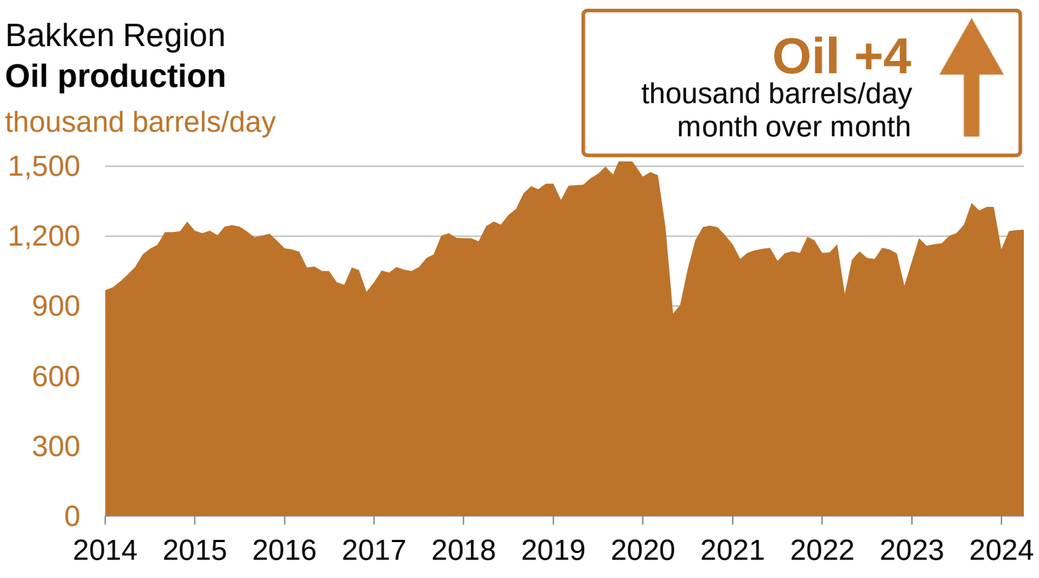
Bakken Region
Indicated change in oil production (Apr vs. Mar)



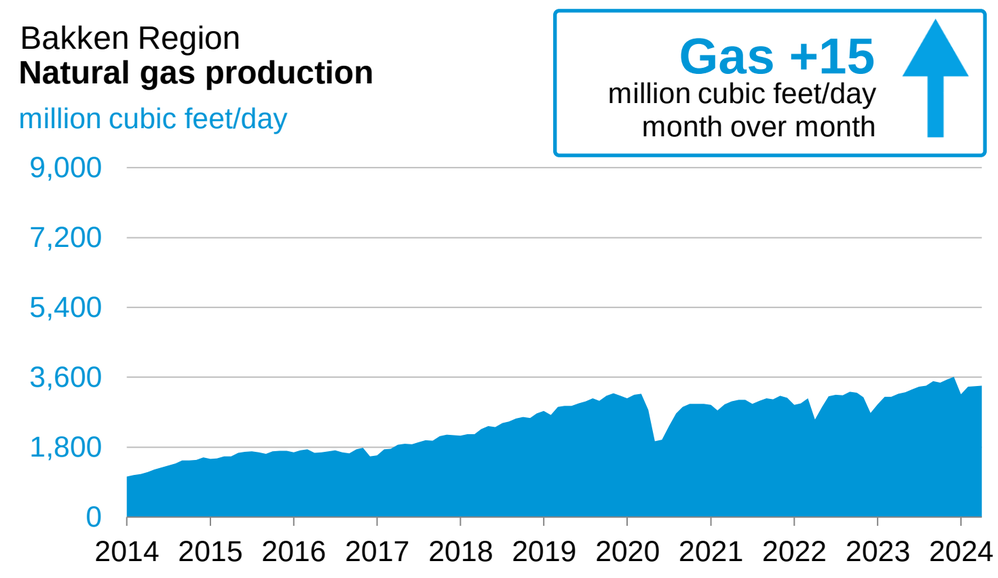
Bakken Region
Indicated change in natural gas production (Apr vs. Mar)



Bakken Region
Oil production



Bakken Region
Natural gas production



Eagle Ford Region

Drilling Productivity Report

March 2024

drilling data through February
projected production through April

Oil +5
barrels/day
month over month

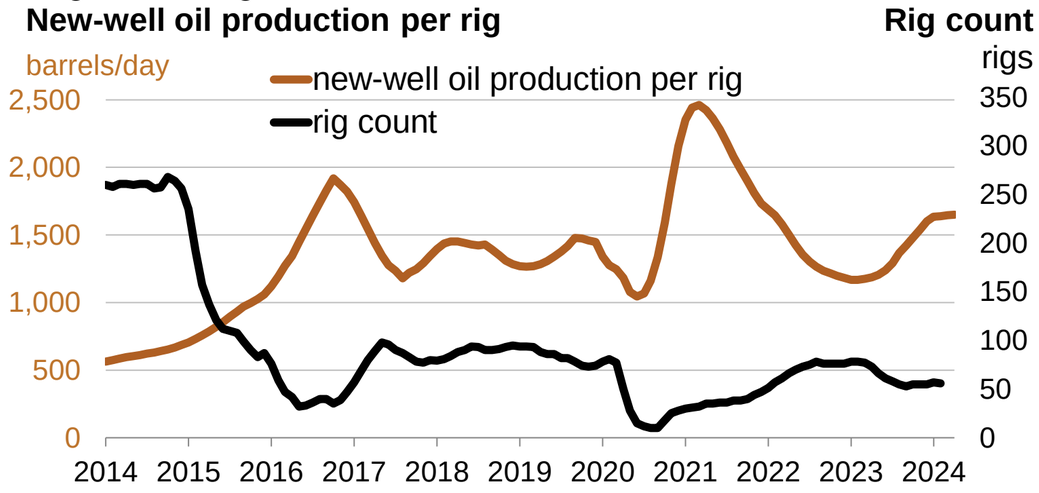
1,650 *April*
1,645 *March*
barrels/day

Monthly additions from one average rig

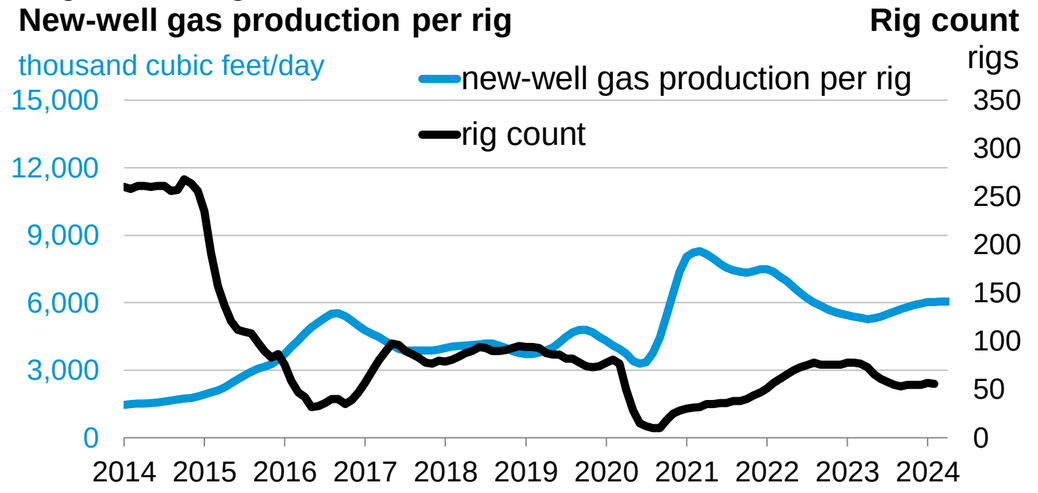
April **6,050**
March **6,043**
thousand cubic feet/day

Gas +7
thousand cubic feet/day
month over month

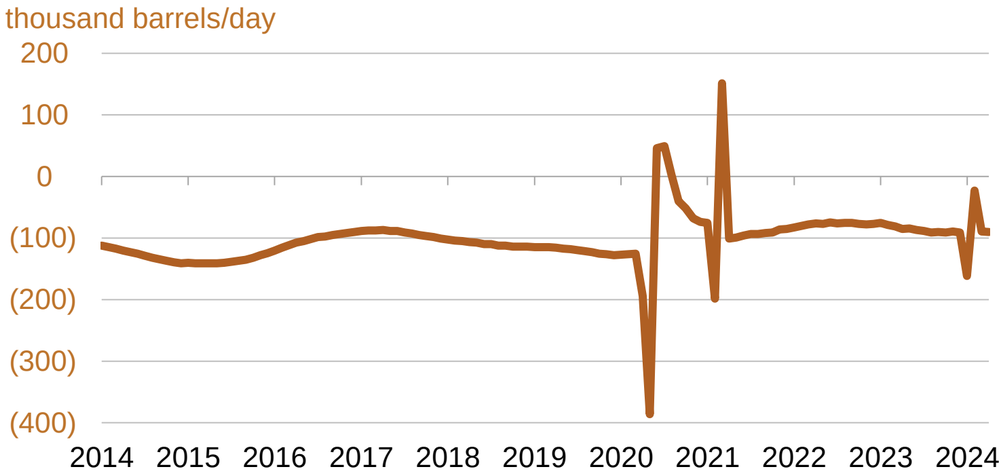
Eagle Ford Region
New-well oil production per rig



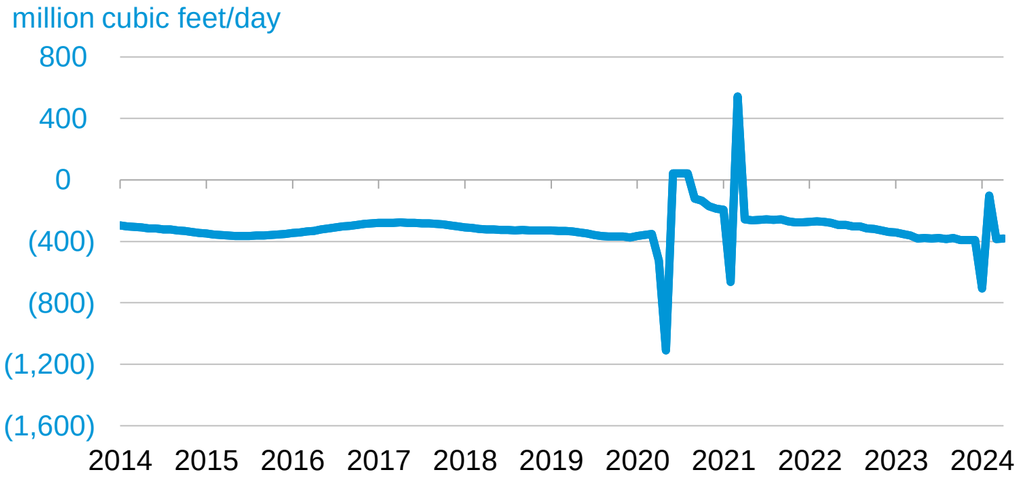
Eagle Ford Region
New-well gas production per rig



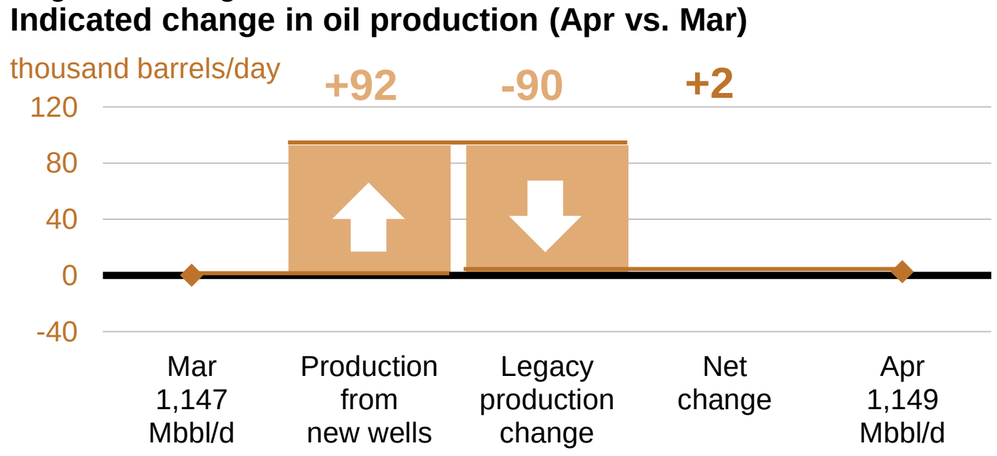
Eagle Ford Region
Legacy oil production change



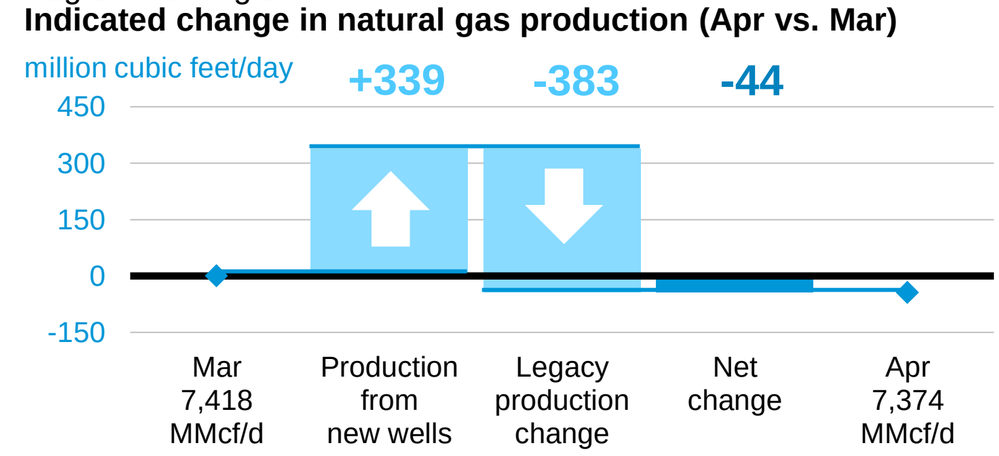
Eagle Ford Region
Legacy gas production change



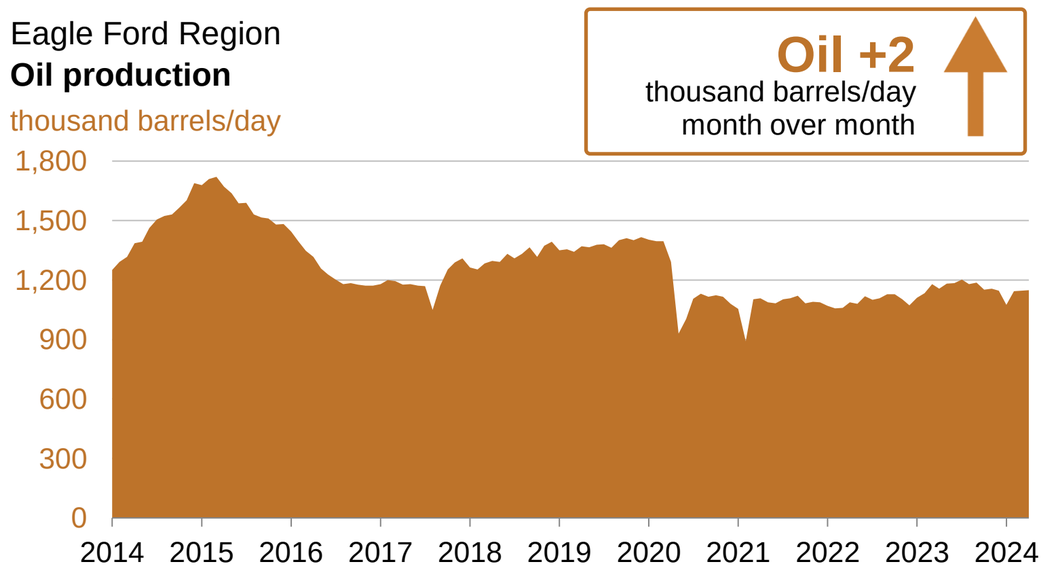
Eagle Ford Region
Indicated change in oil production (Apr vs. Mar)



Eagle Ford Region
Indicated change in natural gas production (Apr vs. Mar)

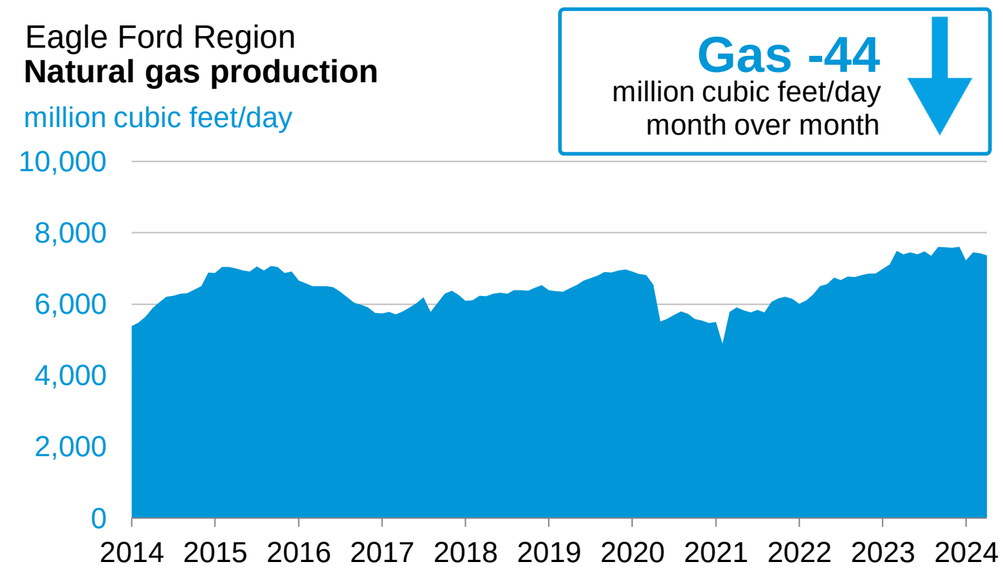


Eagle Ford Region
Oil production



Oil +2
thousand barrels/day
month over month

Eagle Ford Region
Natural gas production



Gas -44
million cubic feet/day
month over month

Haynesville Region

Drilling Productivity Report

March 2024

drilling data through February
projected production through April

Oil
0
barrels/day
month over month

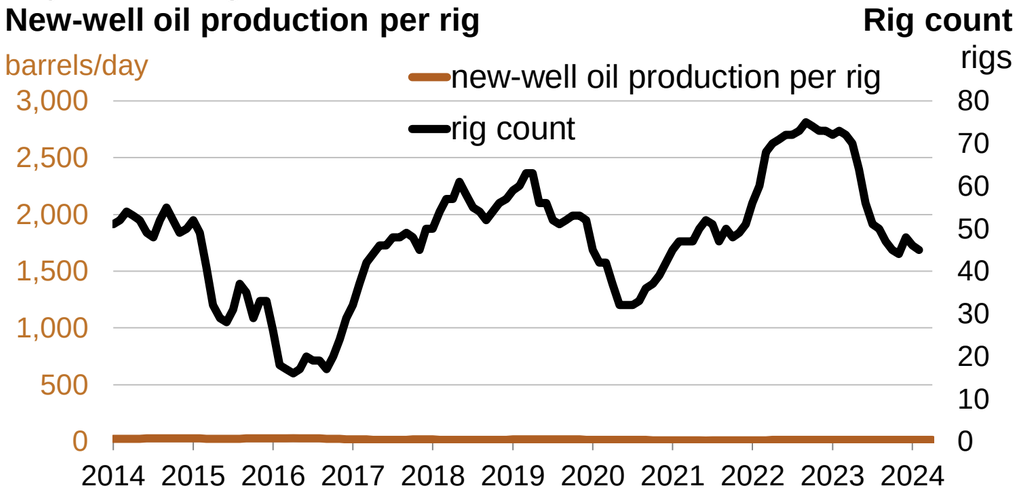
15 *April*
15 *March*
barrels/day

Monthly additions from one average rig

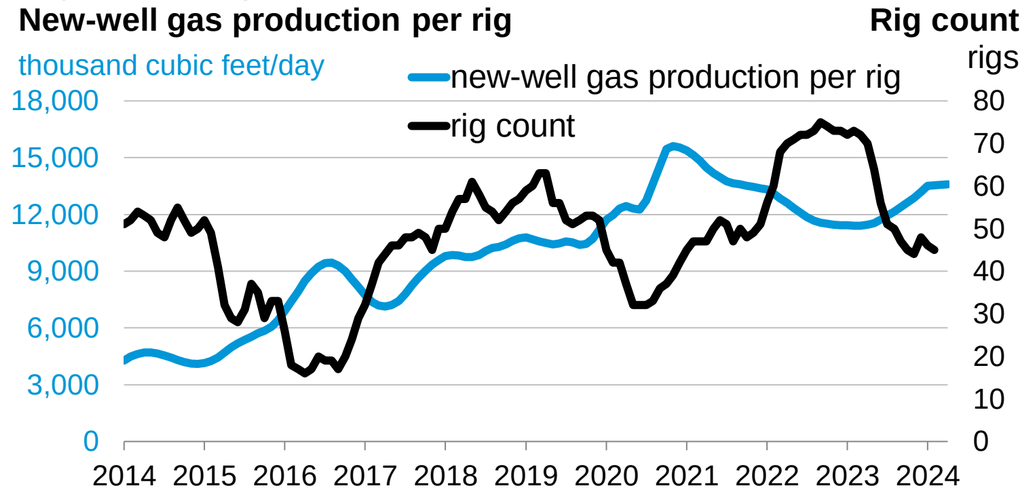
April **13,598**
March **13,571**
thousand cubic feet/day

Gas
+27
thousand cubic feet/day
month over month

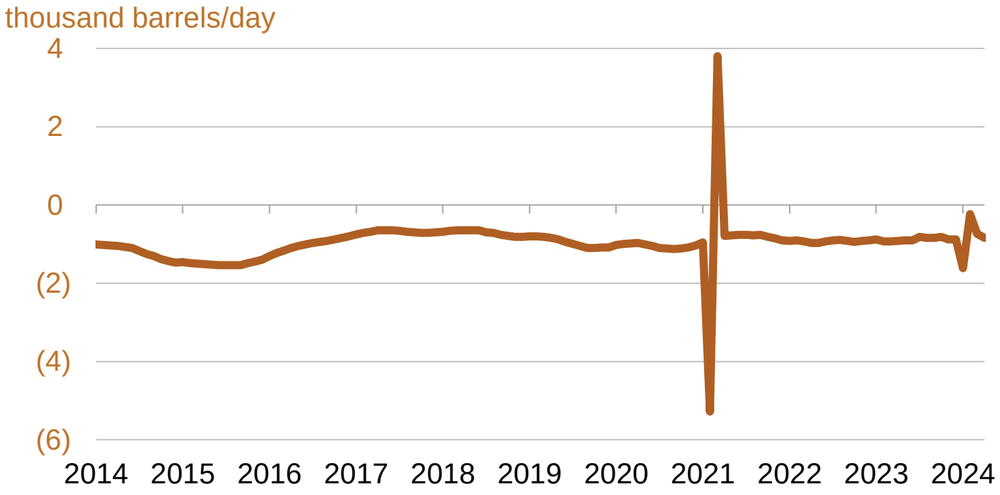
Haynesville Region
New-well oil production per rig



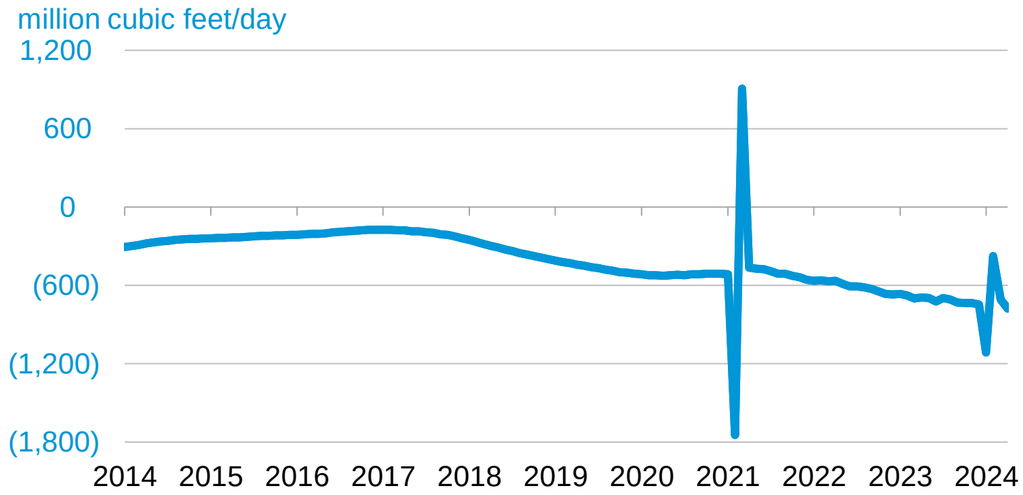
Haynesville Region
New-well gas production per rig



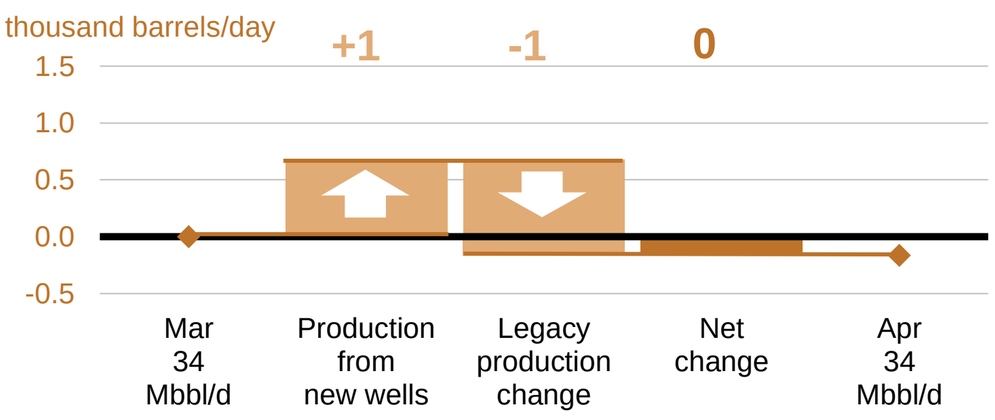
Haynesville Region
Legacy oil production change



Haynesville Region
Legacy gas production change

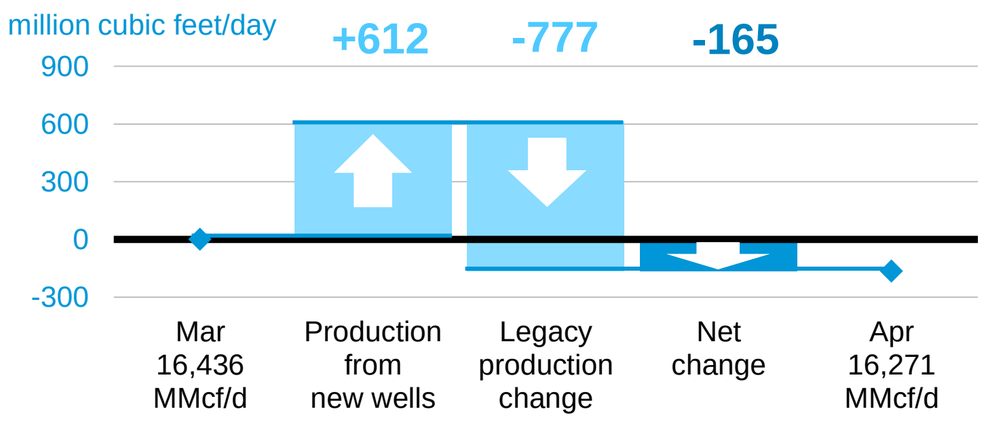


Haynesville Region
Indicated change in oil production (Apr vs. Mar)



Mar 34 Mbbl/d	Production from new wells	Legacy production change	Net change	Apr 34 Mbbl/d
	+1	-1	0	

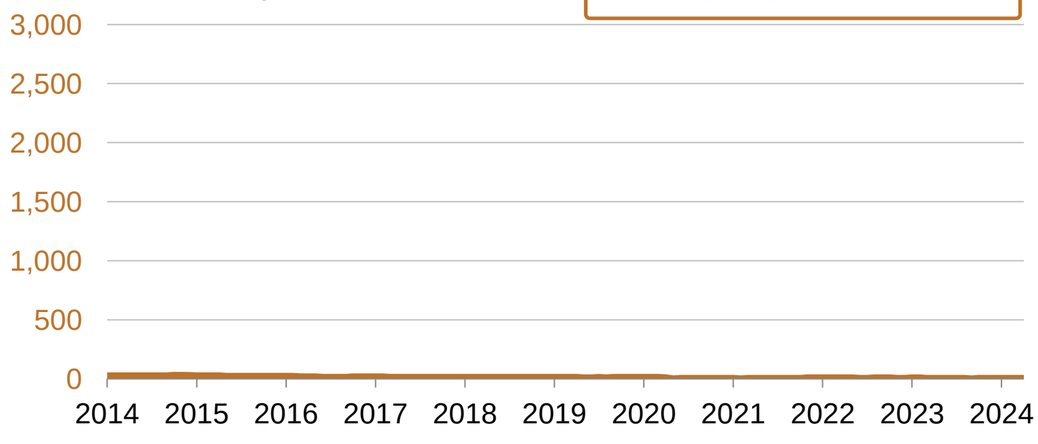
Haynesville Region
Indicated change in natural gas production (Apr vs. Mar)



Mar 16,436 MMcf/d	Production from new wells	Legacy production change	Net change	Apr 16,271 MMcf/d
	+612	-777	-165	

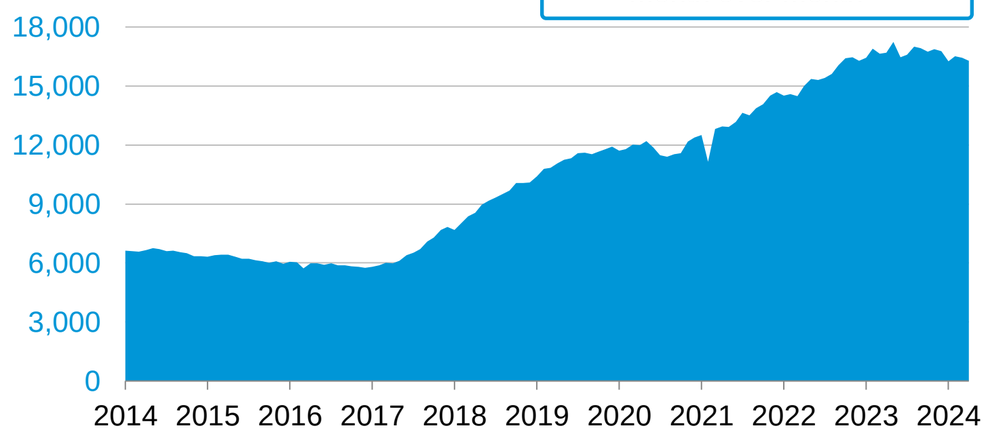
Haynesville Region
Oil production

Oil 0
thousand barrels/day
month over month



Haynesville Region
Natural gas production

Gas -165
million cubic feet/day
month over month



Niobrara Region

Drilling Productivity Report

March 2024

drilling data through February
projected production through April

Oil +3 barrels/day month over month

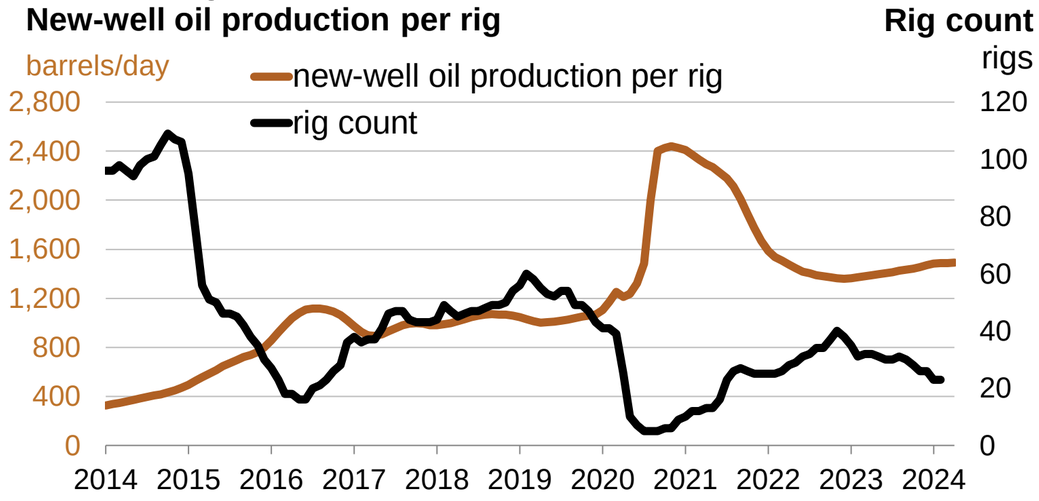
1,491 *April*
1,488 *March*
barrels/day

Monthly additions from one average rig

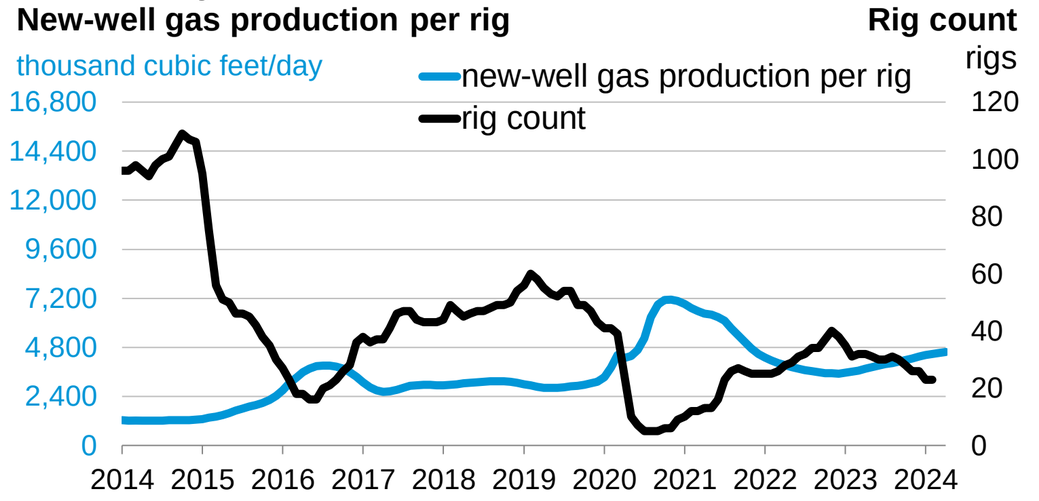
April **4,569**
March **4,523**
thousand cubic feet/day

Gas +46 thousand cubic feet/day month over month

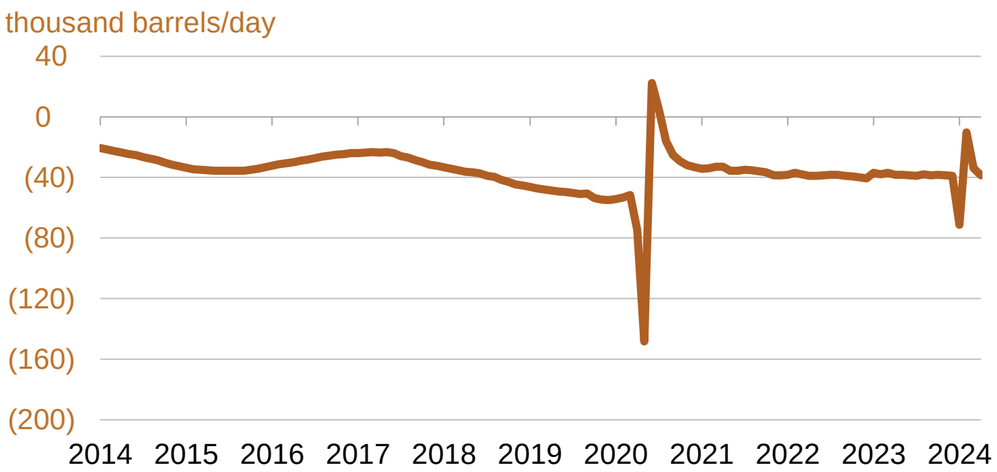
Niobrara Region
New-well oil production per rig



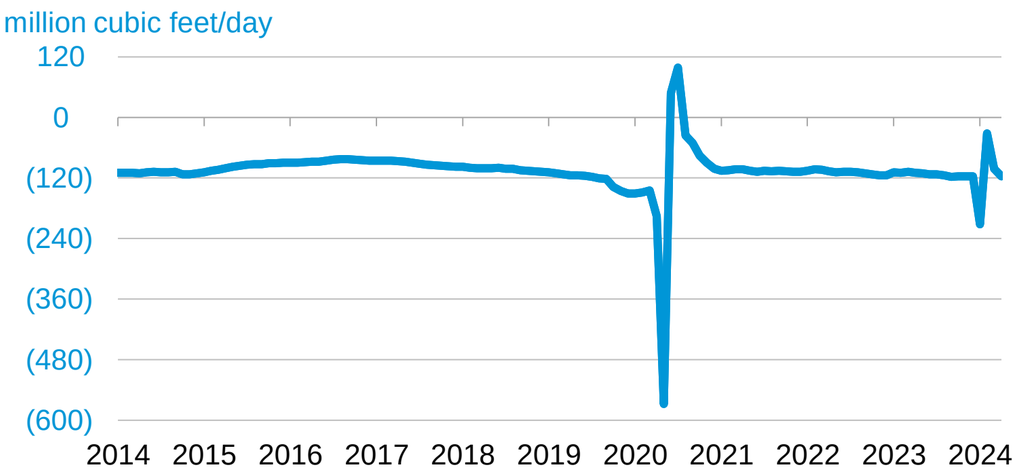
Niobrara Region
New-well gas production per rig



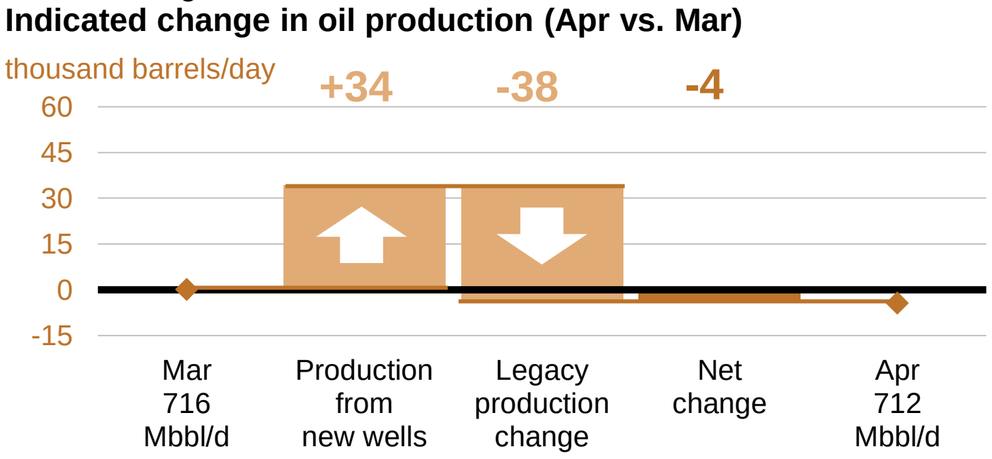
Niobrara Region
Legacy oil production change



Niobrara Region
Legacy gas production change

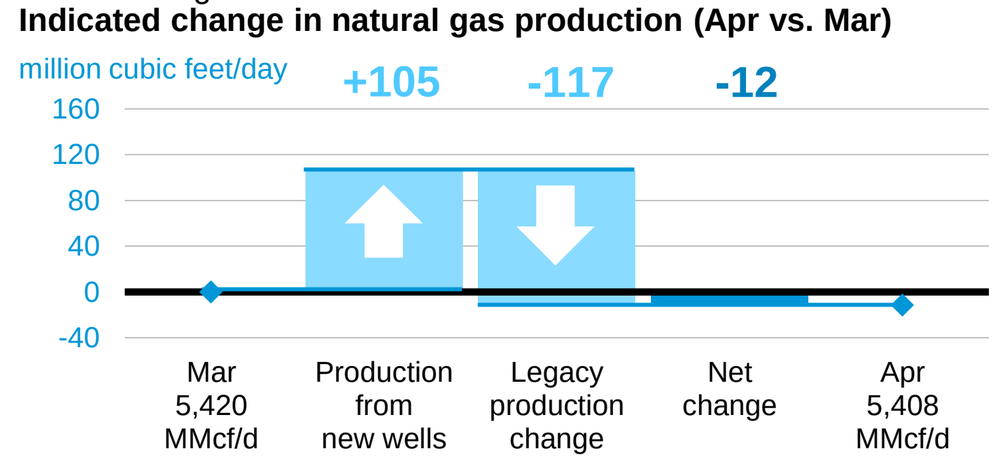


Niobrara Region
Indicated change in oil production (Apr vs. Mar)



Mar 716 Mbbl/d	Production from new wells	Legacy production change	Net change	Apr 712 Mbbl/d

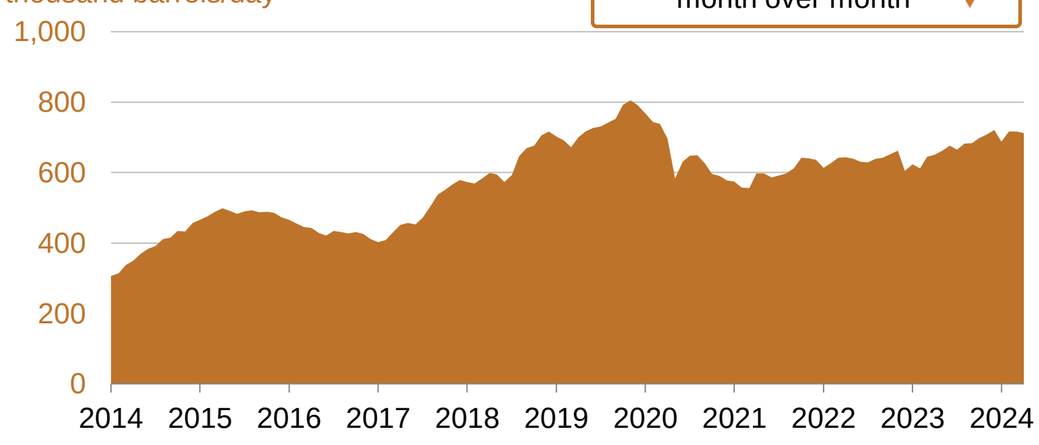
Niobrara Region
Indicated change in natural gas production (Apr vs. Mar)



Mar 5,420 MMcf/d	Production from new wells	Legacy production change	Net change	Apr 5,408 MMcf/d

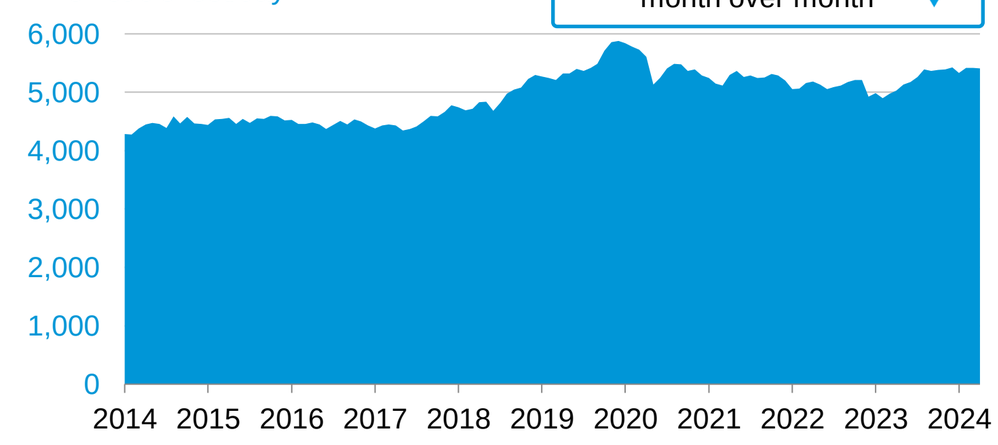
Niobrara Region
Oil production

Oil -4 thousand barrels/day month over month



Niobrara Region
Natural gas production

Gas -12 million cubic feet/day month over month



Permian Region

Drilling Productivity Report

March 2024

drilling data through February
projected production through April

Oil +13
barrels/day
month over month

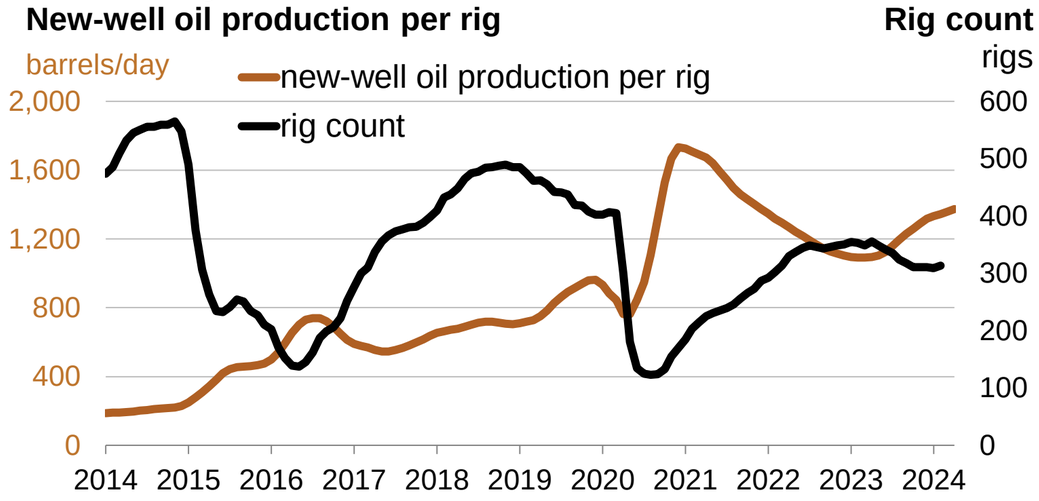
1,372 *April*
1,359 *March*
barrels/day

Monthly additions from one average rig

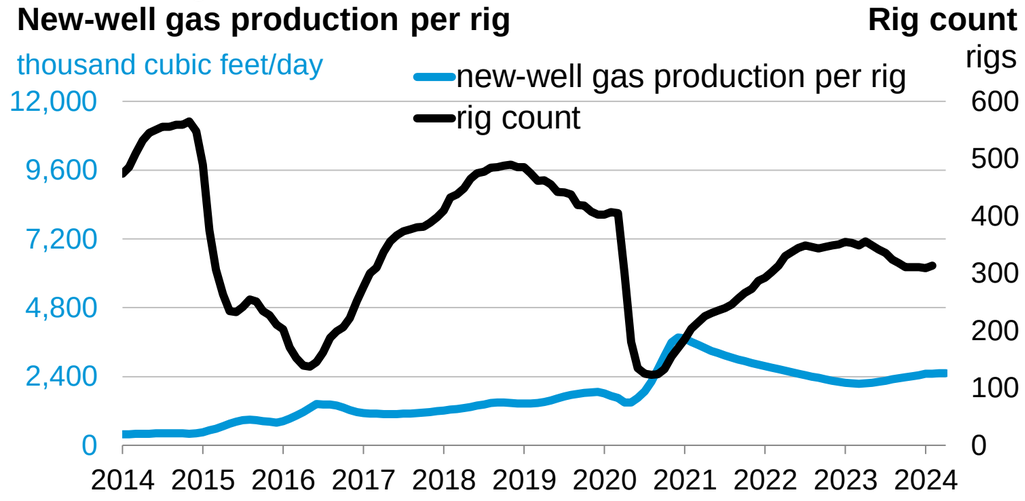
April **2,523**
March **2,512**
thousand cubic feet/day

Gas +11
thousand cubic feet/day
month over month

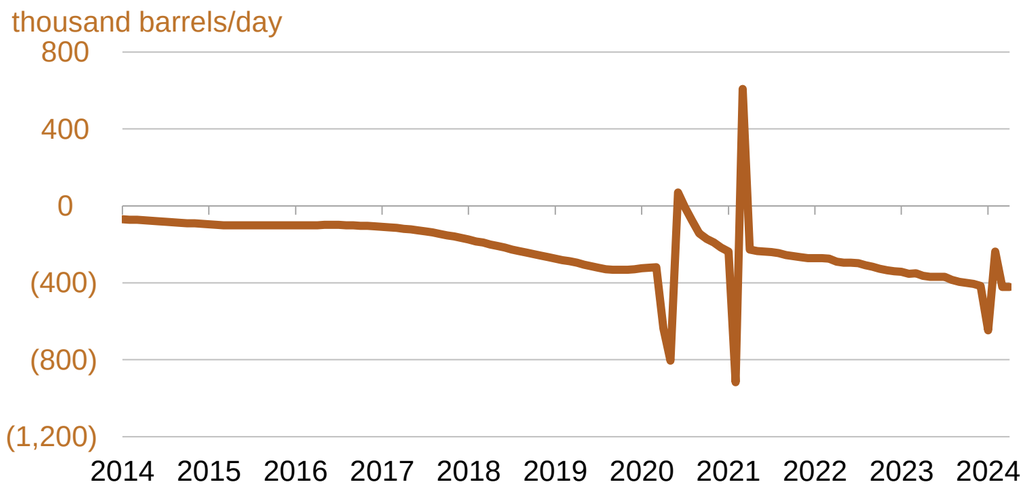
Permian Region
New-well oil production per rig



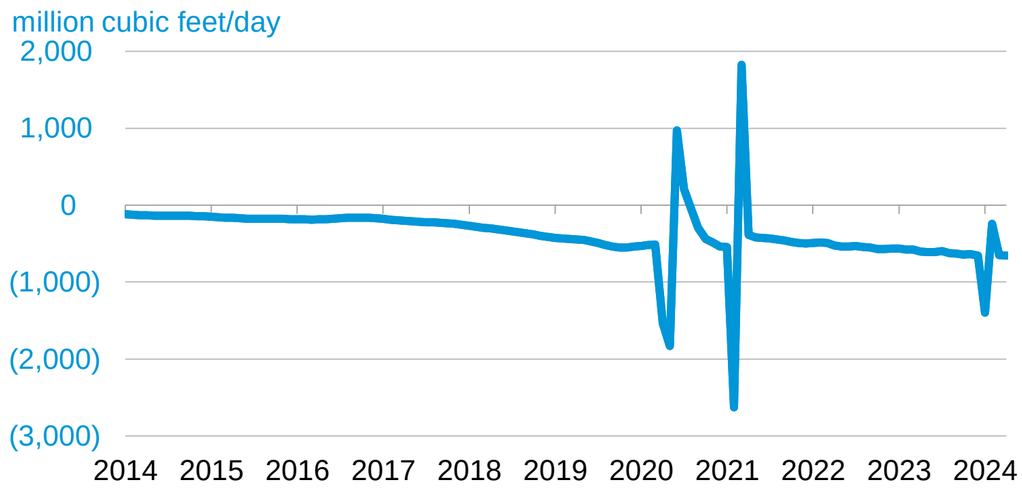
Permian Region
New-well gas production per rig



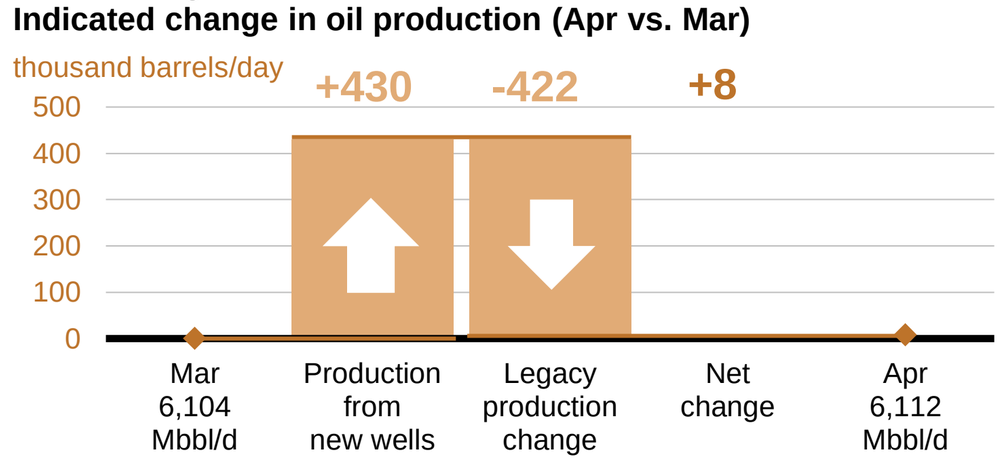
Permian Region
Legacy oil production change



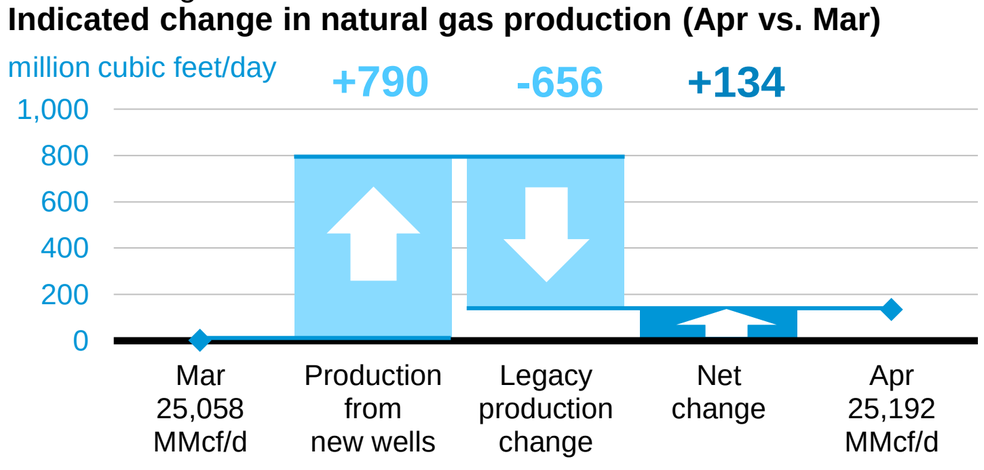
Permian Region
Legacy gas production change



Permian Region
Indicated change in oil production (Apr vs. Mar)

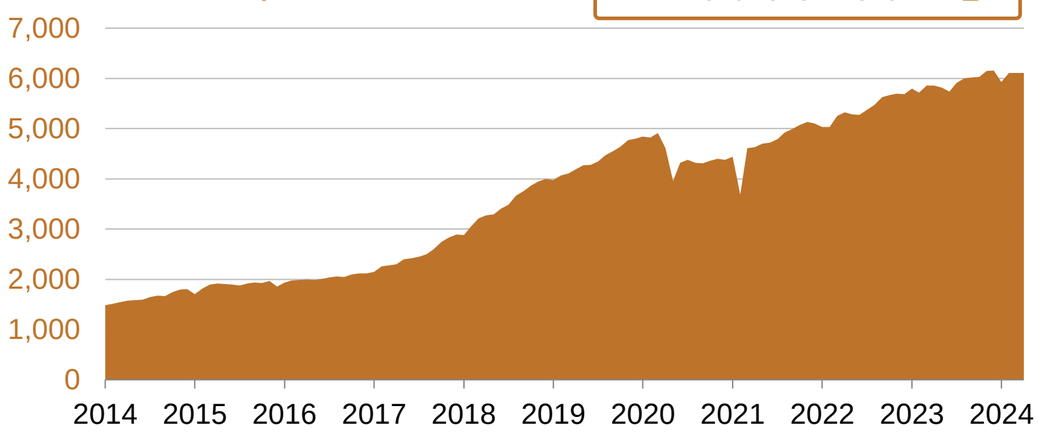


Permian Region
Indicated change in natural gas production (Apr vs. Mar)



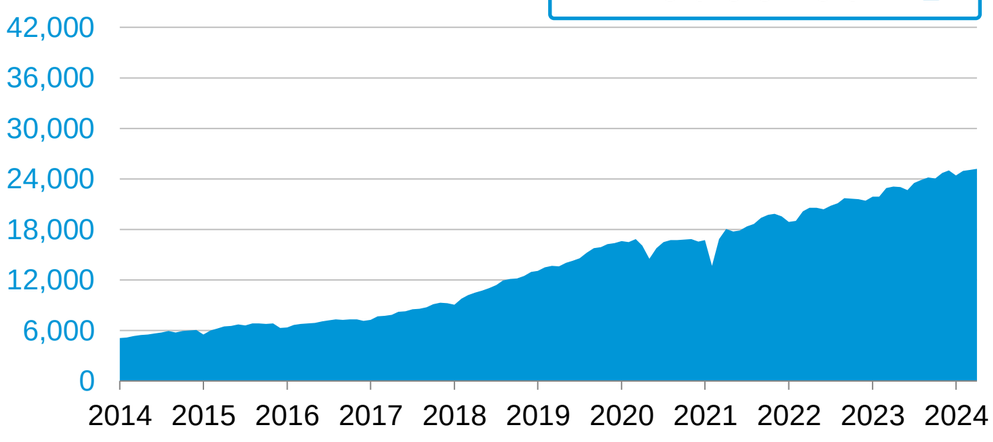
Permian Region
Oil production
thousand barrels/day

Oil +8
thousand barrels/day
month over month



Permian Region
Natural gas production
million cubic feet/day

Gas +134
million cubic feet/day
month over month



Explanatory notes

Drilling Productivity Report

March 2024

The Drilling Productivity Report uses recent data on the total number of drilling rigs in operation along with estimates of drilling productivity and estimated changes in production from existing oil and natural gas wells to provide estimated changes in oil[1] and natural gas[2] production for seven key regions. EIA's approach does not distinguish between oil-directed rigs and gas-directed rigs because once a well is completed it may produce both oil and gas; more than half of the wells do that.

Monthly additions from one average rig

Monthly additions from one average rig represent EIA's estimate of an average rig's[3] contribution to production of oil and natural gas from new wells.[4] The estimation of new-well production per rig uses several months of recent historical data on total production from new wells for each field divided by the region's monthly rig count, lagged by two months.[5] Current- and next-month values are listed on the top header. The month-over-month change is listed alongside, with +/- signs and color-coded arrows to highlight the growth or decline in oil (brown) or natural gas (blue).

New-well oil/gas production per rig

Charts present historical estimated monthly additions from one average rig coupled with the number of total drilling rigs as reported by Baker Hughes.

Legacy oil and natural gas production change

Charts present EIA's estimates of total oil and gas production changes from all the wells other than the new wells. The trend is dominated by the well depletion rates, but other circumstances can influence the direction of the change. For example, well freeze-offs or hurricanes can cause production to significantly decline in any given month, resulting in a production increase the next month when production simply returns to normal levels.

Projected change in monthly oil/gas production

Charts present the combined effects of new-well production and changes to legacy production. Total new-well production is offset by the anticipated change in legacy production to derive the net change in production. The estimated change in production does not reflect external circumstances that can affect the actual rates, such as infrastructure constraints, bad weather, or shut-ins based on environmental or economic issues.

Oil/gas production

Charts present all oil and natural gas production from both new and legacy wells since 2007. This production is based on all wells reported to the state oil and gas agencies. Where state data are not immediately available, EIA estimates the production based on estimated changes in new-well oil/gas production and the corresponding legacy change.

Footnotes:

1. Oil production represents both crude and condensate production from all formations in the region. Production is not limited to tight formations. The regions are defined by all selected counties, which include areas outside of tight oil formations.
2. Gas production represents gross (before processing) gas production from all formations in the region. Production is not limited to shale formations. The regions are defined by all selected counties, which include areas outside of shale formations.
3. The monthly average rig count used in this report is calculated from weekly data on total oil and gas rigs reported by Baker Hughes.
4. A new well is defined as one that began producing for the first time in the previous month. Each well belongs to the new-well category for only one month. Reworked and recompleted wells are excluded from the calculation.
5. Rig count data lag production data because EIA has observed that the best predictor of the number of new wells beginning production in a given month is the count of rigs in operation two months earlier.

The data used in the preparation of this report come from the following sources. EIA is solely responsible for the analysis, calculations, and conclusions.

Drilling Info (http://www.drillinginfo.com) Source of production, permit, and spud data for counties associated with this report. Source of real-time rig location to estimate new wells spudded and completed throughout the United States.

Baker Hughes (http://www.bakerhughes.com) Source of rig and well counts by county, state, and basin.

North Dakota Oil and Gas Division (https://www.dmr.nd.gov/oilgas) Source of well production, permit, and completion data in the counties associated with this report in North Dakota

Railroad Commission of Texas (http://www.rrc.state.tx.us) Source of well production, permit, and completion data in the counties associated with this report in Texas

Pennsylvania Department of Environmental Protection (https://www.paoilandgasreporting.state.pa.us/publicreports/Modules/Welcome/Welcome.aspx) Source of well production, permit, and completion data in the counties associated with this report in Pennsylvania

West Virginia Department of Environmental Protection (http://www.dep.wv.gov/oil-and-gas/Pages/default.aspx) Source of well production, permit, and completion data in the counties associated with this report in West Virginia

Colorado Oil and Gas Conservation Commission (http://cogcc.state.co.us) Source of well production, permit, and completion data in the counties associated with this report in Colorado

Wyoming Oil and Conservation Commission (http://wogcc.state.wy.us) Source of well production, permit, and completion data in the counties associated with this report in Wyoming

Louisiana Department of Natural Resources (http://dnr.louisiana.gov) Source of well production, permit, and completion data in the counties associated with this report in Louisiana

Ohio Department of Natural Resources (http://oilandgas.ohiodnr.gov) Source of well production, permit, and completion data in the counties associated with this report in Ohio

Oklahoma Corporation Commission (http://www.occeweb.com/og/oghome.htm) Source of well production, permit, and completion data in the counties associated with this report in Oklahoma

https://www.thenationalnews.com/business/energy/2024/04/17/oman-signs-10-year-lng-supply-deal-with-shell/

Oman signs 10-year LNG supply deal with Shell

The agreement involves up to 1.6 million metric tonnes of LNG a year and will start in 2025

Oman LNG's complex in the sultanate's north-eastern coastal city of Sur. Photo: Oman LNG

Alvin R Cabral
Apr 17, 2024
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Oman LNG has signed a 10-year liquefied natural gas supply agreement with Shell, as the state-owned Omani company optimises its operations to meet global consumer demand.

The deal involves up to 1.6 million metric tonnes of LNG a year and will start from next year, the Oman News Agency reported on Wednesday.

The supply agreement “contributes to opening new horizons for co-operation in global markets”, said Oman LNG chief executive Hamad Al Numani.

The deal also complements the two companies' agreement in October to extend their partnership beyond 2024 as the demand for natural gas continues to grow amid green transition efforts.

READ MORE
How Oman is quietly planning to be a major green hydrogen exporter
Shell signs agreement with Oman LNG to extend partnership

Oman LNG signs supply deal with Germany's SEFE

As part of that amended agreement, Shell Gas, a unit of London-based Shell, remains the largest private shareholder in Oman LNG, with a 30 per cent shareholding. It will continue its role as technical adviser.

The new deal "strengthens Oman LNG's reputation as a reliable provider of LNG and its … ability to efficiently manage business operations to provide safe and sustainable energy to customers around the world", Mr Al Numani said.

LNG is vital to the energy strategy of Oman, the second-largest exporter of the commodity in the Middle East after Qatar.

Global LNG trade grew by 1.8 per cent to 404 million tonnes last year, from 397 million tonnes in 2022, as tight supplies constrained the sector's growth, Shell said in its latest LNG outlook report.

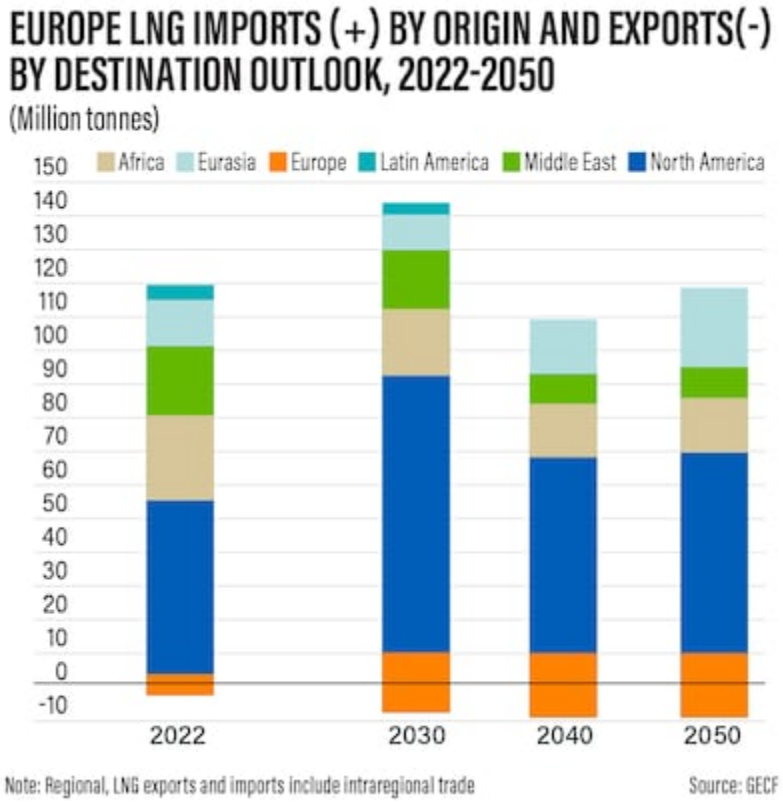
Demand for LNG is projected to more than double by 2040, as industrial coal-to-gas switching gathers pace in China, and South Asian and South-East Asian countries use more LNG to support their economic growth, it said.

Improving LNG technology has also opened up possibilities by allowing gas to be transported in tanker ships, much like oil, although the infrastructure required is complex and expensive, and a pipeline network is still needed to distribute the gas to end users, according to the International Energy Agency.

China, the world's biggest coal consumer, is projected to increase the use of natural gas in its primary energy mix to 12 per cent by 2030, from 8.7 per cent in 2020.

India, the second-largest coal consumer, aims to raise the share of natural gas in its total energy mix to 15 per cent by 2030, from about 6 per cent.

Europe is aiming to replace Russian gas supplies with LNG shipments from the US and the Middle East.



Oman LNG in August signed an agreement with Germany's Securing Energy for Europe to supply 400,000 tonnes of LNG a year, starting from 2026, based on a four-year contract.

The new Oman LNG-Shell agreement is “an important addition to the company’s stock of liquefied natural gas and integrated gas, and helps ensure its ability to meet the growing demand for flexible and reliable energy from its global customer”, said Walid Hadi, chairman of the board of directors of Shell in Oman.

Oman LNG operates a complex in the sultanate's north-eastern coastal city of Sur, capable of producing 11.5 million metric tonnes annually.

Updated: April 17, 2024, 5:33 AM

Highlights for the month

- Indigenous crude oil and condensate production during March 2024 was 2.5 MMT. OIL registered a production of 0.3 MMT, ONGC registered a production of 1.6 MMT whereas PSC/RSC registered production of 0.6 MMT during March 2024. There is a growth of 2.02% in crude oil and condensate production during March 2024 as compared to March 2023.
- Total Crude oil processed during March 2024 was 23.4 MMT which is 1.6% higher than March 2023, where PSU/JV refiners processed 16.1 MMT and private refiners processed 7.3 MMT of crude oil. Total indigenous crude oil processed was 2.4 MMT and total Imported crude oil processed was 21.0 by all Indian refineries (PSU+JV+PVT). There was a growth of 2.5% in total crude oil processed in April March FY 2023 – 24 as compared to same period of FY 2022 – 23.
- Crude oil imports decreased by 4.4% and 0.1% during March 2024 and April-March 2023-24 respectively as compared to the corresponding period of the previous year.As compared to net import bill for Oil & Gas for March 2023 of $9.8 billion, the net import bill for Oil & Gas for March 2024 was $10.7 billion. Out of which, crude oil imports constitutes $11.6 billion, LNG imports $1.1 billion and the exports were $4.0 billion during March 2024.
- The price of Brent Crude averaged $85.48/bbl during March 2024 as against $83.93/bbl during February 2024 and $78.56/bbl during March 2023. The Indian basket crude price averaged $84.49/bbl during March 2024 as against $81.62/bbl during February 2024 and $78.54 /bbl during March 2023.
- Production of petroleum products was 24.9 MMT during March 2024 which is 1.5% higher than March 2023. Out of 24.6 MMT, 24.6 MMT was from refinery production & 0.3 MMT was from fractionator. There was a growth of 3.6 % in production of petroleum products in April March FY 2023 – 24 as compared to same period of FY 2022 – 23. Out of total POL production, in March 2024, share of HSD is 40.5 %, MS 16.6 %, Naphtha 6.7 %, ATF 6.3 %, Pet Coke 5.5 %, LPG 4.6% which are of major products and rest are shared by Bitumen, FO/LSHS, LDO, Lubes & others.
- POL products imports decreased by 8.5% and increased by 7.8% during March 2024 and April-March 2023-24 respectively as compared to the corresponding period of the previous year. Increase in POL products imports during April-March 2023-24 were mainly due to increase in imports of petcoke, fuel oil (FO) and naphtha.

•	Exports of POL products decreased by 11.7% and increased by 1.9% during March 2024 and Apr-Mar 2023-24 respectively as compared to the corresponding period of the previous year. Increase in POL products exports during April-February 2023-24 were mainly due to increase in exports of aviation turbine fuel (ATF), vacuum gas oil (VGO) and fuel oil (FO).
•	The consumption of petroleum products during April-March 2024, with a volume of 233.3 MMT, reported a growth of 4.6 % compared to the volume of 223.0 MMT during the same period of the previous year. This growth was led by 6.4% growth in MS, 4.4% in HSD & 11.8% in ATF & 14.3% in Naptha consumption besides LPG, Lubes, Bitumen, Petcoke and LDO during the period. The consumption of petroleum products during March 2024 recorded de-growth of 0.6% with a volume of 21.1 MMT compared to the same period of the previous year.
•	Ethanol blending with Petrol was 12.8% during March 2024 and cumulative ethanol blending during November2023- March 2024 was 12.0%. As on 31.03.2024, 13,364 PSU outlets out of 81,435 total PSU Retail Outlets are dispensing E20 Ethanol Blended MS.
•	Total Natural Gas Consumption (including internal consumption) for the month of March 2024 was 5594 MMSCM which was 2.9 % higher than the corresponding month of the previous year. The cumulative consumption of 66634 MMSCM for the current financial year till March 2024 was higher by 11.1 % compared with the corresponding period of the previous year.
•	Gross production of natural gas for the month of March 2024 (P) was 3138 MMSCM which was higher by 6.2 % compared with the corresponding month of the previous year. The cumulative gross production of natural gas of 36438 MMSCM for the current financial year till March 2024 was higher by 5.8 % compared with the corresponding period of the previous year.
•	LNG import for the month of March 2024 (P) was 2522 MMSCM which was 1.1 % lower than the corresponding month of the previous year. The cumulative import of 30917 (P) MMSCM for the current financial year till March 2024 is higher by 17.5 % compared with the corresponding period of the previous year.

1. Selected indicators of the Indian economy

	Economic indicators	Unit/ Base	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24
1	Population (basis RGI projections)	Billion	1.323	1.337	1.351	1.365	1.377	1.388
2	GDP at constant (2011-12 Prices)	Growth %	6.5 2nd RE	4.0 1st RE	-6.6 1st RE	9.1 1st RE	7.2 PE	7.6 (E)
3	Agricultural Production (Food grains)	MMT	285.2	297.5	310.7	315.7 4th AE	323.6 2nd AE	-
		Growth %	0.1	4.3	4.5	1.6	2.5	-
4	Gross Fiscal Deficit (as percent of GDP)	%	3.4	4.6	9.5 RE	6.7 RE	6.4 RE	5.9 RE

	Economic indicators	Unit/ Base	2021-22	2022-23	March		April-March	
					2022-23	2023-24 (P)	2022-23	2023-24 (P)
5	Index of Industrial Production (Base: 2011-12)	Growth %	11.4	5.5#	6.0*	5.7* QE	5.6#	5.9#
6	Imports^	$ Billion	611.9	714.2	60.9	57.3	716.0	677.2
7	Exports^	$ Billion	422.0	451.0	42.0	41.7	451.1	437.1
8	Trade Balance	$ Billion	-189.9	-263.2	-19.0	-15.6	-264.9	-240.2
9	Foreign Exchange Reserves @	$ Billion	617.6	578.4	578.5	645.6	-	-

Population projection by RGI is taken as on 1st July for the year. IIP is for the month of *Feb'24 and #April-Feb'24; @ 2021-22 - as on March 25,2022, 2022-23 as on March 31, 2023, March 2023 as on March 31, 2023 and March, 2024 as on March 29, 2024; ^Imports & Exports are for Merchandise for the month of March 2024 and April 23- March 2024; E: Estimates; PE: Provisional Estimates; AE-Advanced Estimates; RE-Revised Estimates; QE-Quick Estimates.

Source: Registrar General India, Ministry of Commerce & Industry, Ministry of Statistics and Programme Implementation, Ministry of Agriculture & Farmer's Welfare, Ministry of Finance, Reserve Bank of India

2. Crude oil, LNG and petroleum products at a glance

	Details	Unit/ Base	2021-22 (P)	2022-23 (P)	March		April-March	
					2022-23 (P)	2023-24 (P)	2022-23 (P)	2023-24 (P)
1	Crude oil production in India[#]	MMT	29.7	29.2	2.5	2.5	29.2	29.4
2	Consumption of petroleum products*	MMT	201.7	223.0	21.2	21.1	223.0	233.3
3	Production of petroleum products	MMT	254.3	266.5	24.5	24.9	266.5	276.1
4	Gross natural gas production	MMSCM	34,024	34,450	2,956	3,138	34,450	36,438
5	Natural gas consumption	MMSCM	64,159	59,969	5,439	5,594	59,969	66,634
6	Imports & exports:							
	Crude oil imports	MMT	212.4	232.7	20.9	20.0	232.7	232.5
		$ Billion	120.7	157.5	10.9	11.6	157.5	132.4
	Petroleum products (POL) imports*	MMT	39.0	44.6	4.4	4.0	44.6	48.1
		$ Billion	23.7	26.9	2.2	2.0	26.9	23.4
	Gross petroleum imports (Crude + POL)	MMT	251.4	277.3	25.3	24.0	277.3	280.5
		$ Billion	144.3	184.4	13.1	13.6	184.4	155.8
	Petroleum products (POL) export	MMT	62.8	61.0	6.0	5.3	61.0	62.2
		$ Billion	44.4	57.3	4.5	4.0	57.3	47.4
	LNG imports*	MMSCM	31,028	26,304	2,550	2,522	26,304	30,917
		$ Billion	13.5	17.1	1.2	1.1	17.1	13.3
	Net oil & gas imports	$ Billion	113.4	144.2	9.8	10.7	144.2	121.6
7	Petroleum imports as percentage of India's gross imports (in value terms)	%	23.6	25.8	24.4	22.7	28.2	25.1
8	Petroleum exports as percentage of India's gross exports (in value terms)	%	10.5	12.7	12.1	9.8	14.0	12.0
9	Import dependency of crude oil (on POL consumption basis)	%	85.5	87.4	88.9	88.0	87.4	87.7

#Includes condensate; *Private direct imports are prorated for the period Jan'24 to March'24 for POL. RIL data prorated. LNG Imports figure from DGCIS are prorated for Feb'24 to Mar'24.Total may not tally due to rounding off.

3. Indigenous crude oil production (Million Metric Tonnes)

Details	2021-22	2022-23 (P)	March			April-March		
			2022-23 (P)	2023-24 Target*	2023-24 (P)	2022-23 (P)	2023-24 Target*	2023-24 (P)
ONGC	18.5	18.4	1.6	1.6	1.5	18.4	19.2	18.1
Oil India Limited (OIL)	3.0	3.2	0.3	0.3	0.3	3.2	3.4	3.3
Private / Joint Ventures (JVs)	7.0	6.2	0.5	0.6	0.5	6.2	7.4	5.7
Total Crude Oil	**28.4**	**27.8**	**2.3**	**2.5**	**2.3**	**27.8**	**30.0**	**27.2**
ONGC condensate	0.9	1.0	0.1	0.0	0.1	1.0	0.0	1.1
PSC condensate	0.3	0.31	0.03	0.0	0.1	0.3	0.0	1.1
Total condensate	**1.2**	**1.4**	**0.12**	**0.0**	**0.2**	**1.4**	**0.0**	**2.2**
Total (Crude + Condensate) (MMT)	**29.7**	**29.2**	**2.5**	**2.5**	**2.5**	**29.2**	**30.0**	**29.4**
Total (Crude + Condensate) (Million Bbl/Day)	0.60	0.59	0.58	0.60	0.59	0.58	0.60	0.59

*Provisional targets inclusive of condensate.

4. Domestic and overseas oil & gas production (by Indian Companies)

Details	2021-22	2022-23 (P)	March		April-March	
			2022-23 (P)	2023-24 (P)	2022-23 (P)	2023-24 (P)
Total domestic production (MMTOE)	63.7	63.6	5.4	5.6	63.6	65.8
Overseas production (MMTOE)	21.8	19.5	1.7	1.7	19.5	19.9

Source: ONGC Videsh, GAIL, OIL , IOCL, HPCL & BPRL

5. High Sulphur (HS) & Low Sulphur (LS) crude oil processing (MMT)

	Details	2021-22	2022-23 (P)	March		April-March	
				2022-23 (P)	2023-24 (P)	2022-23 (P)	2023-24 (P)
1	High Sulphur crude	185.0	197.9	17.9	18.8	197.9	205.2
2	Low Sulphur crude	56.7	57.4	5.1	4.6	57.4	56.3
Total crude processed (MMT)		**241.7**	**255.2**	**23.0**	**23.4**	**255.2**	**261.5**
Total crude processed (Million Bbl/Day)		4.85	5.13	5.44	5.53	5.11	5.24
Percentage share of HS crude in total crude oil processing		**76.6%**	**77.5%**	**78.0%**	**80.5%**	**77.5%**	**78.5%**

6. Quantity and value of crude oil imports			
Year	**Quantity (MMT)**	**$ Million**	**Rs. Crore**
2021-22	212.4	1,20,675	9,01,262
2022-23	232.7	1,57,531	12,60,372
April-Mar 2023-24(P)	232.5	1,32,392	10,96,840

7. Self-sufficiency in petroleum products (Million Metric Tonnes)							
Particulars		**2021-22**	**2022-23 (P)**	**March**		**April-March**	
				2022-23 (P)	**2023-24 (P)**	**2022-23 (P)**	**2023-24 (P)**
1	Indigenous crude oil processing	27.0	26.5	2.2	2.4	26.5	26.9
2	Products from indigenous crude (93.3% of crude oil processed)	25.2	24.7	2.0	2.2	24.7	25.1
3	Products from fractionators (Including LPG and Gas)	4.1	3.5	0.3	0.3	3.5	3.5
4	Total production from indigenous crude & condensate **(2 + 3)**	29.3	28.2	2.3	2.5	28.2	28.6
5	Total domestic consumption	201.7	223.0	21.2	21.1	223.0	233.3
% Self-sufficiency (4 / 5)		**14.5%**	**12.6%**	**11.1%**	**12.0%**	**12.6%**	**12.3%**

8. Refineries: Installed capacity and crude oil processing (MMTPA / MMT)										
Sl. no.	Refinery	Installed capacity (01.04.2024) MMTPA	Crude oil processing (MMT)							
			2021-22	2022-23 (P)	March			April-March		
					2022-23 (P)	2023-24 (Target)	2023-24 (P)	2022-23 (P)	2023-24 (Target)	2023-24 (P)
1	Barauni (1964)	6.0	5.6	6.8	0.6	0.6	0.6	6.8	6.6	6.6
2	Koyali (1965)	13.7	13.5	15.6	1.3	1.3	1.4	15.6	14.4	15.2
3	Haldia (1975)	8.0	7.3	8.5	0.7	0.7	0.7	8.5	7.6	8.1
4	Mathura (1982)	8.0	9.1	9.6	0.9	0.9	0.9	9.6	9.2	9.2
5	Panipat (1998)	15.0	14.8	13.8	1.3	1.0	1.1	13.8	14.3	14.3
6	Guwahati (1962)	1.2	0.7	1.1	0.10	0.09	0.1	1.1	1.0	1.0
7	Digboi (1901)	0.65	0.7	0.7	0.06	0.06	0.07	0.7	0.7	0.7
8	Bongaigaon(1979)	2.70	2.6	2.8	0.3	0.2	0.3	2.8	2.8	3.0
9	Paradip (2016)	15.0	13.2	13.6	1.4	1.3	1.4	13.6	15.3	15.2
	IOCL-TOTAL	**70.3**	**67.7**	**72.4**	**6.7**	**6.2**	**6.6**	**72.4**	**72.0**	**73.3**
10	Manali (1969)	10.5	9.0	11.3	1.0	0.9	1.1	11.3	10.2	11.6
11	CBR (1993)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	CPCL-TOTAL	**10.5**	**9.0**	**11.3**	**1.0**	**0.9**	**1.1**	**11.3**	**10.2**	**11.6**
12	Mumbai (1955)	12.0	14.4	14.5	1.4	1.3	1.5	14.5	14.5	15.1
13	Kochi (1966)	15.5	15.4	16.0	1.5	1.4	1.6	16.0	15.8	17.3
14	Bina (2011)	7.8	7.4	7.8	0.7	0.7	0.6	7.8	7.0	7.1
	BPCL-TOTAL	**35.3**	**37.2**	**38.4**	**3.6**	**3.3**	**3.7**	**38.4**	**37.3**	**39.5**
15	Numaligarh (1999)	3.0	2.6	3.1	0.2	0.3	0.3	3.1	2.8	2.5

Sl. no.	Refinery	Installed capacity (01.04.2024) MMTPA	Crude oil processing (MMT)							
			2021-22	2022-23	March			April-March		
					2022-23 (P)	2023-24 (Target)	2023-24 (P)	2022-23 (P)	2023-24 (Target)	2023-24 (P)
16	Tatipaka (2001)	0.07	0.08	0.07	0.005	0.006	0.005	0.07	0.06	0.07
17	MRPL-Mangalore (1996)	15.0	14.9	17.1	1.5	1.5	1.5	17.1	15.9	16.5
	ONGC-TOTAL	**15.1**	**14.9**	**17.2**	**1.5**	**1.5**	**1.5**	**17.2**	**16.0**	**16.6**
18	Mumbai (1954)	9.5	5.6	9.8	0.9	0.8	0.5	9.8	9.0	9.6
19	Visakh (1957)	13.7	8.4	9.3	0.9	1.2	1.3	9.3	12.0	12.7
20	HMEL-Bathinda (2012)	11.3	13.0	12.7	1.1	1.0	1.1	12.7	11.5	12.6
	HPCL- TOTAL	**34.5**	**27.0**	**31.8**	**2.9**	**3.0**	**3.0**	**31.8**	**32.5**	**35.0**
21	RIL-Jamnagar (DTA) (1999)	33.0	34.8	34.4	2.8	2.8	3.0	34.4	34.4	34.4
22	RIL-Jamnagar (SEZ) (2008)	35.2	28.3	27.9	2.5	2.5	2.6	27.9	27.9	28.3
23	NEL-Vadinar (2006)	20.0	20.2	18.7	1.7	1.7	1.7	18.7	18.7	20.3
All India (MMT)		**256.8**	**241.7**	**255.2**	**23.0**	**22.2**	**23.4**	**255.2**	**251.7**	**261.5**
All India (Million Bbl/Day)		**5.02**	**4.85**	**5.13**	**5.44**	**5.26**	**5.53**	**5.11**	**5.04**	**5.24**

Note: Provisional Targets; Some sub-totals/ totals may not add up due to rounding off at individual levels. The Inputs to Refinery includes both Crude Oil and Other Inputs (OI), however Other Inputs (OI) do not form part of the above data.

9. Major crude oil and product pipeline network (as on 01.04.2024)

Details		ONGC	OIL	Cairn	HMEL	IOCL	BPCL	HPCL	Others*	Total
Crude Oil	Length (KM)	1,284	1,193	688	1,017	5,822	937			**10,941**
	Cap (MMTPA)	60.6	9.0	10.7	11.3	53.8	7.8			**153.1**
Products	Length (KM)		654			12,581	2,600	5,123	2,399	**23,357**
	Cap (MMTPA)		1.7			70.6	22.6	35.2	10.2	**140.3**

*Others include GAIL and Petronet India. HPCL and BPCL lubes pipeline included in products pipeline data

11. Production and consumption of petroleum products (Million Metric Tonnes)												
Products	2021-22		2022-23 (P)		Mar- 2023 (P)		Mar-2024 (P)		Apr-Mar 2023 (P)		Apr-Mar 2024 (P)	
	Prod	Cons	Prod	Cons	Prod	Cons	Prod	Cons	Prod	Cons	Prod	Cons
LPG	12.2	28.3	12.8	28.5	1.1	2.4	1.2	2.6	12.8	28.5	12.8	29.6
MS	40.2	30.8	42.8	35.0	4.1	3.1	4.1	3.3	42.8	35.0	45.1	37.2
NAPHTHA	20.0	13.2	17.0	12.2	1.5	1.1	1.7	1.2	17.0	12.1	18.3	13.9
ATF	10.3	5.0	15.0	7.4	1.4	0.7	1.6	0.8	15.0	7.4	17.1	8.2
SKO	1.9	1.5	0.9	0.5	0.1	0.0	0.1	0.0	0.9	0.5	1.0	0.5
HSD	107.2	76.7	113.8	85.9	10.3	7.8	10.1	8.0	113.8	85.9	115.9	89.7
LDO	0.8	1.0	0.6	0.7	0.08	0.1	0.07	0.1	0.6	0.7	0.7	0.8
LUBES	1.2	4.5	1.3	3.7	0.3	0.4	0.1	0.4	1.4	3.7	1.4	4.1
FO/LSHS	8.9	6.3	10.4	7.0	0.6	0.6	0.7	0.5	10.2	7.0	10.3	6.5
BITUMEN	5.1	7.8	4.9	8.0	0.6	1.1	0.6	1.0	4.9	8.0	5.2	8.8
PET COKE	15.5	14.3	15.4	18.3	1.4	2.0	1.4	1.6	15.4	18.3	15.1	19.1
OTHERS	30.9	12.3	31.5	15.8	3.0	2.0	3.3	1.5	31.5	15.8	33.3	14.8
ALL INDIA	**254.3**	**201.7**	**266.5**	**223.0**	**24.5**	**21.2**	**24.9**	**21.1**	**266.5**	**223.0**	**276.1**	**233.3**
Growth (%)	**-3.1%**	**-5.4%**	**4.8%**	**10.6%**	**1.5%**	**8.7%**	**1.5%**	**-0.6%**	**4.8%**	**10.6%**	**3.6%**	**4.6%**

Note: Prod - Production; Cons - Consumption

15. LPG consumption (Thousand Metric Tonne)

LPG categorv	2021-22	2022-23	March			April-March		
			2022-23	2023-24 (P)	Growth (%)	2022-23	2023-24 (P)	Growth (%)
1. PSU Sales :								
LPG-Packed Domestic	25,501.6	25,381.5	2,181.2	2,345.1	7.5%	25,381.5	26,207.5	3.3%
LPG-Packed Non-Domestic	2,238.8	2,606.0	192.5	216.1	12.2%	2,606.0	2,760.2	5.9%
LPG-Bulk	390.9	408.9	24.8	44.9	80.6%	408.9	593.8	45.2%
Auto LPG	122.0	106.7	7.9	6.4	-19.2%	106.7	88.0	-17.6%
Sub-Total (PSU Sales)	28,253.3	28,503.1	**2,406.5**	**2,612.4**	**8.6%**	**28,503.1**	**29,649.4**	**4.0%**
2. Direct Private Imports*	0.1	0.1	0.00	0.01	-	0.08	0.06	-29.6%
Total (1+2)	28,253.4	28,503.2	**2,406.5**	**2,612.4**	**8.6%**	**28,503.2**	**29,649.5**	**4.0%**

*Jan-Mar'24 DGCIS data is prorated.

16. LPG marketing at a glance

Particulars (As on 1st of April)	Unit	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	1.04.24 (P)
LPG Active Domestic Customers	(Lakh)				1486	1663	1988	2243	2654	2787	2895	3053	3140	3242
	Growth					11.9%	19.6%	12.8%	18.3%	5.0%	3.9%	5.5%	2.9%	3.2%
LPG Coverage (Estimated)	(Percent)				56.2	61.9	72.8	80.9	94.3	97.5	99.8	-	-	-
	Growth					10.1%	17.6%	11.1%	16.5%	3.4%	2.3%	-	-	-
PMUY Beneficiaries	(Lakh)						200.3	356	719	802	800	899.0	958.6	1032.7
	Growth							77.7%	101.9%	11.5%	-0.2%	12.2%	6.6%	7.7%
LPG Distributors	(No.)	11489	12610	13896	15930	17916	18786	20146	23737	24670	25083	25269	25386	25481
	Growth	9.0%	9.8%	10.2%	14.6%	12.5%	4.9%	7.2%	17.8%	3.9%	1.7%	0.7%	0.5%	0.4%
Auto LPG Dispensing Stations	(No.)	652	667	678	681	676	675	672	661	657	651	601	526	468
	Growth	7.9%	2.3%	1.6%	0.4%	-0.7%	-0.1%	-0.4%	-1.6%	-0.6%	-0.9%	-8.5%	-12.5%	-11.0%
Bottling Plants	(No.)	184	185	187	187	188	189	190	192	196	200	202	208	210
	Growth	0.5%	0.5%	1.1%	0.0%	0.5%	0.5%	0.5%	1.1%	2.1%	2.0%	1.0%	4.5%	1.0%

Source: PSU OMCs (IOCL,BPCL and HPCL)

1.Growth rates as on 01.04.2024 are with respect to figs as on 01.04.2023. Growth rates as on 1 April of any year are with respect to figs as on 1 April of previous year.

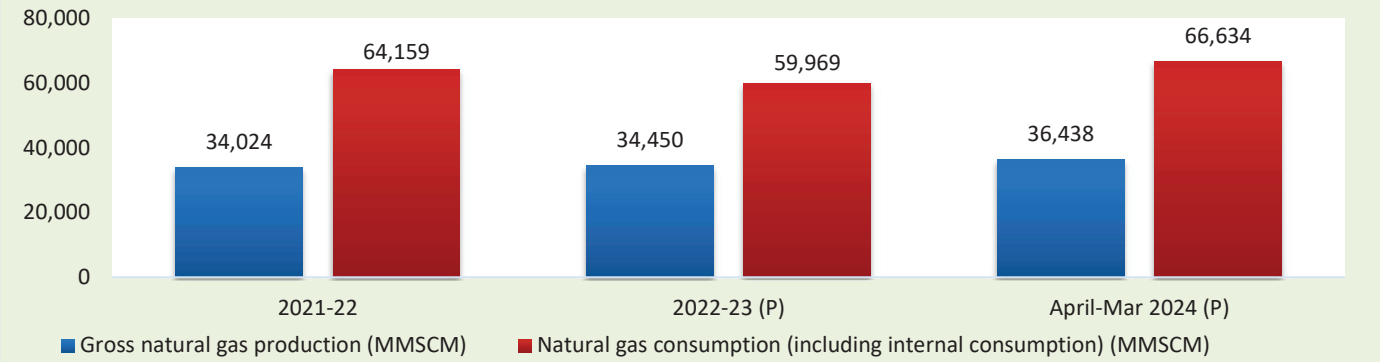
2. The LPG coverage is calculated by PSU OMCs based upon the active LPG domestic connections and the estimated number of households. The number of households has been projected by PSU OMCs based on 2011 census data. Factors like increasing nuclearization of families, migration of individuals/ families due to urbanization and reduction in average size of households etc. impact the growth of number of households. Due to these factors, the estimated no. of households through projection of 2011 census data may slightly differ from the actual no. of households in a State/UT. Further, this methodology does not include PNG (domestic) connections.

18. Natural gas at a glance

(MMSCM)

Details	2021-22 (P)	2022-23 (P)	March			April-March		
			2022-23 (P)	2023-24 (Target)	2023-24 (P)	2022-23 (P)	2023-24 (Target)	2023-24 (P)
(a) Gross production	34,024	34,450	2,956	3,330	3,138	34,450	38,181	36,438
- ONGC	20,629	19,969	1,696	1,731	1,617	19,969	20,559	19,316
- Oil India Limited (OIL)	2,893	3,041	261	268	277	3,041	3,155	3,090
- Private / Joint Ventures (JVs)	10,502	11,440	999	1,330	1,245	11,440	14,466	14,032
(b) Net production (excluding flare gas and loss)	33,131	33,664	2,889		3,072	33,664		35,717
(c) LNG import#	31,028	26,304	2,550		2,522	26,304		30,917
(d) Total consumption including internal consumption (b+c)	64,159	59,969	5,439		5,594	59,969		66,634
(e) Total consumption **(in BCM)**	64.2	60.0	5.4		5.6	60.0		66.6
(f) Import dependency based on consumption (%), {c/d*100}	48.4	43.9	46.9		45.1	43.9		46.399

March 2024 DGCIS data prorated.



19. Coal Bed Methane (CBM) gas development in India

Prognosticated CBM resources		91.8	TCF
Established CBM resources		10.4	TCF
CBM Resources (33 Blocks)		62.8	TCF
Total available coal bearing areas (India)		32760	Sq. KM
Total available coal bearing areas with MoPNG/DGH		12254*	Sq. KM
Area awarded		21,177**	Sq. KM
Blocks awarded*		39	Nos.
Exploration initiated (Area considered if any boreholes were drilled in the awarded block)		10670	Sq. KM
Production of CBM gas	April-Mar 2024 (P)	650.48	MMSCM
Production of CBM gas	Mar 2024 (P)	56.83	MMSCM

*ST CBM Block awarded & relinquished twice- in CBM Round II and Round IV -Area considered if any boreholes were drilled in the awarded block. **MoPNG awarded 04 new CBM Blocks (Area 3862 sq. km) under Special CBM Bid Round 2021 in September 2022. ***Area considered if any boreholes were drilled in the awarded block.

19a. Status of Compressed Bio Gas (CBG) projects under SATAT (as on 01.04.2024) (Provisional)

Particulars	Units	IOCL	HPCL	BPCL	GAIL#	IGL	Total
No. of CBG plants commissioned and initiated sale of CBG	No. of plants	31*	9	8	10	5	**61***
Start of CBG sale from retail outlet(s)	Nos.	85	41	50	1	0	**177**
Sale of CBG in 2022-23	Tons	5,822	77	6	5322		**11,227**
Sale of CBG in 2023-24 (up to March, 2023)	Tons	6500	309	102	9156@		**16068**
Sale of CBG in CGD network	GA Nos.				25		**25**

#Sale of CBG sourced under CBG-CGD synchronization by GAIL through its own marketing channels and other CGDs/OMCs. @GAIL data is upto Feb-24.*2 LOI holders of IndianOil are supplying CBG produced at their plants to two other OGMCs and hence they are counted only once in cumulative CBG plants commissioned on industry basis.

20. Common Carrier Natural Gas pipeline network as on 31.12.2023

Nature of pipeline		GAIL	GSPL	PIL	IOCL	AGCL	RGPL	GGL	DFPCL	ONGC	GIGL	GITL	Others*	Total
Operational	Length	11,009	2,716	1,483	143	107	304	73	42	24	0	0	0	**15,901**
	Capacity	167.2	43.0	85.0	20.0	2.4	3.5	5.1	0.7	6.0				**-**
Partially commissioned#	Length	4,743	0	0	1,080	0	0	0	0	0	1,302	0	365	**7,490**
	Capacity	55.0	0.0	0.0	84.7	0.0	0.0	0.0	0.0	0.0	122.5	0.0	0.0	**-**
Total operational length		**15,752**	**2,716**	**1,483**	**1,223**	**107**	**304**	**73**	**42**	**24**	**1,302**	**0**	**365**	**23,391**
Under construction	Length	1,347	3	0	352	0	0	0	0	0	899	36	1,488	**4,125**
	Capacity	26.3	3.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	36.0	0.0	**-**
Total length		**17,099**	**2,719**	**1,483**	**1,575**	**107**	**304**	**73**	**42**	**24**	**2,201**	**36**	**1,853**	**27,516**

Source: PNGRB; Length in KMs ; Authorized Capacity in MMSCMD (Arithmetic sum taken for each entity -capacity may vary from pipeline to pipeline); *Others-APGDC, , IGGL, IMC,GTIL,HPPL Consortium of H-Energy. Total authorized Natural Gas pipelines including Tie-in connectivity, dedicated & STPL is 33,347 Kms (P),however total operational and Under Construction Pipeline length is 35,217 Kms (P)

21. Existing LNG terminals

Location	Promoters	Capacity as on 01.04.2024	% Capacity utilisation (April-Feb 2024)
Dahej	Petronet LNG Ltd (PLL)	17.5 MMTPA	95.1
Hazira	Shell Energy India Pvt. Ltd.	5.2 MMTPA	31.5
Dabhol	Konkan LNG Limited	*5 MMTPA	41.5
Kochi	Petronet LNG Ltd (PLL)	5 MMTPA	20.6
Ennore	Indian Oil LNG Pvt Ltd	5 MMTPA	17.8
Mundra	GSPC LNG Limited	5 MMTPA	12.6
Dhamra	Adani Total Private Limited	5 MMTPA	23.1
Total Capacity		**47.7 MMTPA**	

* To increase to 5 MMTPA with breakwater. Only HP stream of capacity of 2.9 MMTPA is commissioned

22. Status of PNG connections and CNG stations across India (Nos.), as on 29.02.2024(P)				
State/UT (State/UTs are clubbed based on the GAs authorised by PNGRB)	CNG Stations	PNG connections		
		Domestic	Commercial	Industrial
Andhra Pradesh	174	2,68,579	467	38
Andhra Pradesh, Karnataka & Tamil Nadu	43	9,275	4	6
Assam	17	55,689	1,391	453
Bihar	123	1,37,824	121	9
Bihar & Jharkhand	6	8,355	4	0
Bihar & Uttar Pradesh	23	1,690	0	0
Chandigarh (UT), Haryana, Punjab & Himachal Pradesh	27	26,724	163	43
Chhattisgarh	16	419	0	0
Dadra & Nagar Haveli (UT)	6	12,083	56	63
Daman & Diu (UT)	5	5,180	62	47
Daman and Diu & Gujarat	15	6,044	23	0
Goa	12	13,465	30	40
Gujarat	993	32,53,175	23,445	5,786
Haryana	362	3,45,599	920	2,259
Haryana	22	22,617	137	59
Haryana & Himachal Pradesh	10	48	0	0
Haryana & Punjab	27	1,081	0	0
Himachal Pradesh	13	7,314	20	0
Jharkhand	95	1,31,288	26	4
Karnataka	362	4,28,136	571	359
Kerala	131	66,957	44	20
Kerala & Puducherry	11	2,136	0	0
Madhya Pradesh	281	2,28,481	462	508
Madhya Pradesh and Chhattisgrah	7	0	0	0
Madhya Pradesh and Rajasthan	35	806	0	0
Madhya Pradesh and Uttar Pradesh	16	0	0	3
Maharashtra	852	33,36,031	4,817	976
Maharashtra & Gujarat	64	1,87,645	10	32
Maharashtra and Madhya Pradesh	15	0	0	0

State/UT (State/UTs are clubbed based on the GAs authorised by PNGRB)	CNG Stations	PNG connections		
		Domestic	Commercial	Industrial
National Capital Territory of Delhi (UT)	481	15,56,912	3,965	1,910
Odisha	98	1,08,991	8	0
Puducherry	2	0	0	0
Puducherry & Tamil Nadu	8	322	0	0
Punjab	215	82,644	608	288
Punjab & Rajasthan	18	508	0	0
Rajasthan	283	2,71,787	180	1,691
Tamil Nadu	277	19,884	7	13
Telangana	176	1,99,649	106	111
Telangana and Karnataka	4	0	0	1
Tripura	18	61,408	508	62
UT of Jammu and Kashmir	1	0	0	0
Uttar Pradesh	914	15,86,903	2,644	3,270
Uttar Pradesh & Rajasthan	45	21,532	48	349
Uttar Pradesh and Uttrakhand	28	14,864	0	0
Uttarakhand	35	72,795	90	99
West Bengal	90	11,194	3	1
Grand Total	**6,456**	**1,25,66,034**	**40,940**	**18,500**

Source: PNGRB

Note: 1. All the GAs where PNG connections/CNG Stations have been established are considered as Operational, 2. Under normal conditions. Operation of any particular GA commences within around one year of authorization. 3. State/UTs wherever clubbed are based on the GAs authorised by PNGRB.

https://rbnenergy.com/texas-hold-em-permian-takeaway-constraints-loom-as-basins-oil-output-grows

Texas Hold 'Em - Permian Pipeline Takeaway Constraints Loom As Basin's Oil Output Grows

Tuesday, 04/16/2024 Published by: Sheela Tobben

Crude oil output in the Permian Basin is now averaging 6.3 MMb/d, up about 400 Mb/d from year-ago levels and 800 Mb/d from April 2022. The gains — and related increases in associated gas — have spurred a new round of concerns about pipeline exit capacity, complicating drillers' hopes to boost crude production. In today's RBN blog, we will discuss the takeaway capacity issue and what it means for producers and pipeline operators, including those planning offshore crude export terminals.

Permian E&Ps want to increase their crude oil production, but they are hemmed in — and at least a tad hesitant. As producers in West Texas and southeastern New Mexico know all too well, crude production growth can only happen if there is sufficient pipeline capacity in place to move not only the oil they extract, but also the massive volumes of associated gas that emerge with it. As we discussed recently in Come Dancing, takeaway capacity for gas is once again at the knife's edge, and there really are no good alternatives to piping that incremental gas to market — for most producers, flaring at scale is no longer an acceptable. Luckily, there's at least one gas-takeaway fix in the short-term: The greenfield, 2.5-Bcf/d Matterhorn Express gas pipeline will come online later this year.

But while Matterhorn will help, it's likely to fill up quickly, meaning even more gas takeaway will be needed to keep crude production growing through the next decade. That may include the expansion of the Gulf Coast Express (GCX) system as well as installing some new pipes (See Come Dancing for our projections of new gas pipe capacity). Assuming that new gas pipeline capacity out of the Permian is added as needed, crude oil production growth in the basin will eventually drive the need for more takeaway capacity, especially to major Gulf Coast oil hubs. That growth could also drive the development of one or more of the new deepwater export terminals being planned off the Texas coast, which could spur additional pipeline capacity to feed those terminals.

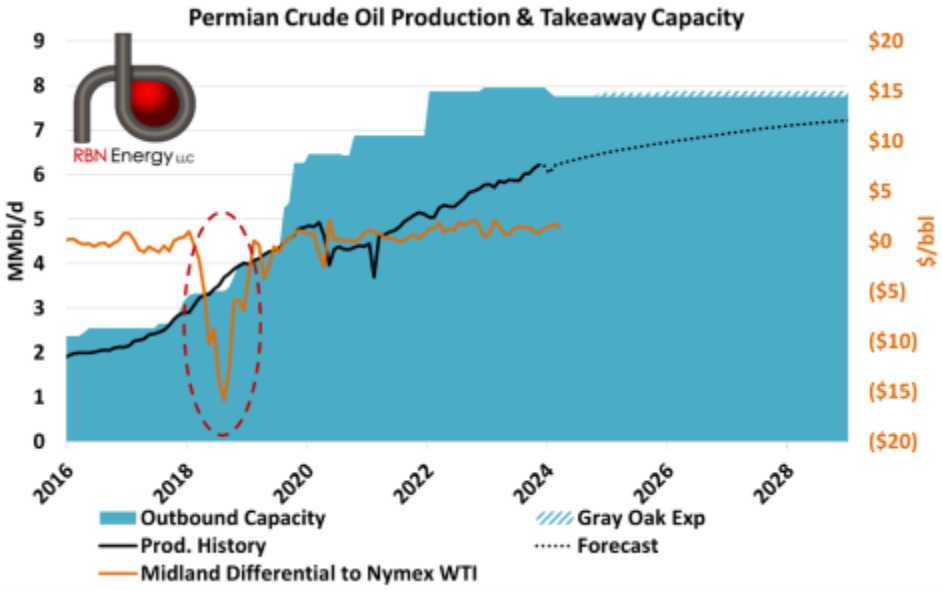


Figure 1. Permian Crude Oil Production & Takeaway Capacity, With Midland Differential to NYMEX WTI.

Sources: Bloomberg, RBN

Crude takeaway constraints can have serious impacts. Six years ago, booming crude production growth in the basin caused major headaches for crude shippers that were trying to send their barrels to market

but were met with limited takeaway capacity. So, suppliers without committed pipe space had to drop their WTI Midland prices low enough to attract buyers. This also gave a big boost to secondary markets for pipe space where shippers that had capacity on key pipes were reselling them at higher prices, keeping up the pressure on WTI Midland prices to offset the higher cost of transportation. In any case, the capacity shortage got so severe (orange line and right axis in Figure 1) in August and September 2018 — with output (black line) exceeding local demand + pipeline exit capacity (blue-shaded area) by more than 500 Mb/d (red dashed circle) — that the Permian's benchmark WTI Midland crude price fetched jaw-dropping, double-digit discounts to NYMEX oil futures at Cushing. (See our All Dressed Up And Nowhere To Go series and Don't Play No Game That I Can't Win.) Some suppliers resorted to trucks or rail to move barrels when they were the only alternatives to production cuts or shut ins.

Things finally improved in 2019 when a slew of Permian pipeline projects began service, which we discussed in Have It All, helping to strengthen Midland WTI differentials. That year, WTI Midland Sweet crude averaged around a 70 cents/bbl discount to NYMEX oil futures, up from a $7.25/bbl discount the year prior, based on Bloomberg data. Another tranche of exit capacity emerged in 2020, followed by even more in 2021, leaving capacity constraints in the past — at least for the time being. (It's worth noting that potential Permian exit constraints aren't yet causing crude oil prices to react like they did in 2018. WTI Midland Sweet crude differentials have averaged a roughly $1.60/bbl premium to NYMEX oil futures this year, up from $1.20/bbl in 2023, based on Bloomberg data.)

U.S. crude production had been rising since the pandemic before leveling off in recent months, with the Permian (black line in Figure 1) driving the gains, like it's been doing for years. For 2024, the prolific play is expected to generate 6.3 MMb/d of crude oil — just under half of all expected U.S. output, according to RBN data. That will expand to 7.5 MMb/d by 2030, or more than half of annual U.S. supply. By the mid-2030s, that should inch up to nearly 7.8 MMb/d, which is just about where Permian exit capacity is sitting right now. That said, the constraints out of the Permian will be felt considerably sooner for barrels bound for the Gulf Coast, which is home to more than half of all U.S. refining capacity and all crude export terminals. The major hubs of Corpus Christi, Houston and Nederland/Beaumont can tap into roughly 6.4 MMb/d of Permian pipeline takeaway capacity. Flows on these systems averaged 5.3 MMb/d last year, or nearly 85% of capacity to those three hubs, based on data in RBN's weekly Crude Oil Permian report. By far the tightest pipeline capacity is to Corpus Christi, where utilization rates for key pipelines from the Permian averaged 95% in 2023 and today is maxed out.

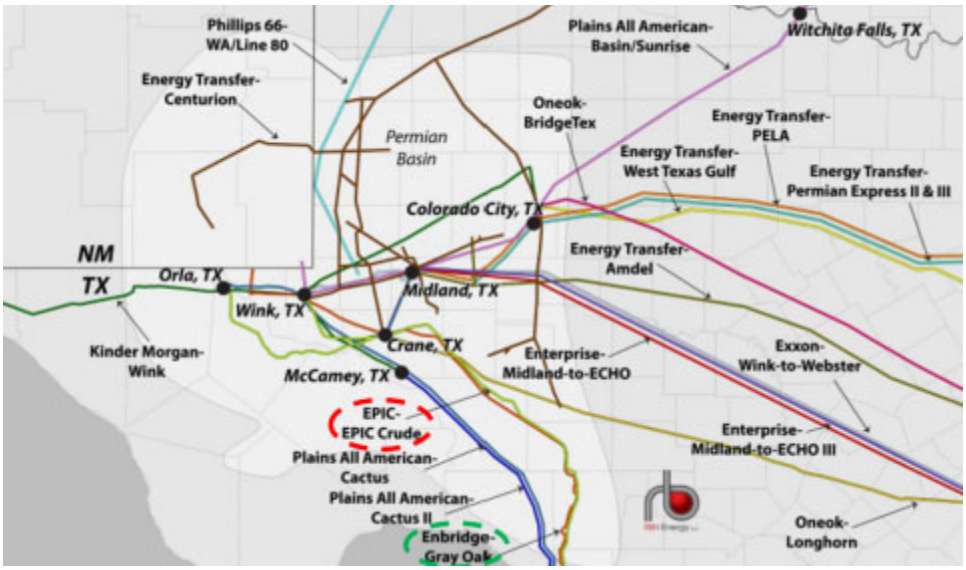


Figure 2. Permian Crude Oil Pipelines. Source: RBN Crude Oil Permian

Two companies are already stepping up their efforts to boost takeaway capacity, targeting their Permian-to-Corpus Christi pipe assets. Enbridge is planning to expand its 900-Mb/d Gray Oak crude oil pipeline by 120 Mb/d (blue-and-white striped area at top of Figure 1 and dashed green oval in Figure 2). The

company said the new capacity will be added in two phases that will conclude in early 2026. The current plan is notably less than the original announcement which was to add 200 Mb/d. That reduction could indicate that producers and shippers, whose commitments are critical in getting new pipeline capacity built, for one reason or another, are not yet compelled to sign up for capacity. In addition, it is our understanding that EPIC Midstream wants to add 300 Mb/d of new capacity to its namesake crude system (dashed red oval in Figure 2), although there are no timelines for it.

As we described back in 2021 in our Midstream Conundrum series, we anticipated that the market would need more infrastructure but regulatory uncertainty coupled with capital discipline meant that the already difficult task of getting the required commitments would be even more challenging. With the frenzy of upstream consolidation of the last year, the list of producers with the motivation and wherewithal to take out big chunks of capacity is much shorter and they're likely also the ones with the most options to get by if and when capacity does get tight. Then, on top of that, Enterprise has the ability to convert its Seminole NGL pipeline back to crude service (as it was until late last year, when it was referred to as the Midland to Echo II pipeline (see Leader of the Pack) which would add back another 210 Mb/d — and that may happen as soon as the completion of the Bahia NGL pipeline is done in 2025. (Later in this series, we'll do a deep dive into these expansion plans and other issues at play.)

Even if there is some reluctance from producers and shippers to back some of these proposals in the short term, more takeaway capacity is going to be needed in the medium to long term, especially if one or more of the deepwater export projects under development eventually begins operations. In Gulf Coast Time, we detailed the four projects that are in different stages of the permitting phase: Enterprise Products Partners' Sea Port Oil Terminal (SPOT); Energy Transfer's Blue Marlin project; Sentinel Midstream's Texas GulfLink project; and Phillips 66 and Trafigura's Bluewater Texas project. The most advanced of these projects is SPOT, which received its deepwater port license from the U.S. Department of Transportation's Maritime Administration (MARAD) on April 9, meaning that it is now up to Enterprise whether and when to proceed. (We'll discuss how these projects could redraw Permian flows in a future blog.)

In the next few blogs of this series, we will unpack and discuss how each of the major Gulf Coast hubs — Corpus Christi, Houston and Nederland/Beaumont — and the key Permian hubs — such as Wink and Crane — are managing their existing takeaway capacity and which hubs need more.

"Texas Hold 'Em" was written by Beyonce, Elizabeth Lowell Boland, Megan Bulow, Brian Bates, Nathan Ferraro and Raphael Saadiq. It appears as the seventh song on Beyonce's eighth studio album, *Cowboy Carter*. Released as a single in February 2024, the song went to #1 on the Billboard Hot 100 and Hot Country Singles charts, making Beyonce the first black woman with a #1 country song in the history of Billboard. Personnel on the record were: Beyonce (vocals), Elizabeth Lowell Boland (piano), Nathan Ferraro (bass, piano), Rhiannon Giddens (banjo, viola), Hit-Boy (synthesizers), Killah B (drums), Raphael Saadiq (drums, bass, keyboards), and Khirye Tyler (keyboards, bass).

Cowboy Carter was recorded between 2019-24 at APG, Dezert Flower, Electric Feel, Kings Landing West, Record Plant, The Sound Factory, and The Village Westlake in Los Angeles; The Cave, East Iris, Dolly P's Studio, and The Library in Nashville; and The Trailor in East Hampton, NY. Produced by Beyonce, 070 Shake, BAH, Jon Batiste, Cadenza, Miley Cirus, D.A. Got That Dope, Derek Dixie, Dixon, Ian Fitchuk, Harry Edwards, Shawn Everett, Nathan Ferraro, Ink, Tyler Johnson, Paul McCartney, No I.D., Nova Way, Dave Hamelin, Killa B, Nick Kobe, Mamii, Simon Martensson, Pharrell Wiliams, Jack Ro, Raphael Saadiq, Sean Solymar, Sounwave, Swizz Beatz, The Dream, and Khirye Tyler, the album was released in March 2024. It went to #1 on the Billboard 200 and Top Country Albums charts. The album is presented as a broadcast on a fictional Texas radio station, with Dolly Parton, Linda Martell and Willie Nelson acting as DJs. Famous guest musicians on the LP include Stevie Wonder, Paul McCartney and Niles Rogers, among others. Three singles have been released from the LP so far.

Beyonce (Beyonce Giselle Knowles-Carter) is an American singer, songwriter, record producer, actress and film director. She is married to hip-hop record mogul Jay-Z. She rose to fame professionally as a member of the successful R&B girl group Destiny's Child in the late nineties. She released her first solo studio album, *Dangerously in Love*, in 2003. She has released eight studio albums, five live albums, three compilation albums, one soundtrack album, five EPs and 61 singles. She has sold over 200 million

records worldwide. She has won 32 Grammy Awards, seven American Music Awards, and 26 MTV Video Music Awards. She is the recipient of the Billboard Millenium Award and has a star on the Hollywood Walk of Fame. She has starred in 12 motion pictures and 10 concert films. Beyonce continues to record, act and tour.

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

DON’T GET APRIL FOOLED BY WOBBLING GAS PRICES

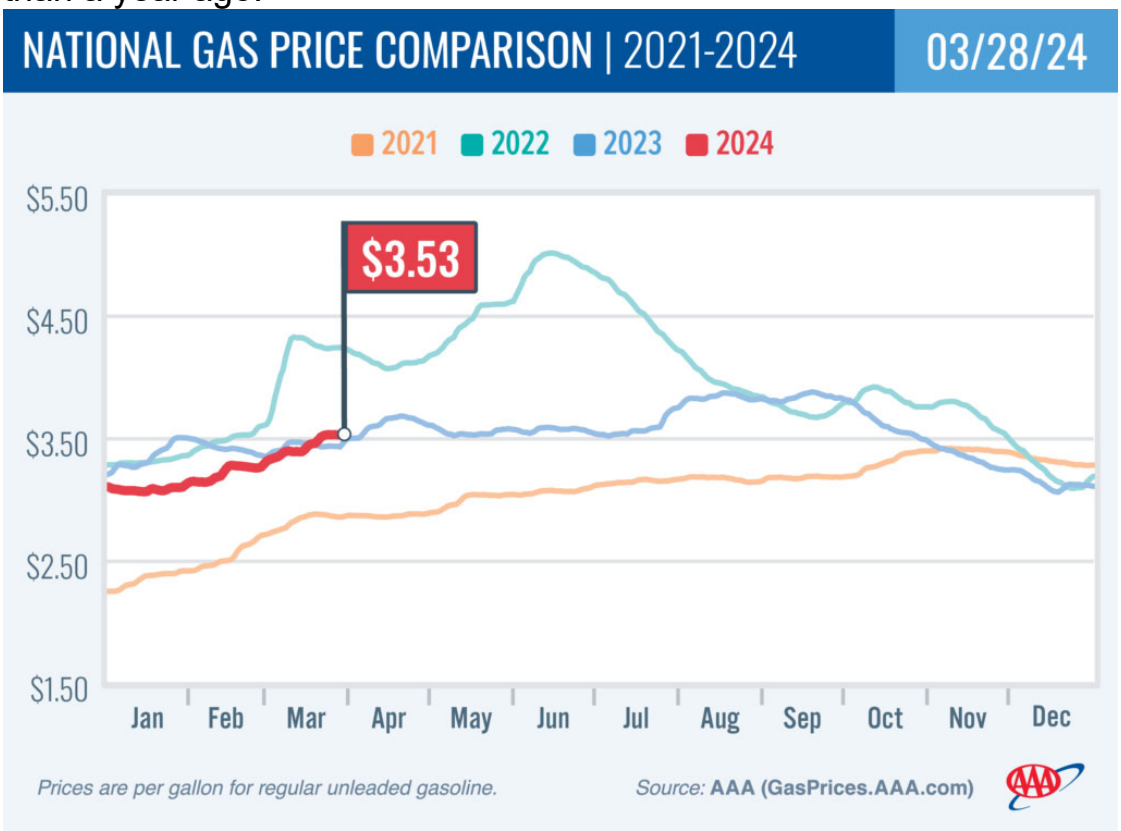
March 28,2024

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.

https://www.reuters.com/business/energy/mexico-cut-least-330000-bpd-crude-exports-may-sources-say-2024-04-08/

Exclusive: Mexico to cut at least 330,000 bpd of crude exports in May, sources say

By Marianna Parraga and Stefanie Eschenbacher
April 8, 20241:00 PM MDTUpdated 5 hours ago

The Dos Bocas refinery from the Mexican state-run oil producer Petroleos Mexicanos (PEMEX) is pictured during its inauguration, in Paraiso, Tabasco state, Mexico, July 1, 2022. REUTERS/Edgard Garrido/File Photo *Purchase Licensing Rights, opens new tab*

HOUSTON/MEXICO CITY, April 8 (Reuters) - Mexico's state energy company, Pemex, is planning to cut at least 330,000 barrels per day (bpd) of crude exports in May, leaving customers in the United States, Europe and Asia with a third less supply, two sources said.

The plan follows the withdrawal of 436,000 bpd of Maya, Isthmus and Olmeca crudes this month, ordered by Pemex to its trading arm PMI Comercio Internacional because it needs to supply more to its domestic refineries as it targets energy self-sufficiency.

Pemex has no option other than applying monthly cuts to exports after its crude production in February fell to the lowest level in 45 years and the country's refineries, including a new facility in the port of Dos Bocas, began taking in more crude oil.

Dos Bocas alone is expected to need an average of some 179,000 bpd of crude this year, according to official figures.

Neither Pemex nor its trading arm immediately responded to a request for comment.

Over the weekend, a deadly fire at a key offshore platform in the Gulf of Mexico also meant Pemex had to halt production at several wells, one of the sources said. It is not clear how many barrels would be cut as a result.

Pemex exported 1.03 million bpd of crude last year, and 945,000 bpd in January-February.

Mexico's energy ministry expects domestic processing to increase to an average of 1.04 million bpd this year from 713,300 bpd in 2023, leaving fewer barrels available for exports in the remainder of the year.

"May cuts are expected to be between 10 million and 14 million barrels (in total)," another source said.

Even though the cuts are significant and expected to be applied on a monthly basis from April onward, Pemex's trading arm has not declared force majeure over supply contracts, the sources, who are traders, said.

Most of the contracts include provisions to allocate monthly volumes of specific crudes depending on availability, the sources added. The volumes are agreed mid-month.

Pemex and the government of President Andres Manuel Lopez Obrador said earlier this year that the Dos Bocas refinery, in Mexico's Tabasco state, would start producing gasoline and diesel in the first quarter.

While the refinery has begun processing crude in recent months, it has yet to contribute to the domestic market with finished motor fuels.

Apart from the increased local demand, dwindling reserves - especially at old Gulf of Mexico fields - is another challenge, a separate source, at the energy ministry, said.

There have been "discrepancies" in Mexico's data on reserves, the source said, adding that these currently overestimate both the amount of crude oil Pemex can technically recover at a cost that is financially feasible, and the quality of the crude oil itself.

"The prognosis for the future is not encouraging," the source said. "The (production) decline is unavoidable."

Reporting by Marianna Párraga in Houston and Stefanie Eschenbacher in Mexico City Additional reporting by Ana Isabel Martinez in Mexico City Editing by Matthew Lewis
Our Standards: The Thomson Reuters Trust Prin

https://www.spglobal.com/commodityinsights/en/market-insights/latest-news/oil/041724-us-will-not-renew-oil-and-gas-sanctions-relief-for-venezuela-amid-election-concerns

- 17 Apr 2024 | 19:52 UTC

US will not renew oil and gas sanctions relief for Venezuela amid election concerns

- Author **Kate Winston** **Jeff Mower**
- Editor **Gary Gentile**

HIGHLIGHTS

Companies will have 45 days to wind down operations

But US leaves door open for company-specific licenses

The United States announced April 17 that it will snap back sanctions on Venezuela's oil and gas sector with a 45-day window to wind down operations, after Venezuelan President Nicolás Maduro failed to meet his commitment to make progress toward a free and fair election in July.

The policy change could have some impact on global oil flows by shifting more Venezuelan crude purchases to China. And expectations that sanctions would be reimposed on Venezuela have helped to tighten crude and fuel oil price spreads.

However, the move did not impact Chevron's General License 41, and it leaves open the door for other companies to apply for similar individual licenses.

License options

"With the wind down today of the public general license individual companies may now apply for specific licenses related to activities in Venezuela's oil and gas sector, which will then be evaluated on a case-by-case basis," a senior administration official said during an April 17 background press briefing.

"Although the Venezuelan authorities have met some key commitments, they've also fallen short in several areas," another senior administration official said.

"The areas in which they have fallen short includes the disqualification of candidates and parties on technicalities and what we see as a continued pattern of harassment and repression against opposition figures and civil society," the other official said. The officials spoke on the condition of anonymity.

Maduro's government has disqualified the leading opposition candidate, María Corina Machado, and did not allow registration of her designated alternative candidate, Corina Yoris, the other official noted.

The US in October issued General License 44, which authorized transactions related to oil and gas for six months, after an agreement in Barbados between Maduro and the political opposition to hold fair presidential elections in 2024.

The US has now decided that Maduro did not hold up his end of the deal and will not be renewing GL 44 when it expires April 18. Instead, the US will issue a new license, general license 44A authorizing a 45-day wind down period for transactions related to oil and gas sector operations in Venezuela, according to the background briefing.

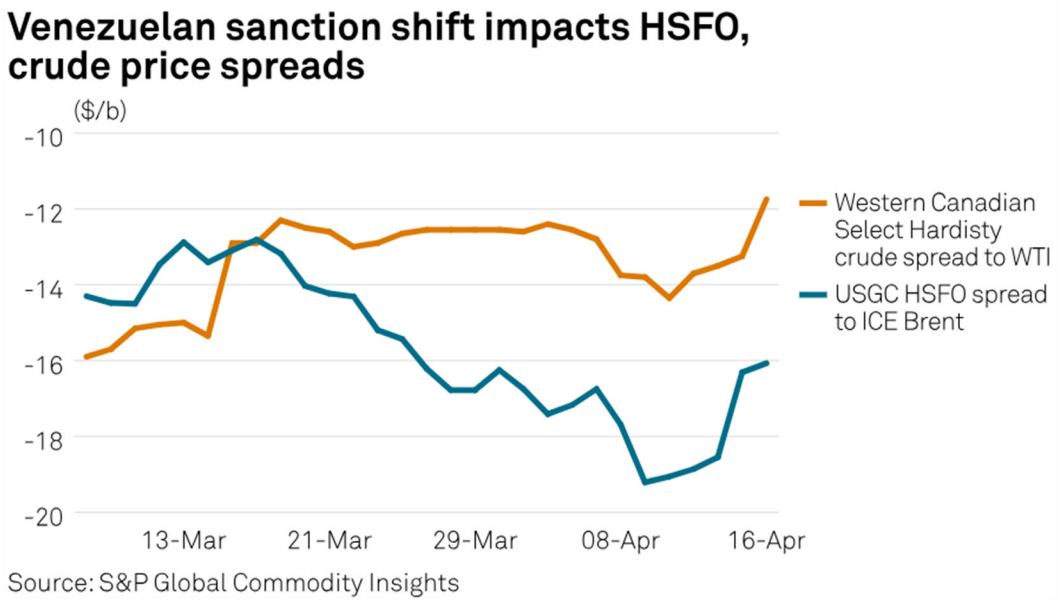
Venezuelan production has increased since the October issuance of GL 44. State-owned PDVSA and its partners produced an average of 870,000 b/d in crude oil production in March, up from 760,000 b/d in October, according to estimated data included in the PDVSA production report, which S&P Global Commodity Insights has reviewed.

Price impacts

Market expectations that GL 44 would expire has had an impact on crude and fuel oil price spreads.

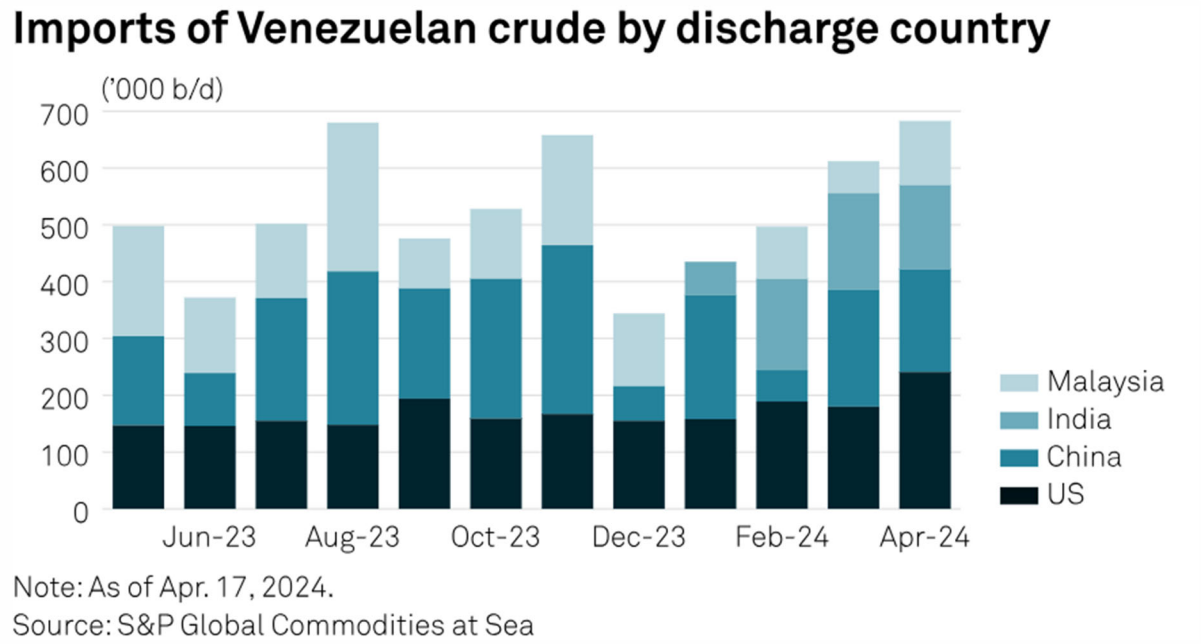
The **Western Canadian Select at Hardisty crude price discount** to WTI was assessed at an $11.75/b discount on April 16, tightening from a $13.25/b discount the prior day, according to Platts assessments. Venezuelan crude exports have edged higher since sanctions were lifted, averaging roughly 560,000 b/d so far in 2024, up from 549,000 b/d in 2023 and 273,000 b/d in 2022, S&P Global Commodities at Sea data shows.

Likewise, Venezuela has also boosted exports of high sulfur fuel oil. The **USGC HSFO price discount to Dated Brent** was assessed at $16.07/b April 16, tightening from a $19.21/b discount April 9, Platts data shows. Platts is a unit of S&P Global Commodity Insights.



Venezuelan crude flows have shifted since the October sanctions relief. In the five months before GL 44, from May 2023 through September 2023, US imports of Venezuelan crude averaged 158,000 b/d, hitting a high of 194,000 b/d in September, according to S&P Global Commodities at Sea data. But in the five months since the license, from November 2023 to March 2024, imports have crept up to average 170,000 b/d and are slated to hit 241,000 b/d in April, CAS data shows.

With the expiration of GL 44, flows of Venezuelan crude are expected to shift back toward China. "The net result of the snapback is likely to put China back in the driver's seat on pricing on the bulk (60% of production)," said Rachel Ziemba, senior advisor at political risk consultancy Horizon Engage. "Chinese buyers will be the marginal buyer."



The policy shift might reduce the chances of additional Venezuelan production and might mean a short-term modest reduction in trade as buyers scramble to learn the new rules, Ziemba said.

The policy change will not have much of an impact on global balances given that the delta on Venezuela's production is relatively small, Ziemba noted. "But it could have more impact on heavy crudes due to the coincident reductions in Mexican supplies," she said.

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

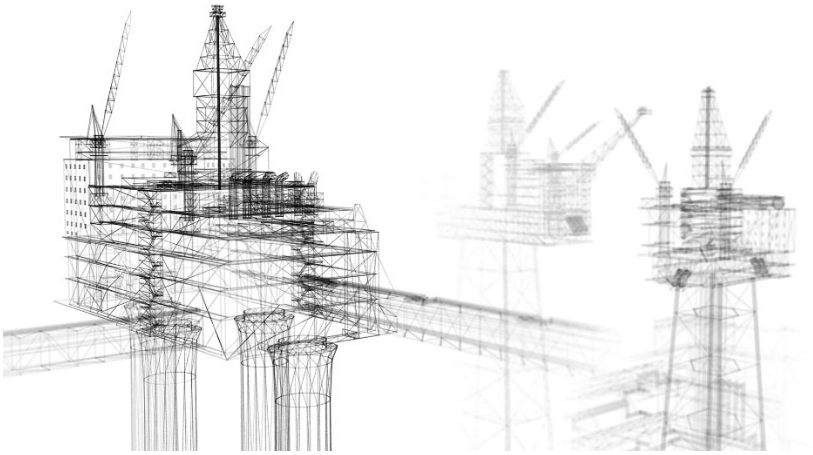


Illustration of a production facility on the Norwegian Continental Shelf.

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

opened their arbitrage, that's been closed for quite a while. So that's, of course, a positive indicator for the crude differential.

And then your question on Valhall and the impairment case. Valhall is not impaired in this quarter. And I don't think there are any changes to the 2C reserves or resources on Valhall in this quarter either.

A - David Tonne {BIO 20925193 <GO>}

I can qualify that. So there's impairment of technical goodwill on Valhall this quarter, together with Edvard Grieg and Ivar Aasen, which is, of course, is a bit specific. But it's not impairment of resources. So this is, of course, driven, as you know, and most of you on the line know, by previous acquisitions and the way that we have to account for the differences in accounting and tax. So, that's to be expected over time, specifically in quarters, when the forward curve for oil and gas prices drops. And as you are producing out, call it volumes in the asset.

Q - Yoann Charenton {BIO 17372477 <GO>}

Thank you. Have a nice day, then.

A - Karl Johnny Hersvik {BIO 18337255 <GO>}

Thank you. Let's move on, Kjetil.

A - Kjetil Bakken {BIO 20629786 <GO>}

Yes, absolutely. It's from John Olaisen from ABG. Please, John, go ahead.

Q - John Olaisen {BIO 4949660 <GO>}

Yeah, thank you for taking my question. And good morning, everybody. I can see from fax [ph] pages from the Norwegian offshore directorate that the water production is increasing significantly at the Johan Sverdrup field. So I just wonder if the watering production is higher than expected? And also I had hoped for plateau to be taken -- coming off the plateau would be taking place a little bit later than 2024. But if you could elaborate a little bit about that, do you have sufficient water handling capacity on the top sides, et cetera? And is there anything you could do to handle the water -- increase the water handling capacity and thereby extend plateau? And also maybe if you could elaborate a little bit of what kind of depletion rates we should expect from Johan Sverdrup once it goes off the plateau. And what can be done to fight that apart from, of course, a Phase 3? Thank you.

A - Karl Johnny Hersvik {BIO 18337255 <GO>}

Good. Excellent question. Yes, you are right. We are seeing water in some wells in Johan Sverdrup. The behavior is really related to well by well coning and not -- it's not an overall well. It's not an overall field water-cut development. It's a well issue. We are, in the course of 2024, putting another eight wells on stream on Johan Sverdrup, which will limit the issue as it's directly correlated and linked to well rates.

And of course, the total field rails are capped to the water handling and oil handling capacity. Oil handling, of course, standing at 755,000 barrels of oil equivalents.

So I think the main issue here is to get more wells on stream and therefore more or less production per well. And then, of course, the water handling capacity is at the moment significant and quite in line with what we expected and sufficient for treating the water. And then, of course, the last issue will be mass balance in the reservoir, and we're just doing a turnaround to change out the water injection pump, which are now basically done I think, to make sure that there is sufficient capacity. So those are the three main initiatives that is ongoing in 2024 to extend the plateau. And then, of course, the next line of things will be new wells. And this is as with all oil and gas fields, as you reach the end of the plateau, the way to extend the plateau is to increase capacity, particularly water treatment capacity and gas treatment capacity, and add IOR wells. I mean, this is bread and butter for the oil and gas industry. This is what we do in all fields.

Q - John Olaisen {BIO 4949660 <GO>}

And then on depletion rates once it goes off plateau, please?

A - Karl Johnny Hersvik {BIO 18337255 <GO>}

Yeah. That's -- I don't think I'll guide on that John, at this point in time. And the reason is that, yeah, of course, from a technical perspective, you will see the largest depletion rates, relatively speaking, in the first few months after you go off battle. But they will depend on water volume, on the increase in water volume, well stock, et cetera, et cetera. So that's a pretty difficult assessment to make at this point in time.

Q - John Olaisen {BIO 4949660 <GO>}

But the potential plateau in the second half of 2024, is that what you had expected and what you already have in your charts showing the expected production profile for (inaudible) in the years to come, or is it a little bit earlier?

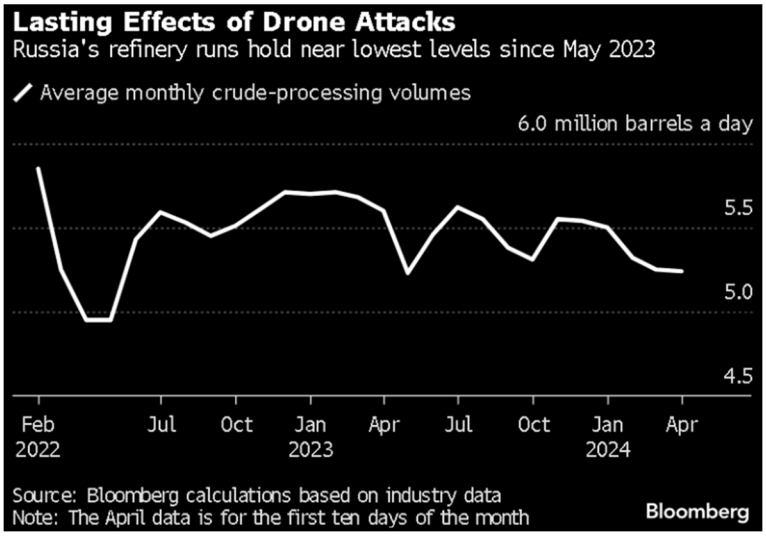
A - Karl Johnny Hersvik {BIO 18337255 <GO>}

So I would say that this -- as you know, we increased the plateau level quite significantly above nameplate capacity in 2023. And it's been producing extremely well at this level, with nearly 100% uptime, low cost, highly energy efficient. One year ago, I would say we expected it to continue that well into 2025. And the operator has now basically said that they assume that this level can be sustained. It's probably a good word until late 2024 or early 2025.

And it's the uncertainty and that timing that is basically incorporated into the guidance of 2024. And of course, that means that maybe starting another -- but that means that when we assessed this earlier, we had an assumption that it'll carry well into 2025. That, of course, means that the guidance for 2024 is a bit lower than we assumed a year ago, but it also means that in the next couple of years, we'll be impacted by this, call it, a little bit more conservative phasing of production. But it's important to note that there are no reserve changes. This is essentially a phasing of production related to the production strategy at the field.

Russian Oil Processing Stagnates as Drone-Attack Repairs Slow
2024-04-15 12:51:19.82 GMT

By Bloomberg News
(Bloomberg) -- Russia's crude-refining rates are languishing near an 11-month low, as the recovery of operations damaged in Ukrainian drone attacks slowed.
The nation processed 5.24 million barrels a day over the April 4-10 period, according to a person with knowledge of industry data. That's some 19,000 barrels a day, or 0.4%, below the level in the first three days of the month, according to Bloomberg calculations based on historical data.



With the invasion of Ukraine in its third year, Kyiv has been using drones to target Russia's most important industry. The Ukraine government has defended that strategy, saying it's seeking to curb fuel supplies to the front line and cut the flow of petrodollars to the Kremlin's coffers.
Earlier in April, the drones for the first time reached the Tatarstan region, about 930 miles (1,500 kilometers) from Russia's border with Ukraine. That signaled a wider range of crude-processing facilities may be at risk. Russia has responded to the attacks by targeting Ukraine's key gas-storage infrastructure.
Read More: War in Ukraine Enters New Phase That Puts Energy in Crosshairs
In the absence of further drone strikes, most of the affected Russian oil-processing facilities have been able to partly or completely restore their operations. However, the overall pace of the recovery has slowed down compared with the first days of April, according to the person with the knowledge.

In the week of April 4-10, crude processing at Rosneft PJSC — one of the Russian producers most heavily affected by the drone strikes — fell about 0.7% compared with the first three days of the month. That followed an almost 16% jump in the company's crude runs in the first days of April from the week

before, the person said.
Crude processing at Lukoil PJSC's refineries increased just 0.3%, compared with a hike of nearly 7% in the first days of April, the person said.
Russia expects to have all the damaged refineries repaired by June, Energy Minister Nikolai Shulginov told the nation's media earlier this month.
In addition, Surgutneftegas PJSC's Kirishi refinery reduced its crude runs by nearly 11%, or some 41,000 barrels a day, compared with the week before, according to Bloomberg calculations based on the industry data. The facility on the Baltic coast focuses on supplies overseas, so its lower runs may put pressure on Russia's total fuel exports.
Crude processing at the Orsk refinery in Russia's Orenburg region more than halved over April 4-10, reaching just 27,000 barrels a day, due to massive flooding, the data shows.
Gazprom PJSC's Astrakhan gas-condensate plant raised its runs nearly fivefold to almost 46,000 barrels a day after pipeline repairs, the person said.
The Russian producers did not immediately respond to Bloomberg requests for comments on their refinery runs.

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Russian Crude Shipments Surge to the Highest in Almost a Year

2024-04-16 09:05:13.486 GMT

By Julian Lee

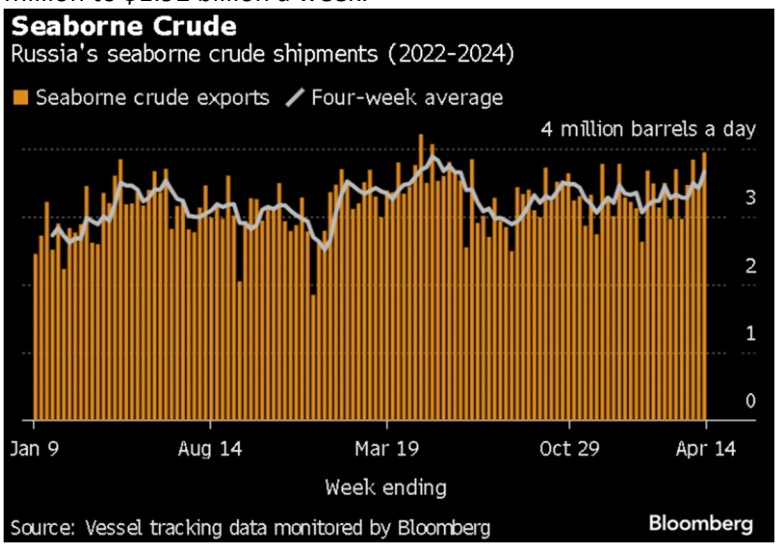
(Bloomberg) -- Russia's seaborne crude exports soared to an 11-month high in the second week of April with flows from all major ports near peak levels.

Last week's jump propelled total weekly flows to the highest since May 2023, for a level that has been exceeded only twice since the start of 2022, vessel-tracking data compiled by Bloomberg show. The less volatile four-week average also rose sharply, climbing to the highest since early June.

Weekly shipments were well above a target for this month that's part of the OPEC+ alliance's broader effort to curb supplies and support prices.

Cargoes from Primorsk, Ust-Luga, Novorossiysk and Kozmino were close to historical highs. Primorsk on the Baltic handled 10 tankers in three of the past four weeks, possibly reflecting a diversion to exports of crude that would have been processed at refineries hit by Ukrainian drones. The port hasn't handled more than 11 tankers in a week in data back to the start of 2022. Refining rates are languishing near an 11-month low as repairs continue.

The jump in flows, combined with higher Urals crude prices, boosted Moscow's oil earnings. The gross value of crude exports rose to $2.15 billion in the seven days to April 14 from $1.82 billion previously. Four-week average income added about $170 million to $1.92 billion a week.



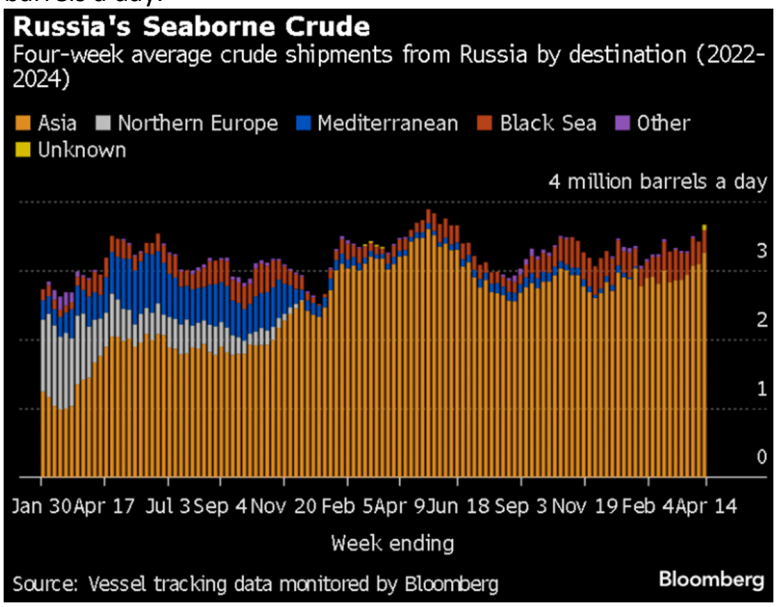
Separately, four-week average shipments to Asia continued to climb, following a similar pattern to that seen at the same time last year. Then, shipments to Asia — predominantly China and India — peaked at 3.6 million barrels a day in the four weeks to May 14, before dropping by about 1 million barrels a day over the following three months.

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 are

finding their way back to India. Two cargoes have been delivered to Pakistan.
That leaves just 1.4 million barrels still to show a destination, with another 700,000 barrels in a tanker that's been anchored off India's east coast since the start of April.
All of the Sokol cargoes loaded since mid-February headed directly to China.

Flows by Destination

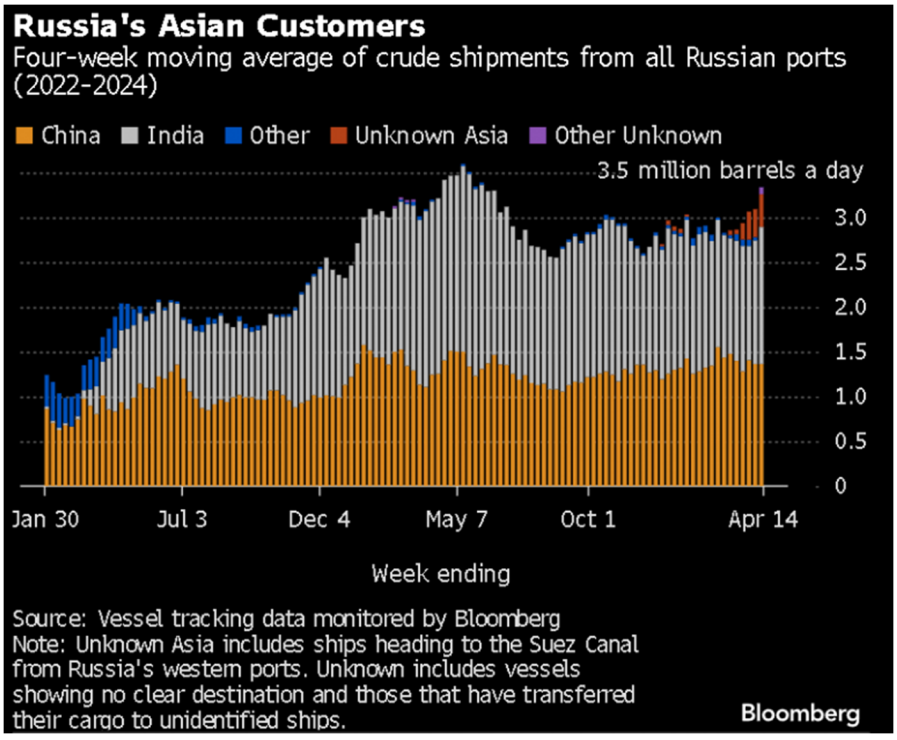
Russia's seaborne crude flows in the week to April 14 surged by 560,000 barrels a day to 3.95 million, reaching the highest since May 2023. The less volatile four-week average also soared, up by about 250,000 barrels a day to 3.66 million, to the highest since June.
Weekly shipments were about 365,000 barrels a day higher than the average seen in May and June, or about 490,000 barrels a day above 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 200,000 barrels a day above the target.r
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 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 the Black Sea port of Novorossiysk and the Baltic's 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 grade. Since Russia's invasion of Ukraine, Kazakhstan has rebranded its cargoes to distinguish them from those shipped by Russian companies.

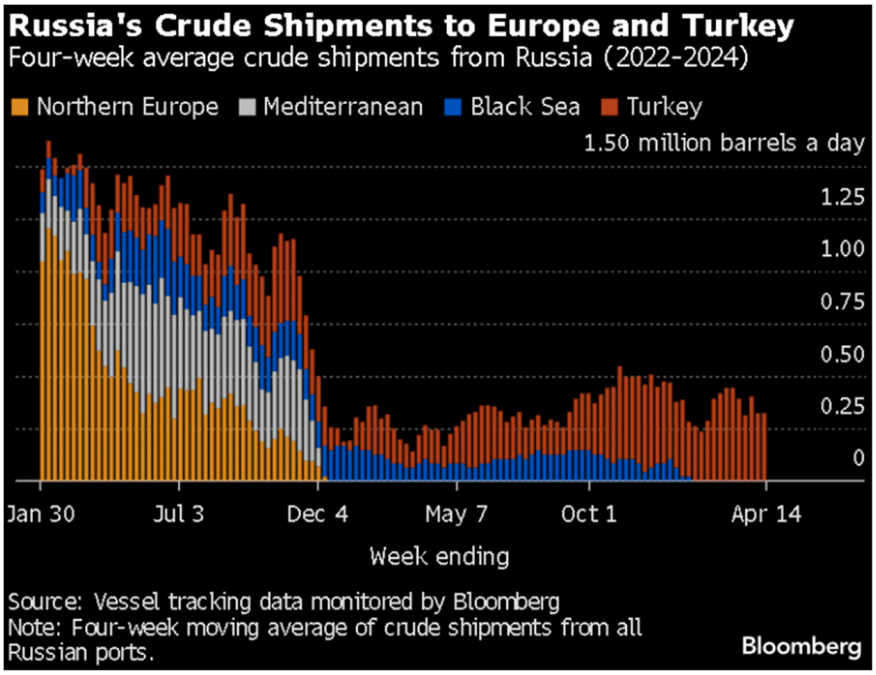
*** Asia**

Observed shipments to Russia's Asian customers, including those showing no final destination, rose to 3.34 million barrels a day in the four weeks to April 14, up from 3.09 million in the previous four-week period, to the highest since June 2023.
About 1.36 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 1.53 million barrels a day.
Both the Chinese and Indian figures will rise as the discharge ports become clear for vessels that are not currently showing final destinations.
The equivalent of about 365,000 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 80,000 barrels a day in the four weeks to April 14, 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.



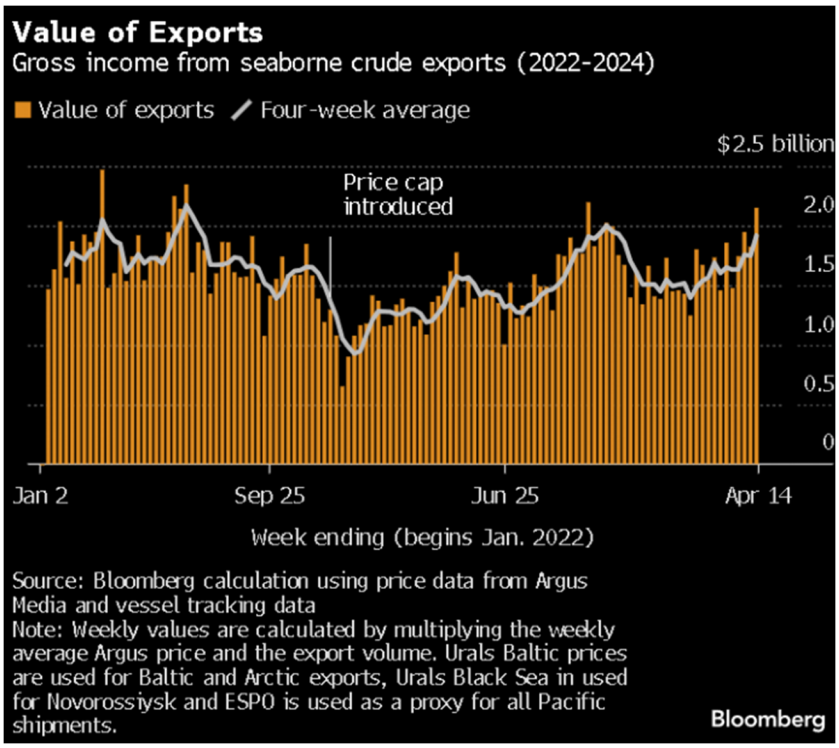
Europe and Turkey
Russia's seaborne crude exports to European countries have

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 14, down from 400,000 barrels a day in the period to March 31.
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.

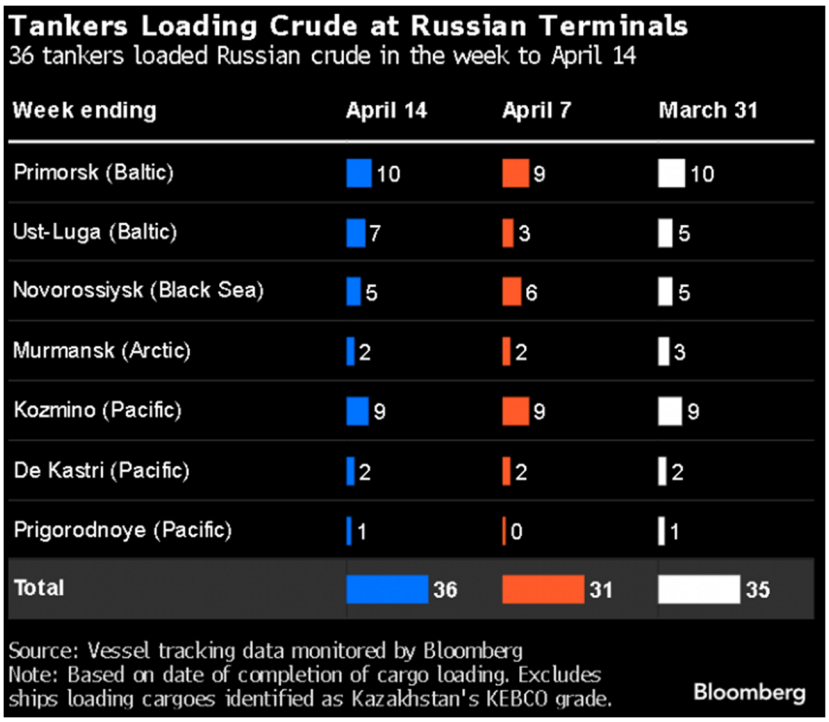
Export Value
Following the abolition of export duty on Russian crude, we have begun to track the gross value of seaborne crude exports, using Argus Media price data and our own tanker tracking.
The gross value of Russia's crude exports soared to $2.15 billion in the seven days to April 14 from $1.82 billion in the period to April 7. Four-week average income was also up, rising by about $170 million to $1.92 billion a week. 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 36 tankers loaded 27.6 million barrels of Russian crude in the week to April 14, vessel-tracking data and port agent reports show. That was up by about 3.9 million barrels from the previous week and the highest weekly total since May 2023.



All figures exclude cargoes identified as Kazakhstan's KEBCO grade. No cargoes of KEBCO were loaded 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 23.

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 for 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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Iranian foreign minister says it will not escalate conflict and mocks Israeli weapons as ‘toys that our children play with’

In an interview with NBC News, Hossein Amirabdollahian refused to acknowledge that Israel was behind the recent attack on his country.

April 19, 2024, 4:13 PM MDT

By Tom Llamas, Rich Schapiro and Dan De Luce

Iran's foreign minister on Friday refused to acknowledge that Israel was behind the recent attack on his country and described the weapons that were used as more like children's toys.

"What happened last night was not a strike," the foreign minister, Hossein Amirabdollahian, said in an interview with NBC News' Tom Llamas. "They were more like toys that our children play with – not drones."

Amirabdollahian, who spoke to NBC News in New York where he was attending a U.N. Security Council session, said Iran was not planning to respond unless Israel launches a significant attack.

"As long as there is no new adventurism by Israel against our interests, then we are not going to have any new reactions," he said.

But the foreign minister warned that if Israel did attack Iran, the response would be swift and severe.

"If Israel takes a decisive action against my country and this is proven to us," he said, "our response will be immediate and to the maximum and will cause them to regret it."

Iranian Foreign Minister Hossein Amirabdollahian during an interview with NBC News on Friday.NBC News

The recent cycle of violence between Israel and Iran began on April 1 when Israel bombed an Iranian consular building in the Syrian capital of Damascus, killing two generals and five officers in the Iranian Revolutionary Guard Corps.

Iran responded 12 days later, launching an unprecedented, direct military attack on Israel involving more than 300 missiles and drones. The assault caused no significant damage, however. Nearly all of the missiles and drones were intercepted by Israeli, U.S. and other allied forces.

Amirabdollahian said the attack was intended to be "a warning." "We could have hit Haifa and Tel Aviv," he said. "We could have also targeted all the economic ports of Israel."

"But our red lines was civilians," he added. "We only had a military purpose."

Although Iran has been locked in a shadow war with Israel for decades, with Iran arming and training proxy forces hostile to Israel in Lebanon, Syria, Yemen and the Palestinian enclave of Gaza, the Iranian aerial barrage marked the first time Tehran had staged an overt military attack on Israel.

In the days that followed, the Biden administration urged Israel to exercise restraint and not conduct a retaliatory attack that could trigger a full-blown war between the two longtime adversaries.

[Israel strikes back on Iran: What is the significance of the attack?]

Israel, though, retaliated on Thursday night, striking a military airfield near the city of Isfahan in central Iran. Nuclear facilities in the area were not damaged, according to Iranian state media, and there were no reports of casualties.

The attack was downplayed by Iranian state media and met with mostly silence from Israeli officials. The limited scope of the strike and the lack of public statements afterward appears to indicate that both sides are looking to ease tensions, experts said.

U.S. officials called for calm. "We do not want to see this conflict escalate," White House press secretary Karine Jean-Pierre said Friday.

The Biden administration has accused Iran of being “complicit” in Hamas’ Oct. 7 attack on Israel, citing Tehran’s years-long effort to arm and train Hamas militants in the Gaza strip.

Iran touts its support for Hamas but the government has said it did not order or coordinate the Oct. 7 attack on Israel, which killed some 1,200 people.

In his interview, Amirabdollahian said Iran had no prior knowledge of Hamas' attack. He also said Hamas was not a terrorist organization but a liberation movement opposed to Israeli occupation of Palestinian land.

He called Israeli Prime Minister Benjamin Netanhayu "unhinged" and blamed the Israeli government for the stalled hostage negotiations. He accused Israel of making excessive demands to compensate for its failure to meet its objectives in the war in Gaza.

"It has not been able to destroy Hamas or to arrest the leaders inside Gaza, has not been able to disarm Hamas, has not been able to destroy the weapons and equipment," Amirabdollahian said.

"Therefore it had to resort to killing women and children," he added, "and now at the negotiating table, they are trying to get what they could not get on the ground."

Still, the foreign minister said he hopes that a deal will be reached soon for the release of the hostages as part of a broad settlement. Hamas is "ready to go ahead with the release of the prisoners within the format of a humanitarian political package encompassing everything."

"I think now is a good time," he said. "There is a good chance for this."

https://www.whitehouse.gov/briefing-room/statements-releases/2024/04/18/statement-from-president-joe-biden-on-iran-sanctions/

THE WHITE HOUSE

APRIL 18, 2024

Statement from President Joe Biden on Iran Sanctions

Less than a week ago, Iran launched one of the largest missile and drone attacks the world has ever seen against Israel. Together with our allies and partners, the United States defended Israel. We helped defeat this attack. And today, we are holding Iran accountable—imposing new sanctions and export controls on Iran.

The sanctions target leaders and entities connected to the Islamic Revolutionary Guard Corps, Iran's Defense Ministry, and the Iranian government's missile and drone program that enabled this brazen assault. As I discussed with my fellow G7 leaders the morning after the attack, we are committed to acting collectively to increase economic pressure on Iran. And our allies and partners have or will issue additional sanctions and measures to restrict Iran's destabilizing military programs.

During my Administration, the United States has sanctioned over 600 individuals and entities—including Iran and its proxies, Hamas, Hezbollah, the Houthis, and Kataib Hezbollah. And we will keep at it. I've directed my team, including the Department of the Treasury, to continue to impose sanctions that further degrade Iran's military industries.

Let it be clear to all those who enable or support Iran's attacks: The United States is committed to Israel's security. We are committed to the security of our personnel and partners in the region. And we will not hesitate to take all necessary action to hold you accountable.

###

Excerpt from https://www.congress.gov/bill/118th-congress/house-bill/8038/text

118TH CONGRESS
2D SESSION

H. R. 8038

To authorize the President to impose certain sanctions with respect to Russia and Iran, and for other purposes.

IN THE HOUSE OF REPRESENTATIVES
APRIL 17, 2024

Mr. MCCAUL introduced the following bill; which was referred to the Committee on Foreign Affairs, and in addition to the Committees on Financial Services, the Judiciary, Ways and Means, Armed Services, the Budget, Rules, Energy and Commerce, and Transportation and Infrastructure, for a period to be subsequently determined by the Speaker, in each case for consideration of such provisions as fall within the jurisdiction of the committee concerned

DIVISION F—SHIP ACT

SEC. 1. SHORT TITLE.

This division may be cited as the "Stop Harboring Iranian Petroleum Act" or the "SHIP Act".

SEC. 2. STATEMENT OF POLICY.

It is the policy of the United States—

(1) to deny Iran the ability to engage in destabilizing activities, support international terrorism, fund the development and acquisition of weapons of mass destruction and the means to deliver such weapons by limiting export of petroleum and petroleum products by Iran;

(2) to deny Iran funds to oppress and commit human rights violations against the Iranian people assembling to peacefully redress the Iranian regime;

(3) to fully enforce sanctions against those entities which provide support to the Iranian energy sector; and

(4) to counter Iran's actions to finance and facilitate the participation of foreign terrorist organizations in ongoing conflicts and illicit activities due to the threat such actions pose to the vital national interests of the United States.

SEC. 3. IMPOSITION OF SANCTIONS WITH RESPECT TO IRANIAN PETROLEUM.

(a) IN GENERAL.—On and after the date that is 180 days after the date of the enactment of this Act, and except as provided in subsection (e)(2), the President shall impose the sanctions described in subsection (c) with

respect to each foreign person that the President determines knowingly engaged, on or after such date of enactment, in an activity described in subsection (b).

(b) ACTIVITIES DESCRIBED.—A foreign person engages in an activity described in this subsection if the foreign person—

(1) owns or operates a foreign port at which, on or after the date of the enactment of this Act, such person knowingly permits to dock a vessel—

(A) that is included on the list of specially designated nationals and blocked persons maintained by the Office of Foreign Assets Control of the Department of the Treasury for transporting Iranian crude oil or petroleum products; or

(B) of which the operator or owner of such vessel otherwise knowingly engages in a significant transaction involving such vessel to transport, offload, or deal in significant transactions in condensate, refined, or unrefined petroleum products, or other petrochemical products originating from the Islamic Republic of Iran;

(2) owns or operates a vessel through which such owner knowingly conducts a ship to ship transfer involving a significant transaction of any petroleum product originating from the Islamic Republic of Iran;

(3) owns or operates a refinery through which such owner knowingly engages in a significant transaction to process, refine, or otherwise deal in any petroleum product originating from the Islamic Republic of Iran;

(4) is a covered family member of a foreign person described in paragraph (1), (2), or (3); or

(5) is owned or controlled by a foreign person described in paragraph (1), (2), or (3), and knowingly engages in an activity described in paragraph (1), (2), or (3).

(c) SANCTIONS DESCRIBED.—The sanctions described in this subsection with respect to a foreign person described in subsection (a) are the following:

(1) SANCTIONS ON FOREIGN VESSELS.—Subject to such regulations as the President may prescribe, the President may prohibit a vessel described in subsection (b)(1)(A) or (b)(1)(B) from landing at any port in the United States—

(A) with respect to a vessel described in subsection (b)(1)(A), for a period of not more than 2 years beginning on the date on which the President imposes sanctions with respect to a related foreign port described in subsection (b)(1)(A); and

(B) with respect to a vessel described in subsection (b)(1)(B), for a period of not more than 2 years.

(2) BLOCKING OF PROPERTY.—The President shall exercise all of the powers granted to the President under the International Emergency Economic Powers Act (50 U.S.C. 1701 et seq.) to the extent necessary to block and prohibit all transactions in property and interests in property of the foreign person if such property and interests in property are in the United States, come within the United States, or are or come within the possession or control of a United States person.

(3) INELIGIBILITY FOR VISAS, ADMISSION, OR PAROLE.—

(A) VISAS, ADMISSION, OR PAROLE.—An alien described in subsection (a) is—

(i) inadmissible to the United States;

(ii) ineligible to receive a visa or other documentation to enter the United States; and

(iii) otherwise ineligible to be admitted or paroled into the United States or to receive any other benefit under the Immigration and Nationality Act (8 U.S.C. 1101 et seq.).

(B) CURRENT VISAS REVOKED.—

(i) IN GENERAL.—An alien described in subsection (a) is subject to revocation of any visa or other entry documentation regardless of when the visa or other entry documentation is or was issued.

(ii) IMMEDIATE EFFECT.—A revocation under clause (i) shall take effect immediately and automatically cancel any other valid visa or entry documentation that is in the alien's possession.

(C) EXCEPTIONS.—Sanctions under this paragraph shall not apply with respect to an alien if admitting or paroling the alien into the United States is necessary—

(i) to permit the United States to comply with the Agreement regarding the Headquarters of the United Nations, signed at Lake Success June 26, 1947, and entered into force November 21, 1947, between the United Nations and the United States, or other applicable international obligations; or

(ii) to carry out or assist law enforcement activity in the United States.

(4) PENALTIES.—The penalties provided for in subsections (b) and (c) of section 206 of the International Emergency Economic Powers Act (50 U.S.C. 1705) shall apply to a person that violates, attempts to violate, conspires to violate, or causes a violation of this section or any regulations promulgated to carry out this section to the same extent that such penalties apply to a person that commits an unlawful act described in section 206(a) of that Act.

(d) RULES OF CONSTRUCTION.—

(1) For purposes of determinations under subsection (a) that a foreign person engaged in activities described in subsection (b), a foreign person shall not be determined to know that petroleum or petroleum products originated from Iran if such person relied on a certificate of origin or other documentation confirming that the origin of the petroleum or petroleum products was a country other than Iran, unless such person knew or had reason to know that such documentation was falsified.

(2) Nothing in this division shall be construed to affect the availability of any existing authorities to issue waivers, exceptions, exemptions, licenses, or other authorization.

(e) IMPLEMENTATION; REGULATIONS.—

(1) IN GENERAL.—The President may exercise all authorities under sections 203 and 205 of the International Emergency Economic Powers Act (50 U.S.C. 1702 and 1704) for purposes of carrying out this section.

(2) DEADLINE FOR REGULATIONS.—Not later than 180 days after the date of the enactment of this Act, the President shall prescribe such regulations as may be necessary for the implementation of this division.

(3) NOTIFICATION TO CONGRESS.—Not later than 10 days before the prescription of regulations under paragraph (2), the President shall brief and provide written notification to the appropriate congressional committees regarding—

(A) the proposed regulations; and

(B) the specific provisions of this division that the regulations are implementing.

(f) EXCEPTION FOR HUMANITARIAN ASSISTANCE.—

(1) IN GENERAL.—Sanctions under this section shall not apply to—

(A) the conduct or facilitation of a transaction for the provision of agricultural commodities, food, medicine, medical devices, or humanitarian assistance, or for humanitarian purposes; or

(B) transactions that are necessary for or related to the activities described in subparagraph (A).

(2) DEFINITIONS.—In this subsection:

(A) AGRICULTURAL COMMODITY.—The term "agricultural commodity" has the meaning given that term in section 102 of the Agricultural Trade Act of 1978 (7 U.S.C. 5602).

(B) MEDICAL DEVICE.—The term "medical device" has the meaning given the term "device" in section 201 of the Federal Food, Drug, and Cosmetic Act (21 U.S.C. 321).

(C) MEDICINE.—The term "medicine" has the meaning given the term "drug" in section 201 of the Federal Food, Drug, and Cosmetic Act (21 U.S.C. 321).

(g) EXCEPTION FOR SAFETY OF VESSELS AND CREW.—Sanctions under this section shall not apply with respect to a person providing provisions to a vessel otherwise subject to sanctions under this section if such provisions are intended for the safety and care of the crew aboard the vessel, the protection of human life aboard the vessel, or the maintenance of the vessel to avoid any environmental or other significant damage.

(h) WAIVER.—

(1) IN GENERAL.—The President may, on a case-by-case basis and for periods not to exceed 180 days each, waive the application of sanctions imposed with respect to a foreign person under this section if the President certifies to the appropriate congressional committees, not later than 15 days after such waiver is to take effect, that the waiver is vital to the national interests of the United States.

(2) SPECIAL RULE.—The President shall not be required to impose sanctions under this section with respect to a foreign person described in subsection (a) if the President certifies in writing to the appropriate congressional committees that the foreign person—

(A) is no longer engaging in activities described in subsection (b); or

(B) has taken and is continuing to take significant, verifiable steps toward permanently terminating such activities.

(i) TERMINATION.—The authorities provided by this section shall cease to have effect on and after the date that is 30 days after the date on which the President certifies to the appropriate congressional committees that—

(1) the Government of Iran no longer repeatedly provides support for international terrorism as determined by the Secretary of State pursuant to—

(A) section 1754(c)(1)(A) of the Export Control Reform Act of 2018 (50 U.S.C. 4318(c)(1)(A));

(B) section 620A of the Foreign Assistance Act of 1961 (22 U.S.C. 2371);

(C) section 40 of the Arms Export Control Act (22 U.S.C. 2780); or

(D) any other provision of law; and

(2) Iran has ceased the pursuit, acquisition, and development of, and verifiably dismantled, its nuclear, biological, and chemical weapons, ballistic missiles, and ballistic missile launch technology.

SEC. 4. REPORT ON IRANIAN PETROLEUM AND PETROLEUM PRODUCTS EXPORTS.

(a) IN GENERAL.—Not later than 120 days after the date of enactment of this Act, and annually thereafter until the date described in subsection (d), the Administrator of the Energy Information Administration shall submit to the appropriate congressional committees a report describing Iran's growing exports of petroleum and petroleum products, that includes the following:

(1) An analysis of Iran's exports and sale of petroleum and petroleum products, including—

(A) an estimate of Iran's petroleum export and sale revenue per year since 2018;

(B) an estimate of Iran's petroleum export and sale revenue to China per year since 2018;

(C) the amount of petroleum and crude oil barrels exported per year since 2018;

(D) the amount of petroleum and crude oil barrels exported to China per year since 2018;

(E) the amount of petroleum and crude oil barrels exported to countries other than China per year since 2018;

(F) the average price per petroleum and crude oil barrel exported per year since 2018; and

(G) the average price per petroleum and crude oil barrel exported to China per year since 2018.

(2) An analysis of Iran's labeling practices of exported petroleum and petroleum products.

(3) A description of companies involved in the exporting and sale of Iranian petroleum and petroleum products.

(4) A description of ships involved in the exporting and sale of Iranian petroleum and petroleum products.

(5) A description of ports involved in the exporting and sale of Iranian petroleum and petroleum products.

(b) FORM.—The report required by subsection (a) shall be submitted in unclassified form but may include a classified annex.

(c) PUBLICATION.—The unclassified portion of the report required by subsection (a) shall be posted on a publicly available website of the Energy Information Administration.

(d) TERMINATION.—The requirement to submit reports under this section shall be terminated on the date on which the President makes the certification described in section 3(f).

SEC. 5. STRATEGY TO COUNTER ROLE OF THE PEOPLE'S REPUBLIC OF CHINA IN EVASION OF SANCTIONS WITH RESPECT TO IRAN.

(a) IN GENERAL.—Not later than 120 days after the date of the enactment of this Act, the Secretary of State, in consultation with the heads of other appropriate Federal agencies, shall submit to the appropriate congressional committees a written strategy, and provide to those committees an accompanying briefing, on the role of the People's Republic of China in evasion of sanctions imposed by the United States with respect to Iranian-origin petroleum products that includes an assessment of options—

(1) to strengthen the enforcement of such sanctions; and

(2) to expand sanctions designations targeting the involvement of the People's Republic of China in the production, transportation, storage, refining, and sale of Iranian-origin petroleum products.

(b) ELEMENTS.—The strategy required by subsection (a) shall include—

(1) a description and assessment of the use of sanctions in effect before the date of the enactment of this Act to target individuals and entities of the People's Republic of China that are directly or indirectly associated with smuggling of Iranian-origin petroleum products;

(2) an assessment of—

(A) Iranian-owned entities operating in the People's Republic of China and involved in petroleum refining supply chains;

(B) the People's Republic of China's role in global petroleum refining supply chains;

(C) how the People's Republic of China leverages its role in global petroleum supply chains to achieve political objectives;

(D) the People's Republic of China's petroleum importing and exporting partners;

(E) what percent of the People's Republic of China's energy consumption is linked to illegally imported Iranian-origin petroleum products; and

(F) what level of influence the Chinese Communist Party holds over non-state, semi-independent "teapot" refineries;

(3) a detailed plan for—

(A) monitoring the maritime domain for sanctionable activity related to smuggling of Iranian-origin petroleum products;

(B) identifying the individuals, entities, and vessels engaging in sanctionable activity related to Iranian-origin petroleum products, including—

(i) vessels—

(I) transporting petrochemicals subject to sanctions;

(II) conducting ship-to-ship transfers of such petrochemicals;

(III) with deactivated automatic identification systems; or

(IV) that engage in "flag hopping" by changing national registries;

(ii) individuals or entities—

(I) storing petrochemicals subject to sanctions; or

(II) refining or otherwise processing such petrochemicals; and

(iii) through the use of port entry and docking permission of vessels subject to sanctions;

(C) deterring individuals and entities from violating sanctions by educating and engaging—

(i) insurance providers;

(ii) parent companies; and

(iii) vessel operators;

(D) collaborating with allies and partners of the United States engaged in the Arabian Peninsula, including through standing or new maritime task forces, to build sanctions enforcement capacity through assistance and training to defense and law enforcement services; and

(E) using public communications and global diplomatic engagements to highlight the role of illicit petroleum product smuggling in bolstering Iran's support for terrorism and its nuclear program; and

(4) an assessment of—

(A) the total number of vessels smuggling Iranian-origin petroleum products;

(B) the total number of vessels smuggling such petroleum products destined for the People's Republic of China;

(C) the number of vessels smuggling such petroleum products specifically from the Islamic Revolutionary Guard Corps;

(D) interference by the People's Republic of China with attempts by the United States to investigate or enforce sanctions on illicit Iranian petroleum product exports;

(E) the effectiveness of the use of sanctions with respect to insurers of entities that own or operate vessels involved in smuggling Iranian-origin petroleum products;

(F) the personnel and resources needed to enforce sanctions with respect to Iranian-origin petroleum products; and

(G) the impact of smuggled illicit Iranian-origin petroleum products on global energy markets.

(c) FORM.—The strategy required by subsection (a) shall be submitted in unclassified form, but may include a classified index.

SEC. 6. DEFINITIONS.

In this division:

(1) APPROPRIATE CONGRESSIONAL COMMITTEES.—The term "appropriate congressional committees" means—

(A) the Committee on Foreign Affairs, the Committee on the Judiciary, and the Committee on Financial Services of the House of Representatives; and

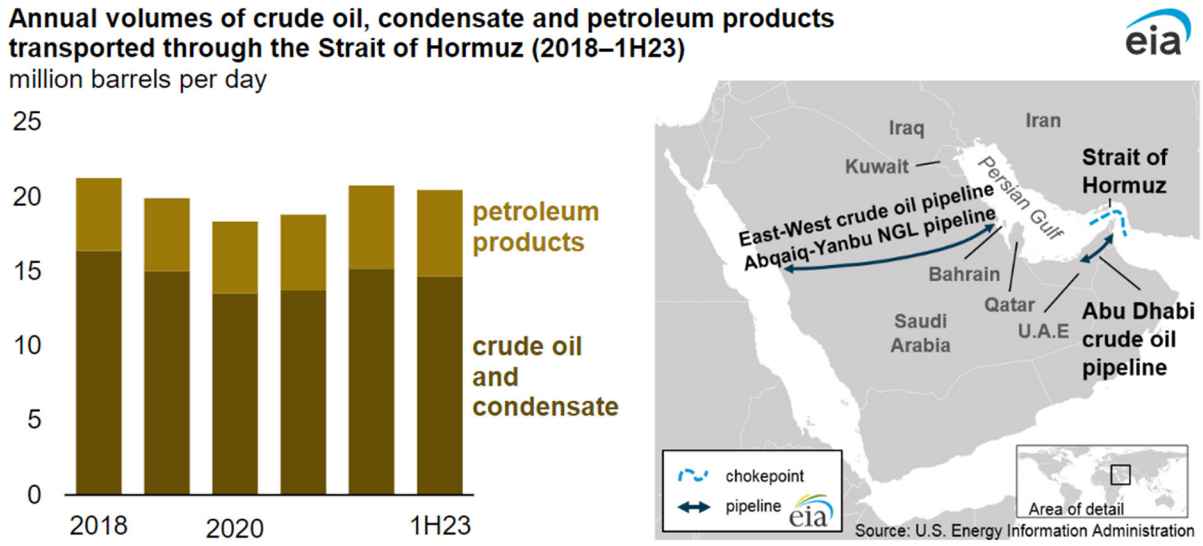
(B) the Committee on Foreign Relations, the Committee on the Judiciary, and the Committee on Banking, Housing, and Urban Affairs of the Senate.

(2) COVERED FAMILY MEMBER.—The term "covered family member", with respect to a foreign person who is an individual, means a spouse, adult child, parent, or sibling of the person who engages in the sanctionable activity described under section 3 or who demonstrably benefits from such activity.

https://www.eia.gov/todayinenergy/detail.php?id=61002

NOVEMBER 21, 2023

The Strait of Hormuz is the world's most important oil transit chokepoint



Data source: U.S. Energy Information Administration analysis based on Vortexa tanker tracking and FACTS Global Energy
Note: 1H23=first half of 2023

The Strait of Hormuz, located between Oman and Iran, connects the Persian Gulf with the Gulf of Oman and the Arabian Sea. The Strait of Hormuz is the world's most important oil chokepoint because large volumes of oil flow through the strait. In 2022, its oil flow averaged 21 million barrels per day (b/d), or the equivalent of about 21% of global petroleum liquids consumption. In the first half of 2023, total oil flows through the Strait of Hormuz remained relatively flat compared with 2022 because increased flows of oil products partially offset declines in crude oil and condensate.

Chokepoints are narrow channels along widely used global sea routes that are critical to global energy security. The inability of oil to transit a major chokepoint, even temporarily, can create substantial supply delays and raise shipping costs, increasing world energy prices. Although most chokepoints can be circumvented by using other routes, which often add significantly to transit time, some chokepoints have no practical alternatives.

Between 2020 and 2022, volumes of crude oil, condensate, and petroleum products transiting the Strait of Hormuz rose by 2.4 million b/d as oil demand recovered after the economic downturn from the COVID-19 pandemic. In the first half of 2023, shipments of crude oil and condensates dropped because OPEC+ members implemented crude oil production cuts starting in November 2022. Flows through the Strait of Hormuz in 2022 and the first half of 2023 made up more than one-quarter of total global seaborne traded oil. In addition, around one-fifth of global liquefied natural gas trade also transited the Strait of Hormuz in 2022.

Volume of crude oil, condensate, and petroleum products transported through the Strait of Hormuz (2018–1H23)
million barrels per day

	2018	2019	2020	2021	2022	1H23
Total oil flows through Strait of Hormuz	**21.3**	**19.9**	**18.3**	**18.8**	**20.8**	**20.5**
Crude oil and condensate	16.4	15.0	13.5	13.7	15.2	14.7
Petroleum products	4.9	4.9	4.8	5.1	5.6	5.8
World maritime oil trade	**77.4**	**77.1**	**71.9**	**73.2**	**75.2**	**76.3**
World total petroleum and other liquids consumption	**100.1**	**100.9**	**91.6**	**97.1**	**99.6**	**100.3**
LNG flows through Strait of Hormuz (billion cubic feet per day)	**10.3**	**10.6**	**10.4**	**10.6**	**10.9**	**10.8**

Data source: U.S. Energy Information Administration, *Short-Term Energy Outlook*, and U.S. Energy Information Administration analysis based on Vortexa tanker tracking and FACTS Global Energy
Note: World maritime oil trade excludes intra-country volumes except those volumes that transit the Strait of Hormuz. LNG=liquefied natural gas. 1H23=first half of 2023.

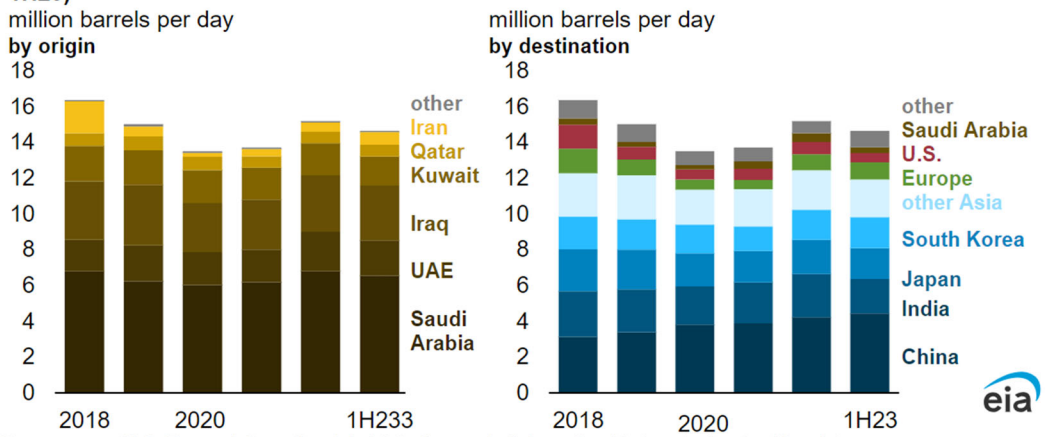
Only Saudi Arabia and the United Arab Emirates (UAE) have operating pipelines that can circumvent the Strait of Hormuz. Saudi Aramco operates the 5-million-b/d East-West crude oil pipeline and temporarily expanded the pipeline's capacity to 7 million b/d in 2019 when it converted some natural gas liquids pipelines to accept crude oil. The UAE links its onshore oil fields to the Fujairah export terminal on the Gulf of Oman with a 1.5 million b/d pipeline.

Iran inaugurated the Goreh-Jask pipeline and the Jask export terminal on the Gulf of Oman with a single export cargo in July 2021. The pipeline's capacity was 0.3 million b/d at that time, although Iran has not used the pipeline since then. We estimate that around 3.5 million b/d of effective unused capacity from these pipelines could be available to bypass the strait in the event of a supply disruption.

Based on tanker tracking data published by Vortexa, Saudi Arabia moves more crude oil and condensate through the Strait of Hormuz than any other country, most of which is exported to other countries. Around 0.5 million b/d transited the strait in 2022 from Saudi ports in the Persian Gulf to Saudi ports in the Red Sea.

We estimate that 82% of the crude oil and condensate that moved through the Strait of Hormuz went to Asian markets in 2022. China, India, Japan, and South Korea were the top destinations for crude oil moving through the Strait of Hormuz to Asia, accounting for 67% of all Hormuz crude oil and condensate flows in 2022 and the first half of 2023.

Annual volumes (crude oil and condensate) transported through the Strait of Hormuz (2018–1H23)



Data source: U.S. Energy Information Administration analysis based on Vortexa tanker tracking data
Note: 1H23=first half of 2023.

In 2022, the United States imported about 0.7 million b/d of crude oil and condensate from Persian Gulf countries through the Strait of Hormuz, accounting for about 11% of U.S. crude oil and condensate imports and 3% of U.S. petroleum liquids consumption. U.S. crude oil imports from countries in the Persian Gulf have fallen by half since 2018 as domestic production has increased.

Principal contributors: Candace Dunn, Justine Barden

"seen a little bit of a buildup .... in Iranian crude oil floating storage. In March we saw that go up by somewhere in the order of 10 million barrels or so. What that suggests ….. is a little bit of weakness coming in from China on the buying side of things." **Vortexa's Jay Maroo.**

SAF Group created transcript of comments by Jay Maroo (Head of Market Intelligence and Analytics MENA, Vortexa) on Gulf Intelligence's Daily Energy Markets Podcast April 17, 2024 hosted by Sean Evers (Founder, Managing Partner of Gulf Intelligence). [LINK]

Items in "*italics"* are SAF Group created transcript.

At 6:30 min mark, Maroo "*… there is no imminent risk of closure of the Strait of Hormuz. There is no change in oil flows or production from Iran at this stage. Looking at the data that we have, Iran's been exporting plenty of oil recently. And I think our latest figure for March was somewhere in the order of 1.4 million barrels a day. So that's very high compared to year ago levels. That in itself is a sign that there is so much oil coming out from Iran at the moment. Most of it is going to China. And it really isn't in anyone's interest for an escalation in this to effect energy supply. And that's why it's clear given the response from the US and other nations everyone is calling for de-escalation. On the shipping side of things, we've seen Iran continue to export at normal levels. One interesting thing that I do want to point out though is on the Iranian side, we have seen a little bit of a buildup in floating storage, in Iranian crude oil floating storage. In March we saw that go up by somewhere in the order of 10 million barrels or so. What that suggests and I think we will probably come to this later on is a little bit of weakness coming in from China on the buying side of things. And I guess that probably feeds into the wider comment about bearishness on oil prices because of demand issues*."

At 25:40 min mark, Maroo "*China obviously, given the size of its oil imports, is the most important consumer for the market to look at. If we look at our own data and we try to understand what's happeniung with apparent oil demand. What we did is we looked at imports minus stock changes and actually what we see is China's apparent oil demand isn't looking great at the moment. That really suggests that there isn't that much growth n the economy taking place on oil demand. Somewhere in the order of 10.2, 10.3 million barrels per day, that's where we put crude import demand in March. And that's well within the seasonal range. And actually looking ahead to the second half of the year, we think, at best, it will be similar to year ago levels. So when it comes to China importing much more crude, we're not very bullish on that. The only thing that could change that is if there is a significant decrease in the price and obviously Chinese being very opportunistic buyers, they'd be quick to pick that up. But that hasn't really happened yet. Speaking to some of our wider network, we're hearing that some of the Iranian crude that is being offered, is being offered at deeper discounts than usual to some new buyers. And what that suggests to me is that, even with Iranian crude being priced so cheap, they're struggling to find buyers in China that are willing to pay even below market rates. So they are going to have dig deeper to get those barrels into China*. "

Prepared by SAF Group https://safgroup.ca/news-insights/

04/17/2024 07:01:52 [BN] Bloomberg News

OIL DEMAND MONITOR: Traders Upbeat But IEA Signals Headwinds

- Senior industry figures see bright outlook for demand growth
- Data shows pockets of weakness and IEA strikes cautious note

By John Deane and Julian Lee

(Bloomberg) -- Commodity traders are sounding confident about the prospects for a bullish oil market this year. The International Energy Agency is taking a less sanguine view, highlighting signs that demand growth is ebbing.

At a conference in Switzerland last week, a number of senior industry figures talked up the demand outlook. Vitol Group Chief Executive Officer Russell Hardy said the world's largest independent oil trader now expects demand growth of 1.9 million barrels a day this year. If achieved, that would be on a par with growth in 2023, which was boosted by the ongoing recovery from the pandemic.

Trafigura Group and Gunvor Group also expressed optimism around demand, respectively citing strong global economic growth and robust recent data. Rystad Energy highlighted strong jet fuel consumption. Macquarie has struck a more cautious note though, seeing the potential for US inflation to eat into demand.

With a seasonal demand uptick due over the summer, many market watchers say there could be a further rally to come for oil prices. There will be a keen focus on the position of the OPEC+ alliance, which will decide in June whether to bring barrels back as prices climb.

In the meantime, recent demand data has painted a mixed picture. Oil shipments into China – the world's biggest importer – surged in March to the highest since August as refineries replenished inventories following a strong holiday travel period and ahead of the maintenance season. Refining rose to the highest in five months, while the Asian nation's apparent oil demand added 1% year-on-year.

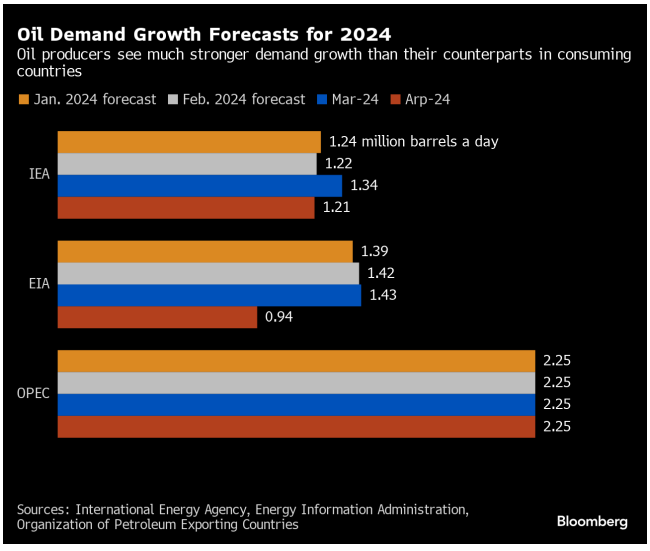
India, the third-biggest oil consumer, saw strong year-on-year gains in gasoline, diesel, jet fuel and LPG sales in March, according to government data.

Elsewhere though, there have been indications of softness. In the US, recent diesel and gasoline consumption measures have faltered. In France, combined road fuel sales declined by 7.7% year-on-year in March, dragged down by a significant drop in diesel sales. In Asia, a South Korean refiner will lower operating rates from this month, while another processor is considering a reduction as higher oil prices depress refining margins.

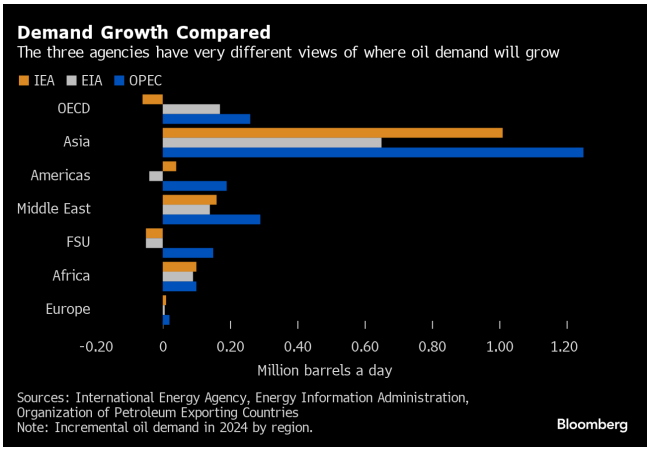
The major oil forecasting agencies are divided on the outlook. In its latest monthly oil market report, the Vienna-based Organization of Petroleum Exporting Countries maintained its bullish forecasts for global oil demand growth this year, with the producers' group leaving its outlook unchanged at 2.25 million barrels a day of additional demand.

The IEA, however, poured a sizable measure of cold water on the mood of optimism. In its monthly report, the Paris-based adviser cut its oil demand growth forecast for this year and estimated even slower growth in 2025 due to a lackluster economic outlook and the rising popularity of electric vehicles.

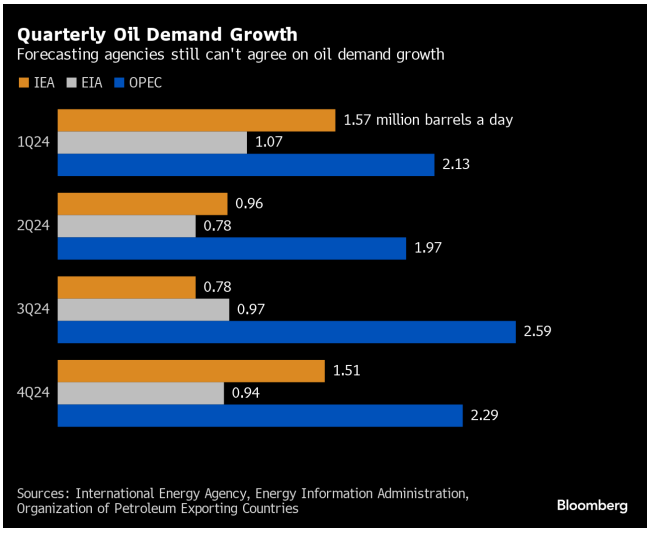
In its first forecast for 2025, the agency predicted demand growth of 1.1 million barrels a day. It trimmed its estimate for this year's expansion in consumption by about 130,000 barrels a day to 1.2 million, citing exceptionally weak deliveries in developed economies in the first quarter.



While all three agree that demand growth will once again be driven by developments in Asia, the Energy Information Administration sees the region's appetite increasing by just 650,000 barrels a day in 2024, about half the increase forecast by OPEC. Forecasts for the countries that make up the Organization for Economic Cooperation and Development vary sharply. The IEA sees oil use in these developed economies falling this year, while the EIA and OPEC both see growth.



Breaking forecasts down by quarter shows a general trend of somewhat weaker growth in the second period than the first, though the IEA and EIA both see a more rapid slowdown than OPEC. The two consumer-side agencies expect demand growth to remain muted, though still positive, in the third quarter. The IEA expects growth to pick up again in the final quarter of the year, while the EIA is less optimistic. After a brief dip below 2 million barrels a day in the second quarter, OPEC expects demand growth to recover strongly in the second half of the year.



While China will remain the mainstay of global expansion this year, demand gains in the Asian nation are projected to fall to 540,000 barrels a day this year from about 1.7 million in 2023, IEA analysts including Toril Bosoni said in a commentary accompanying the group's monthly report.

"While we expect growth in oil consumption in 2024 (1.2 million barrels a day) and 2025 (1.1 million barrels a day) to remain robust by historical standards, structural factors will lead to a gradual easing of oil demand growth over the rest of this decade," and an overall peak in demand by the turn of the decade, the analysts said.

The Bloomberg oil demand monitor uses a range of high-frequency data to help identify emerging trends. Following are the latest indicators. The first table shows fuel demand, the second shows air travel globally and the third refinery activity.

Demand Measure	Location	%vs 2023	%vs 2022	% vs 2021	% vs 2020	% vs 2019	% m/m	Freq	Latest Date	Latest Value	Source
Gasoline product supplied	US	-3.6	-1.4	-1.9	+70	-12	-4.8	w	April 5	8.61m b/d	EIA
Distillates product supplied	US	-21	-14	-19	-22	-21	-12	w	April 5	2.99m b/d	EIA

Jet fuel product supplied	US	+5.5	+0.3	+28	+113	+11	+1.6	w	April 5	1.61m b/d	EIA
Total oil products supplied	US	+0.9	+2.5	unch.	+33	−5.3	−7.5	w	April 5	19.24m b/d	EIA
Gasoline (petrol) avg sales per filling station	UK	−1	+0.3	+23	+188	−5.1	−3.4	w	Week to March 31	6,822 liters/day	BEIS
Diesel avg sales per station	UK	−11	−14	−9	+82	−23	−7.9	w	Week to March 31	8,043	BEIS
Total road fuels sales per station	UK	−6.6	−8.2	+3.2	+119	−16	−5.9	w	Week to March 31	14,865	BEIS
Diesel sales	India	−9.5					−2.7	m	April 1−15	3.141m tons	Bberg
Gasoline sales	India	+6.9					−3.6	m	April 1−15	1.228m tons	Bberg
Jet fuel sales	India	+10					−1.2	m	April 1−15	336k tons	Bberg
LPG sales	India	+8.8					−12	m	April 1−15	1.207m tons	Bberg
Diesel sales	India	+3.1					+8.1	m	March	8.04m tons	PPAC
Gasoline sales	India	+6.9					+10	m	March	3.32m tons	PPAC
Jet fuel sales	India	+10					+7.5	m	March	758k tons	PPAC
LPG sales	India	+8.6					+0.7	m	March	2.61m tons	PPAC
Total oil products	India	−0.6					+6.8	m	March	21.1m tons	PPAC
Gasoline deliveries	Spain	+18						m	March	557k m3	Exolum
Diesel (and heating oil) deliveries	Spain	+8.9						m	March	2,322k m3	Exolum
Jet fuel deliveries	Spain	+11						m	March	535k m3	Exolum
Total oil products deliveries	Spain	+9.7						m	March	3,415k m3	Exolum
Naphtha	Germany	−15						m	January	823k tons	BAFA
Gasoline	Germany	+3						m	January	1.31m tons	BAFA
Diesel	Germany	−3.9						m	January	2.27m tons	BAFA
Heating oil	Germany	+18						m	January	1.03m tons	BAFA
LPG	Germany	+3						m	January	265k tons	BAFA
Jet fuel	Germany	−3.1						m	January	676k tons	BAFA
Total oil product sales	Germany	−2.2						m	January	6.51m tons	BAFA
Road fuel sales	France	−7.7						m	March	3.935 m3	UFIP
Gasoline sales	France	+2.9						m	March	n/a	UFIP
Road diesel sales	France	−12						m	March	n/a	UFIP
Jet fuel sales	France	+17						m	March	623k m3	UFIP
All petroleum products sales	France	−7.4						m	March	4.37m tons	UFIP
All vehicles traffic	Italy	−2					+1	m	March	n/a	Anas
Heavy vehicle traffic	Italy	−4					−2	m	March	n/a	Anas
% change in toll roads kms traveled	France	+4.7						m	March	n/a	Mundys

% change in toll roads kms traveled	Italy	−1.6	m	March	n/a	Mundys
% change in toll roads kms traveled	Spain	+8.9	m	March	n/a	Mundys
% change in toll roads kms traveled	Brazil	+4.3	m	March	n/a	Mundys
% change in toll roads kms traveled	Chile	−2.1	m	March	n/a	Mundys
% change in toll roads kms traveled	Mexico	+2.8	m	March	n/a	Mundys

Notes: Click here for a PDF with more information on sources, methods. The frequency column shows w for data updated weekly, 2/m for twice a month and m for monthly.

Congestion:

- READ: Oil Price Indicators Weekly: OPEC's View Still an Outlier

Air Travel:

Measure	Location	vs 2023	vs 2022	vs 2021	vs 2020	vs 2019	m/m	w/w	Freq.	Latest Date	Latest Value	Source
					changes shown as %							
All flights	Worldwide	+5.4	+19	+31	+245	+21	+5.7	−1	d	April 15	220,433	Flightradar24
Commercial flights	Worldwide	+9.7	+43	+62	+351	+14	+5	+0.9	d	April 15	127,397	Flightradar24
Seat capacity per month	Worldwide	+7.7	+32	+80	+244	+3.2		+0.4	w	April 15 week	112.5m	OAG
Air traffic (flights)	Europe					−4.6	+10	−0.1	d	April 15	29,537	Eurocontrol
Airline passenger throughput (7−day avg)	US	+4	+14	+78	+2,424	+4	−2	−1	w	April 14	2.46m	TSA
Air passenger traffic per month	China	+45	+100	+162	+653	+16	+9.1		m	February	62.5m	CAAC
Heathrow airport passengers	UK	+8	+60	+1,142	+116	+3	+16		m	March	6.73m	Heathrow. See related story
Rome % change in passengers carried	Italy	+26				+2			m	March	n/a	Mundys

Note: Comparisons versus 2019 are a better measure of a return to normal for most nations, rather than y/y comparisons.

Note: FlightRadar24 data shown above, and comparisons thereof, all use 7−day moving averages, except for w/w which uses single day data.

- READ: Global Jet Fuel Demand Stalls With Mid−April Lull: BNEF Chart

Refineries:

Measure	Location	vs 2023	vs 2022	vs 2021	vs 2019	m/m chg	Latest as of Date	Latest Value	Source
				Changes are in ppt unless noted					
Crude intake	US	+1.3	+1.7	+4.9	−2	+0.8	April 5	15.78m b/d	EIA
Utilization	US	−1	−1.7	+4.3	+0.8	+1.5	April 5	88.3%	EIA

Utilization	US Gulf	−1.7	−2.7	+8.3	+1.4	+1.7	April 5	91.4%	EIA
Utilization	US East	−8	−1.2	−1.3	+0.1	−2.1	April 5	79.9%	EIA
Utilization	US Midwest	−1.4	−3.8	−4.7	−2.5	−0.7	April 5	84%	EIA
Utilization (indep. refs)	Shandong, China	−8.4	+1.6	−20	−10	−0.8	April 12	53.3%	Oilchem

Note: US refinery data is weekly. Changes are shown in percentages for the row on crude intake, while refinery utilization changes are shown in percentage points.

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https://www.iea.org/commentaries/oil-demand-growing-at-a-slower-pace-as-post-covid-rebound-runs-its-course

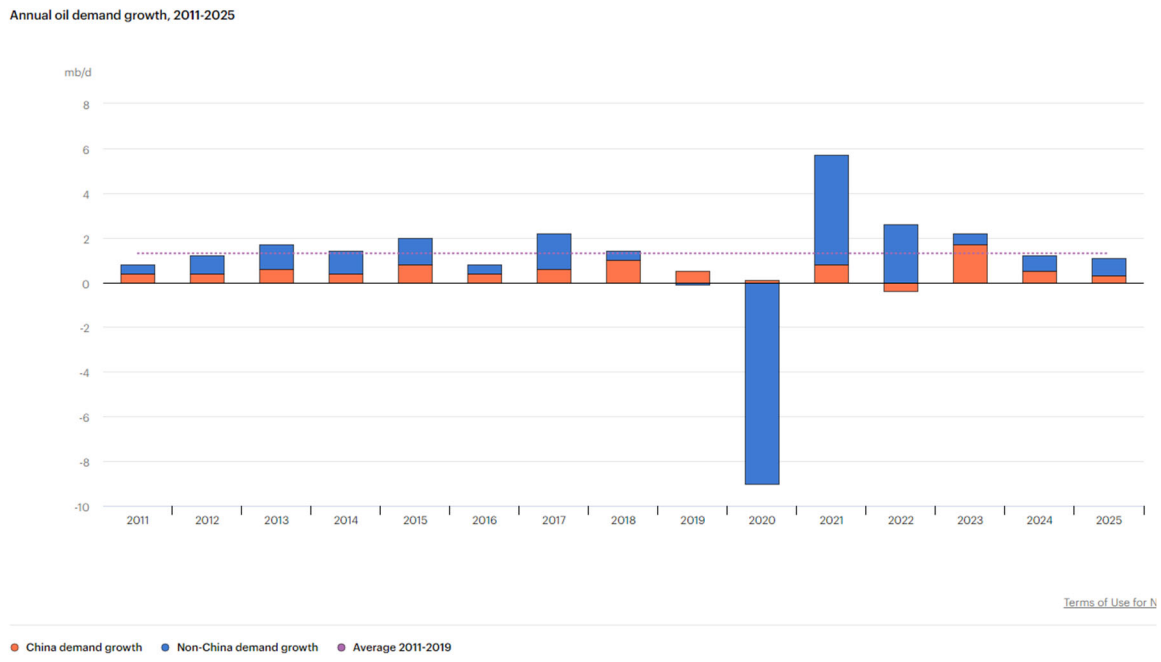
Oil demand growing at a slower pace as post-Covid rebound runs its course

Toril Bosoni, Head of Oil Industry and Markets Division
Ciarán Healy, Oil Market AnalystCommentary — 12 April 2024

Global oil demand growth returns to historical trend

Global oil demand growth is currently in the midst of a slowdown and is expected to ease to 1.2 million barrels a day (mb/d) this year and 1.1 mb/d in 2025 – bringing a peak in consumption into view this decade. This is primarily the result of a normalisation of growth following the disruptions of 2020-2023, when oil markets were shaken by the Covid-19 pandemic and then the global energy crisis sparked by Russia's invasion of Ukraine.

Despite the deceleration that is forecast, this level of oil demand growth remains largely in line with the pre-Covid trend, even amid muted expectations for global economic growth this year and increased deployment of clean energy technologies.



In both 2022 and 2023, global oil consumption rose by more than 2 mb/d as economies continued their recoveries from the Covid-19 shock and saw spikes in personal mobility, along with exceptional releases of pent-up demand for travel and tourism. While there are reasonable grounds for uncertainty about how complete the global recovery is, both oil demand data and mobility indicators suggest that its pace has slowed sharply and that the period of demand growth above the historical average is coming to an end.

China's post-Covid rebound is running out of steam

Without a steep fall in oil prices, a sudden resurgence in the post-pandemic recovery or an acceleration in economic activity, it is unlikely that global oil demand growth will approach the

levels seen in 2022 and 2023. Indeed, the pace of gains slowed substantially in the second half of 2023, and the latest data shows that the trend continued at the beginning of 2024.

Oil use increased by an estimated 1.6 mb/d year-on-year in the first quarter of 2024, down from 1.9 mb/d in the fourth quarter of 2023 and more than 3 mb/d during the middle of last year. Given that China was the last major economy to lift public health restrictions related to the pandemic and saw an abrupt economic recovery in mid-2023, this easing of year-on-year demand growth is likely to continue during 2024.

Indeed, because the timing of Chinese lockdowns was quite different from the rest of the world, global oil demand growth in 2023 was extremely dependent on the country. With the explosive phase of the pandemic rebound largely complete elsewhere, China contributed to more than three-quarters of the global increase in demand (1.7 mb/d out of 2.3 mb/d). The world's second largest economy will remain the mainstay of global expansion this year. However, gains are projected to fall to 540 kb/d. In the absence of a dramatic acceleration in other countries, this will result in a wider global slowdown.

In the decade up to 2023, almost two-thirds of all oil demand growth came from China. Over this period, the nation's GDP grew at an annual average rate of 6%. An expected slackening in economic growth, to a rate of between 4% and 5% in 2024 and 2025 – combined with the rapid domestic uptake of oil-substituting technologies such as electric vehicles (EVs) and high-speed rail – means that in 2024 and 2025, only a little over one-third of oil demand growth is expected to come from China.

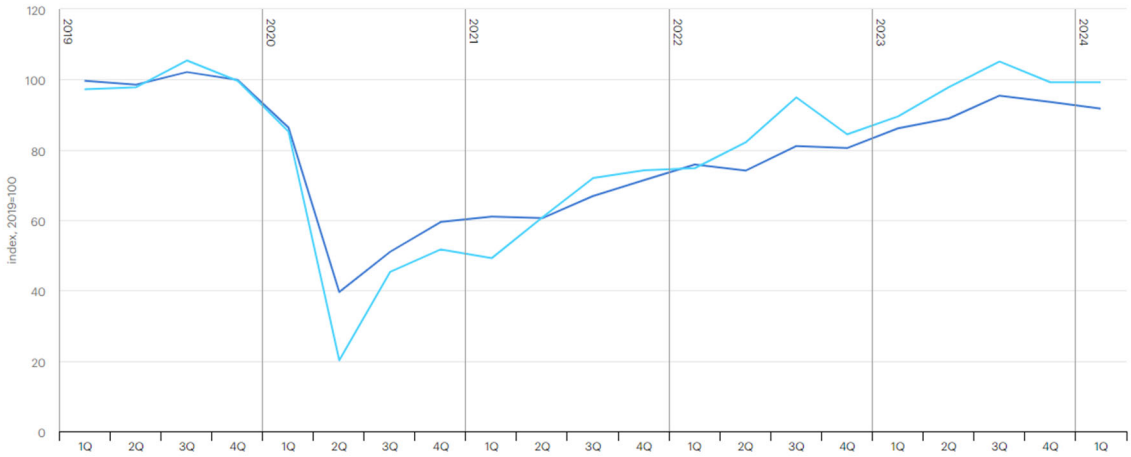
Demand for aviation fuel is easing as air traffic stabilises

The other major driver of rising oil consumption in 2022 and 2023 was a steady recovery in air traffic as pandemic-era travel restrictions were relaxed. Demand for jet fuel/kerosene, primarily

from the aviation sector, grew by more than 1 mb/d in both years and contributed almost half of the increase in global oil demand.

However, gains have moderated since the first half of 2023, according to *Airportia* data. As a result, the increase in demand for jet fuel/kerosene in 2024 is forecast to be far smaller, at 230 kb/d. In addition to a stabilisation in air traffic, there have also been large gains in the fuel efficiency of aircraft since 2019. This has meant that, despite roughly equivalent activity, fuel demand from the sector was more than 6% lower in the second half of 2023 than in the same period in 2019. This trend is set to continue as more new planes with vastly improved fuel economy enter the global fleet, helping to restrain the impact of increasing demand for air travel on oil use during the medium term.

Demand for jet fuel/kerosene lags global miles flown as aircraft fuel efficiency improves



Global consumption of oil is set to peak, but its centrality remains

While we expect growth in oil consumption in 2024 (1.2 mb/d) and 2025 (1.1 mb/d) to remain robust by historical standards, structural factors will lead to a gradual easing of oil demand growth over the rest of this decade. Continued rapid gains in the market share of EVs, particularly in China; steady improvements in vehicle fuel economies; and, notably, efforts by Middle Eastern economies, especially Saudi Arabia, to reduce the quantity of oil used in power generation are together expected to generate an overall peak in demand by the turn of the decade.

Oil remains extremely important to the global economy, and across some of its key applications, alternatives still cannot easily be substituted. In the absence of additional energy and climate policies and an increased investment push into clean energy technologies, the decline in global oil demand following the peak will not be a steep one, leaving demand close to current levels for some time. Nevertheless, cooling Chinese demand growth and considerable progress on the deployment of clean energy transition technologies mean that the oil market is set to enter a new and consequential period of transformation.

Executive summary

Electric car sales break new records with momentum expected to continue through 2023

Electric car markets are seeing exponential growth as sales exceeded 10 million in 2022. A total of 14% of all new cars sold were electric in 2022, up from around 9% in 2021 and less than 5% in 2020. Three markets dominated global sales. China was the frontrunner once again, accounting for around 60% of global electric car sales. More than half of the electric cars on roads worldwide are now in China and the country has already exceeded its 2025 target for new energy vehicle sales. In Europe, the second largest market, electric car sales increased by over 15% in 2022, meaning that more than one in every five cars sold was electric. Electric car sales in the United States – the third largest market – increased 55% in 2022, reaching a sales share of 8%.

Electric car sales are expected to continue strongly through 2023. Over 2.3 million electric cars were sold in the first quarter, about 25% more than in the same period last year. We currently expect to see 14 million in sales by the end of 2023, representing a 35% year-on-year increase with new purchases accelerating in the second half of this year. As a result, electric cars could account for 18% of total car sales across the full calendar year. National policies and incentives will help bolster sales, while a return to the exceptionally high oil prices seen last year could further motivate prospective buyers.

There are promising signs for emerging electric vehicle (EV) markets, albeit from a small base. Electric car sales are generally low outside the major markets, but 2022 was a growth year in India, Thailand and Indonesia. Collectively, sales of electric cars in these countries more than tripled compared to 2021, reaching 80 000. For Thailand, the share of electric cars in total sales came in at slightly over 3% in 2022, while both India and Indonesia averaged around 1.5% last year. In India, EV and component manufacturing is ramping up, supported by the government's USD 3.2 billion incentive programme that has attracted investments totalling USD 8.3 billion. Thailand and Indonesia are also strengthening their policy support schemes, potentially providing valuable experience for other emerging market economies seeking to foster EV adoption.

Landmark EV policies are driving the outlook for EVs closer to climate ambitions

Market trends and policy efforts in major car markets are supporting a bright outlook for EV sales. Under the IEA Stated Policies Scenario (STEPS), the global outlook for the share of electric car sales based on existing policies and firm objectives has increased to 35% in 2030, up from less than 25% in the previous outlook. In the projections, China retains its position as the largest market for electric cars with 40% of total sales by 2030 in the STEPS. The United States doubles its market share to 20% by the end of the decade as recent policy announcements drive demand, while Europe maintains its current 25% share.

Projected demand for electric cars in major car markets will have profound implications on energy markets and climate goals in the current policy environment. Based on existing policies, oil demand from road transport is projected to peak around 2025 in the STEPS, with the amount of oil displaced by electric vehicles exceeding 5 million barrels per day in 2030. In the STEPS, emissions of around 700 Mt CO_2-equivalents are avoided by the use of electric cars in 2030.

The European Union and the United States have passed legislation to match their electrification ambitions. The European Union adopted new CO_2 standards for cars and vans that are aligned with the 2030 goals set out in the Fit for 55 package. In the United States, the Inflation Reduction Act (IRA), combined with adoption of California's Advanced Clean Cars II rule by a number of states, could deliver a 50% market share for electric cars in 2030, in line with the national target. The implementation of the recently proposed emissions standards from the US Environmental Protection Agency is set to further increase this share.

Battery manufacturing continues to expand, encouraged by the outlook for EVs. As of March 2023, announcements on battery manufacturing capacity delivered by 2030 are more than sufficient to meet the demand implied by government pledges and would even be able to cover the demand for electric vehicles in the Net Zero Emissions by 2050 Scenario. It is therefore well possible that higher shares of sales are achievable for electric cars than those anticipated on the basis of current government policy and national targets.

As spending and competition increase, a growing number of more affordable models come to market

Global spending on electric cars exceeded USD 425 billion in 2022, up 50% relative to 2021. Only 10% of the spending can be attributed to government support, the remainder was from consumers. Investors have also maintained confidence in EVs, with the stocks of EV-related companies consistently

outperforming traditional carmakers since 2019. Venture capital investments in start-up firms developing EV and battery technologies have also boomed, reaching nearly USD 2.1 billion in 2022, up 30% relative to 2021, with investments increasing in batteries and critical minerals.

SUVs and large cars dominate available electric car options in 2022. They account for 60% of available BEV options in China and Europe and an even greater share in the United States, similar to the trend towards SUVs seen in internal combustion engine (ICE) car markets. In 2022, ICE SUVs emitted over 1 Gt CO_2, far greater than the 80 Mt net emissions reductions from the electric vehicle fleet that year. Battery electric SUVs often have batteries that are two- to three-times larger than small cars, requiring more critical minerals. However, last year electric SUVs resulted in the displacement of over 150 000 barrels of oil consumption per day and avoided the associated tailpipe emissions that would have been generated through burning the fuel in combustion engines.

The electric car market is increasingly competitive. A growing number of new entrants, primarily from China but also from other emerging markets, are offering more affordable models. Major incumbent carmakers are increasing ambition as well, especially in Europe, and 2022-2023 saw another series of important EV announcements: fully electric fleets, cheaper cars, greater investment, and vertical integration with battery-making and critical minerals.

Consumers can choose from an increasing number of options for electric cars. The number of available electric car models reached 500 in 2022, more than double the options available in 2018. However, outside of China, there is a need for original equipment manufacturers (OEMs) to offer affordable, competitively priced options in order to enable mass adoption of EVs. Today's level of available electric car models is still significantly lower than the number of ICE options on the market, but the number of ICE models available has been steadily decreasing since its peak in the mid-2010s.

Focus expands to electrification of more vehicle segments as electric cars surge ahead

Electrification of road transport goes beyond cars. Two or three-wheelers are the most electrified market segment today; in emerging markets and developing economies, they outnumber cars. Over half of India's three-wheeler registrations in 2022 were electric, demonstrating their growing popularity due to government incentives and lower lifecycle costs compared with conventional models, especially in the context of higher fuel prices. In many developing economies, two/three-wheelers offer an affordable way to get access to mobility, meaning their electrification is important to support sustainable development.

The commercial vehicle stock is also seeing increasing electrification. Electric light commercial vehicle (LCV) sales worldwide increased by more than 90% in 2022 to more than 310 000 vehicles, even as overall LCV sales declined by nearly 15%. In 2022, nearly 66 000 electric buses and 60 000 medium- and heavy-duty trucks were sold worldwide, representing about 4.5% of all bus sales and 1.2% of truck sales. Where governments have committed to reduce emissions from public transport, such as in dense urban areas, electric bus sales reached even higher shares; in Finland, for example, electric bus sales accounted for over 65% in 2022.

Ambition with respect to electrifying heavy-duty vehicles is growing. In 2022, around 220 electric heavy-duty vehicle models entered the market, bringing the total to over 800 models offered by well over 100 OEMs. A total of 27 governments have pledged to achieve 100% ZEV bus and truck sales by 2040 and both the United States and European Union have also proposed stronger emissions standards for heavy-duty vehicles.

EV supply chains and batteries gain greater prominence in policy-making

The increase in demand for electric vehicles is driving demand for batteries and related critical minerals. Automotive lithium-ion (Li-ion) battery demand increased by about 65% to 550 GWh in 2022, from about 330 GWh in 2021, primarily as a result of growth in electric passenger car sales. In 2022, about 60% of lithium, 30% of cobalt and 10% of nickel demand was for EV batteries. Only five years prior, these shares were around 15%, 10% and 2%, respectively. Reducing the need for critical materials will be important for supply chain sustainability, resilience and security, especially given recent price developments for battery material.

New alternatives to conventional lithium-ion are on the rise. The share of lithium-iron-phosphate (LFP) chemistries reached its highest point ever, driven primarily by China: around 95% of the LFP batteries for electric LDVs went into vehicles produced in China. Supply chains for (lithium-free) sodium-ion batteries are also being established, with over 100 GWh of manufacturing capacity either currently operating or announced, almost all in China.

The EV supply chain is expanding, but manufacturing remains highly concentrated in certain regions, with China being the main player in battery and EV component trade. In 2022, 35% of exported electric cars came from China, compared with 25% in 2021. Europe is China's largest trade partner for both electric cars and their batteries. In 2022, the share of electric cars manufactured in China and sold in the European market increased to 16%, up from about 11% in 2021.

EV supply chains are increasingly at the forefront of EV-related policy-making to build resilience through diversification. The Net Zero Industry Act, proposed by the European Union in March 2023, aims for nearly 90% of the European Union's annual battery demand to be met by EU battery manufacturers, with a manufacturing capacity of at least 550 GWh in 2030. Similarly, India aims to boost domestic manufacturing of electric vehicles and batteries through Production Linked Incentive (PLI) schemes. In the United States, the Inflation Reduction Act emphasises the strengthening of domestic supply chains for EVs, EV batteries and battery minerals, laid out in the criteria to qualify for clean vehicle tax credits. As a result, between August 2022 and March 2023, major EV and battery makers announced cumulative post-IRA investments of at least USD 52 billion in North American EV supply chains – of which 50% is for battery manufacturing, and about 20% each for battery components and EV manufacturing.

Trends and developments in EV markets

Electric light-duty vehicles

Electric car sales continue to increase, led by China

Electric car sales [1] saw another record year in 2022, despite supply chain disruptions, macro-economic and geopolitical uncertainty, and high commodity and energy prices. The growth in electric car sales took place in the context of globally contracting car markets: total car sales in 2022 dipped by 3% relative to 2021. Electric car sales – including battery electric vehicles (BEVs) and plug-in hybrid electric vehicles (PHEVs) – exceeded 10 million last year, up 55% relative to 2021.[2] This figure – 10 million EV sales worldwide – exceeds the total number of cars sold across the entire European Union (about 9.5 million vehicles) and is nearly half of the total number of cars sold in China in 2022. In the course of just five years, from 2017 to 2022, EV sales jumped from around 1 million to more than 10 million. It previously took five years from 2012 to 2017 for EV sales to grow from 100 000 to 1 million, underscoring the exponential nature of EV sales growth. The share of electric cars in total car sales jumped from 9% in 2021 to 14% in 2022, more than 10 times their share in 2017.

Over 26 million electric cars were on the road in 2022, up 60% relative to 2021 and more than 5 times the stock in 2018

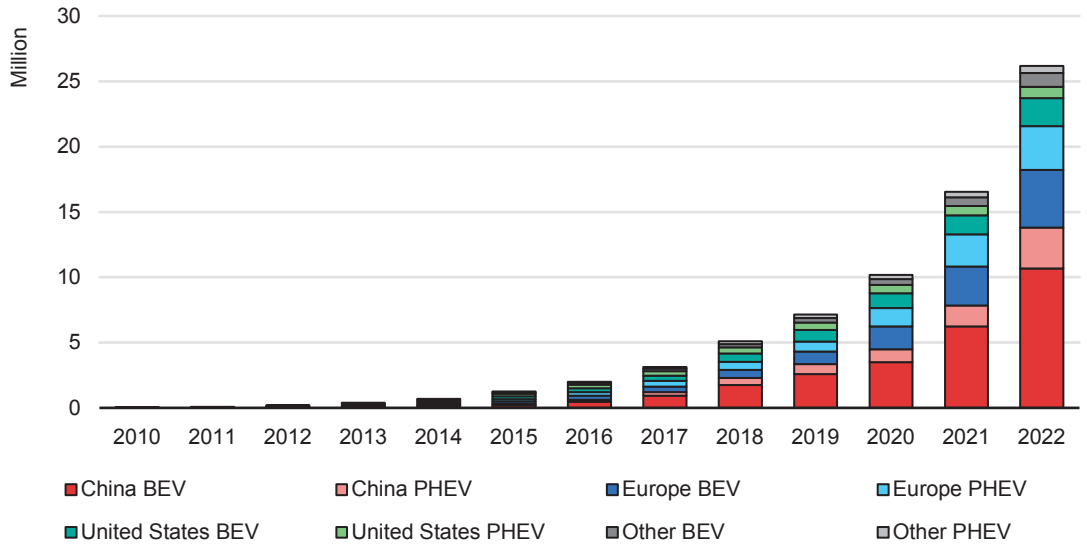
Increasing sales pushed the total number of electric cars on the world's roads to 26 million, up 60% relative to 2021, with BEVs accounting for over 70% of total annual growth, as in previous years. As a result, about 70% of the global stock of electric cars in 2022 were BEVs. The increase in sales from 2021 to 2022 was just as high as from 2020 to 2021 in absolute terms – up 3.5 million – but relative growth was lower (sales doubled from 2020 to 2021). The exceptional boom in 2021 may be explained by EV markets catching up in the wake of the coronavirus

[1] The term sales, as used in this report, represents an estimate of the number of new vehicles hitting the roads. Where possible, data on new vehicle registrations is used. In some cases, however, only data on retail sales (such as sales from a dealership) are available. See Box 1.2 for further details. The term car is used to represent passenger light-duty vehicles and includes cars of different sizes, sports utility-vehicles and light trucks.

[2] Unless otherwise specified, the term electric vehicle is used to refer to both battery electric and plug-in hybrid electric vehicles but does not include fuel cell electric vehicles. For a brief description of the trends related to fuel cell electric vehicles, see Box 1.3.

(Covid-19) pandemic. Seen in comparison to recent years, the annual growth rate for electric car sales in 2022 was similar to the average rate over 2015-2018, and the annual growth rate for the global stock of electric cars in 2022 was similar to that of 2021 and over the 2015-2018 period, showing a robust recovery of EV market expansion to pre-pandemic pace.

Figure 1.1 Global electric car stock in selected regions, 2010-2022



Notes: BEV = battery electric vehicle; PHEV = plug-in hybrid electric vehicle. Electric car stock in this figure refers to passenger light-duty vehicles. In "Europe", European Union countries, Norway, and the United Kingdom account for over 95% of the EV stock in 2022; the total also includes Iceland, Israel, Switzerland and Türkiye. Main markets in "Other" include Australia, Brazil, Canada, Chile, Mexico, India, Indonesia, Japan, Malaysia, New Zealand, South Africa, Korea and Thailand.

The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.

Source: IEA analysis based on country submissions, ACEA, EAFO, EV Volumes and Marklines.

Over 26 million electric cars were on the road in 2022, up 60% relative to 2021 and more than five times the stock in 2018.

Half of the world's electric cars are in China

The increase in electric car sales varied across regions and powertrains, but remains dominated by the People's Republic of China (hereafter "China"). In 2022, BEV sales in China increased by 60% relative to 2021 to reach 4.4 million, and PHEV sales nearly tripled to 1.5 million. The faster growth in PHEV sales relative to BEVs warrants further examination in the coming years, as PHEV sales still remain lower overall and could be catching up on the post-Covid-19 boom only now; BEV sales in China tripled from 2020 to 2021 after moderate growth over 2018-2020. Electric car sales increased even while total car sales dipped by 3% in 2022 relative to 2021.

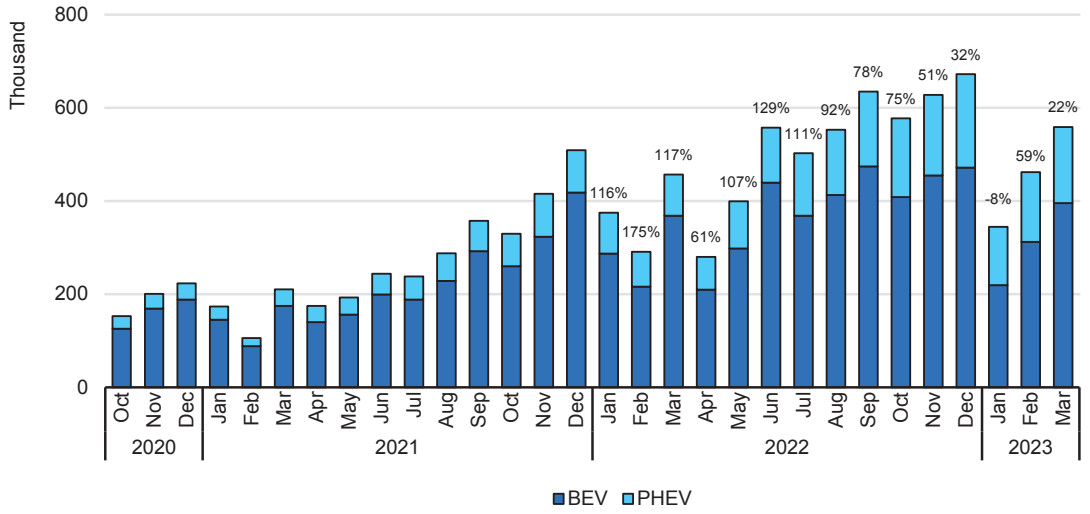
China accounted for nearly 60% of all new electric car registrations globally. For the first time in 2022, China accounted for more than 50% of all the electric cars on the world's roads, a total of 13.8 million. This strong growth results from more than a decade of sustained policy support for early adopters, including an extension of purchase incentives initially planned for phase-out in 2020 to the end of 2022 due to Covid-19, in addition to non-financial support such as rapid roll-out of charging infrastructure and stringent registration policies for non-electric cars.

In 2022, the share of electric cars in total domestic car sales reached 29% in China, up from 16% in 2021 and under 6% between 2018 and 2020. China has therefore achieved its 2025 national target of a 20% sales share for so-called new energy vehicles (NEVs)[3] well in advance. All indicators point to further growth: although the national NEV sales target is yet to be updated by China's Ministry of Industry and Information Technology (MIIT), which is responsible for the automotive industry, the objective of greater road transport electrification is re-affirmed in multiple strategy documents. China aims to reach a 50% sales share by 2030 in so-called "key air pollution control regions", and 40% across the country by 2030 to support the national action plan for carbon peaking. If recent market trends continue, China's 2030 targets may also be reached ahead of time. Provincial governments are also supporting adoption of NEVs, with 18 provinces to date having set NEV targets.

Support at the regional level in China has also helped to advance some of the world's largest EV makers. Shenzhen-based BYD has supplied most of the city's electric buses and taxis, and its leading position is also reflected in Shenzhen's ambition of reaching a 60% NEV sales share by 2025. Guangzhou, which has a 50% NEV sales share by 2025 target, facilitated the expansion of Xpeng Motors to become one of the national EV frontrunners.

[3] NEVs (China) include BEVs, PHEVs and fuel cell electric vehicles.

Figure 1.2 Monthly new electric car registrations in China, 2020-2023



Note: BEV = battery electric vehicle; PHEV = plug-in hybrid electric vehicle. Percentage labels in 2022-2023 refer to year-on-year growth rates relative to the same month in the previous year.
Source: IEA analysis based on EV Volumes.

Electric car sales in China have been steadily increasing since 2020, but future trends will warrant further examination given that purchase incentives ended in 2022.

Whether China's electric car sales share will remain significantly above the 20% target in 2023 remains uncertain, as sales may have been especially high in anticipation of incentives being phased out at the end of 2022. Sales in January 2023 plunged, and while this is in part due to the timing of the Chinese New Year, they were nearly 10% lower than sales in January 2022. However, electric car sales caught up in February and March 2023, standing nearly 60% above sales in February 2022 and more than 25% above sales in March 2022, thereby bringing sales in the first quarter of 2023 more than 20% higher than in the first quarter of 2022.

Growth remained steady in Europe despite disruptions

In Europe,[4] electric car sales increased by more than 15% in 2022 relative to 2021 to reach 2.7 million. Sales grew more quickly in previous years: annual growth stood at more than 65% in 2021 and averaged 40% over 2017-2019. In 2022, BEV sales rose by 30% relative to 2021 (compared to 65% growth in 2021 relative to 2020) while PHEV sales dipped by around 3%. Europe accounted for 10% of global growth in new electric car sales. Despite slower growth in 2022, electric car

[4] Europe includes European Union countries, Iceland, Israel, Norway, Switzerland, Türkiye, and the United Kingdom.

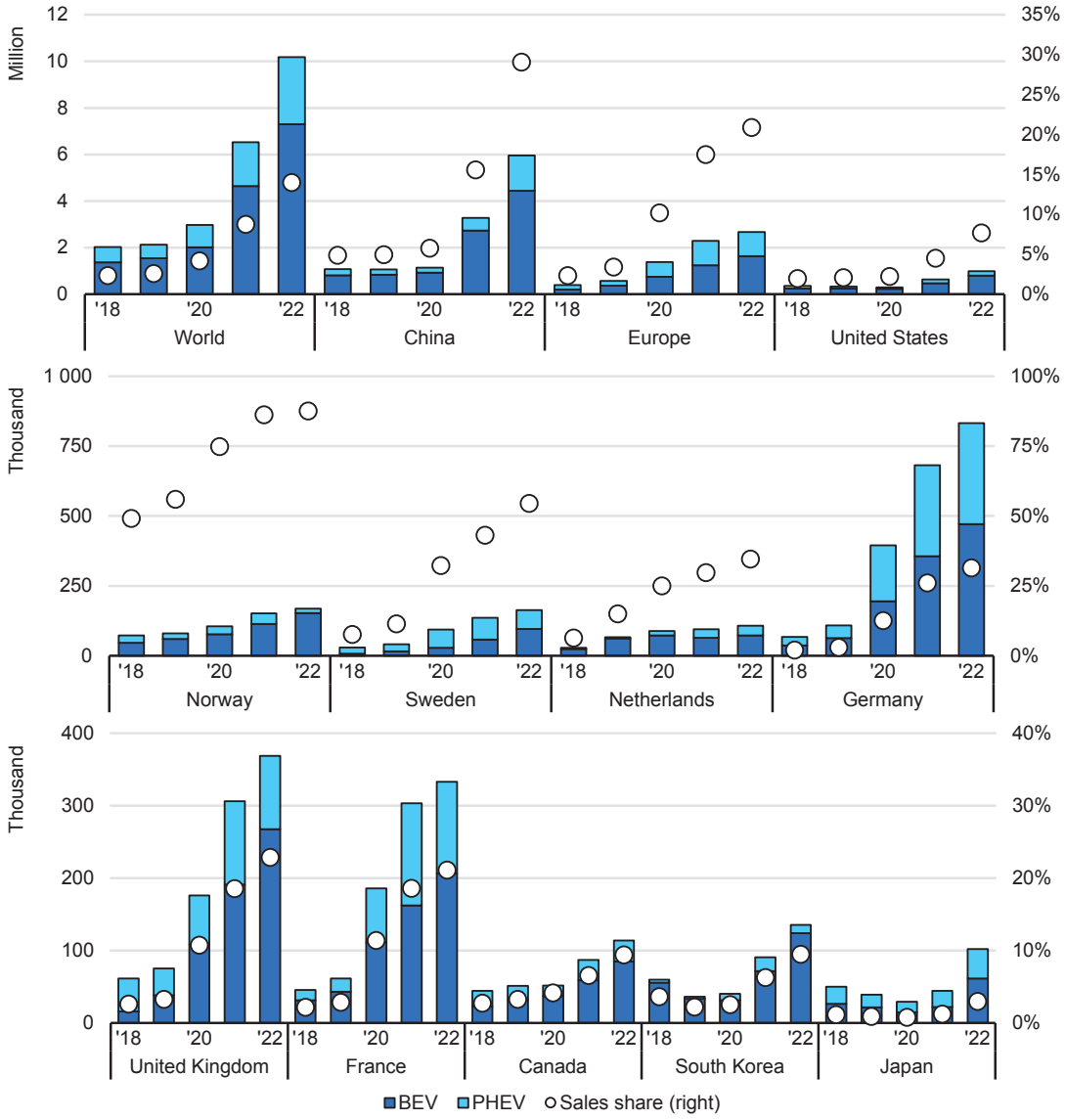
sales are still increasing in Europe in the context of continued contraction in car markets: total car sales in Europe dipped by 3% in 2022 relative to 2021.

The slowdown seen in Europe relative to previous years was, in part, a reflection of the exceptional growth in electric car sales that took place in 2020 and 2021 in the European Union, as manufacturers quickly adjusted corporate strategy to comply with the CO_2 emission standards passed in 2019. These standards covered the 2020-2024 period, with EU-wide emission targets becoming stricter only from 2025 and 2030 onwards.

High energy prices in 2022 had a mixed impact on the competitiveness of EVs relative to internal combustion engine (ICE) cars. Gasoline and diesel prices for ICE cars spiked, but residential electricity tariffs (with relevance for charging) also increased in some cases. Higher electricity and gas prices also increased manufacturing costs for both ICE and EV cars, with some carmakers arguing that high energy prices could restrict future investment for new battery manufacturing capacity.

Europe remained the world's second largest market for electric cars after China in 2022, accounting for 25% of all electric car sales and 30% of the global stock. The sales share of electric cars reached 21%, up from 18% in 2021, 10% in 2020 and under 3% prior to 2019. European countries continued to rank highly for the sales share of electric cars, led by Norway at 88%, Sweden at 54%, the Netherlands at 35%, Germany at 31%, the United Kingdom at 23% and France at 21% in 2022. In volume terms, Germany is the biggest market in Europe with sales of 830 000 in 2022, followed by the United Kingdom with 370 000 and France with 330 000. Sales also exceeded 80 000 in Spain. The share of electric cars in total car sales has increased tenfold in Germany since before the Covid-19 pandemic, which can in part be explained by increasing support post-pandemic, such as purchase incentives through the Umweltbonus, and a frontloading of sales in 2022 in expectation of subsidies being further reduced from 2023 onwards. However, in Italy, electric car sales decreased from 140 000 in 2021 to 115 000 in 2022, and they also decreased or stagnated in Austria, Denmark and Finland.

Figure 1.3 Electric car registrations and sales share in selected countries and regions, 2018-2022



Notes: BEV = battery electric vehicle; PHEV = plug-in hybrid electric vehicle. Passenger light-duty vehicles only. Major markets at the top. Other countries (middle, bottom) ordered by the share of electric car sales in total car sales. Y-axes do not have the same scale to improve readability.

Source: IEA analysis based on country submissions, ACEA, EAFO, EV Volumes and Marklines.

Electric car sales exceeded 10 million in 2022, up 55% relative to 2021. Sales in China increased by 80% and accounted for 60% of global growth. Growth in Europe remained high (up 15%) and accelerated in the United States (up 55%).

Sales are expected to continue increasing in Europe, especially following recent policy developments under the 'Fit for 55' package. New rules set stricter CO_2 emission standards for 2030-2034 and target a 100% reduction in CO_2 emissions for new cars and vans from 2035 relative to 2021 levels. In the nearer term, an

incentive mechanism operating between 2025 and 2029 will reward manufacturers that achieve a 25% car sales share of zero- and low-emission cars (17% for vans). In the first two months of 2023, battery electric car sales were already up by over 30% year-on-year, while overall car sales increased by just over 10% year-on-year.

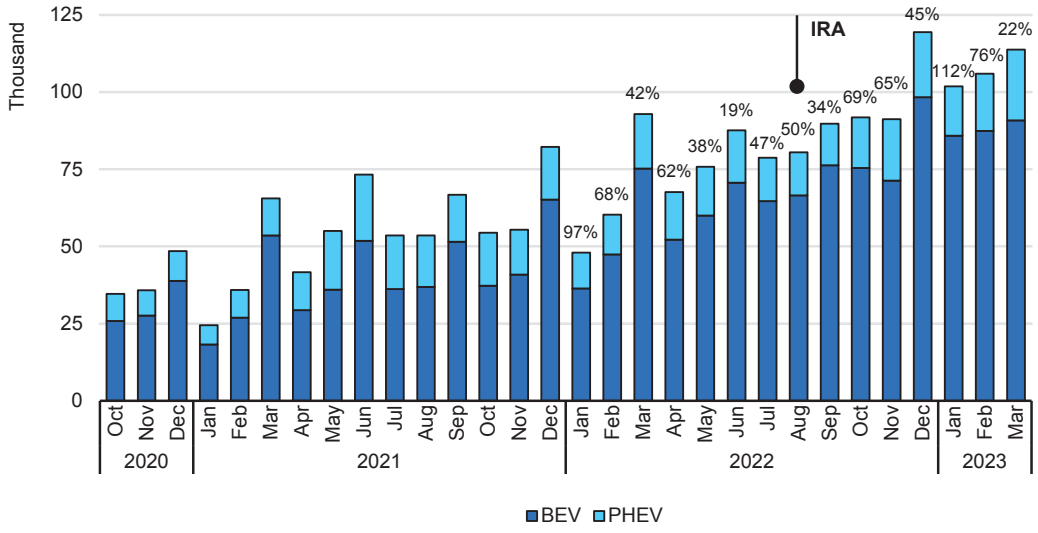
The United States confirms return to growth

In the United States, electric car sales increased 55% in 2022 relative to 2021, led by BEVs. Sales of BEVs increased by 70%, reaching nearly 800 000 and confirming a second consecutive year of strong growth after the 2019-2020 dip. Sales of PHEVs also grew, albeit by only 15%. The increase in electric car sales was particularly high in the United States, considering that total car sales dropped by 8% in 2022 relative to 2021, a much sharper decrease than the global average (minus 3%). Overall, the United States accounted for 10% of the global growth in sales. The total stock of electric cars reached 3 million, up 40% relative to 2021 and accounting for 10% of the global total. The share of electric cars in total car sales reached nearly 8%, up from just above 5% in 2021 and around 2% between 2018 and 2020.

A number of factors are helping to increase sales in the United States. A greater number of available models, beyond those offered by Tesla, the historic leader, helped to close the supply gap. Given that major companies like Tesla and General Motors had already reached their subsidy cap under US support in previous years,[5] new models from other companies being available means that more consumers can benefit from purchase incentives, which can be as high as USD 7 500. Awareness is increasing as government and companies lean towards electrification: in 2022, a quarter of Americans expect that their next car will be electric, according to the American Automobile Association. Although charging infrastructure and driving range have improved over the years, they remain major concerns for US drivers given the typically long travel distances and lower popularity and limited availability of alternatives such as rail. However, in 2021 the Bipartisan Infrastructure Law strengthened support for EV charging, allocating USD 5 billion in total funding over the 2022-2026 period through the National Electric Vehicle Infrastructure Formula Program, as well as USD 2.5 billion in competitive grants over the same period through the Charging and Fueling Infrastructure Discretionary Grant Program.

[5] Manufacturer caps were still in place for sales taking place in 2022, with models by carmakers having sold over 200 000 EVs losing eligibility for the purchase incentive, even if they were manufactured in North America following requirements under the IRA. Caps were removed starting from 2023.

Figure 1.4 Monthly new electric car registrations in the United States, 2020-2023



Notes: BEV = battery electric vehicle; PHEV = plug-in hybrid electric vehicle; "IRA" refers to the Inflation Reduction Act. Percentage labels in 2022-2023 refer to year-on-year growth rates relative to the same month in the previous year.
Source: IEA analysis based on EV Volumes.

Monthly sales of electric cars have been steadily increasing in the United States, with further growth expected in 2023 as a result of strengthened policy support.

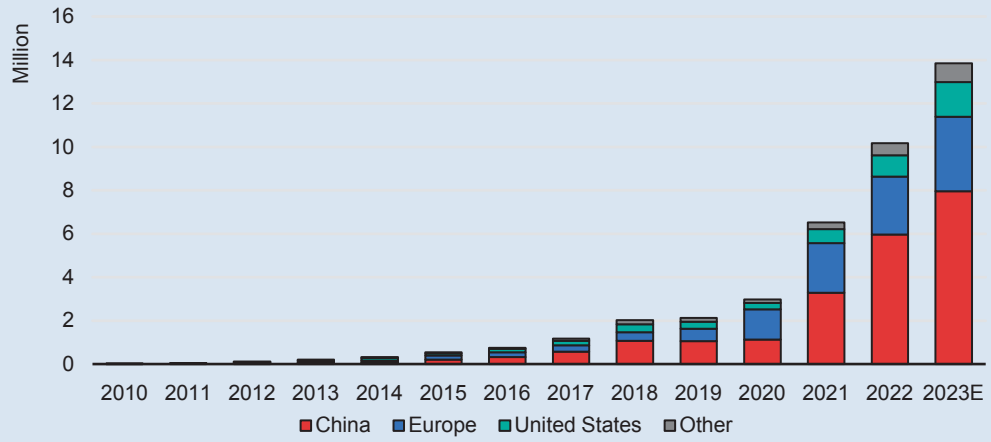
The acceleration in sales growth could continue in 2023 and beyond thanks to recent new policy support (see Prospects for electric vehicle deployment). The Inflation Reduction Act (IRA) has triggered a rush by global electromobility companies to expand US manufacturing operations. Between August 2022 and March 2023, major EV and battery makers announced cumulative post-IRA investments of USD 52 billion in North American EV supply chains, of which 50% is for battery manufacturing, and about 20% each for battery components and EV manufacturing. Overall, company announcements including tentative commitments for US investments for future battery and EV production add up to around USD 75-108 billion. As an example, Tesla plans to relocate its Berlin-based lithium-ion battery gigafactory to Texas, where it will work in partnership with China's CATL, and to manufacture next-generation EVs in Mexico. Ford also announced a deal with CATL for a battery plant in Michigan, and plans to increase electric car manufacturing sixfold by the end of 2023 relative to 2022, at 600 000 vehicles per year, scaling up to 2 million by 2026. BMW is seeking to expand EV manufacturing at its plant in South Carolina following the IRA. Volkswagen chose Canada for its first battery plant outside Europe, which will begin operations in 2027, and is also investing USD 2 billion in its plant in South Carolina. While these investments can be expected to lead to high growth in the years to come, the impact may only fully be seen from 2024 onwards as plants come online.

In the immediate term, the IRA has constrained eligibility requirements for purchase incentives, as vehicles need to be produced in North America in order to qualify for a subsidy. However, electric car sales have remained strong since August 2022 (Figure 1.4), and the first months of 2023 have been no exception: In the first quarter of 2023, electric car sales increased 60% compared to the same period in 2022, potentially boosted by the January 2023 removal of the subsidy caps for manufacturers, which means models by market leaders can now benefit from purchase incentives. In the longer-term, the list of models eligible for subsidies is expected to expand.

Box 1.1 The 2023 outlook for electric cars is bright

Early indications from first quarter sales of 2023 point to an upbeat market, supported by cost declines as well as strengthened policy support in key markets such as the United States. Globally, our current estimate is therefore for nearly 14 million electric cars to be sold in 2023, building on the more than 2.3 million already sold in the first quarter of the year. This represents a 35% increase in electric car sales in 2023 compared to 2022 and would bring the global electric sales share to around 18%, up from 14% in 2022.

Electric car sales, 2010-2023



Note: 2023 sales ("2023E") are estimated based on market trends through the first quarter of 2023.
Source: IEA analysis based on EV Volumes.

Electric car sales in the first three months of 2023 have shown strong signs of growth compared to the same period in 2022. In the United States, more than 320 000 electric cars were sold in the first quarter of 2023, 60% more than over the same period in 2022. Our current expectation is for this growth to be sustained throughout the year, with electric car sales reaching over 1.5 million in 2023, bringing the electric car sales share in the United States up to around 12% in 2023.

In China, electric car sales were off to a rough start in 2023, with January sales being 8% lower than in January 2022. The latest available data suggests a quick recovery: over the entire first quarter of 2023, electric car sales in China were more than 20% higher than in the first quarter of 2022, with more than 1.3 million electric cars being registered. For the remainder of 2023, we expect the generally favourable cost structure of electric cars to outweigh the effects of the phase-out of the NEV subsidy. As a result, our current expectation is for electric car sales in China to be more than 30% higher than in 2022 and reach around 8 million by the end of 2023, reaching a sales share of over 35% (from 29% in 2022).

Based on recent trends and tightening CO_2 targets not going into effect until 2025, the growth of electric car sales in Europe is expected to be the lowest of the three largest markets. In the first quarter of 2023, electric car sales in Europe increased by around 10% compared to the same period in 2022. For the full year, we currently expect electric car sales to increase by over 25%, with one-in-four cars sold in Europe being electric.

Outside of the major EV markets, electric car sales are expected to reach around 900 000 in 2023 – 50% higher than in 2022. Electric car sales in India in the first quarter of 2023 are already double what they were in the same period in 2022. In India and across all regions outside the three major EV markets, electric car sales are expected to represent 2-3% of car sales in 2023, a relatively small yet growing share.

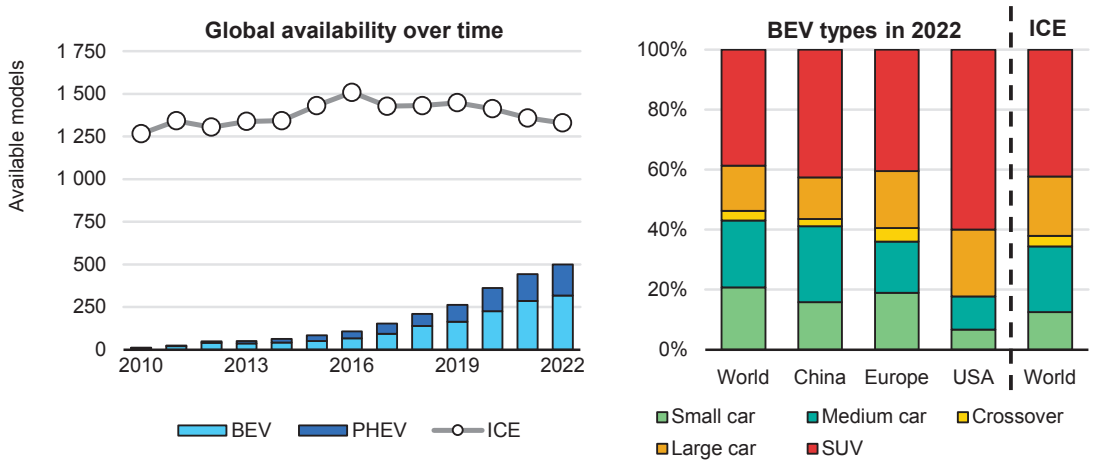
There are, of course, downside risks to the 2023 outlook: a sluggish global economy and the phase-out of subsidies for NEVs in China could reduce 2023 growth in global electric car sales. On the upside, new markets may open up more quickly than anticipated, as persistent high oil prices make the case for EVs stronger in an increasing number of settings. And new policy developments, such as the April 2023 proposal from the US Environmental Protection Agency (EPA) to strengthen GHG emissions standards for cars, may send signals that boost sales even before going into effect.

The number of electric car models rises, especially for large cars and SUVs, at the same time as it decreases for conventional cars

The race to electrification is increasing the number of electric car models available on the market. In 2022, the number of available options reached 500, up from below 450 in 2021 and more than doubling relative to 2018-2019. As in previous years, China has the broadest portfolio with nearly 300 available models, double the number available in 2018-2019, prior to the Covid-19 pandemic. This remains nearly twice as many as in Norway, the Netherlands, Germany, Sweden, France and the United Kingdom, which all have around 150 models available, more than

three times as many as before the pandemic. In the United States, there were fewer than 100 models available in 2022, but twice as many as before the pandemic; and 30 or fewer were available in Canada, Japan and Korea.

Figure 1.5 Car model availability by powertrain, 2010-2022 (left), and breakdown of available cars by powertrain and segment in 2022 (right)



Notes: BEV = battery electric vehicle; PHEV = plug-in hybrid vehicle; ICE = internal combustion engine; SUV = sports utility vehicle; USA = United States. 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. In the chart on the right-hand side, distribution is based on the number of available models, not sales-weighted. Small cars include A and B segments. Medium cars include C and D segments. Crossovers are a type of sports utility vehicle (SUV) built on a passenger car platform. Large cars include E and F segments and multi-purpose vehicles.

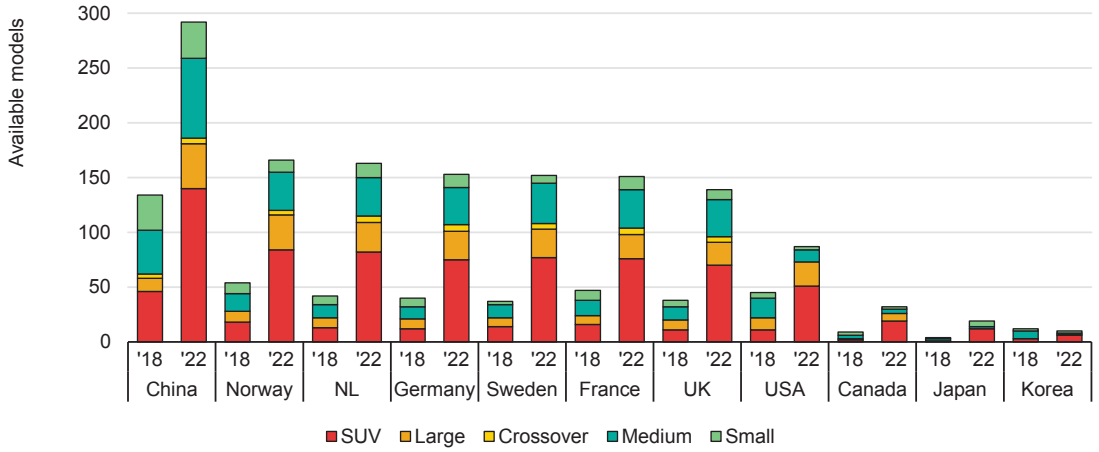
Source: IEA analysis based on Marklines.

The number of available electric car models reached 500 in 2022 but remains far below the number of ICE options. Large cars and SUVs still account for over half of available BEVs.

The 2022 trend reflects the increasing maturity of EV markets and demonstrates that carmakers are responding to increasing consumer demand for electric cars. However, the number of electric car models available remains much lower than that of conventional ICE cars, which has remained above 1 250 since 2010 and peaked at 1 500 in the middle of the past decade. In recent years, the number of ICE models sold has been steadily decreasing, at a compound annual growth rate of minus 2% over the 2016-2022 period, reaching about 1 300 models in 2022. This dip varies across major car markets and is most pronounced in China, where the number of available ICE options was 8% lower in 2022 than in 2016, versus 3-4% lower in the United States and Europe over the same period. This could result from contracting car markets and a progressive shift towards EVs among major carmakers. Looking forward, the total number of ICE models available could remain stable, while the number of new models shrinks, if carmakers focus on electrification and keep selling existing ICE options rather than increasing budgets to develop new models.

In contrast to ICE models, EV model availability has been growing quickly, at a compound annual growth rate of 30% over the 2016-2022 period. Such growth is to be expected in a nascent market with a large number of new entrants bringing innovative products to the market, and as incumbents diversify their portfolios. Growth has been slightly lower in recent years: the annual growth rate stood at around 25% in 2021 and 15% in 2022. In the future, the number of models can be expected to continue to increase quickly, as major carmakers expand their EV portfolios and new entrants strengthen their positions, particularly in emerging markets and developing economies (EMDEs). The historic number of ICE models available on the market suggests that the current number of EV options could double, at least, before stabilising.

Figure 1.6 Electric car model availability in selected countries by size, 2018-2022



Notes: NL = the Netherlands; UK = United Kingdom; USA = United States; SUV = sports utility vehicle. Includes battery electric vehicles and plug-in hybrid electric vehicles. Countries are ordered by the number of available models in 2022. 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.

Source: IEA analysis based on Marklines.

In 2022, 7 countries had around 150 EV models or more available for sale, up from 50 in 2018. The number of large models is increasing more quickly than that of small models.

SUVs and large car models dominate both EV and ICE markets

A major concern for global car markets – both EV and ICE – is the overwhelming dominance of SUVs and large models among available options. Carmakers are able to generate higher revenues from such models, given higher profit margins, which can cover some of the investments made in developing electric options. In certain cases, such as in the United States, larger vehicles can also benefit from less stringent fuel economy standards, hence creating an incentive for carmakers to slightly increase the vehicle size of a car for it to qualify as a light truck.

However, large models are more expensive, which poses significant affordability issues across the board, and all the more so in EMDEs. Large models also have

implications for sustainability and supply chains, being equipped with larger batteries that require more critical minerals. In 2022, the sales-weighted average battery size of small battery electric cars ranged from 25 kWh in China to 35 kWh across France, Germany and the United Kingdom, and about 60 kWh in the United States. In comparison, the average for battery electric SUVs was around 70-75 kWh in these countries, and within the 75-90 kWh range for large car models.

Transitioning from ICE to electric is a priority for achieving net zero emissions targets, regardless of vehicle size, but mitigating the impacts of higher battery sizes will also be important. In France, Germany and the United Kingdom in 2022, the sales-weighted average weight of a battery electric SUV was 1.5 times higher than the average small battery electric car, requiring greater amounts of steel, aluminium and plastic; the battery in the SUV was twice as large, requiring about 75% more critical minerals. The CO_2 emissions associated with materials processing, manufacturing and assembly can be estimated at more than 70% higher as a result.

At the same time, in 2022, electric SUVs resulted in the displacement of over 150 000 barrels per day of oil consumption and avoided the associated tailpipe emissions that would have been generated through burning the fuel in combustion engines. Although electric SUVs represented roughly 35% of all electric passenger light-duty vehicles (PLDVs) in 2022, their share of oil displacement was even higher (about 40%), as SUVs tend to be driven more than smaller cars. Of course, smaller vehicles generally require less energy to operate and less materials to build, but electric SUVs certainly remain favourable to ICE vehicles.

In 2022, ICE SUVs emitted more than 1 Gt CO_2, far greater than the 80 Mt net emissions reductions from the electric vehicle fleet that year. While total car sales decreased by 0.5% in 2022, SUV sales increased by 3% relative to 2021, accounting for about 45% of total car sales, with noticeable growth in the United States, India and Europe. Of the 1 300 available options for ICE cars in 2022, more than 40% were SUVs, compared to fewer than 35% for small and medium cars. The total number of available ICE options went down from 2016 to 2022, but the drop was only for small and medium cars (down 35%) while large cars and SUVs increased (up 10%).

Similar trends are observed in EV markets. Around 16% of all SUVs sold were electric in 2022, which is above the overall market share of EVs and demonstrates consumer preferences for SUVs regardless of whether they are an ICE vehicle or EV. Nearly 40% of all BEV models available in 2022 were SUVs, which is equivalent to the shares of small and medium car options combined. Other large models accounted for more than 15%. Just 3 years before, in 2019, small and medium models accounted for 60% of all available models, and SUVs just 30%.

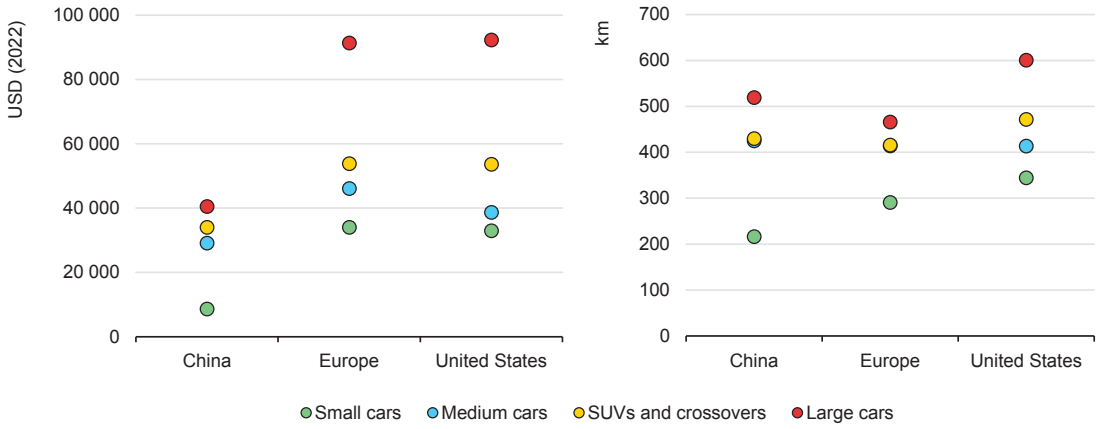
In China and Europe, SUVs and large models accounted for 60% of available BEV options in 2022, on par with the world average. As a comparison, ICE SUVs and large models accounted for about 70% of available ICE options in these regions,

suggesting that electric cars currently remain somewhat smaller than their ICE equivalents. Announcements by some major European carmakers indicate that there could be a greater focus on smaller, more popular models in the years to come. For example, Volkswagen has announced the launch of a compact model for the European market under EUR 25 000 by 2025 and under EUR 20 000 by 2026-2027, as a means to appeal to a broader consumer base. In the United States, over 80% of available BEV options in 2022 were SUVs or large car models, which is greater than the share of ICE SUVs or large models at 70%. Looking ahead, more electric SUVs are to be expected in the United States, should recent policy announcements on expansion of IRA incentives to more SUVs be implemented. Following the IRA, the US Treasury has been revising vehicle classifications, and in 2023 changed the eligibility criteria for clean vehicle credits relevant to smaller SUVs, which are now eligible if priced under USD 80 000, up from the previous limit of USD 55 000.

Electric cars remain much cheaper in China

The growth in electric car sales in China has been underpinned by sustained policy support, but also cheaper retail prices. In 2022, the sales-weighted average price of a small BEV in China was below USD 10 000. This is significantly less than the prices of small BEVs found in Europe and the United States, where the sales-weighted average price exceeded USD 30 000 in the same year.

Figure 1.7 Sales-weighted average retail price (left) and driving range (right) of BEV passenger cars in selected countries, by size, in 2022



Notes: BEV = battery electric vehicle; SUV = sports utility vehicle. 'Europe' is based on data only from France, Germany and the United Kingdom. Retail prices collected in 2022-2023, before subsidy.

Source: IEA analysis based on EV Volumes.

In 2022, BEV passenger cars remained much cheaper in China, which explains in part higher adoption rates there.

In China, the best-selling electric cars in 2022 were the Wuling Mini BEV, a small model priced at under USD 6 500, and BYD's Dolphin, another small model, below USD 16 000. Together, these two models accounted for nearly 15% of Chinese BEV passenger car sales, illustrating the appetite for smaller models. To compare, the best-selling small BEVs across France, Germany and the United Kingdom – Fiat's 500, Peugeot's e-208 and Renault's Zoe – were all priced above USD 35 000. Few small BEVs were sold in the United States, limited mainly to Chevrolet's Bolt and the Mini Cooper BEV, which are priced around USD 30 000. Tesla's Y Model was the best-selling BEV passenger car in both the selected European countries (priced at more than USD 65 000) and the United States (more than USD 50 000).[6]

Chinese carmakers have focused on developing smaller and more affordable models in advance of their international peers, cutting down costs following years of tough competition domestically. Hundreds of small EV manufacturers have entered the market since the 2000s, benefitting from a variety of public support schemes, including subsidies and incentives for both consumers and manufacturers. The majority of these firms went bankrupt due to competition as subsidies were gradually phased out, and the market has since consolidated around a dozen frontrunners, which have succeeded in developing small and cheap electric cars for the Chinese market. Vertical integration of battery and EV supply chains from mineral processing to battery and EV manufacturing, as well as cheaper labour, manufacturing and access to finance across the board, have also contributed to developing cheaper models.

Meanwhile, carmakers in Europe and the United States – both early developers such as Tesla and incumbent major manufacturers – have mostly focused on larger or more luxurious models to date, hence offering few options affordable for mass-market consumers. However, the small options available in these countries typically offer greater performance than those in China, such as longer driving range. In 2022, the sales-weighted average range of small BEVs sold in the United States was nearly 350 km, while in France, Germany and the United Kingdom it was just under 300 km, compared to under 220 km in China. For other segments, the differences are less significant. The broader availability of public charging points in China may, in part, explain why consumers there have been more willing to opt for lower driving ranges than their European or American counterparts.

In 2022, Tesla heavily reduced the price of its models on two occasions as competition increased, and many carmakers have also announced cheaper options in the coming years. While these announcements warrant further examination, this trend could indicate that the price gap between small electric cars and incumbent ICE options could progressively close during this decade.

[6] However, Tesla has decreased car prices several times since the publication of the IRA in the United States, in part to boost sales as competition gets tougher (see section on corporate strategy and finance).

Actual vehicle range depends on the loaded vehicle weight, duty cycle, aerodynamics and drivetrain efficiency, as well as environmental factors such as temperature. In addition, as no harmonised test procedure currently exists to measure electric range for medium- and heavy-duty vehicles in any of the major markets where deployment of electric trucks has begun, manufacturers can determine their own methods to declare the electric range of the commercially available and announced models. However, any standardised test procedure would need to consider complicated issues of non-motive energy consumption (e.g. heating ventilation and air conditioning in buses, cooling in refrigerated trucks), as well as the potential for buses and trucks to be used in vehicle-to-grid applications (as has been demonstrated, for instance, with electric school buses in the United States). In light of such considerations, a first regulatory step could be to mandate that electric medium- and heavy-duty vehicle makers measure and disclose the usable battery energy according to a yet-to-be-developed standardised measurement procedure.

Charging infrastructure

Public charging points are increasingly necessary to enable wider EV uptake

While most of the charging demand is currently met by home charging, publicly accessible chargers are increasingly needed in order to provide the same level of convenience and accessibility as for refuelling conventional vehicles. In dense urban areas, in particular, where access to home charging is more limited, public charging infrastructure is a key enabler for EV adoption. At the end of 2022, there were 2.7 million public charging points worldwide, more than 900 000 of which were installed in 2022, about a 55% increase on 2021 stock, and comparable to the pre-pandemic growth rate of 50% between 2015 and 2019.

Slow chargers

Globally, more than 600 000 public slow charging points[11] were installed in 2022, 360 000 of which were in China, bringing the stock of slow chargers in the country to more than 1 million. At the end of 2022, China was home to more than half of the global stock of public slow chargers.

Europe ranks second, with 460 000 total slow chargers in 2022, a 50% increase from the previous year. The Netherlands leads in Europe with 117 000, followed by around 74 000 in France and 64 000 in Germany. The stock of slow chargers

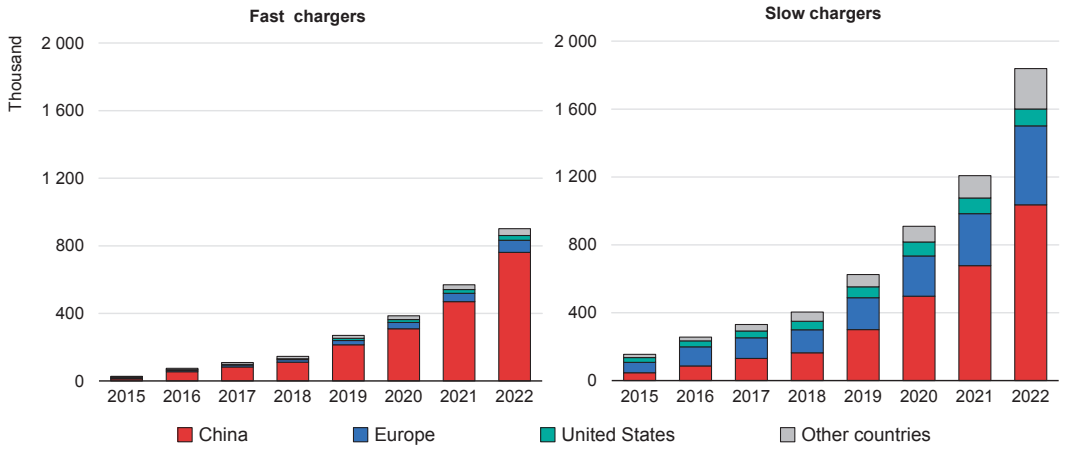
[11] Slow chargers have power ratings less than or equal to 22 kW. Fast chargers are those with a power rating of more than 22 kW and up to 350 kW. “Charging points” and “chargers” are used interchangeably and refer to the individual charging sockets, reflecting the number of EVs that can charge at the same time. ‘‘Charging stations” may have multiple charging points.

in the United States increased by 9% in 2022, the lowest growth rate among major markets. In Korea, slow charging stock has doubled year-on-year, reaching 184 000 charging points.

Fast chargers

Publicly accessible fast chargers, especially those located along motorways, enable longer journeys and can address range anxiety, a barrier to EV adoption. Like slow chargers, public fast chargers also provide charging solutions to consumers who do not have reliable access to private charging, thereby encouraging EV adoption across wider swaths of the population. The number of fast chargers increased by 330 000 globally in 2022, though again the majority (almost 90%) of the growth came from China. The deployment of fast charging compensates for the lack of access to home chargers in densely populated cities and supports China's goals for rapid EV deployment. China accounts for total of 760 000 fast chargers, but more than 70% of the total public fast charging pile stock is situated in just ten provinces.

Figure 1.13 Installed publicly accessible light-duty vehicle charging points by power rating and region, 2015-2022



Note: Values shown represent number of charging points.
Source: IEA analysis based on country submissions.

Installed publicly accessible charging points have increased by around 55%, with accelerated deployment led by China and Europe.

In Europe the overall fast charger stock numbered over 70 000 by the end of 2022, an increase of around 55% compared to 2021. The countries with the largest fast charger stock are Germany (over 12 000), France (9 700) and Norway (9 000). There is a clear ambition across the European Union to further develop the public charging infrastructure, as indicated by provisional agreement on the proposed

Alternative Fuels Infrastructure Regulation (AFIR), which will set electric charging coverage requirements across the trans-European network-transport (TEN-T).[12] An agreement between the European Investment Bank and the European Commission will make over EUR 1.5 billion available by the end of 2023 for alternative fuels infrastructure, including electric fast charging.

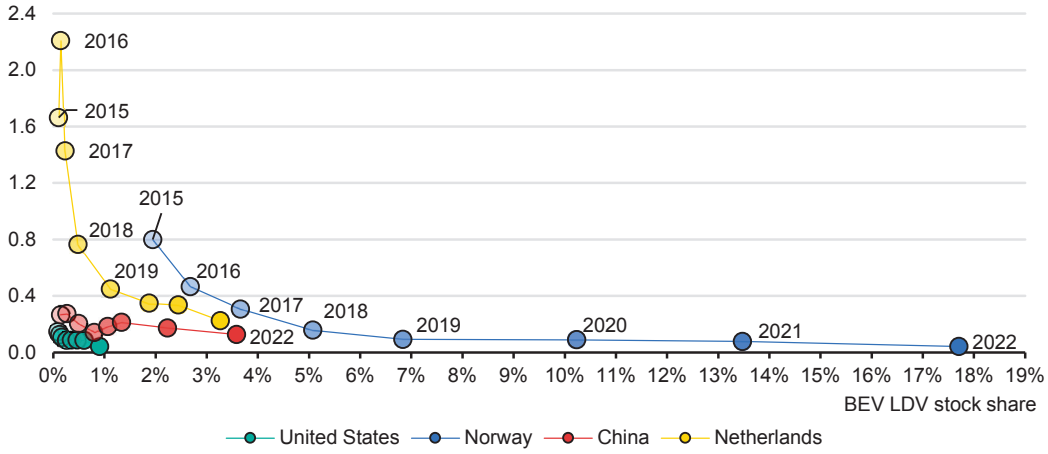
The United States installed 6 300 fast chargers in 2022, about three-quarters of which were Tesla Superchargers. The total stock of fast chargers reached 28 000 at the end of 2022. Deployment is expected to accelerate in the coming years following government approval of the National Electric Vehicle Infrastructure Formula Program (NEVI). All US states, Washington DC, and Puerto Rico are participating in the programme, and have already been allocated USD 885 million in funding for 2023 to support the build-out of chargers across 122 000 km of highway (see Policy support for EV charging infrastructure). The US Federal Highway Administration has announced new national standards for federally funded EV chargers to ensure consistency, reliability, accessibility and compatibility. As a result of the new standards, Tesla has announced it will open a portion of its US Supercharger (where Superchargers represent 60% of the total stock of fast chargers in the United States) and Destination Charger network to non-Tesla EVs.

Ratio of electric LDVs per public charger

Deployment of public charging infrastructure in anticipation of growth in EV sales is critical for widespread EV adoption. In Norway, for example, there were around 1.3 battery electric LDVs per public charging point in 2011, which supported further adoption. At the end of 2022, with over 17% of LDVs being BEVs, there were 25 BEVs per public charging point in Norway. In general, as the stock share of battery electric LDVs increases, the charging point per BEV ratio decreases. Growth in EV sales can only be sustained if charging demand is met by accessible and affordable infrastructure, either through private charging in homes or at work, or publicly accessible charging stations.

[12] Previously a directive, the proposed AFIR, once formally approved, would become a binding legislative act, stipulating, among other things, a maximum distance between chargers installed along the TEN-T, the primary and secondary roads within the European Union.

Figure 1.14 Public charging points per battery electric light-duty vehicle ratio in selected countries against battery electric light-duty vehicle stock share, 2015-2022



Notes: BEV = battery electric vehicle; LDV = light-duty vehicle. Charging points include only publicly available chargers, both fast and slow. Shading grows darker each year.

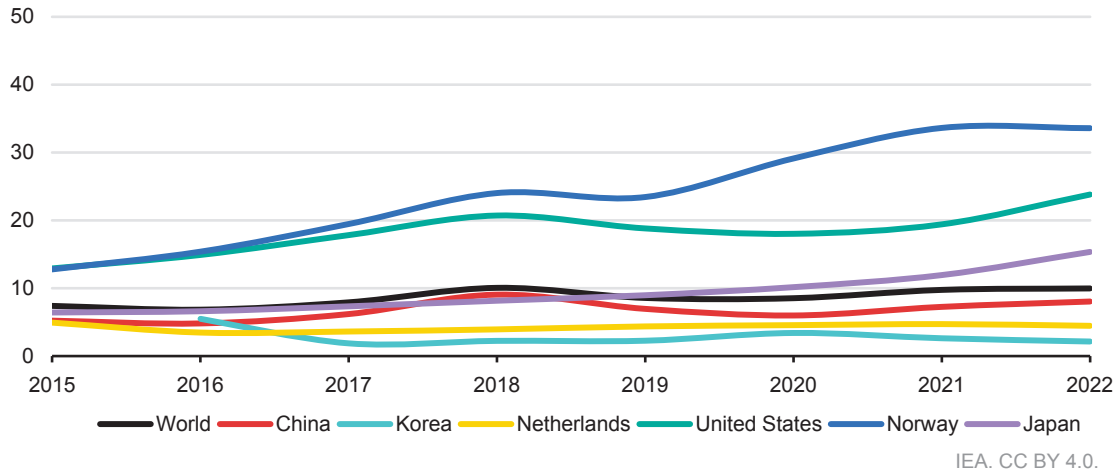
Source: IEA analysis based on country submissions.

In many advanced markets, as the stock share of battery electric LDVs increased, the charging point per BEV ratio has decreased.

While PHEVs are less reliant on public charging infrastructure than BEVs, policy-making relating to the sufficient availability of charging points should incorporate (and encourage) public PHEV charging. If the total number of electric LDVs per charging point is considered, the global average in 2022 was about ten EVs per charger. Countries such as China, Korea and the Netherlands have maintained fewer than ten EVs per charger throughout past years. In countries that rely heavily on public charging, the number of publicly accessible chargers has been expanding at a speed that largely matches EV deployment.

However, in some markets characterised by widespread availability of home charging (due to a high share of single-family homes with the opportunity to install a charger) the number of EVs per public charging point can be even higher. For example, in the United States, the ratio of EVs per charger is 24, and in Norway is more than 30. As the market penetration of EVs increases, public charging becomes increasingly important, even in these countries, to support EV adoption among drivers who do not have access to private home or workplace charging options. However, the optimal ratio of EVs per charger will differ based on local conditions and driver needs.

Figure 1.15 Electric light-duty vehicle per public charging point, 2010-2022



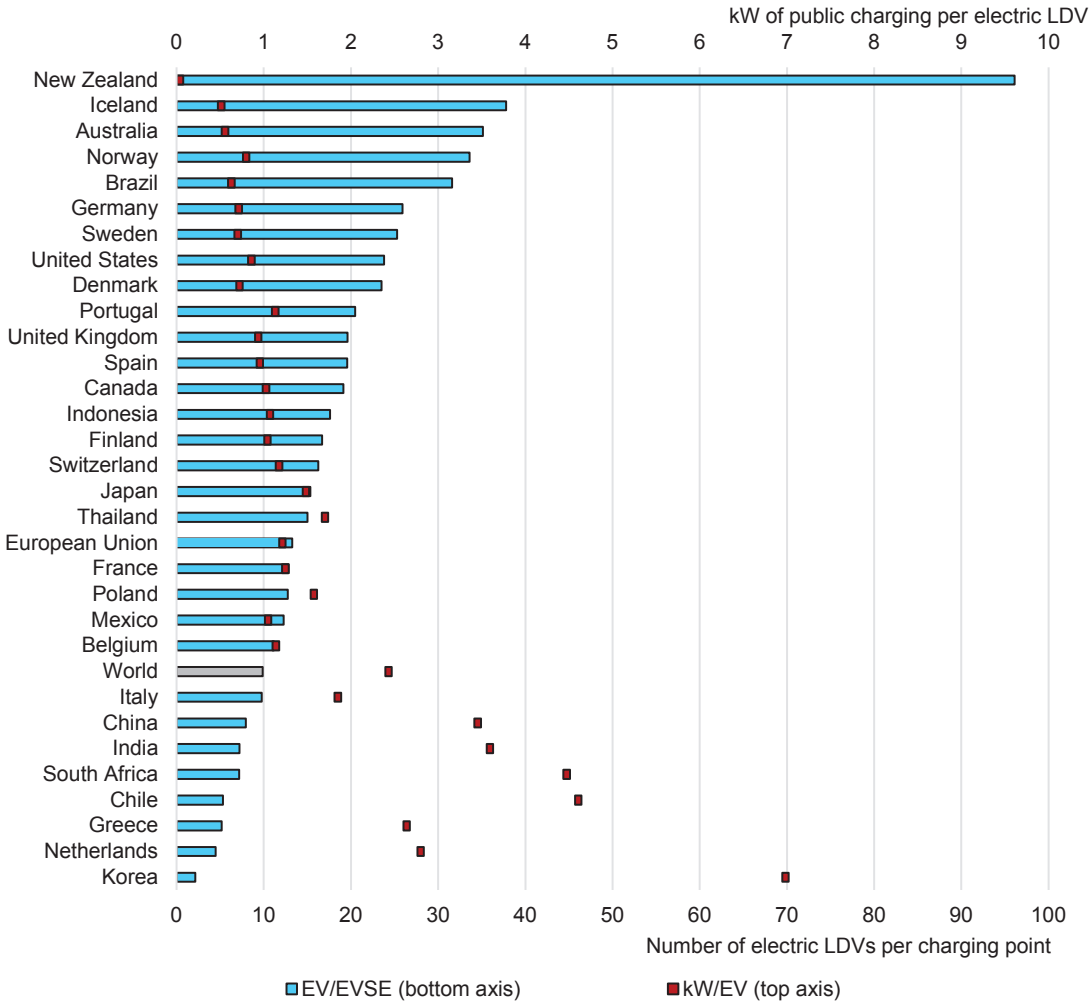
Note: Charging points include only publicly available chargers, both fast and slow.
Source: IEA analysis based on country submissions.

Countries show different speeds in public charging deployment as the number of EVs on the road increases.

Perhaps more important than the number of public chargers available is the total public charging power capacity per EV, given that fast chargers can serve more EVs than slow chargers. During the early stages of EV adoption, it makes sense for available charging power per EV to be high, assuming that charger utilisation will be relatively low until the market matures and the utilisation of infrastructure becomes more efficient. In line with this, the European Union's provisional agreement on the AFIR includes requirements for the total power capacity to be provided based on the size of the registered fleet.

Globally, the average public charging power capacity per electric LDV is around 2.4 kW per EV. In the European Union, the ratio is lower, with an average around 1.2 kW per EV. Korea has the highest ratio at 7 kW per EV, even with most public chargers (90%) being slow chargers.

Figure 1.16 Number of electric light-duty vehicles per public charging point and kW per electric light-duty vehicle, 2022



Notes: EV = electric vehicle; EVSE = electric vehicle supply equipment; LDV = light-duty vehicle. Kilowatts per EV are estimated assuming 11 kW for slow and 50 kW for fast chargers. Official national metrics might differ from these values as they can rely on more granular data.

Source: IEA analysis based on country submissions.

The number of electric light-duty vehicles per public EV charging point varies dramatically between countries, ranging from about 2 vehicles per charging point in Korea to almost 100 in New Zealand.

Charging needs for heavy-duty vehicles

In the regions where electric trucks are becoming commercially available, battery electric trucks can compete on a TCO basis with conventional diesel trucks for a growing range of operations, not only urban and regional, but also in the heavy-duty tractor-trailer regional and long-haul segments. Three parameters that determine the time at which TCO parity is reached are tolls; fuel and operations

costs (e.g. the difference between diesel and electricity prices faced by truck operators, and reduced maintenance costs); and CAPEX subsidies to reduce the gap in the upfront vehicle purchase price. Since electric trucks can provide the same operations with lower lifetime costs (including if a discounted rate is applied), the time horizon in which vehicle owners expect to recuperate upfront costs is a key factor in determining whether to purchase an electric or conventional truck.

The economics for electric trucks in long-distance applications can be substantially improved if charging costs can be reduced by maximising "off-shift" (e.g. night-time or other longer periods of downtime) slow charging, securing bulk purchase contracts with grid operators for "mid-shift" (e.g. during breaks), fast (up to 350 kW), or ultra-fast (>350 kW) charging, and exploring smart charging and vehicle-to-grid opportunities for extra income.

Electric trucks and buses will rely on off-shift charging for the majority of their energy. This will be largely achieved at private or semi-private charging depots or at public stations on highways, and often overnight. Depots to service growing demand for heavy-duty electrification will need to be developed, and in many cases may require distribution and transmission grid upgrades. Depending on vehicle range requirements, depot charging will be sufficient to cover most operations in urban bus as well as urban and regional truck operations.

The major constraint to rapid commercial adoption of electric trucks in regional and long-haul operations is the availability of "mid-shift" fast charging. Although the majority of energy requirements for these operations could come from "off-shift" charging, fast and ultra-fast charging will be needed to extend range such that operations currently covered by diesel can be performed by battery electric trucks with little to no additional dwell time (i.e. waiting). Regulations that mandate rest periods can also provide a time window for mid-shift charging if fast or ultra-fast charging options are available en route: the European Union requires 45 minutes of break after every 4.5 hours of driving; the United States mandates 30 minutes after 8 hours.

Most commercially available direct current (DC) fast charging stations currently enable power levels ranging from 250-350 kW. The European Union's Alternative Fuels Infrastructure Regulation (AFIR) aims to enable mid-shift charging across the EU's core TEN-T network, which covers 88% of total long-haul freight activity, and along other key freight corridors. The provisional agreement reached by the European Council and Parliament includes a gradual process of infrastructure deployment for electric heavy-duty vehicles starting in 2025. Recent studies of power requirements for regional and long-haul truck operations in the United States and Europe find that charging power higher than 350 kW, and as high as 1 MW, may be required to fully recharge electric trucks during a 30- to 45-minute break.

Recognising the need to scale up fast or ultra-fast charging as a prerequisite for making both regional and, in particular, long-haul operations technically and economically viable, in 2022 Traton, Volvo, and Daimler established an independent joint venture, Milence. With EUR 500 million in collective investments from the three heavy-duty manufacturing groups, the initiative aims to deploy more than 1 700 fast (300 to 350 kW) and ultra-fast (1 MW) charging points across Europe.

Multiple charging standards are currently in use, and technical specifications for ultra-fast charging are under development. Ensuring maximum possible convergence of charging standards and interoperability for heavy-duty EVs will be needed to avoid the cost, inefficiency, and challenges for vehicle importers and international operators that would be created by manufacturers following divergent paths.

In China, co-developers China Electricity Council and CHAdeMO's "ultra ChaoJi" are developing a charging standard for heavy-duty electric vehicles for up to several megawatts. In Europe and the United States, specifications for the CharIN Megawatt Charging System (MCS), with a potential maximum power of 4.5 MW, are under development by the International Organization for Standardization (ISO) and other organisations. The final MCS specifications, which will be needed for commercial roll-out, are expected for 2024. After the first megawatt charging site offered by Daimler Trucks and Portland General Electric (PGE) in 2021, at least twelve high-power charging projects are planned or underway in the United States and Europe, including charging of an electric Scania truck in Oslo, Norway, at a speed of over 1 MW, Germany's HoLa project, and the Netherlands Living Lab Heavy-Duty and Green Transport Delta Charging Stations, as well as investments and projects in Austria, Sweden, Spain and the United Kingdom.

Commercialisation of chargers with rated power of 1 MW will require significant investment, as stations with such high-power needs will incur significant costs in both installation and grid upgrades. Revising public electric utility business models and power sector regulations, co-ordinating planning across stakeholders and smart charging can all help to manage grid impacts. Direct support through pilot projects and financial incentives can also accelerate demonstration and adoption in the early stages. A recent study outlines some key design considerations for developing MCS rated charging stations:

- Planning charging stations at highway depot locations near transmission lines and substations can be an optimal solution for minimising costs and increasing charger utilisation.
- "Right-sizing" connections with direct connections to transmission lines at an early stage, thereby anticipating the energy needs of a system in which high shares of freight activity have been electrified, rather than upgrading distribution grids on an

ad-hoc and short-term basis, will be critical to reduce costs. This will require structured and co-ordinated planning between grid operators and charging infrastructure developers across sectors.

- Since transmission system interconnections and grid upgrades can take 4-8 years, siting and construction of high-priority charging stations will need to begin as soon as possible.

Alternative solutions include installing stationary storage and integrating local renewable capacity, combined with smart charging, which can help reduce both infrastructure costs related to grid connection and electricity procurement costs (e.g. by enabling truck operators to minimise cost by arbitraging price variability throughout the day, taking advantage of vehicle-to-grid opportunities, etc.).

Other options to provide power to electric heavy-duty vehicles (HDVs) are battery swapping and electric road systems. Electric road systems can transfer power to a truck either via inductive coils[13] in a road, or through conductive connections between the vehicle and road, or via catenary (overhead) lines. Catenary and other dynamic charging options may hold promise for reducing the uncertainty of system-level costs in the transition to zero-emission regional and long-haul trucks, competing favourably in terms of total capital and operating costs. They can also help to reduce battery capacity needs. Battery demand can be further reduced, and utilisation further improved, if electric road systems are designed to be compatible not only with trucks but also electric cars. However, such approaches would require inductive or in-road designs that come with greater hurdles in terms of technology development and design, and are more capital intensive. At the same time, electric road systems pose significant challenges resembling those of the rail sector, including a greater need for standardisation of paths and vehicles (as illustrated with trams and trolley buses), compatibility across borders for long-haul trips, and appropriate infrastructure ownership models. They provide less flexibility for truck owners in terms of routes and vehicle types, and have high development costs overall, all affecting their competitiveness relative to regular charging stations. Given these challenges, such systems would most effectively be deployed first on heavily used freight corridors, which would entail close co-ordination across various public and private stakeholders. Demonstrations on public roads to date in Germany and Sweden have relied on champions from both private and public entities. Calls for electric road system pilots are also being considered in the China, India, the United Kingdom and the United States.

[13] Inductive solutions are further from commercialisation and face challenges to deliver sufficient power at highway speeds.

in 2022, and the company has set a target of 4 000 battery swap stations globally by 2025. The company claims their swap stations can perform over 300 swaps per day, charging up to 13 batteries concurrently at a power of 20-80 kW.

NIO also announced plans to build battery swap stations in Europe as their battery swapping-enabled car models became available in European markets towards the end of 2022. The first NIO battery swap station in Sweden was opened in November 2022, and by the end of 2022, ten NIO battery swap stations had been opened across Norway, Germany, Sweden and the Netherlands. In contrast to NIO, whose swapping stations service NIO cars, the Chinese battery swapping station operator Aulton's stations support 30 models from 16 different vehicle companies.

Battery swapping could also be a particularly attractive option for LDV taxi fleets, whose operations are more sensitive to recharging times than personal cars. US start-up Ample currently operates 12 battery swapping stations in the San Francisco Bay area, mainly serving Uber rideshare vehicles.

Batteries

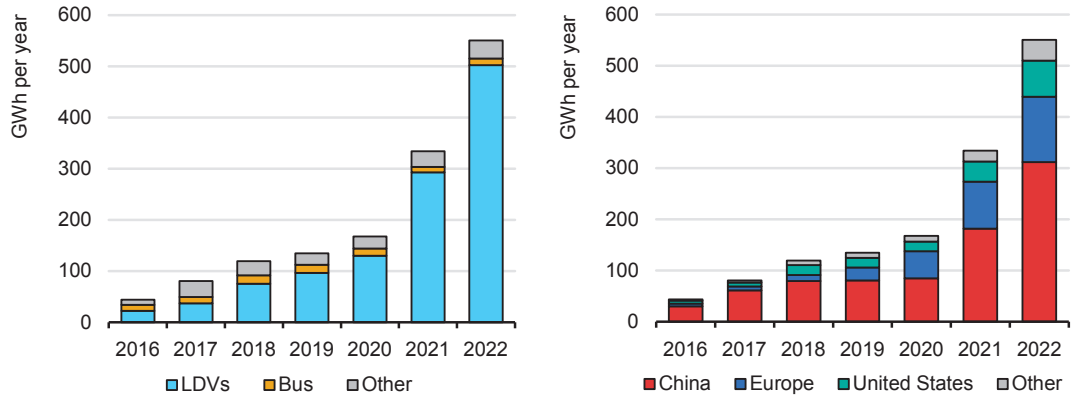
Battery demand for EVs continues to rise

Automotive lithium-ion (Li-ion) battery demand increased by about 65% to 550 GWh in 2022, from about 330 GWh in 2021, primarily as a result of growth in electric passenger car sales, with new registrations increasing by 55% in 2022 relative to 2021.

In China, battery demand for vehicles grew over 70%, while electric car sales increased by 80% in 2022 relative to 2021, with growth in battery demand slightly tempered by an increasing share of PHEVs. Battery demand for vehicles in the United States grew by around 80%, despite electric car sales only increasing by around 55% in 2022. While the average battery size for battery electric cars in the United States only grew by about 7% in 2022, the average battery electric car battery size remains about 40% higher than the global average, due in part to the higher share of SUVs in US electric car sales relative to other major markets,[14] as well as manufacturers' strategies to offer longer all-electric driving ranges. Global sales of BEV and PHEV cars are outpacing sales of hybrid electric vehicles (HEVs), and as BEV and PHEV battery sizes are larger, battery demand further increases as a result.

[14] For more information on the climate impact of SUVs, refer to the IEA's 27 February 2023 commentary on the subject.

Figure 1.17 Battery demand by mode and region, 2016-2022



Notes: LDVs = light-duty vehicles, including cars and vans; In the left chart, "Other" includes medium- and heavy-duty trucks and two/three-wheelers. Battery demand refers to automotive lithium-ion batteries. This analysis does not include conventional hybrid vehicles.

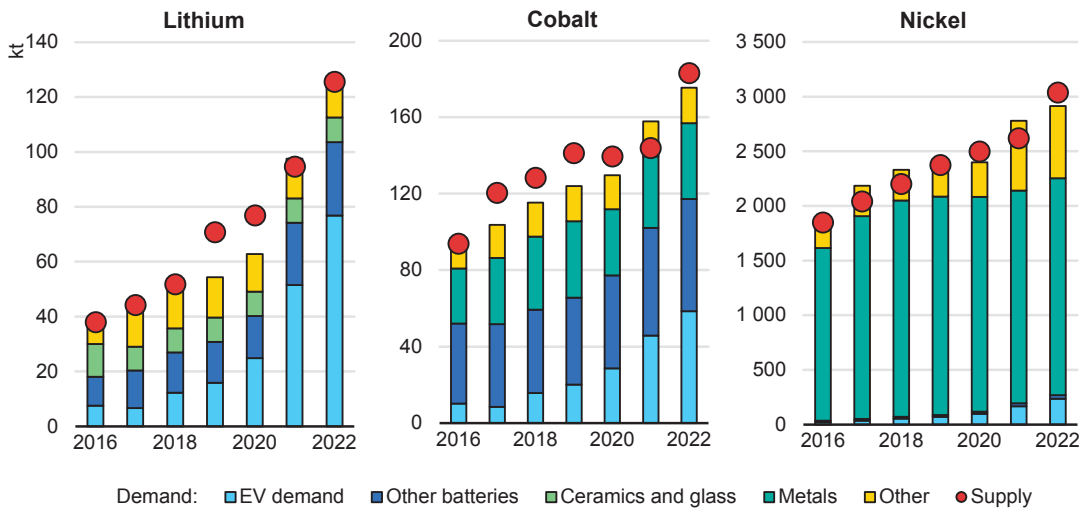
Source: IEA analysis based on EV Volumes.

Global battery demand increased by 65% in 2022, mainly as a result of electric car sales in China.

The increase in battery demand drives the demand for critical materials. In 2022, lithium demand exceeded supply (as in 2021) despite the 180% increase in production since 2017. In 2022, about 60% of lithium, 30% of cobalt and 10% of nickel demand was for EV batteries. Just five years earlier, in 2017, these shares were around 15%, 10% and 2%, respectively. As has already been seen for lithium, mining and processing of these critical minerals will need to increase rapidly to support the energy transition, not only for EVs but more broadly to keep up with the pace of demand for clean energy technologies.[15] Reducing the need for critical materials will also be important for supply chain sustainability, resilience and security. Accelerating innovation can help, such as through advanced battery technologies requiring smaller quantities of critical minerals, as well as measures to support uptake of vehicle models with optimised battery size and the development of battery recycling.

[15] For more information on the future of supply and demand of critical minerals, refer to the Energy Technology Perspective 2023 report.

Figure 1.18 Overall supply and demand of battery metals by sector, 2016-2022



Note: EV = electric vehicle. The metals category includes alloying applications. Supply refers to refinery output and not mining output.

Source: IEA analysis based on Mineral Commodity Summary 2022 by USGS, lithium and cobalt global supply-demand balance (January 2023) and nickel global supply-demand balance (January 2023) from S&P Global and World Metal Statistics Yearbook by the World Bureau of Metal Statistics.

In 2022, supply of nickel and cobalt exceeded demand, while lithium demand outpaced supply by a small margin.

Battery chemistries are diversifying

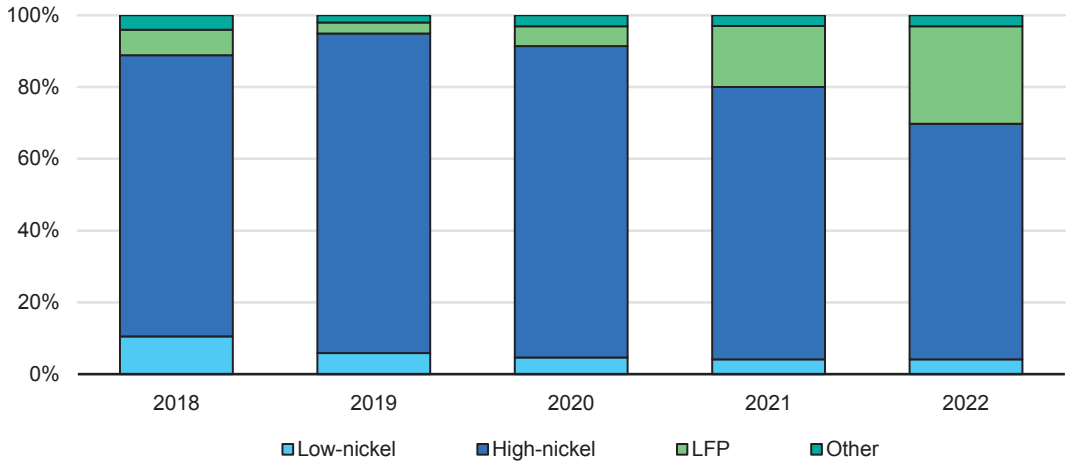
New alternatives to conventional lithium-ion are on the rise

In 2022, lithium nickel manganese cobalt oxide (NMC) remained the dominant battery chemistry with a market share of 60%, followed by lithium iron phosphate (LFP) with a share of just under 30%, and nickel cobalt aluminium oxide (NCA) with a share of about 8%.

Lithium iron phosphate (LFP) cathode chemistries have reached their highest share in the past decade (Figure 1.19). This trend is driven mainly by the preferences of Chinese OEMs. Around 95% of the LFP batteries for electric LDVs went into vehicles produced in China, and BYD alone represents 50% of demand. Tesla accounted for 15%, and the share of LFP batteries used by Tesla increased from 20% in 2021 to 30% in 2022. Around 85% of the cars with LFP batteries manufactured by Tesla were manufactured in China, with the remainder being manufactured in the United States with cells imported from China. In total, only around 3% of electric cars with LFP batteries were manufactured in the United States in 2022.

LFP batteries contrast with other chemistries in their use of iron and phosphorus rather than the nickel, manganese and cobalt found in NCA and NMC batteries. The downside of LFP is that the energy density tends to be lower than that of NMC. LFP batteries also contain phosphorus, which is used in food production. If all batteries today were LFP, they would account for nearly 1% of current agricultural phosphorus use by mass, suggesting that conflicting demands for phosphorus may arise in the future as battery demand increases.

Figure 1.19 Electric light-duty vehicle battery capacity by chemistry, 2018-2022

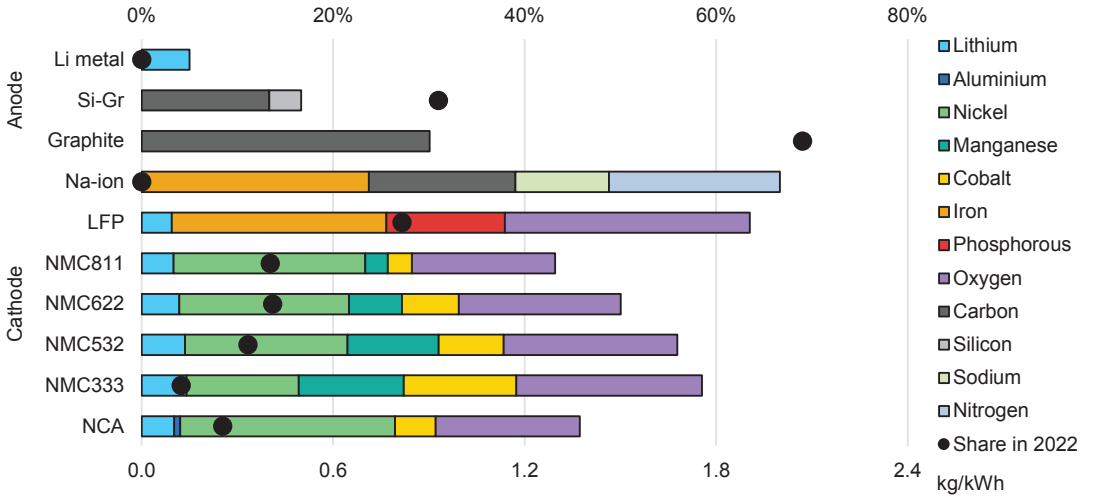


Notes: LFP = Lithium iron phosphate. Low-nickel includes: NMC333. High-nickel includes: NMC532, NMC622, NMC721, NMC811, NCA and NMCA. Cathode sales share is based on battery capacity.
Source: IEA analysis based on EV Volumes.

The share of lithium iron phosphate reached its highest ever point, accounting for almost 30% of new electric LDV battery capacity in 2022.

With regards to anodes, a number of chemistry changes have the potential to improve energy density (watt-hour per kilogram, or Wh/kg). For example, silicon can be used to replace all or some of the graphite in the anode in order to make it lighter and thus increase the energy density. Silicon-doped graphite already entered the market a few years ago, and now around 30% of anodes contain silicon. Another option is innovative lithium metal anodes, which could yield even greater energy density when they become commercially available (Figure 1.20).

Figure 1.20 Material content in different anode and cathodes



Notes: Li metal = Lithium metal anode; Si-Gr = Silicon-graphite anode; Graphite = Pure graphite anode; Na-ion = Sodium-ion; LFP = Lithium iron phosphate; NMC = Lithium nickel manganese cobalt oxide; NCA = Lithium nickel cobalt aluminium oxide. Materials composing the battery casing and the electrolyte are excluded. Chemistry shares are based on demand. The share of NCA battery includes every NCA type and Si-Gr includes every degree of silicon-graphite mix. Carbon covers the graphite composing anodes. The Na-ion cathode shown is the Prussian white.

Source: IEA analysis based on Lithium-Ion Batteries: State of the Industry 2022 by BNEF, BatPaC v4 by Argonne Laboratory and Sodium-ion batteries: disrupt and conquer? by Wood Mackenzie.

Lithium iron phosphate cathodes do not rely on nickel, manganese or cobalt, which has contributed to their increased market share.

In recent years, alternatives to Li-ion batteries have been emerging, notably sodium-ion (Na-ion). This battery chemistry has the dual advantage of relying on lower cost materials than Li-ion, leading to cheaper batteries, and of completely avoiding the need for critical minerals. It is currently the only viable chemistry that does not contain lithium. The Na-ion battery developed by China's CATL is estimated to cost 30% less than an LFP battery. Conversely, Na-ion batteries do not have the same energy density as their Li-ion counterpart (respectively 75 to 160 Wh/kg compared to 120 to 260 Wh/kg). This could make Na-ion relevant for urban vehicles with lower range, or for stationary storage, but could be more challenging to deploy in locations where consumers prioritise maximum range autonomy, or where charging is less accessible. There are nearly 30 Na-ion battery manufacturing plants currently operating, planned or under construction, for a combined capacity of over 100 GWh, almost all in China. For comparison, the current manufacturing capacity of Li-ion batteries is around 1 500 GWh.

Multiple carmakers have already announced Na-ion electric cars, such as the Seagull by BYD, which has an announced range of 300 km and is sold for USD 11 600 (with possible discounts bringing the price down to USD 9 500), and the Sehol EX10, produced by the VW-JAC joint venture, with a 250 km range.

While these first models are likely to be slightly more expensive than the cheapest small BEV models in China – such as the Wuling Mini BEV, sold for as little as USD 5 000 to 6 500 – they are still cheaper than equivalent options with similar driving range. To compare, the Wuling Mini BEV's range stands at 170 km, but BYD's Dolphin BEV, the second best-selling small BEV in China in 2022, with a similar range to the announced Na-ion cars, can cost more than USD 15 000. BYD plans to progressively integrate Na-ion batteries into all its models below USD 29 000 as battery production ramps up. These announcements suggest that electric vehicles powered by Na-ion will be available for sale and driven for the first time in 2023-2024, hence bringing the technology to a readiness level (TRL[16]) of 8-9, between first-of-a-kind commercial and commercial operation in the relevant environment. In 2022, it was assessed at TRL 6 (full prototype at scale) in the IEA Clean Technology Guide, compared to only TRL 3-4 (small prototypes) in the assessment from 2021, highlighting quick technological progress.

Critical mineral prices can have an impact on chemistry choice

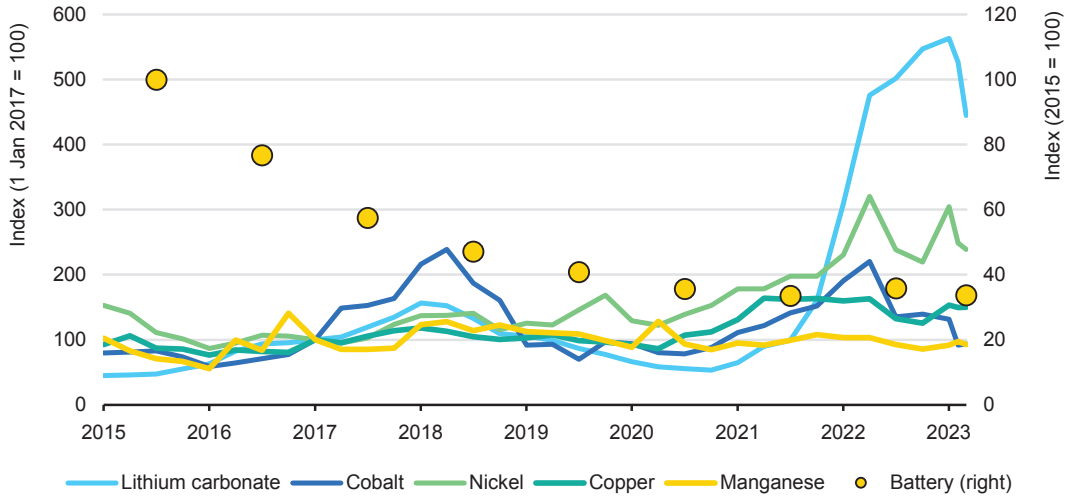
The variability in price and availability of critical minerals can also explain some of the developments in battery chemistry from the last few years (Figure 1.21). NMC chemistries using an equal ratio of nickel, manganese, and cobalt (NMC333 or NMC111) were popular until 2015. Since then, cobalt price increases and concerns affecting public acceptance of cobalt mining have contributed to a shift towards lower-cobalt ratios, such as NMC622, and then NMC811, which are nevertheless more difficult to manufacture. In 2022, the price of nickel increased, reaching a peak twice as high as the 2015-2020 average. This created incentives to use chemistries that are less reliant on nickel, such as LFP, despite their lower energy density.

Lithium carbonate prices have also been steadily increasing over the past two years. In 2021, prices multiplied four- to five-fold, and continued to rise throughout 2022, nearly doubling between 1 January 2022 and 1 January 2023. At the beginning of 2023, lithium prices stood six times above their average over the 2015-2020 period. In contrast to nickel and lithium, manganese prices have been relatively stable. One reason for the increase in prices for lithium, nickel and cobalt was the insufficient supply compared to demand in 2021 (Figure 1.18). Although nickel and cobalt supply surpassed demand in 2022, this was not the case for lithium, causing its price to rise more strongly over the year. Between January and March 2023, lithium prices dropped 20%, returning to their late 2022 level. The combination of an expected 40% increase in supply and slower growth in demand, especially for EVs in China, has contributed to this trend. This drop – if sustained – could translate into lower battery prices.

[16] Technology Readiness Level (TRL) provides a snapshot of the maturity of a given technology. It has 11 steps ranging from initial idea at step 1 to proof of stability reached at step 11. For more information, refer to the IEA Clean Technology Guide.

Beyond those materials, global commodity prices have surged in the last few years, as a result of supply disruptions in the wake of the Covid-19 pandemic, rising demand as the global economy started to recover, and Russia's invasion of Ukraine in February 2022, among other factors.

Figure 1.21 Price of selected battery materials and lithium-ion batteries, 2015-2023



Notes: Data until March 2023. Lithium-ion battery prices (including the pack and cell) represent the global volume-weighted average across all sectors. Nickel prices are based on the London Metal Exchange, used here as a proxy for global pricing, although most nickel trade takes place through direct contracts between producers and consumers. The 2023 battery price value is based on cost estimates for NMC 622.

Source: IEA analysis based on material price data by S&P, 2022 Lithium-Ion Battery Price Survey by BNEF and Battery Costs Drop as Lithium Prices in China Fall by BNEF.

From 2021 to the end of 2022, the price of critical materials such as lithium, cobalt and nickel increased dramatically, putting pressure on historical Li-ion battery price decreases.

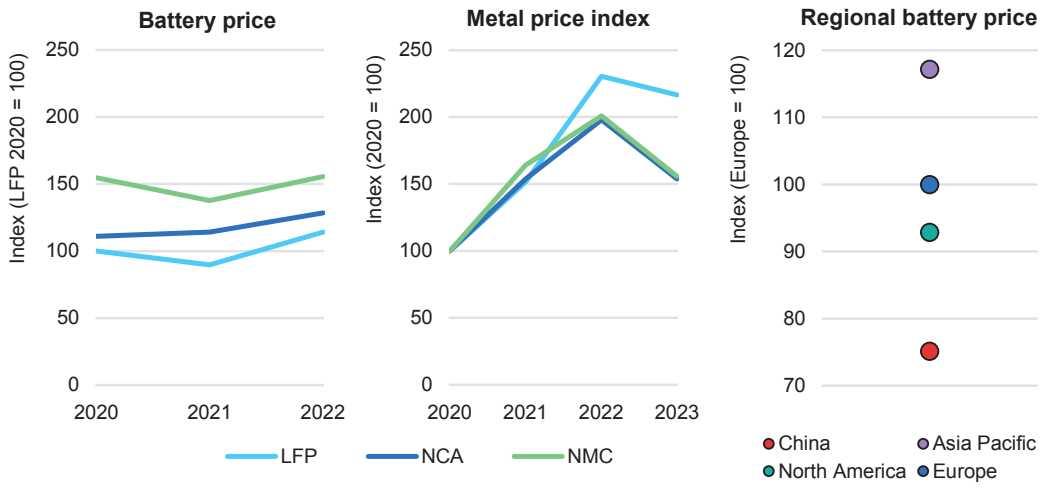
In 2022, the estimated average battery price stood at about USD 150 per kWh, with the cost of pack manufacturing accounting for about 20% of total battery cost, compared to more than 30% a decade earlier. Pack production costs have continued to decrease over time, down 5% in 2022 compared to the previous year. In contrast, cell production costs increased in 2022 relative to 2021, returning to 2019 levels. This can be explained in part by the increasing prices of materials, which account for a significant portion of cell price, and of electricity, which affects manufacturing costs, whereas efficiency gains in pack manufacturing help decrease costs. Bloomberg New Energy Finance (BNEF) sees pack manufacturing costs dropping further, by about 20% by 2025, whereas cell production costs decrease by only 10% relative to their historic low in 2021. This warrants further analysis based on future trends in material prices.

The effect of increased battery material prices differed across various battery chemistries in 2022, with the strongest increase being observed for LFP batteries

(over 25%), while NMC batteries experienced an increase of less than 15% (Figure 1.21). Since LFP batteries contain neither nickel nor cobalt, which are relatively expensive compared to iron and phosphorus, the price of lithium plays a relatively larger role in determining the final cost. Given that the price of lithium increased at a higher rate than the price of nickel and cobalt, the price of LFP batteries increased more than the price of NMC batteries. Nonetheless, LFP batteries remain less expensive than NCA and NMC per unit of energy capacity.

The price of batteries also varies across different regions, with China having the lowest prices on average, and the rest of the Asia Pacific region having the highest (Figure 1.21). This price discrepancy is influenced by the fact that around 65% of battery cells and almost 80% of cathodes are manufactured in China.

Figure 1.22 Price index for selected battery chemistries, regions and metal price, 2020-2023



Note: LFP = Lithium iron phosphate; NMC = Lithium nickel manganese cobalt oxide; NCA = Lithium nickel cobalt aluminium oxide. The metal price index is based on the price evolution of four commodities (lithium carbonate, cobalt, nickel and copper) weighted by their use in each battery chemistry. For this metal price index, NMC uses the NMC622 chemistry. The 2023 value of the metal price index covers only the first 3 months of the year. Asia Pacific excludes China. Regional battery (pack) price refers to 2022.

Source: IEA analysis based on material price data by S&P, 2022 Lithium-Ion Battery Price Survey by BNEF, BatPaC v4 by Argonne Laboratory and Lithium-Ion Batteries: State of the Industry 2022 by BNEF.

Despite a higher relative increase in price compared to other battery chemistries, LFP batteries remain the lowest price per kWh.

Prospects for electric vehicle deployment

Several pathways to electrify road transport in the period to 2030 are explored in this section. First, deployment of electric vehicles (EVs) is projected by region and road segment for the Stated Policies and Announced Pledges scenarios, and globally by segment for the Net Zero Emissions by 2050 Scenario. These projections are then compared to announcements by original equipment manufacturers (OEMs). Then the corresponding battery demand is projected, followed by roll-out requirements for charging infrastructure. Finally, the impacts of EV deployment are assessed, including increased electricity demand, oil displacement, implications for tax revenues, and net well-to-wheels GHG emissions.

Outlook for electric mobility

Scenarios

A scenario-based approach is used to explore road transport electrification and its impact, based on the latest market data, policy drivers and technology perspectives. Two IEA scenarios – the Stated Policies and Announced Pledges scenarios – inform the outlooks, which are examined in relation to the Net Zero Emissions by 2050 Scenario at the global level.[1] These scenarios are based on announced policies, ambitions and market trends through the first quarter of 2023.

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

These scenario projections incorporate GDP and population assumptions from the International Monetary Fund (2022) and United Nations (2022), respectively.

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

[1] The projections in the Stated Policies and Announced Pledges scenarios are based on historical trends through the end of 2022 as well as stated policies and ambitions as of the end of March 2023. The Net Zero Emissions by 2050 Scenario is consistent with the World Energy Outlook 2022 publication.

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 (NDCs). 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

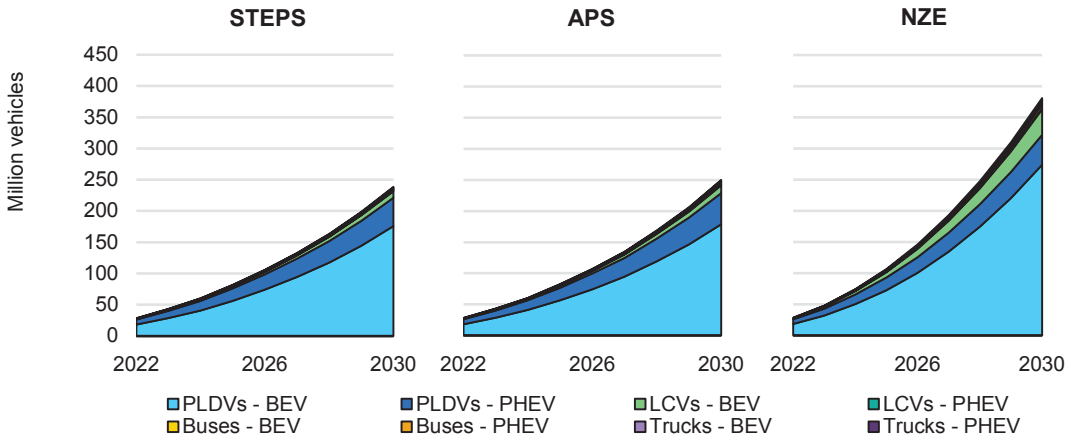
The Net Zero Emissions by 2050 Scenario (NZE Scenario) is a normative scenario that sets out a narrow but achievable pathway for the global energy sector to achieve net zero CO_2 emissions by 2050. The scenario is compatible with limiting the global temperature rise to 1.5°C with no or limited temperature 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.

Electric vehicle fleet to grow by a factor of eight or more by 2030

The total fleet of EVs (excluding two/three-wheelers) grows from almost 30 million in 2022 to about 240 million in 2030 in the Stated Policies Scenario (STEPS), achieving an average annual growth rate of about 30%. In this scenario, EVs account for over 10% of the road vehicle fleet by 2030. Total EV sales reach over 20 million in 2025 and over 40 million in 2030, representing over 20% and 30% of all vehicle sales, respectively.

Figure 3.1. Electric vehicle stock by mode and scenario, 2022-2030

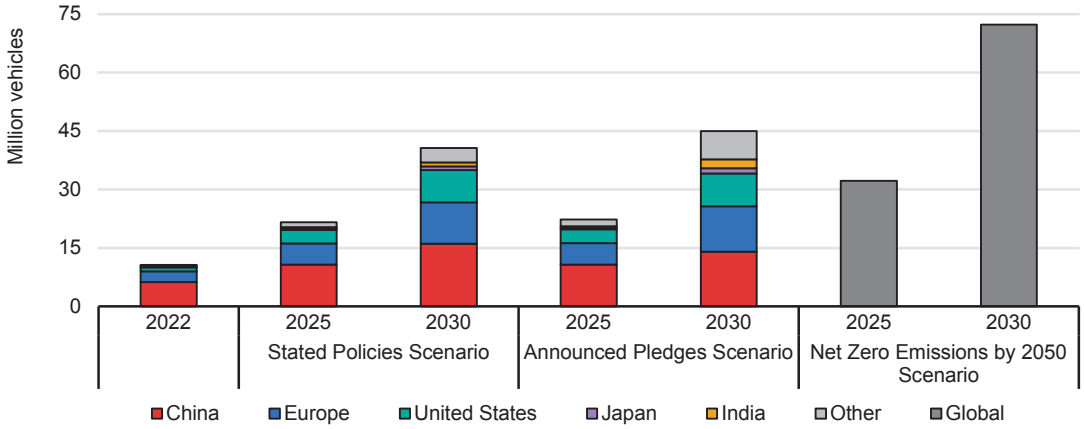


Notes: STEPS = Stated Policies Scenario; APS = Announced Pledges Scenario; NZE = Net Zero Emissions by 2050 Scenario; BEV = battery electric vehicle; PHEV = plug-in hybrid electric; PLDV = passenger light-duty vehicle; LCV = light commercial vehicle.

EV deployment commensurate with government pledges is only 5% above what stated policies would imply by 2030.

In the Announced Pledged Scenario (APS), based on announced government targets and pledges that go beyond existing policies, the global EV fleet reaches almost 250 million in 2030, around 5% higher than in the STEPS. The average annual growth rate in the APS is nearly 35%, with the result that one in seven vehicles on the road is an EV in 2030. Total EV sales reach 45 million in 2030, representing over 35% of all vehicle sales.

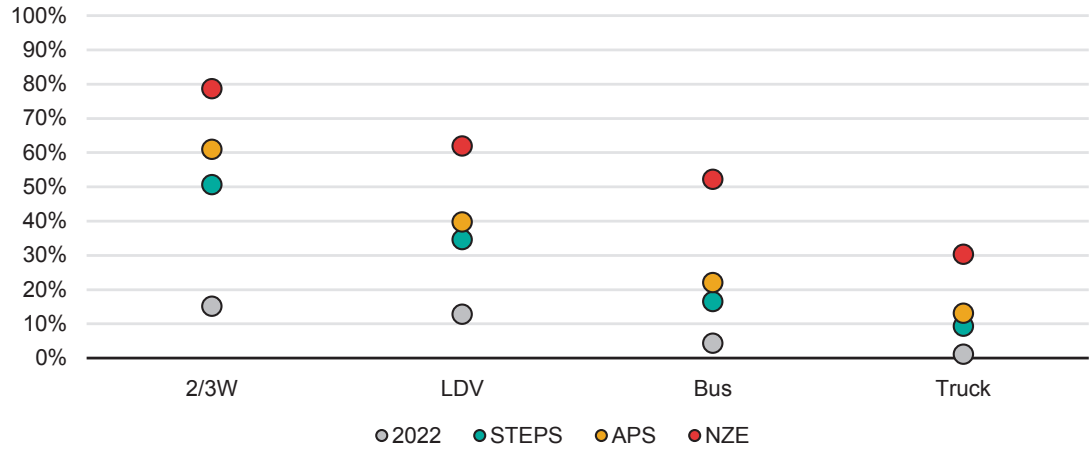
Figure 3.2. Electric vehicle sales by region, 2022-2030



Global EV sales increase around fourfold from 2022 to 2030 under both stated policies and announced ambitions.

The global EV sales share in 2030 in the STEPS is about half that in the NZE Scenario, in which the fleet of EVs grows more rapidly, at an average annual rate of around 40%, reaching 380 million EVs on the road in 2030. Electric vehicle sales reach over 30 million in 2025 and over 70 million in 2030, a total of approximately 30% and 60% of all vehicle sales, respectively.

Figure 3.3. Electric vehicle sales shares by mode and scenario, 2030



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.

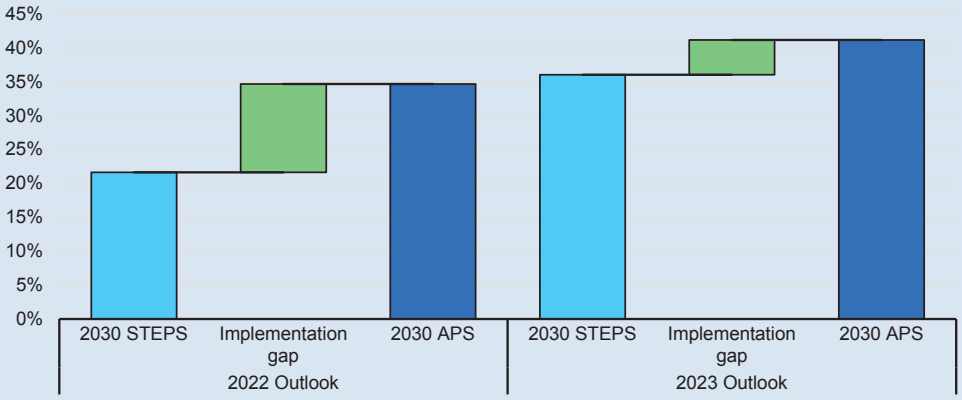
Existing policies are projected to yield market shares almost in line with country pledges across all modes of transport.

Box 3.1 Closing the implementation gap: how EV policy is catching up with targets

Targets and ambitions for clean energy technology deployment are generally more easily formulated than they are achieved, but in the case of EVs, the momentum is clearly on the side of achievement. Strong market uptake in 2022, combined with major policy announcements over the past year, have led to a significant upward revision of EV deployment to 2030 in the STEPS presented in this edition of the Global EV Outlook compared to the 2022 edition. The projected sales shares of EVs based on stated policies and market trends are now coming close to country stated ambitions for EVs, meaning that the policy implementation gap – the difference between country deployment ambitions and the policies currently in place – in the 2023 Outlook is much smaller than in the 2022 edition.

This is most notable for light-duty vehicles, where recent policies such as the US Inflation Reduction Act (IRA) and new EU CO_2 standards for cars and vans have resulted in a significantly higher EV sales share in 2030 in the STEPS. In this year's Outlook, under announced ambitions, the electric car sales share exceeds 40% in 2030 compared to 35% under stated policies: this gap has more than halved in the past year. For trucks and buses, the EV sales share in 2030 in the STEPS also increased faster than ambition. As a result, the gap between ambition and legislated policies for HDVs is half of what it was in the 2022 Outlook.

Electric car sales share implementation gap, 2030



Realising the potential of EVs to support government climate (as well as energy security) ambitions is thus almost in reach under current policy frameworks. In particular, the gap between policy and ambition has closed in three of the largest EV markets: the European Union, the United States and China. At the global level, oil displacement by EVs reaches 1.8 million barrels per day in 2025 (over 5 mb/d in 2030) under stated policies. As a result, global demand for oil-based road transport fuels will peak by 2025.

The momentum seen over the past year in terms of increasing EV sales and new supportive policies being introduced, along with funding designated for the necessary infrastructure (for example, the USD 5 billion allocated in the US IIJA to support EV charger installation), have also led industry players to invest more in EV supply chains. Notably, planned EV battery manufacturing expansions are set to increase capacity more than fourfold, reaching 6.8 TWh/year of production capacity in 2030, 65% higher than is needed to enable the level of EV deployment in the APS. Taken together, this suggests that even higher EV deployment than is implied by the APS is achievable by 2030 if policy efforts are sustained and critical potential bottlenecks (such as around recharging infrastructure and mining) are addressed early on.

Light-duty vehicles

Light-duty vehicles (LDVs), including passenger light-duty vehicles (PLDVs) and light commercial vehicles (LCVs), continue to make up the majority of electric vehicles (excluding two/three-wheelers). This is a result of strong policy support, including light-duty vehicle fuel economy or CO_2 standards, the availability of EV models, and the size of the LDV market. In the STEPS, electric LDV sales are projected to reach over 20 million in 2025, doubling the number of sales in 2022, and to quadruple to 40 million in 2030. The sales share of electric LDVs thus increases from 13% in 2022 to over 20% in 2025 and around 35% in 2030. The stock of electric LDVs reaches about 230 million in 2030, meaning that about one in every seven LDVs on the road is electric.

In the APS, the fleet of electric LDVs reaches over 240 million in 2030, a 15% stock share. Of these, 230 million are electric PLDVs, with only 6% being LCVs. Sales of electric LDVs reach almost 45 million in 2030 in the APS, representing a sales share of 40%. These results reflect government electrification ambitions and net zero pledges, including the 2021 COP 26 declaration target to achieve 100% zero-emission LDV sales by 2040, and by 2035 in leading markets, which 40 national governments have committed to.

In the NZE Scenario, the sales share of electric LDVs reaches 30% in 2025, four years earlier than in the STEPS. In 2030, the sales share is over 60%, about 80% higher than in the STEPS and 55% higher than in the APS.

Buses

Governments have made significant progress in electrifying public bus fleets. In 2022, there were more than 800 000 electric buses on the road, representing over 3% of all buses. As such, buses are the most electrified road segment, excluding two/three-wheelers. In the STEPS, the electric bus fleet reaches 1.4 million in 2025 and 2.7 million in 2030, at which point around one in ten buses will be electric. In the near term, electrification is expected to progress most rapidly within the publicly owned urban bus fleet, which is covered by government procurement

regulations and, in some cases, government funding. For example, Canada is aiming to put 5 000 electric public and school buses on the road by the end of 2025 via the CAD 2.75 billion Zero Emission Transit Fund.

In the APS, the electric bus fleet exceeds 3 million in 2030, reaching a stock share of over 10%. In 2030, about a quarter of buses sold are electric, which is about 35% higher than the sales share in the STEPS. In part, this increase is due to the proposed EU heavy-duty vehicle CO_2 standards, which would require 100% zero-emission city bus sales from 2030. In the NZE Scenario, the electrification of buses is even more rapid, with one in two buses sold in 2030 being electric.

Medium- and heavy-duty trucks

Medium- and heavy-duty trucks are more difficult to electrify than other road segments, due in part to the size, weight and cost of the batteries needed to fully electrify this segment. However, progress is being made: around 320 000 electric trucks were on the road in 2022. By 2030, the fleet of electric trucks reaches almost 3.5 million in the STEPS, over 3% of the total truck fleet.

In the APS, the stock of electric trucks exceeds 4 million in 2030, a stock share of 4%. Electric truck sales increase from a negligible share today to over 9% in the STEPS in 2030 and 13% in the APS. The increased sales in the APS are driven in particular by the Global Memorandum of Understanding (MoU) on Zero-Emission Medium- and Heavy-Duty Vehicles, through which 27 countries have now pledged to reach 30% zero-emission medium- and heavy-duty vehicle[2] sales by 2030 and 100% by 2040. In addition, the European Union has proposed HDV CO_2 standards that would require a 45% reduction in emissions in 2030 compared to 2019 levels.

In the NZE Scenario, electric trucks reach 30% of sales in 2030, which is aligned with the Global MoU on Zero-Emission Medium- and Heavy-Duty vehicles. However, this sales share is still two-and-a-half times that in the APS, and over three times that in the STEPS.

Two/three-wheelers

Two/three-wheelers are currently the most electrified road transport segment. Given the vehicles' light weight and limited daily driving distance, battery electrification is relatively easy and makes economic sense on a total cost of ownership basis in many regions. In 2022, the electric two/three-wheeler fleet totalled over 50 million, reaching a stock share of around 7%.

In the STEPS, the fleet of electric two/three-wheelers reaches 220 million in 2030, or a quarter of the total two/three-wheeler fleet. In the APS, the stock grows to 280 million, and almost 30% of all two/three-wheelers are electric. The electric sales share in 2030 reaches 50% in the STEPS and 60% in the APS. In the NZE Scenario, the electric two/three-wheeler sales share reaches almost 80% in 2030.

[2]Includes buses.

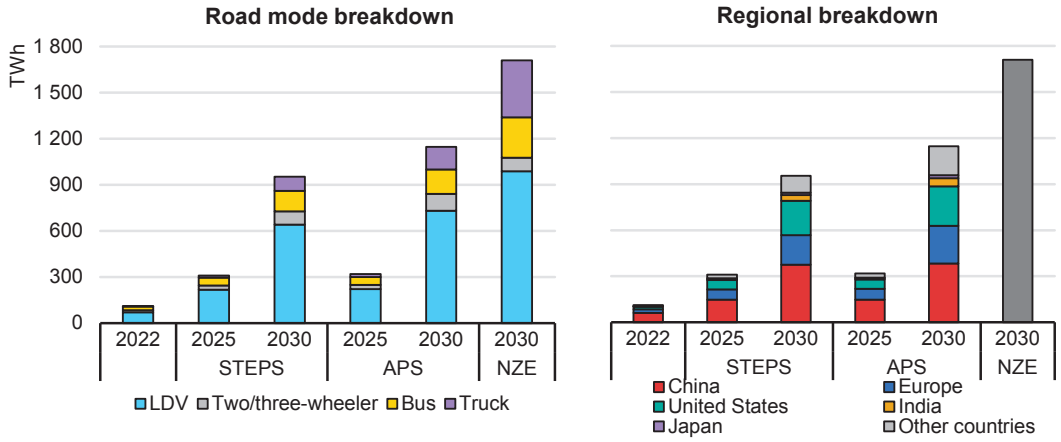
To power the growing stock of electric trucks, the number of depot chargers increases from around 300 000 today to 3.5 million in 2030 in the STEPS and 4.2 million in the APS. The installed capacity of truck depot chargers is about 310 GW in the STEPS and 380 GW in the APS in 2030. As with buses, the number of depot chargers needed in 2030 is far greater than the number of opportunity chargers. In the STEPS, the number of opportunity truck chargers is about 13 500 (6.5 GW installed capacity), increasing to 25 000 (13 GW installed capacity) in the APS in 2030.

Impact on energy demand and emissions

Electricity demand

The global EV fleet consumed about 110 TWh of electricity in 2022, which equates roughly to the current total electricity demand in the Netherlands. Almost a quarter of the total EV electricity consumption was for electric cars in China, and a fifth for electric buses in the same country. Electricity demand for EVs accounts for less than half a percent of current total final electricity consumption worldwide, and still less than one percent of China's final electricity consumption.

Figure 3.12. Electricity demand by mode and region, 2022-2030



Notes: STEPS = Stated Policies Scenario; APS = Announced Pledges Scenario; NZE = Net Zero Emissions by 2050 Scenario; LDV = light-duty vehicle; RoW = rest of the world. The analysis is carried out for each region in the transport model within the IEA's Global Energy and Climate Model (GEC-Model) separately and then aggregated for global results. For the Net Zero Emissions by 2050 Scenario, only global values are reported. Regional data can be interactively explored via the Global EV Data Explorer.

Electricity demand for EVs accounts for only a minor share of global electricity consumption in 2030 in the Announced Pledges Scenario.

Electricity demand for EVs is projected to reach over 950 TWh in the STEPS and about 1 150 TWh in the APS in 2030. Notably, electricity demand in the APS is

about 20% higher than in the STEPS, despite the stock of EVs only being about 15% higher. This is in part due to higher rates of electrification in many high-average vehicle mileage markets such as the United States, but also to greater electrification in the truck and bus segments, which contribute incrementally to vehicle stock, but have a high electricity demand per vehicle. In addition, it is assumed that in countries with net zero pledges, a larger share of energy consumption in PHEVs is provided by electricity (as opposed to gasoline or diesel). This is particularly relevant for cars and vans, which account for about two-thirds of demand in both scenarios.

By 2030, electricity demand for EVs accounts for less than 4% of global final electricity consumption in both scenarios. As shown in the World Energy Outlook 2022, in 2030 the share of electricity for EVs is relatively small compared to demand for industrial applications, appliances or cooling and heating.

Table 3.1 Share of electricity consumption from electric vehicles relative to final electricity demand by region and scenario, 2022 and 2030

Country/region	2022	Stated Policies Scenario 2030	Announced Pledges Scenario 2030
China	0.8%	3.8%	4.0%
Europe	0.7%	4.7%	5.7%
United States	0.4%	5.4%	6.3%
Japan	0.1%	1.7%	2.2%
India	0.1%	1.7%	2.5%
Global	0.5%	3.2%	3.8%

Note: Non-road electricity consumption from the World Energy Outlook 2022.

China remains the largest consumer of electricity for EVs in 2030, although its share of global EV electricity demand decreases significantly from about 55% in 2022 to less than 40% in the STEPS, and around 30% in the APS. This reflects wider adoption of electromobility across other countries in the period to 2030.

The size of the EV fleet becomes an important factor for power systems in both scenarios, with implications for peak power demand, transmission and distribution capacity. Careful planning of electricity infrastructure, peak load management, and smart charging will be critical. Reducing dependence on fast charging will allow for optimal planning and resiliency of power systems, mitigating peak power demand. More than 80% of the electricity demand for electric LDVs in 2030 in both scenarios is via slow chargers (private and public).

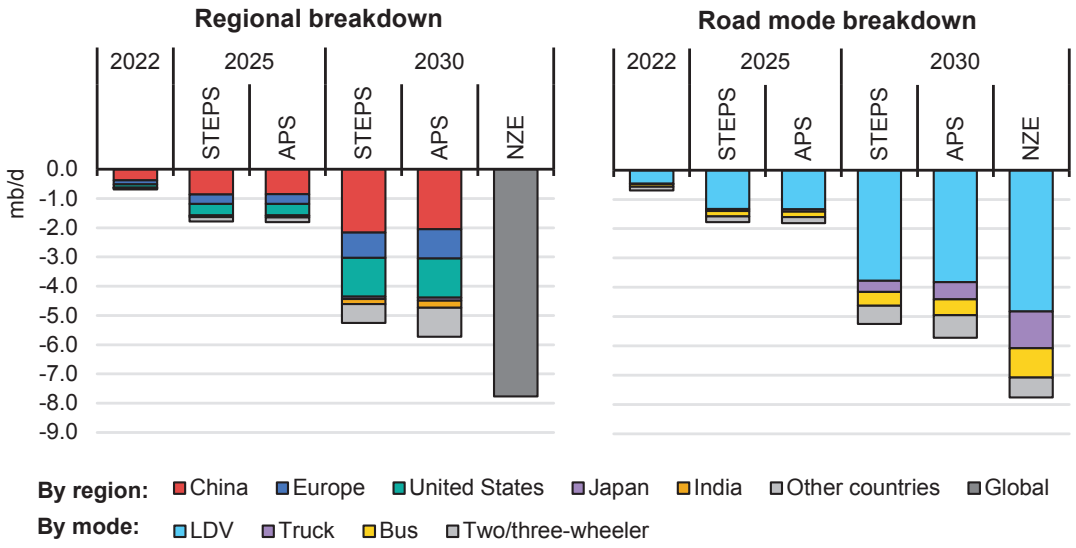
To help policy makers prioritise charging strategies according to the size of their EV fleet and their power system configuration, the IEA has developed a guiding framework and online tool for EV grid integration.

Oil displacement

The growing EV stock will reduce oil use, which today accounts for over 90% of total final consumption in the transport sector. Globally, the projected EV fleet in 2030 displaces more than 5 million barrels per day (mb/d) of diesel and gasoline in the STEPS and almost 6 mb/d in the APS, up from about 0.7 mb/d in 2022. For reference, Australia consumed around 1 mb/d of oil products across all sectors in 2021.

However, recent price volatility for critical minerals that are important inputs to battery manufacturing, and market tension affecting supply chains, are a stark reminder that in the transition to electromobility, energy security considerations evolve and require regular reconsideration.

Figure 3.13. Oil displacement by region and mode, 2022-2030



Notes: STEPS = Stated Policies Scenario; APS = Announced Pledges Scenario; NZE = Net Zero Emissions by 2050 Scenario; LDV = light-duty vehicle. Oil displacement based on internal combustion engine (ICE) vehicle fuel consumption to cover the same mileage as the EV fleet.

Oil displacement increases from 0.7 mb/d in 2022 to nearly 6 mb/d in 2030 if pledges supporting electromobility in road transport around the world are fulfilled.

Box 3.2 How much oil really gets displaced by electric vehicles?

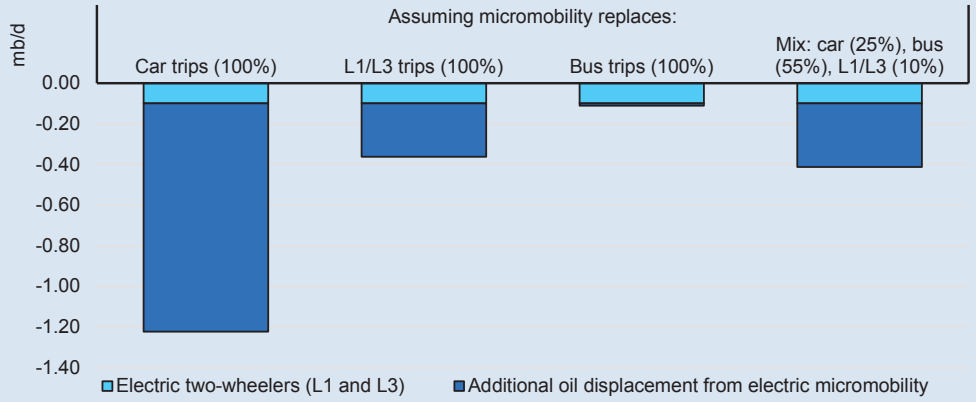
Oil displacement through the use of EVs can be estimated by assuming that the distance (total kilometres) travelled by EVs by segment each year would have otherwise been travelled by ICE vehicles or hybrid electric vehicles (HEVs) (based on the stock shares of each). In the case of PHEVs, only the distance covered by electricity gets included. The stock average fuel consumption of gasoline and diesel vehicles determines the total liquid fuel displacement, where the biofuel portion is taken out of the estimate based on regional blending rates. As a result, it can be estimated that in 2022, the stock of EVs displaced 700 000 barrels of oil per day.

This method of estimation assumes that EVs replace ICE or hybrid vehicles of the same segment, as opposed to some other means of transport, i.e. an electric car replaces an ICE car. The accuracy of this assumption is uncertain, in particular with respect to two-wheelers. In IEA analysis, only two-wheelers that fit the United Nations Economic Commission for Europe (UNECE) classification of L1 or L3 are considered. This definition excludes micromobility options such as electric-assisted bicycles and low-speed electric scooters, leading to a significantly lower stock (around 80% lower) than when including micromobility segments.

Whether or not electric micromobility avoids oil use is uncertain, as it might displace manual bicycles or walking rather than ICE two-wheelers. At the same time, there is evidence that in some cases micromobility displaces personal car or taxi trips. The estimate of the amount of oil use that is avoided by two-wheeled micromobility therefore strongly depends on the assumptions about the mode that is being displaced.

The case of China, which represents over 95% of the global stock of two-wheeled electric micromobility, is a good example. Assuming that all two-wheeled micromobility in China replaces conventional ICE two-wheelers would increase oil displacement by 260 kb/d (or 160%). If instead electric micromobility was assumed to replace only bus trips, then the total oil displacement from two-wheelers in China would increase by just 10 kb/d (10%). However, if it was assumed that they displaced car trips, then oil use avoided by two-wheelers in China would be more than 1 mb/d higher. Including oil displacement from the two-wheeled electric micromobility segment in China alone can therefore increase the estimated 2022 global oil displacement from all electric vehicles anywhere from 1% to 160%. But there is significant uncertainty as to whether any oil is displaced at all.

Additional two-wheeler oil displacement in China when accounting for micromobility segments, 2022



Notes: Electric L1 and L3 two-wheelers (based on UNECE classifications) are assumed to replace ICE two-wheelers. For this analysis, it is assumed micromobility two-wheelers travel on average 10 km/day. The mix shown is based on findings from an investigation of e-bike use in Kunming, China. The other 10% of the mix is assumed to replace active transport, and thus does not contribute to oil displacement.
Sources: IEA analysis based on BNEF and Cherry et al. (2016).

Tax revenues

Taxes on petroleum-based road fuels can be a significant source of income for governments, [7] and are often used to support investments in transport infrastructure, such as roads and bridges. Given the levels of oil displacement discussed above, the transition to EVs will reduce these tax revenues. Additional tax revenue from electricity will not be sufficient to fully compensate for this reduction, both because taxes on electricity tend to be lower on an energy basis and because EVs are more efficient and thus use less energy than ICE vehicles.

In 2022, the transition to electric vehicle stock displaced around USD 11 billion in gasoline and diesel tax revenues globally. At the same time, the use of EVs generated around USD 2 billion in electricity tax revenue, meaning there was a net loss of around USD 9 billion. Although China has the greatest stock of EVs, the greatest impact on tax revenues was seen in Europe, a trend which is expected to continue into the future. This is because Europe has some of the highest taxes on gasoline and diesel; for example, the gasoline tax rate in Germany is almost ten times the rate in China.

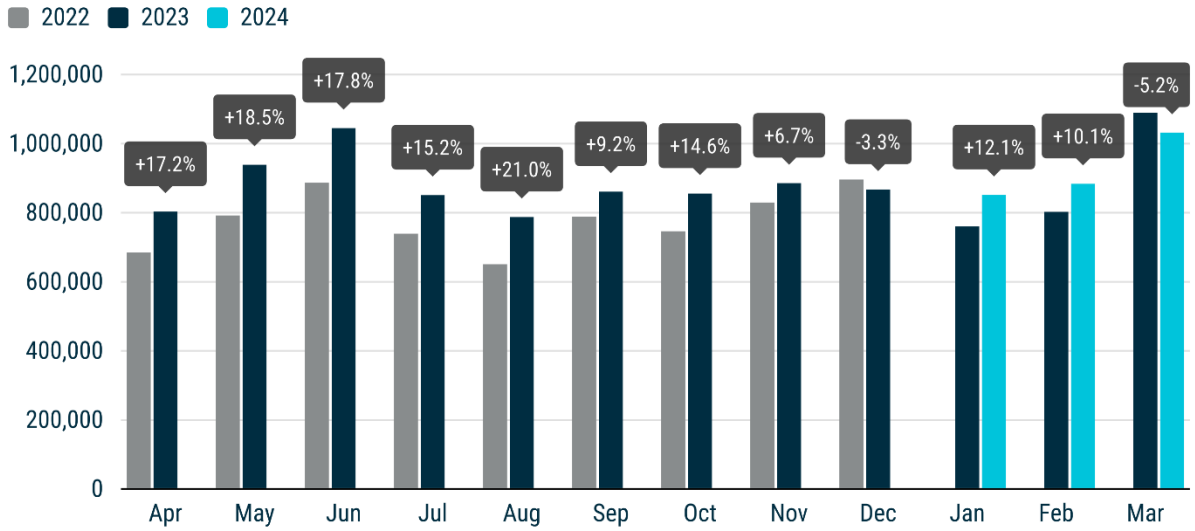
As the number of EVs increases globally, government fuel tax revenues are expected to decline, with global net tax losses increasing by around two-and-a-

[7] While the share of total government revenue from fuel taxes may be small, for example it has recently been less than 3% in the United Kingdom, in many cases it represents a large share of the budget allocations for transportation infrastructure.

NEW CAR REGISTRATIONS, EUROPEAN UNION

EMBARGOED PRESS RELEASE
8.00 CEST (6.00 GMT), 18 April 2024

New car registrations: -5.2% in March 2024; battery electric 13% market share



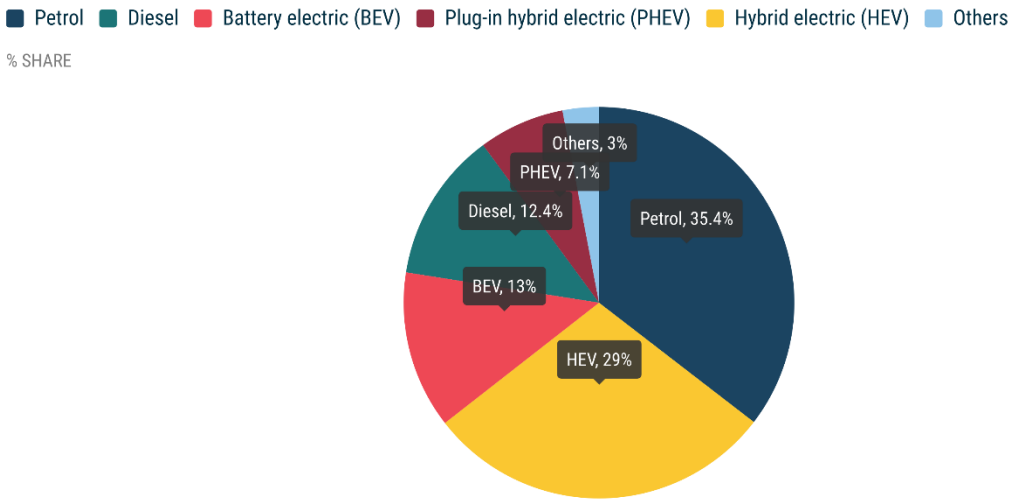
In **March 2024**, the European Union car market experienced its first decline of the year, registering a 5.2% decrease to 1 million units. The timing of the Easter holidays negatively impacted last month's sales across most EU markets, including the four largest: Germany (-6.2%), Spain (-4.7%), Italy (-3.7%), and France (-1.5%).

For the first quarter of the year, car registrations increased by 4.4%, reaching nearly 2.8 million units. The bloc's major markets saw solid growth from January to March, with Italy and France each recording a 5.7% increase, followed by Germany (+4.2%) and Spain (+3.1%).

NEW EU CAR REGISTRATIONS BY POWER SOURCE

Last **March** saw a shift in the car market's composition: battery-electric cars slipped to a 13% share from last year's 13.9%, while hybrid-electrics charged up to 29% from 24.4%. Petrol and diesel combined captured less than half the market (47.8%, from 51.8%).

Data source: the European Automobile Manufacturers' Association (ACEA), based on aggregated data provided by national automobile associations, ACEA members and S&P Global Mobility.



Electric cars

In **March 2024**, battery-electric car registrations declined by 11.3% to 134,397 units, reflecting the broader market downturn. Consequently, their market share shrank from 13.9% in March 2023 to 13% in the same month of this year. Among the three largest BEV markets, Belgium (+23.8%) and France (+10.9%) enjoyed double-digit increases, while Germany faced a significant decrease of 28.9%. The first quarter of 2024 ended with a total of 332,999 new battery-electric cars registered, a 3.8% rise from the same quarter in the previous year.

Hybrid-electric cars stood out, achieving a 12.6% rise in registrations in March, despite the general market decline. France and Italy, two of the three largest HEV markets, registered significant increases of 29.6% and 8.3%, respectively. Meanwhile, Germany saw a marginal decrease of 0.3%. This segment reached sales of 299,426 units, capturing 29% of the market, up from 24.4% in March 2023.

On the other hand, plug-in hybrid registrations fell by 6.5% last month, with Germany and Belgium experiencing declines of 4.5% and 15.3%, respectively. France countered the trend with a modest increase of 3.6%. In March, plug-in hybrids made up 73,029 units sold, equating to 7.1% of the overall car market.

Petrol and diesel cars

In **March 2024**, out of all powertrain segments, petrol and diesel were the most significantly impacted by the overall market downturn. Petrol sales decreased by 10.2%, with notable reductions across most EU markets, including France (-17.7%), Spain (-10.1%), and Germany (-3.4%). In contrast, Italy posted growth, with an increase of 5.7%. As a result, market share declined from 37.4% to 35.4% compared to March of the previous year.

The downturn in the diesel market was even more severe, with a 18.5% drop in March. Substantial declines were seen in the largest markets: France (-32.1%), Spain (-38%), and Italy (-27.6%), while Germany experienced only a slight reduction of 0.5%. Diesel car sales totalled 128,227 units, accounting for a market share of 12.4%, a decrease from last year's 14.4%.

NEW CAR REGISTRATIONS BY MARKET AND POWER SOURCE

MONTHLY

	BATTERY ELECTRIC			PLUG-IN HYBRID			HYBRID ELECTRIC[1]			OTHERS[2]			PETROL			DIESEL			TOTAL		
	March 2024	March 2023	% change 24/23	March 2024	March 2023	% change 24/23	March 2024	March 2023	% change 24/23	March 2024	March 2023	% change 24/23	March 2024	March 2023	% change 24/23	March 2024	March 2023	% change 24/23	March 2024	March 2023	% change 24/23
Austria	4,657	5,075	-8.2	1,477	1,898	-22.2	6,199	5,260	+17.9	6	1	+500.0	8,312	8,812	-5.7	5,050	5,261	-4.0	25,701	26,307	-2.3
Belgium	11,711	9,459	+23.8	7,160	8,450	-15.3	4,321	3,331	+29.7	434	403	+7.7	18,858	24,776	-23.9	2,267	5,335	-57.5	44,751	51,754	-13.5
Bulgaria	141	136	+3.7	53	22	+140.9	90	47	+91.5	140	109	+28.4	2,876	2,172	+32.4	644	567	+13.6	3,944	3,053	+29.2
Croatia	62	219	-71.7	148	91	+62.6	1,690	1,385	+22.0	223	136	+64.0	2,976	3,329	-10.6	1,311	1,252	+4.7	6,410	6,412	-0.03
Cyprus	146	64	+128.1	76	51	+49.0	678	563	+20.4	0	0		509	1,010	-49.6	28	63	-55.6	1,437	1,751	-17.9
Czechia	386	590	-34.6	475	399	+19.0	4,029	3,851	+4.6	494	344	+43.6	9,581	12,064	-20.6	3,951	5,130	-23.0	18,916	22,378	-15.5
Denmark	7,101	6,549	+8.4	852	1,926	-55.8	4,021	3,140	+28.1	0	0		4,420	5,599	-21.1	480	740	-35.1	16,874	17,954	-6.0
Estonia	92	110	-16.4	68	74	-8.1	648	798	-18.8	17	5	+240.0	571	1,025	-44.3	303	276	+9.8	1,699	2,288	-25.7
Finland	1,850	2,872	-35.6	1,406	1,384	+1.6	2,047	1,921	+6.6	18	25	-28.0	887	1,208	-26.6	275	267	+3.0	6,483	7,677	-15.6
France	33,981	30,635	+10.9	16,294	15,722	+3.6	49,908	38,515	+29.6	7,482	6,473	+15.6	58,861	71,501	-17.7	13,497	19,866	-32.1	180,023	182,712	-1.5
Germany	31,384	44,125	-28.9	16,016	16,776	-4.5	67,033	67,253	-0.3	1,293	1,339	-3.4	99,753	103,271	-3.4	48,365	48,597	-0.5	263,844	281,361	-6.2
Greece	549	724	-24.2	689	822	-16.2	4,662	3,829	+21.8	361	392	-7.9	5,195	5,891	-11.8	1,009	1,626	-37.9	12,465	13,284	-6.2
Hungary	1,174	650	+80.6	492	488	+0.8	6,606	4,616	+43.1	10	60	-83.3	3,353	4,451	-24.7	1,260	1,231	+2.4	12,895	11,496	+12.2
Ireland	1,998	3,412	-41.4	1,291	1,477	-12.6	3,335	3,748	-11.0	0	0		4,966	5,207	-4.6	3,087	3,841	-19.6	14,677	17,685	-17.0
Italy	5,357	8,161	-34.4	5,668	7,278	-22.1	62,798	57,962	+8.3	12,990	13,026	-0.3	50,765	48,044	+5.7	24,401	33,710	-27.6	161,979	168,181	-3.7
Latvia	99	150	-34.0	56	34	+64.7	496	537	-7.6	43	23	+87.0	581	792	-26.6	212	277	-23.5	1,487	1,813	-18.0
Lithuania	120	147	-18.4	110	74	+48.6	1,000	856	+16.8	46	61	-24.6	686	1,051	-34.7	329	377	-12.7	2,291	2,566	-10.7
Luxembourg	1,245	1,044	+19.3	343	514	-33.3	915	1,043	-12.3	0	0		1,478	1,801	-17.9	604	844	-28.4	4,585	5,246	-12.6
Malta	106	104	+1.9	65	86	-24.4	133	192	-30.7	1	0		274	262	+4.6	80	55	+45.5	659	699	-5.7
Netherlands	13,051	13,200	-1.1	4,969	5,247	-5.3	10,437	7,754	+34.6	256	149	+71.8	7,991	10,505	-23.9	415	454	-8.6	37,119	37,309	-0.5
Poland	1,705	1,913	-10.9	1,377	1,328	+3.7	22,803	18,200	+25.3	1,766	1,252	+41.1	17,658	21,947	-19.5	4,618	4,820	-4.2	49,927	49,460	+0.9
Portugal	3,739	3,549	+5.4	2,550	2,165	+17.8	3,732	3,419	+9.2	2,100	790	+165.8	8,884	8,661	+2.6	1,791	2,888	-38.0	22,796	21,472	+6.2
Romania	660	1,027	-35.7	0	0		3,294	3,240	+1.7	589	1,812	-67.5	2,806	4,824	-41.8	1,807	1,348	+34.1	9,156	12,251	-25.3
Slovakia	192	213	-9.9	185	211	-12.3	2,244	2,267	-1.0	160	191	-16.2	3,720	4,503	-17.4	1,253	1,467	-14.6	7,754	8,852	-12.4
Slovenia	349	565	-38.2	99	119	-16.8	571	763	-25.2	46	46	+0.0	3,308	2,866	+15.4	899	912	-1.4	5,272	5,271	+0.02
Spain	4,203	4,324	-2.8	5,559	5,955	-6.6	33,903	28,760	+17.9	2,177	1,671	+30.3	40,412	44,976	-10.1	8,586	13,840	-38.0	94,840	99,526	-4.7
Sweden	8,339	12,577	-33.7	5,551	5,540	+0.2	1,833	2,654	-30.9	768	754	+1.9	5,695	6,423	-11.3	1,705	2,311	-26.2	23,891	30,259	-21.0
EUROPEAN UNION	**134,397**	**151,594**	**-11.3**	**73,029**	**78,131**	**-6.5**	**299,426**	**265,904**	**+12.6**	**31,420**	**29,062**	**+8.1**	**365,376**	**406,971**	**-10.2**	**128,227**	**157,355**	**-18.5**	**1,031,875**	**1,089,017**	**-5.2**
Iceland	152	935	-83.7	117	169	-30.8	69	317	-78.2	0	0		53	208	-74.5	141	201	-29.9	532	1,830	-70.9
Norway	8,709	16,811	-48.2	210	837	-74.9	557	1,191	-53.2	0	0		76	196	-61.2	198	331	-40.2	9,750	19,366	-49.7
Switzerland	4,765	4,812	-1.0	1,994	2,131	-6.4	7,277	6,920	+5.2	1	23	-95.7	7,382	8,955	-17.6	2,048	2,343	-12.6	23,467	25,184	-6.8
EFTA	**13,626**	**22,558**	**-39.6**	**2,321**	**3,137**	**-26.0**	**7,903**	**8,428**	**-6.2**	**1**	**23**	**-95.7**	**7,511**	**9,359**	**-19.7**	**2,387**	**2,875**	**-17.0**	**33,749**	**46,380**	**-27.2**
United Kingdom	48,388	46,626	+3.8	24,517	17,933	+36.7	116,664	92,964	+25.5	0	0		119,005	119,278	-0.2	9,212	11,024	-16.4	317,786	287,825	+10.4
EU + EFTA + UK	**196,411**	**220,778**	**-11.0**	**99,867**	**99,201**	**+0.7**	**423,993**	**367,296**	**+15.4**	**31,421**	**29,085**	**+8.0**	**491,892**	**535,608**	**-8.2**	**139,826**	**171,254**	**-18.4**	**1,383,410**	**1,423,222**	**-2.8**

[1] Includes full and mild hybrids
[2] Includes fuel-cell electric vehicles, natural gas vehicles, LPG, E85/ethanol, and other fuels

NEW CAR REGISTRATIONS BY MARKET AND POWER SOURCE

YEAR TO DATE

	BATTERY ELECTRIC			PLUG-IN HYBRID			HYBRID ELECTRIC[1]			OTHERS[2]			PETROL			DIESEL			TOTAL		
	Jan-Mar 2024	Jan-Mar 2023	% change 24/23	Jan-Mar 2024	Jan-Mar 2023	% change 24/23	Jan-Mar 2024	Jan-Mar 2023	% change 24/23	Jan-Mar 2024	Jan-Mar 2023	% change 24/23	Jan-Mar 2024	Jan-Mar 2023	% change 24/23	Jan-Mar 2024	Jan-Mar 2023	% change 24/23	Jan-Mar 2024	Jan-Mar 2023	% change 24/23
Austria	10,802	11,235	-3.9	4,281	4,392	-2.5	14,959	12,682	+18.0	10	2	+400.0	20,520	21,961	-6.6	12,691	12,780	-0.7	63,263	63,052	+0.3
Belgium	31,091	20,779	+49.6	27,517	22,581	+21.9	12,773	9,937	+28.5	1,115	1,028	+8.5	55,237	62,369	-11.4	7,407	14,790	-49.9	135,140	131,484	+2.8
Bulgaria	411	474	-13.3	133	49	+171.4	224	141	+58.9	279	214	+30.4	8,533	5,633	+51.5	1,948	1,342	+45.2	11,528	7,853	+46.8
Croatia	194	566	-65.7	361	233	+54.9	4,361	2,745	+58.9	460	401	+14.7	6,919	6,890	+0.4	3,137	2,746	+14.2	15,432	13,581	+13.6
Cyprus	316	178	+77.5	192	110	+74.5	1,966	1,390	+41.4	0	0		1,851	2,213	-16.4	140	146	-4.1	4,465	4,037	+10.6
Czechia	1,307	1,323	-1.2	1,260	1,241	+1.5	11,602	9,613	+20.7	1,325	991	+33.7	30,252	30,555	-1.0	11,859	12,618	-6.0	57,605	56,341	+2.2
Denmark	15,201	11,894	+27.8	1,743	3,903	-55.3	7,708	7,871	-2.1	0	0		11,112	14,632	-24.1	1,176	1,646	-28.6	36,940	39,946	-7.5
Estonia	317	245	+29.4	182	131	+38.9	1,940	2,265	-14.3	35	17	+105.9	1,414	2,301	-38.5	828	699	+18.5	4,716	5,658	-16.6
Finland	4,767	6,587	-27.6	4,187	3,840	+9.0	6,065	6,056	+0.1	76	106	-28.3	2,423	3,494	-30.7	926	886	+4.5	18,444	20,969	-12.0
France	79,823	64,859	+23.1	38,575	36,516	+5.6	124,945	93,687	+33.4	19,538	16,731	+16.8	148,683	161,962	-8.2	33,338	47,132	-29.3	444,902	420,887	+5.7
Germany	81,337	94,736	-14.1	44,985	37,545	+19.8	173,927	156,236	+11.3	4,499	3,491	+28.9	258,583	248,550	+4.0	131,454	126,260	+4.1	694,785	666,818	+4.2
Greece	1,580	1,392	+13.5	2,012	1,766	+13.9	13,693	9,177	+49.2	647	889	-27.2	14,844	14,925	-0.5	3,892	5,623	-30.8	36,668	33,772	+8.6
Hungary	2,289	1,651	+38.6	1,484	1,401	+5.9	15,421	12,016	+28.3	33	226	-85.4	9,179	11,102	-17.3	3,267	3,141	+4.0	31,673	29,537	+7.2
Ireland	7,956	9,297	-14.4	5,089	4,626	+10.0	14,277	12,684	+12.6	0	0		20,749	18,257	+13.6	14,472	13,287	+8.9	62,543	58,151	+7.6
Italy	13,325	16,349	-18.5	14,415	18,968	-24.0	172,090	152,820	+12.6	43,340	39,943	+8.5	140,025	116,655	+20.0	67,781	82,032	-17.4	450,976	426,767	+5.7
Latvia	263	424	-38.0	114	77	+48.1	1,360	1,498	-9.2	112	83	+34.9	1,425	1,830	-22.1	644	817	-21.2	3,918	4,729	-17.1
Lithuania	356	421	-15.4	363	181	+100.6	2,872	2,406	+19.4	149	117	+27.4	1,989	2,752	-27.7	708	799	-11.4	6,437	6,676	-3.6
Luxembourg	2,966	2,513	+18.0	1,119	1,213	-7.7	2,762	2,517	+9.7	0	0		3,895	4,488	-13.2	1,756	2,418	-27.4	12,498	13,149	-5.0
Malta	274	257	+6.6	179	303	-40.9	347	326	+6.4	3	1	+200.0	624	565	+10.4	216	135	+60.0	1,643	1,587	+3.5
Netherlands	30,055	25,114	+19.7	14,255	13,598	+4.8	29,615	21,957	+34.9	722	463	+55.9	26,421	35,644	-25.9	942	1,129	-16.6	102,010	97,905	+4.2
Poland	4,191	4,095	+2.3	3,769	3,135	+20.2	64,846	46,931	+38.2	4,424	3,235	+36.8	50,442	54,351	-7.2	11,024	11,284	-2.3	138,696	123,031	+12.7
Portugal	9,424	8,399	+12.2	7,112	5,483	+29.7	9,118	8,684	+5.0	4,744	2,070	+129.2	23,775	19,725	+20.5	4,871	7,830	-37.8	59,044	52,191	+13.1
Romania	3,400	3,140	+8.3	0	0		11,245	9,842	+14.3	2,799	5,803	-51.8	10,464	14,142	-26.0	5,320	4,039	+31.7	33,228	36,966	-10.1
Slovakia	599	397	+50.9	594	495	+20.0	7,011	5,895	+18.9	515	500	+3.0	10,906	11,263	-3.170	3,766	3,605	+4.5	23,391	22,155	+5.6
Slovenia	904	1,146	-21.1	231	294	-21.4	1,629	1,685	-3.3	101	174	-42.0	8,742	7,613	+14.8	2,386	2,241	+6.5	13,993	13,153	+6.4
Spain	11,386	10,573	+7.7	15,700	14,876	+5.5	88,983	72,282	+23.1	7,356	5,209	+41.2	97,057	102,346	-5.2	24,397	32,279	-24.4	244,879	237,565	+3.1
Sweden	18,465	22,904	-19.4	14,149	12,811	+10.4	5,576	6,066	-8.1	2,213	1,575	+40.5	14,413	13,996	+3.0	5,006	5,951	-15.9	59,822	63,303	-5.5
EUROPEAN UNION	**332,999**	**320,948**	**+3.8**	**204,001**	**189,768**	**+7.5**	**801,315**	**669,409**	**+19.7**	**94,495**	**83,269**	**+13.5**	**980,477**	**990,214**	**-1.0**	**355,352**	**397,655**	**-10.6**	**2,768,639**	**2,651,263**	**+4.4**
Iceland	418	1,600	-73.9	303	463	-34.6	236	580	-59.3	0	2	-100.0	121	401	-69.8	308	448	-31.3	1,386	3,494	-60.3
Norway	20,073	24,231	-17.2	451	1,539	-70.7	1,033	1,860	-44.5	0	0		196	340	-42.4	499	693	-28.0	22,252	28,663	-22.4
Switzerland	10,424	10,250	+1.7	5,329	5,205	+2.4	17,677	16,243	+8.8	11	38	-71.1	18,306	21,502	-14.9	5,477	5,581	-1.9	57,224	58,819	-2.7
EFTA	**30,915**	**36,081**	**-14.3**	**6,083**	**7,207**	**-15.6**	**18,946**	**18,683**	**+1.4**	**11**	**40**	**-72.5**	**18,623**	**22,243**	**-16.3**	**6,284**	**6,722**	**-6.5**	**80,862**	**90,976**	**-11.1**
United Kingdom	84,314	76,233	+10.6	42,559	31,765	+34.0	190,239	156,051	+21.9	0	0		211,820	210,559	+0.6	16,616	19,652	-15.4	545,548	494,260	+10.4
EU + EFTA + UK	**448,228**	**433,262**	**+3.5**	**252,643**	**228,740**	**+10.4**	**1,010,500**	**844,143**	**+19.7**	**94,506**	**83,309**	**+13.4**	**1,210,920**	**1,223,016**	**-1.0**	**378,252**	**424,029**	**-10.8**	**3,395,049**	**3,236,499**	**+4.9**

[1] Includes full and mild hybrids
[2] Includes fuel-cell electric vehicles, natural gas vehicles, LPG, E85/ethanol, and other fuels

NEW CAR REGISTRATIONS BY MANUFACTURER

EUROPEAN UNION (EU)

	MARCH					JANUARY-MARCH				
	% share[1]		Units		% change	% share[1]		Units		% change
	2024	2023	2024	2023	24/23	2024	2023	2024	2023	24/23
Volkswagen Group	**24.3**	**25.3**	**251,007**	**275,749**	**-9.0**	**24.9**	**25.7**	**690,423**	**682,643**	**+1.1**
Volkswagen	10.0	10.3	103,239	111,771	-7.6	9.9	10.8	273,460	285,158	-4.1
Skoda	5.4	5.2	55,352	56,488	-2.0	5.9	5.5	163,896	145,126	+12.9
Audi	4.3	5.5	44,750	60,152	-25.6	4.6	5.3	127,326	140,790	-9.6
Seat	2.1	2.1	21,888	23,079	-5.2	2.1	2.2	58,203	57,603	+1.0
Cupra	1.6	1.5	16,433	16,213	+1.4	1.5	1.2	41,538	32,610	+27.4
Porsche	0.8	0.7	8,735	7,246	+20.5	0.9	0.7	24,470	19,559	+25.1
Others[2]	0.1	0.1	609	800	-23.8	0.1	0.1	1,529	1,797	-14.9
Stellantis	**18.3**	**19.9**	**189,081**	**216,383**	**-12.6**	**18.9**	**19.3**	**524,272**	**511,243**	**+2.5**
Peugeot	5.5	6.3	56,395	68,839	-18.1	5.8	6.1	161,372	161,306	+0.04
Citroen	3.9	3.8	40,374	41,067	-1.7	3.8	3.5	104,642	92,514	+13.1
Fiat[3]	3.3	3.4	33,740	37,186	-9.3	3.4	3.6	94,603	96,673	-2.1
Opel/Vauxhall	3.2	3.8	32,529	41,105	-20.9	3.3	3.5	92,241	92,359	-0.1
Jeep	1.1	1.1	11,719	11,767	-0.4	1.2	1.2	33,892	30,492	+11.2
Lancia/Chrysler	0.5	0.5	4,889	5,081	-3.8	0.5	0.4	12,987	11,135	+16.6
Alfa Romeo	0.5	0.5	4,772	5,247	-9.1	0.4	0.4	12,014	11,854	+1.3
DS	0.4	0.5	4,072	5,231	-22.2	0.4	0.5	11,083	12,719	-12.9
Others[4]	0.1	0.1	591	860	-31.3	0.1	0.1	1,438	2,191	-34.4
Renault Group	**10.5**	**10.1**	**108,201**	**110,527**	**-2.1**	**10.3**	**10.8**	**285,958**	**285,899**	**+0.02**
Renault	5.9	5.6	60,629	61,391	-1.2	5.2	5.6	144,163	148,675	-3.0
Dacia	4.6	4.5	47,219	48,991	-3.6	5.1	5.2	140,998	136,839	+3.0
Alpine	0.0	0.0	353	145	+143.4	0.0	0.0	797	385	+107.0
Toyota Group	**7.7**	**6.2**	**79,768**	**67,384**	**+18.4**	**8.1**	**7.2**	**224,976**	**191,526**	**+17.5**
Toyota	7.3	5.9	75,717	64,453	+17.5	7.7	6.9	212,307	183,010	+16.0
Lexus	0.4	0.3	4,051	2,931	+38.2	0.5	0.3	12,669	8,516	+48.8
Hyundai Group	**7.6**	**7.7**	**78,375**	**83,331**	**-5.9**	**7.8**	**8.3**	**216,475**	**219,440**	**-1.4**
Kia	3.9	3.9	40,030	42,128	-5.0	3.9	4.3	108,030	113,008	-4.4
Hyundai	3.7	3.8	38,345	41,203	-6.9	3.9	4.0	108,445	106,432	+1.9
BMW Group	**6.6**	**6.7**	**67,713**	**72,601**	**-6.7**	**6.4**	**6.2**	**178,407**	**165,153**	**+8.0**
BMW	5.6	5.3	57,898	57,362	+0.9	5.5	5.0	152,968	133,181	+14.9
Mini	1.0	1.4	9,814	15,239	-35.6	0.9	1.2	25,439	31,972	-20.4
Mercedes-Benz	**5.8**	**5.6**	**59,545**	**60,570**	**-1.7**	**5.0**	**5.5**	**139,781**	**145,571**	**-4.0**
Mercedes	5.6	5.3	57,365	58,056	-1.2	4.8	5.3	134,089	139,915	-4.2
Smart	0.2	0.2	2,180	2,514	-13.3	0.2	0.2	5,692	5,656	+0.6
Ford	**3.0**	**3.6**	**30,451**	**39,730**	**-23.4**	**3.0**	**3.8**	**82,094**	**99,480**	**-17.5**
Volvo Cars	**2.9**	**2.0**	**29,678**	**21,383**	**+38.8**	**2.7**	**2.0**	**74,982**	**53,797**	**+39.4**
Nissan	**2.9**	**2.3**	**30,236**	**25,477**	**+18.7**	**2.4**	**2.1**	**67,478**	**54,939**	**+22.8**
Tesla	**2.8**	**3.8**	**28,895**	**41,512**	**-30.4**	**2.4**	**2.6**	**66,203**	**69,464**	**-4.7**
Suzuki	**1.8**	**1.4**	**18,444**	**15,219**	**+21.2**	**1.8**	**1.4**	**49,561**	**36,739**	**+34.9**
Mazda	**1.5**	**1.6**	**15,047**	**17,908**	**-16.0**	**1.3**	**1.5**	**36,383**	**40,849**	**-10.9**
SAIC Motor	**1.2**	**1.1**	**12,591**	**11,472**	**+9.8**	**1.2**	**0.9**	**34,321**	**23,682**	**+44.9**
Mitsubishi	**1.1**	**0.3**	**11,217**	**3,550**	**+216.0**	**0.8**	**0.3**	**21,486**	**8,255**	**+160.3**
Jaguar Land Rover Group	**0.6**	**0.7**	**6,011**	**7,136**	**-15.8**	**0.6**	**0.6**	**16,671**	**17,021**	**-2.1**
Land Rover	0.5	0.5	5,230	5,858	-10.7	0.5	0.5	14,831	14,347	+3.4
Jaguar	0.1	0.1	781	1,278	-38.9	0.1	0.1	1,840	2,674	-31.2
Honda	**0.4**	**0.3**	**4,223**	**2,806**	**+50.5**	**0.4**	**0.3**	**10,818**	**7,490**	**+44.4**

[1] ACEA estimation based on total by market
[2] Bentley, Bugatti, Lamborghini, and MAN
[3] Includes Abarth
[4] Dodge, Maserati, and RAM

NEW CAR REGISTRATIONS BY MANUFACTURER

EU + EFTA + UK

	MARCH					JANUARY-MARCH				
	% share[1]		Units		% change	% share[1]		Units		% change
	2024	2023	2024	2023	24/23	2024	2023	2024	2023	24/23
Volkswagen Group	**23.4**	**24.4**	**323,773**	**346,806**	**-6.6**	**24.4**	**25.4**	**827,568**	**821,614**	**+0.7**
Volkswagen	9.3	9.7	128,716	138,086	-6.8	9.5	10.4	322,076	336,526	-4.3
Skoda	4.9	4.7	67,460	66,228	+1.9	5.5	5.2	187,933	168,107	+11.8
Audi	4.7	5.7	64,952	81,509	-20.3	4.8	5.5	164,195	179,154	-8.3
Seat	2.0	2.0	28,346	28,395	-0.2	2.1	2.1	70,794	68,723	+3.0
Cupra	1.5	1.4	20,951	19,920	+5.2	1.5	1.2	49,548	39,541	+25.3
Porsche	0.9	0.8	12,503	11,449	+9.2	0.9	0.8	31,004	27,054	+14.6
Others[2]	0.1	0.1	844	1,219	-30.8	0.1	0.1	2,017	2,509	-19.6
Stellantis	**16.5**	**17.6**	**228,740**	**250,673**	**-8.7**	**17.6**	**17.7**	**598,167**	**574,251**	**+4.2**
Peugeot	5.0	5.5	68,786	78,804	-12.7	5.4	5.5	184,276	178,871	+3.0
Opel/Vauxhall	3.5	3.8	48,445	53,820	-10.0	3.6	3.6	122,049	116,453	+4.8
Citroen	3.3	3.3	45,515	46,935	-3.0	3.4	3.2	114,829	103,057	+11.4
Fiat[3]	2.7	2.9	37,657	41,076	-8.3	3.0	3.2	101,383	103,633	-2.2
Jeep	1.0	0.9	13,426	12,530	+7.2	1.1	1.0	36,849	32,208	+14.4
Lancia/Chrysler	0.4	0.4	4,889	5,082	-3.8	0.4	0.3	12,987	11,137	+16.6
Alfa Romeo	0.4	0.4	5,019	5,640	-11.0	0.4	0.4	12,574	12,524	+0.4
DS	0.3	0.4	4,281	5,673	-24.5	0.3	0.4	11,536	13,710	-15.9
Others[4]	0.1	0.1	722	1,113	-35.1	0.0	0.1	1,684	2,658	-36.6
Renault Group	**8.9**	**8.5**	**123,603**	**120,352**	**+2.7**	**9.2**	**9.5**	**313,194**	**306,549**	**+2.2**
Renault	5.1	4.6	70,144	65,991	+6.3	4.7	4.9	160,718	159,197	+1.0
Dacia	3.8	3.8	52,993	54,165	-2.2	4.5	4.5	151,497	146,869	+3.2
Alpine	0.0	0.0	466	196	+137.8	0.0	0.0	979	483	+102.7
Hyundai Group	**8.1**	**8.4**	**112,692**	**119,349**	**-5.6**	**8.2**	**8.7**	**278,432**	**282,169**	**-1.3**
Kia	4.3	4.4	59,335	63,053	-5.9	4.2	4.6	143,151	148,571	-3.6
Hyundai	3.9	4.0	53,357	56,296	-5.2	4.0	4.1	135,281	133,598	+1.3
Toyota Group	**7.4**	**6.5**	**102,400**	**92,301**	**+10.9**	**7.7**	**7.2**	**261,707**	**234,103**	**+11.8**
Toyota	6.9	6.2	95,358	87,778	+8.6	7.2	6.9	244,632	222,662	+9.9
Lexus	0.5	0.3	7,042	4,523	+55.7	0.5	0.4	17,075	11,441	+49.2
BMW Group	**7.0**	**6.9**	**96,961**	**97,846**	**-0.9**	**6.9**	**6.5**	**234,622**	**209,802**	**+11.8**
BMW	5.8	5.2	80,371	74,631	+7.7	5.8	5.1	195,807	164,836	+18.8
Mini	1.2	1.6	16,589	23,215	-28.5	1.1	1.4	38,815	44,966	-13.7
Mercedes-Benz	**5.9**	**5.6**	**81,717**	**79,520**	**+2.8**	**5.1**	**5.5**	**172,957**	**176,823**	**-2.2**
Mercedes	5.7	5.4	79,422	76,955	+3.2	4.9	5.3	166,991	170,986	-2.3
Smart	0.2	0.2	2,295	2,565	-10.5	0.2	0.2	5,966	5,837	+2.2
Ford	**3.5**	**4.3**	**48,161**	**61,540**	**-21.7**	**3.4**	**4.3**	**116,538**	**138,653**	**-15.9**
Nissan	**3.8**	**3.1**	**51,988**	**43,594**	**+19.3**	**3.0**	**2.5**	**103,259**	**82,466**	**+25.2**
Volvo Cars	**2.8**	**2.0**	**38,582**	**29,112**	**+32.5**	**2.7**	**2.2**	**92,142**	**69,965**	**+31.7**
Tesla	**2.9**	**4.3**	**40,109**	**61,613**	**-34.9**	**2.5**	**2.9**	**86,443**	**94,487**	**-8.5**
SAIC Motor	**1.9**	**1.7**	**25,992**	**23,952**	**+8.5**	**1.7**	**1.4**	**58,621**	**44,851**	**+30.7**
Suzuki	**1.7**	**1.4**	**24,109**	**20,106**	**+19.9**	**1.7**	**1.4**	**58,445**	**44,692**	**+30.8**
Mazda	**1.5**	**1.7**	**20,227**	**23,661**	**-14.5**	**1.3**	**1.6**	**45,141**	**51,102**	**-11.7**
Jaguar Land Rover Group	**1.8**	**1.5**	**24,649**	**21,691**	**+13.6**	**1.3**	**1.2**	**44,828**	**38,440**	**+16.6**
Land Rover	1.4	1.3	19,154	18,411	+4.0	1.1	1.0	36,170	32,325	+11.9
Jaguar	0.4	0.2	5,495	3,280	+67.5	0.3	0.2	8,658	6,115	+41.6
Honda	**0.9**	**0.5**	**12,754**	**7,775**	**+64.0**	**0.7**	**0.5**	**24,131**	**16,146**	**+49.5**
Mitsubishi	**0.8**	**0.3**	**11,586**	**3,779**	**+206.6**	**0.7**	**0.3**	**22,334**	**8,672**	**+157.5**

[1] ACEA estimation based on total by market
[2] Bentley, Bugatti, Lamborghini, and MAN
[3] Includes Abarth
[4] Dodge, Maserati, and RAM

https://rbnenergy.com/the-epa-drives-me-crazy-new-us-rule-on-tailpipe-emisisons-conflicts-with-energy-reality

(The EPA) Drives Me Crazy - New U.S. Rule On Tailpipe Emissions Conflicts With Energy Reality

Friday, 04/12/2024 Published by: Jason Lindquist

The Biden administration recently announced a very ambitious — to say the least — rule on tailpipe emissions. But while the rule's legal and political standing might be a bit uncertain — it's seen by many as a de facto ban on conventionally fueled cars and trucks and is likely to face several court challenges — doubts also remain about whether it matches up with the realities of today's energy world. In today's RBN blog, we look at the new rule, what it would mean for U.S. consumers and automakers, and how it conflicts with the views of RBN's Refined Fuels Analytics (RFA) practice on the future of global oil and refined products demand and the rate of electric vehicle (EV) adoption.

The push to reduce greenhouse gas (GHG) emissions in the transportation sector has been a key piece of President Biden's climate agenda since taking office in 2021. His administration has a two-track strategy aimed at the auto industry: (1) make sure cars and trucks use less gasoline, and (2) make sure the vehicles on the road produce fewer emissions.

To achieve the first goal, the National Highway Transportation and Safety Administration (NHTSA) has sought to improve the fuel efficiency of U.S. passenger vehicles and light trucks through changes to Corporate Average Fuel Economy (CAFE) requirements. The agency in 2022 amended the rules for the 2024-26 model years to require a fleet average of 49 miles per gallon (mpg) by 2026, increasing efficiency requirements by 8% annually for the affected model years. (CAFE standards for 2021-26 passed by the Trump administration called for 1.5% annual increases.)

NHTSA followed that up in July 2023 with its proposal to increase the nationwide fleet average to 58 mpg by 2032 in its rules to cover the 2027-32 model years. Under that proposal — for which a final rule has yet to be published — CAFE standards for passenger vehicles would climb by 2% per year, while light trucks would see 4% annual increases. Note that CAFE requirements use a different methodology to determine fuel economy than that used by the Environmental Protection Agency (EPA) when calculating the mpg number on a vehicle's window sticker. As a result, the CAFE fuel economy is typically considerably higher than what is displayed on the window sticker. Also note that EVs receive *very favorable treatment* in the CAFE rules, but this could change going forward. (A link to the proposed rulemaking, issued in April of last year, is available here.)

To achieve the second goal — that is, to minimize emissions — the EPA in April 2023 rolled out an aggressive proposal to reduce tailpipe emissions and speed the transition to EVs. (The Biden administration hopes that EVs and plug-in hybrids will account for half of U.S. new-car sales by 2030. Hybrids of all types accounted for about 10.5% of sales in Q4 2023; EVs accounted for another 8.1%.) The EPA proposal called for 13% annual average pollution cuts and a 56% reduction in projected fleet average emissions through 2032 (compared with 2026 requirements) for passenger vehicles and light trucks. (The EPA also proposed stricter emissions standards for medium-duty and heavy-duty trucks through 2032.) The EPA said the rules would reduce carbon dioxide (CO_2) emissions by more than 9 billion tons through 2055. These rules, interestingly, do not account for GHG emissions from the electricity produced to power EVs. Rather, EVs are counted as having zero GHG emissions, even though electricity production can be a GHG-intensive process.

Projected New Vehicle Market Share Under Various Compliance Scenarios							
Pathway	Technology	2027	2028	2029	2030	2031	2032
Pathway A: Higher BEV Pathway (base case)	ICE	64%	58%	49%	43%	35%	29%
	HEV	4%	5%	5%	4%	3%	3%
	PHEV	6%	6%	8%	9%	11%	13%
	BEV	26%	31%	39%	44%	51%	56%
Pathway B: Moderate HEV and PHEV Pathway	ICE	62%	56%	49%	39%	28%	21%
	HEV	4%	4%	3%	6%	7%	6%
	PHEV	10%	12%	15%	18%	24%	29%
	BEV	24%	29%	33%	37%	41%	43%
Pathway C: Higher HEV and PHEV Pathway	ICE	61%	41%	35%	27%	19%	17%
	HEV	4%	15%	13%	16%	15%	13%
	PHEV	10%	17%	22%	27%	32%	36%
	BEV	24%	26%	30%	31%	34%	35%

Figure 1. Projected New Vehicle Market Share Under Various Compliance Scenarios. Source: EPA

Under the EPA's original proposal, it was forecast that automakers would have to produce 60% EVs by 2030 and 67% by 2032 to meet requirements, which some industry groups and automakers said was effectively a ban on internal combustion engine (ICE) vehicles, since a rapid shift to EVs was seen as the likeliest — and potentially only — way to comply with the new standard. The EPA softened those requirements a bit when the final rule was published in February 2024 and emphasized that it does not set a hard target for EVs or ICE vehicles. Under the EPA's base case (orange-shaded section in Figure 1 above), ICE vehicles would account for 64% of new-car sales in 2027 (dashed black oval) and fall to 29% in 2032 (dashed green oval), and battery-electric vehicles (BEVs) would climb from 26% (dashed red oval) to 56% (dashed purple oval) during the same time span. Other modeling (blue- and green-shaded sections) shows different changes for ICE vehicles and EVs, depending on how manufacturers incorporate plug-in hybrids (PHEVs) and standard hybrids (HEVs) into their model lines to help meet the EPA guidelines.

It's true that any major piece of regulation is going to produce at least some pushback by those affected, but the Biden administration's targets for lower tailpipe emissions and much-higher EV sales will be difficult, if not impossible, to hit, in large part because they don't line up with the reality of today's energy world.

There are a variety of significant barriers to wider EV adoption — an essential element in the EPA's new rule — starting with politics, technical limitations and consumer acceptance. In addition to the criticism calling the EPA's new rule a back-door ban on ICE vehicles, concerns have been raised about whether faster EV adoption would only serve to further China's current dominance in the global market (something the rules around EV tax credits in the Inflation Reduction Act are intended to address). The U.S. also lacks the essential infrastructure (charging-station networks, for example) to support a rapid escalation of EV adoption, and the rule's singular focus on tailpipe emissions — as opposed to emissions throughout the entire manufacturing process for EVs and ICE vehicles — is also a point of concern in the industry. It's also important to note that while EV sales have grown in recent years (starting from a very small base), that growth in sales volumes and market share could be slowing as consumers in the wider market have balked for a variety of "ease of use" factors and the higher price tags associated with many EVs.

Another obstacle to greater EV adoption is slower fleet turnover. Most people don't buy vehicles all that often and they can be expensive — the average price for a new vehicle was more than $47,000 during January and February 2024, according to Cox Automotive data — which has led many drivers to hold onto their vehicles for longer periods of time. (EVs and hybrids are generally more expensive than ICE vehicles, although that gap is narrowing.) The average age of a U.S. light vehicle (passenger cars and light-duty trucks) was 12.5 years in 2023, according to government data, up from 11.4 years in 2013 and 9.8 years in 2003. That means that even if EV sales were to zoom higher in the coming years, they would remain a small slice of the overall U.S. fleet for quite a while. For the best example of this, let's look at Norway, which has one of the highest rates of EV adoption in the world. As noted in RFA's latest Future of Fuels report, even with EVs responsible for more than 80% of new-car sales in Norway, their share of the overall fleet is much lower — about 30% of all cars on the road — because it takes a long time to change the makeup of a country's entire fleet of vehicles. Norway's experience also shows that even as

EV adoption grows, the impact on petroleum demand is not as great as might be expected. While demand for gasoline and diesel has fallen in Norway since 2014, the level of these declines does not differ in any material way from most of its neighbors with much lower EV adoption rates — Denmark, Finland, France, Germany, Sweden and Switzerland, to name a few.

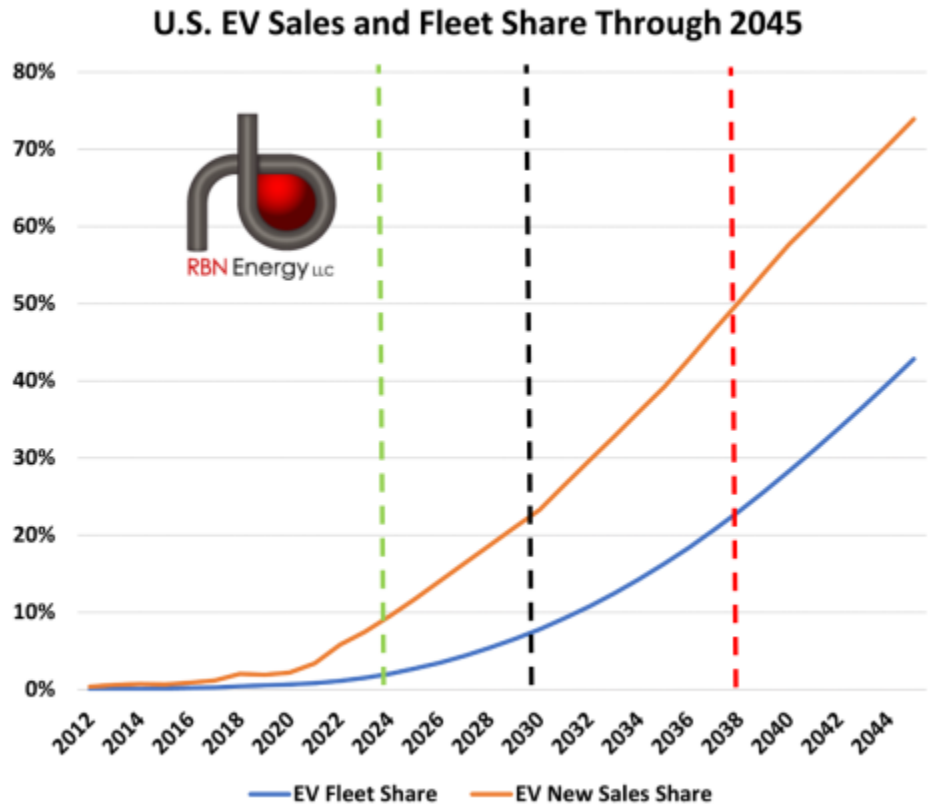


Figure 2. Forecast EV Sales and Fleet Share Through 2045. Source: Refined Fuels Analytics

The data from Norway also indicate what changes in the U.S. fleet could look like over time. RFA sees EV adoption proceeding at a much more measured pace than hoped for by the Biden administration, with EVs accounting for 9.5% of sales (orange line in Figure 2 above) and making up 2% of cars on the road (blue line) in 2024 (dashed vertical green line), reaching 23.3% of sales and 7.8% of cars on the road in 2030 (dashed vertical black line). RFA does not see EVs hitting 50% of sales until 2038 (dashed vertical red line), with the share of cars on the road topping out at 42.8% in 2045, the end of the forecast period.

While there's no doubt that EVs will have a significant downward impact on global demand (particularly for gasoline) in the long term, RFA believes the impact will be smaller than most anticipate, especially in the near term. RFA does not expect global liquid fuels demand to peak until 2040 — well after the 2028 forecast by the International Energy Agency (IEA). As shown in Figure 3 below, RFA's forecast has global demand reaching 109 MMb/d in 2028, about 3.5 MMb/d above the IEA's estimate (dashed black oval), then climbing to a peak of 115 MMb/d in 2040. [RFA's forecast is based on petroleum needed to meet International Monetary Fund (IMF) forecasts for gross domestic product (GDP) and United Nations (UN) population estimates.]

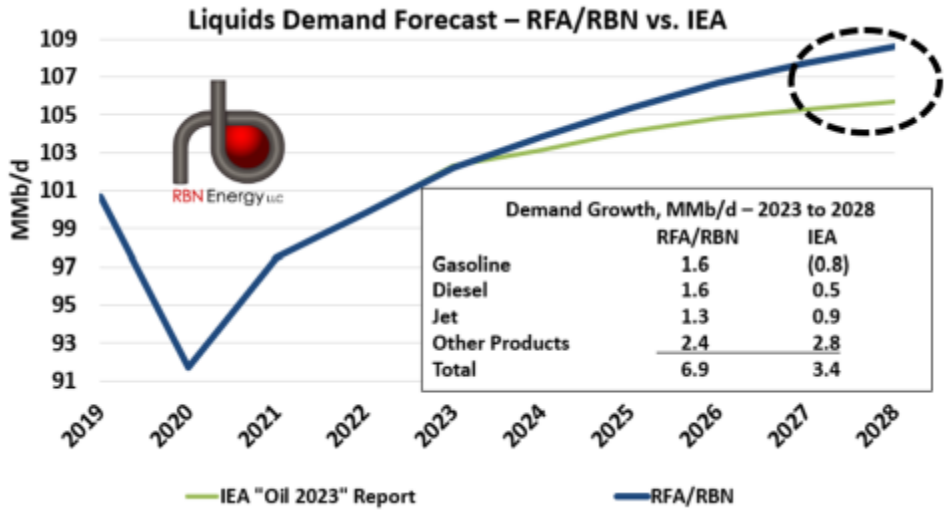


Figure 3. Global Liquids Demand Forecast Through 2028. Source: Refined Fuels Analytics

Most of the difference in forecasts shown in Figure 3 is attributable to RFA's less-pessimistic view of gasoline demand. While RFA sees gasoline demand growing by 1.6 MMb/d between 2023 and 2028, the IEA sees it falling by 800 Mb/d. Both forecasts see demand growing for diesel, jet fuel and other refined products during that period, although by different amounts. It's a similar story for North America, as RFA expects demand for liquid fuels to be relatively flat through 2028, with a modest decline in gasoline balanced out by similar increases for diesel, jet and other products. But just like with the global outlook, this stands in contrast to the IEA's assumptions, which see lower demand for everything but jet fuel.

Forecasting demand for gasoline in a period when many governments around the world — including those in the U.S., China and much of Europe — are pushing EVs is admittedly a challenging task. But from what we've seen lately regarding EV adoption patterns in the U.S. and the difficulty of establishing EV-supportive infrastructure, it seems likely that the transition from ICE-dominated highways to highways choked with EVs may well take quite a bit longer than many hope.

"She Drives Me Crazy" was written by Roland Gift and David Steele and appears as the first song on side one of Fine Young Cannibals' second and final studio album, *The Raw and the Cooked*. The song was recorded in Studio B of Prince's Paisley Park complex. The unique percussive snare drum sound on the song that rides prominently in the mix was achieved when producer David Z combined a Linn drum machine snare sound with a live snare drum miked on the bottom head and played back through a speaker resting on the top head. Released as a single in December 1988, it went to #1 on the Billboard Hot 100 Singles chart and has been certified Gold by the Recording industry Association of America. Dolly Parton recorded a country version of the song that was on her 2008 album, *Backwoods Barbie*. Personnel on the record were: Roland Gift (vocals), Andy Cox (guitar), and David Steele (bass, keyboards, drum machine, drum samples).

The Raw & the Cooked was recorded during 1986-88 at AIR in London and Paisley Park in Chanhassen, MN. The title of the album was taken from the book of the same name by French anthropologist Claude Levi-Strauss. Four of the songs on the album had appeared previously on soundtracks. The band hired producer David Z to come in and finish the newer tunes with an emphasis on creating dance-friendly mixes. Released in January 1989, it went to #6 on the Billboard 200 Albums chart and has been certified 2x Platinum by the RIAA. Eight singles were released from the LP.

Fine Young Cannibals were an English pop rock band formed in Birmingham, England, by former English Beat members David Steele and Andy Cox along with singer Roland Gift. They released two studio albums, one remix album, and 12 singles. They won two Brit Awards, one Ivor Novello Award, and three ASCAP Pop Music Awards before breaking up in 1992. Vocalist Roland Gift has gone on to a successful acting career. Bassist David Steele has been involved in record production and session work and was a

member of Fried, who released two studio albums and three singles. Guitarist Andy Cox still works as a guitarist and is a member of Cribabi, who has released one studio album.

Weekly commentary

BlackRock

April 8, 2024

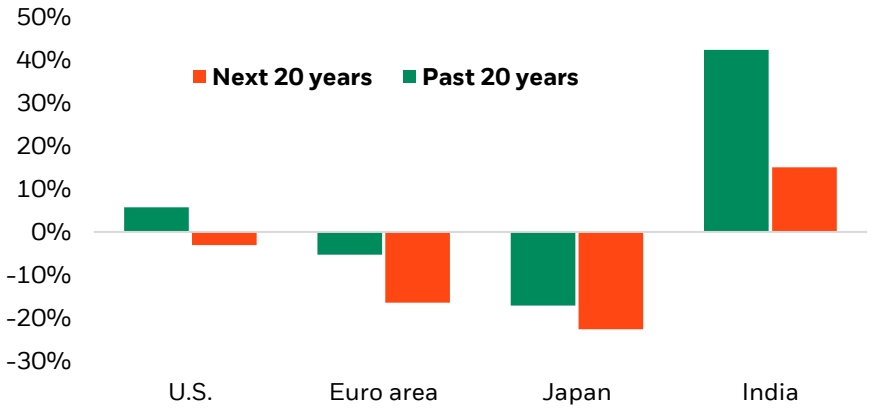
Playing demographic divergence now

- Working-age populations are declining in major economies. We favor countries that are better adapting and sectors set to benefit from spending shifts.
- U.S. yields jumped last week but U.S. stocks remain near all-time highs. The strong March U.S. jobs data supports our view of only two or three cuts this year.
- We eye this week's U.S. CPI. We see goods inflation pulling down overall inflation while services remain sticky. We watch for how soon the ECB will cut rates.

Working-age populations are shrinking across developed markets (DMs) but still growing in emerging markets (EMs). That hurts DM economic growth and favors EM growth – a divergence that is broadly reflected in asset prices, in our view. Yet we think the demographic mega force is also driving structural shifts in sectors – like healthcare and real estate – that are not priced in. We get selective, seeking EMs capitalizing on their younger populations and DMs better adapting to aging.

Mind the DM-EM gap

Change in domestic working-age population, next 20 years vs. past 20 years



Forward-looking estimates may not come to pass. Source: BlackRock Investment Institute, United Nations, with data from Haver Analytics, April 2024. Notes: The chart shows the percentage change in the domestic working-age population (aged 15-64), 2003-2023 vs. 2024-2044. The domestic working-age population is calculated by subtracting the UN's migration projections from the UN's population projections that include migration, assuming the overall age structure does not change.

Life expectancy is rising and birth rates are falling across the globe. In many DMs, that means the working-age population is set to shrink over the next 20 years. See the chart. That has vast macro implications. Fewer workers means slower growth. It is also inflationary, in our view. Retirees stop producing economic output, but do not typically spend less, historical data show. Plus, governments are likely to spend more on healthcare and pensions. The resulting inflationary pressure is one reason why we expect central bank policy rates to stay above pre-pandemic levels. Aging-related spending also threatens to push up government debt, with global public debt having already tripled since the mid-1970s to 92% of global GDP in 2022. And that debt is likely to be subject to higher interest costs. The economic picture looks quite different in EMs, like India, where the working-age population is still growing.

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We think the broad growth impact of diverging population trends is well understood by markets. Yet as we outline in our new research paper, countries can respond differently – creating an uncertain outlook. We believe this will affect asset prices as markets adjust to how countries adapt. Within EMs, we seek those more likely to capitalize on their demographic advantage by bringing more working-age people into the workforce or that look to ramp up investment in productive capital, like public infrastructure. Growing populations consume more energy, so we expect rising spending on energy infrastructure in places like India and Indonesia. We think higher returns are likely in EMs with stronger growth and greater investment demand.

In DMs, we look for those that could better adapt and outperform the growth outlook markets have priced. DMs can mitigate the hit to growth by finding more workers – from other countries, or among women and other groups underrepresented in the workforce. Japan has somewhat lessened the impact of aging by substantially raising female participation. The recent immigration surge in the U.S., UK and Canada is boosting their workforces, as reflected in last week's bumper U.S. jobs report, but it would have to persist for years to fully offset working-age population declines – unlikely, in our view. We're monitoring how much artificial intelligence (AI) can boost the productivity of a smaller workforce.

Even less understood by markets, we believe, is the sectoral impact of mega forces – or big structural shifts driving returns. Older populations spend differently than younger ones. For example, healthcare spending rises with age. Real estate demand could change since older people typically move less frequently. Yet research shows even predictable spending shifts are not priced in until they hit. That was true for healthcare in Japan, where valuations have risen broadly in lockstep with the well-signposted growth of the country's retired population. That appears true now in the U.S. and Europe – one reason we like healthcare in both regions. We also think AI names will benefit from investment in automation to boost worker productivity.

Bottom line: In EM, we favor countries best able to capitalize on their demographic advantage. We prefer DMs whose responses to aging could be underappreciated. We target sectors and firms poised to benefit from new spending patterns.

Market backdrop

The S&P 500 dipped 1% last week but was near a record high and 10-year Treasury yields jumped to their highs of the year near 4.40%. The March U.S. payrolls data showed job gains easily beating expectations. We think this reflects an unexpected surge in immigration helping expand the workforce. Markets are pricing in between two and three quarter-point Fed rate cuts this year. We think June is no longer a given for the Fed to start cutting rates – but see rate cuts coming as inflation falls.

Assets in review

Selected asset performance, year-to-date return and range

Past performance is not a reliable indicator of current or future results. Indexes are unmanaged and do not account for fees. It is not possible to invest directly in an index.

Sources: BlackRock Investment Institute, with data from LSEG Datastream as of April 4, 2024. Notes: The two ends of the bars show the lowest and highest returns at any point year to date, and the dots represent current year-to-date returns. Emerging market (EM), high yield and global corporate investment grade (IG) returns are denominated in U.S. dollars, and the rest in local currencies. Indexes or prices used are: spot Brent crude, ICE U.S. Dollar Index (DXY), spot gold, MSCI Emerging Markets Index, MSCI Europe Index, LSEG Datastream 10-year benchmark government bond index (U.S., Germany and Italy), Bank of America Merrill Lynch Global High Yield Index, J.P. Morgan EMBI Index, Bank of America Merrill Lynch Global Broad Corporate Index and MSCI USA Index.

Week ahead

April 10	U.S. CPI	**April 12**	University of Michigan consumer sentiment survey; China trade data; UK GDP
April 11	China CPI and PPI; European Central Bank policy decision	**April 10–17**	China total social financing

U.S. inflation data is in focus this week. We expect inflation to fall toward the Federal Reserve's 2% policy target this year as goods prices keep falling from pandemic highs. Yet we still see inflation on a rollercoaster back up in 2025, led by stubborn services inflation. We think core inflation will settle closer to 3% – higher than pre-pandemic levels. We watch for the European Central Bank (ECB) to give more clues on the timing of rate cuts at next week's policy meeting.

Big calls

Our highest conviction views on tactical (6-12 month) and strategic (long-term) horizons, April 2024

Tactical	Reasons
U.S. equities	• Our macro view has us neutral at the benchmark level. But the AI theme and its potential to generate alpha – or above-benchmark returns – push us to be overweight overall.
Income in fixed income	• The income cushion bonds provide has increased across the board in a higher rate environment. We like short-term bonds and are now neutral long-term U.S. Treasuries as we see two-way risks ahead.
Geographic granularity	• We favor getting granular by geography and like Japan equities in DM. Within EM, we like India and Mexico as beneficiaries of mega forces even as relative valuations appear rich.
Strategic	**Reasons**
Private credit	• We think private credit is going to earn lending share as banks retreat – and at attractive returns relative to public credit risk.
Inflation-linked bonds	• We see inflation staying closer to 3% in the new regime on a strategic horizon.
Short- and medium-term bonds	• We overall prefer short-term bonds over long term. That's due to more uncertain and volatile inflation, heightened bond market volatility and weaker investor demand.

Note: Views are from a U.S. dollar perspective, April 2024. This material represents an assessment of the market environment at a specific time and is not intended to be a forecast of future events or a guarantee of future results. This information should not be relied upon by the reader as research or investment advice regarding any particular funds, strategy or security.

Tracking five mega forces

Mega forces are big, structural changes that affect investing now – and far in the future. As key drivers of the new regime of greater macroeconomic and market volatility, they change the long-term growth and inflation outlook and are poised to create big shifts in profitability across economies and sectors. This creates major opportunities – and risks – for investors. See our web hub for our research and related content on each mega force.

1. **Demographic divergence:** The world is split between aging advanced economies and younger emerging markets – with different implications.
2. **Digital disruption and artificial intelligence (AI):** Technologies that are transforming how we live and work.
3. **Geopolitical fragmentation and economic competition:** Globalization is being rewired as the world splits into competing blocs.
4. **Future of finance:** A fast-evolving financial architecture is changing how households and companies use cash, borrow, transact and seek returns.
5. **Transition to a low-carbon economy:** The transition is set to spur a massive capital reallocation as energy systems are rewired.

Granular views

Six- to 12-month tactical views on selected assets vs. broad global asset classes by level of conviction, April 2024

Our approach is to first determine asset allocations based on our macro outlook – and what's in the price. **The table below reflects this and, importantly, leaves aside the opportunity for alpha, or the potential to generate above-benchmark returns.** The new regime is not conducive to static exposures to broad asset classes, in our view, but is creating more space for alpha**.**

Underweight | **Neutral** | **Overweight** ● Previous view

	Asset		View	Commentary
Equities	**Developed markets**			
	United States	Benchmark	Neutral	We are neutral in our largest portfolio allocation. Falling inflation and coming Fed rate cuts can underpin the rally's momentum. We are ready to pivot once the market narrative shifts.
		Overall	+1	We are overweight overall when incorporating our U.S.-centric positive view on artificial intelligence (AI). We think AI beneficiaries can still gain while earnings growth looks robust.
	Europe		-1	We are underweight. While valuations look fair to us, we think the near-term growth and earnings outlook remain less attractive than in the U.S. and Japan – our preferred markets.
	UK		Neutral	We are neutral. We find attractive valuations better reflect the weak growth outlook and the Bank of England's sharp rate hikes to fight sticky inflation.
	Japan		+2	We are overweight. Mild inflation, strong earnings growth and shareholder-friendly reforms are all positives. We see the BOJ policy shift as a normalization, not a shift to tightening.
	Emerging markets		Neutral	We are neutral. We see growth on a weaker trajectory and see only limited policy stimulus from China. We prefer EM debt over equity.
	China		Neutral	We are neutral. Modest policy stimulus may help stabilize activity, and valuations have come down. Structural challenges such as an aging population and geopolitical risks persist.
Fixed Income	Short U.S. Treasuries		+1	We are overweight. We prefer short-term government bonds for income as interest rates stay higher for longer
	Long U.S. Treasuries		Neutral	We are neutral. The yield surge driven by expected policy rates has likely peaked. We now see about equal odds that long-term yields swing in either direction.
	U.S. inflation-linked bonds		Neutral	We are neutral. We see higher medium-term inflation, but cooling inflation and growth may matter more near term.
	Euro area inflation-linked bonds		Neutral	We are neutral. Market expectations for persistent inflation in the euro area have come down.
	Euro area govt bonds		Neutral	We are neutral. Market pricing reflects policy rates in line with our expectations and 10-year yields are off their highs. Widening peripheral bond spreads remain a risk.
	UK gilts		Neutral	We are neutral. Gilt yields have compressed relative to U.S. Treasuries. Markets are pricing in Bank of England policy rates closer to our expectations.
	Japanese govt bonds		-2	We are underweight. We find more attractive returns in equities. We see some of the least attractive returns in Japanese government bonds, so we use them as a funding source.
	China govt bonds		Neutral	We are neutral. Bonds are supported by looser policy. Yet we find yields more attractive in short-term DM paper.
	U.S. agency MBS		Neutral	We are neutral. We see agency MBS as a high-quality exposure in a diversified bond allocation and prefer it to IG.
	Global IG credit		-1	We are underweight. Tight spreads don't compensate for the expected hit to corporate balance sheets from rate hikes, in our view. We prefer Europe over the U.S.
	Global high yield		Neutral	We are neutral. Spreads are tight, but we like its high total yield and potential near-term rallies. We prefer Europe.
	Asia credit		Neutral	We are neutral. We don't find valuations compelling enough to turn more positive.
	Emerging hard currency		+1	We are overweight. We prefer EM hard currency debt due to its relative value and quality. It is also cushioned from weakening local currencies as EM central banks cut policy rates.
	Emerging local currency		Neutral	We are neutral. Yields have fallen closer to U.S. Treasury yields. Central bank rate cuts could hurt EM currencies, dragging on potential returns.

Past performance is not a reliable indicator of current or future results. It is not possible to invest directly in an index. Note: Views are from a U.S. dollar perspective. This material represents an assessment of the market environment at a specific time and is not intended to be a forecast or guarantee of future results. This information should not be relied upon as investment advice regarding any particular fund, strategy or security.

BlackRock Investment Institute

The BlackRock Investment Institute (BII) leverages the firm's expertise and generates proprietary research to provide insights on macroeconomics, sustainable investing, geopolitics and portfolio construction to help BlackRock's portfolio managers and clients navigate financial markets. BII offers strategic and tactical market views, publications and digital tools that are underpinned by proprietary research.

BlackRock.

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Dan Tsubouchi @Energy_Tidbits · 11h

ICYMI,

Iran FM downplays Israel attack, setting up expectation for no Iran response thereto

FM "" *What happened last night was not a strike," "They were more like toys that our children play with – not drones.*"

Thx @LlamasNBC.

...

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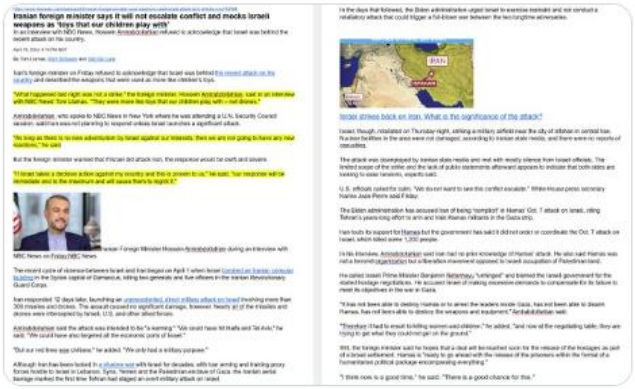


Iranian foreign minister says it will not escalate conflict and mocks Israeli weapons as 'toys that our children play with'

Iran's foreign minister on Friday refused to acknowledge that Israel was behind the recent attack on his country and described the weapons that were used as more like children's toys.

"What happened last night was not a strike," the foreign minister, Hossein Amirabdollahian, said in an interview with NBC News' Tom Llamas. "They were more like toys that our children play with — not drones."

Amirabdollahian, who spoke to NBC News in New York where he was attending a U.N. Security Council session, said Iran was not planning to respond unless Israel launches a significant attack.

"As long as there is no new adventurism by Israel against our interests, then we are not going to have any new reactions," he said.

But the foreign minister warned that if Israel did attack Iran, the response would be swift and severe.

"If Israel takes a decisive action against my country and this is proven to us," he said, "our response will be immediate and to the maximum and will cause them to regret it."

NBC News on Friday.NBC News

The recent cycle of violence between Israel and Iran began on April 1 when Israel bombed an Iranian consular building in the Syrian capital of Damascus, killing two generals and five officers in the Iranian Revolutionary Guard Corps.

Iran responded 12 days later, launching an unprecedented, direct military attack on Israel involving more than 300 missiles and drones. The assault caused no significant damage, however. Nearly all of the missiles and drones were intercepted by Israeli, U.S. and other allied forces.

Amirabdollahian said the attack was intended to be "a warning." "We could have hit Haifa and Tel Aviv," he said. "We could have also targeted all the economic parts of Israel."

"But our red lines was civilians," he added. "We only had a military purpose."

Although Iran has been locked in a shadow war with Israel for decades, with Iran arming and training proxy forces hostile to Israel in Lebanon, Syria, Yemen and the Palestinian enclave of Gaza, the Iranian aerial barrage marked the first time Tehran had staged an overt military attack on Israel.

Israel strikes back on Iran: What is the significance of the attack?

Israel, though, retaliated on Thursday night, striking a military airfield near the city of Isfahan in central Iran. Nuclear facilities in the area were not damaged, according to Iranian state media, and there were no reports of casualties.

The attack was downplayed by Iranian state media and met with mostly silence from Israeli officials. The limited scope of the strike and the lack of public statements afterward appears to indicate that both sides are looking to ease tensions, experts said.

U.S. officials called for calm. "We do not want to see this conflict escalate," White House press secretary Karine Jean-Pierre said Friday.

The Biden administration has accused Iran of being "complicit" in Hamas' Oct. 7 attack on Israel, citing Tehran's years-long effort to arm and train Hamas militants in the Gaza strip.

Iran touts its support for Hamas but the government has said it did not order or coordinate the Oct. 7 attack on Israel, which killed some 1,200 people.

In his interview, Amirabdollahian said Iran had no prior knowledge of Hamas' attack. He also said Hamas was not a terrorist organization but a liberation movement opposed to Israeli occupation of Palestinian land.

He called Israeli Prime Minister Benjamin Netanyahu, "unhinged" and blamed the Israeli government for the stalled hostage negotiations. He accused Israel of making excessive demands to compensate for its failure to meet its objectives in the war in Gaza.

"It has not been able to destroy Hamas or to arrest the leaders inside Gaza, has not been able to disarm Hamas, has not been able to destroy the weapons and equipment," Amirabdollahian said.

"Therefore it had to enact its killing women and children," he added, "and now all the negotiating table; they are trying to get what they could not get on the ground."

Still, the foreign minister said he hopes that a deal will be reached soon for the release of the hostages as part of a broad settlement. Hamas is "ready to go ahead with the release of the prisoners within the frame of a humanitarian political package encompassing everything."

"I think now is a good time," he said. "There is a good chance for this."

> **Tom Llamas** @LlamasNBC · Apr 19
>
> 
>
>
> #Breaking In an interview tonight Iran's Foreign Minister tells me Iran will not escalate the conflict with Israel and mocks Israeli weapons as 'toys that our children play with' nbcnews.com/news/world/ira... via @nbcnews

1 · 2.2K

Dan Tsubouchi @Energy_Tidbits · 4h

ICYMI

US rates stayed up post Powell.

US 2 yr 4.986% Apr 19 vs 4.897% Apr 12

US 10 yr 4.621% Apr 19 vs 4.522% Apr 12.

#OOTT

> **Dan Tsubouchi** @Energy_Tidbits · Apr 16
>
> 
>
> US 2 yr 4.967%
> US 10 yr 4.649%
>
> 👇Powell comments.
> "recent data have clearly not given us greater...

1 · 1 · 2K

Dan Tsubouchi @Energy_Tidbits · 6h

Daily Europe air traffic keeps creeping back closer to pre-Covid.

Now only 3.2% below pre-Covid as of Apr 18, vs 3.7% below as of Apr 11, 6.2% below as of Apr 4, and 7.0% below as of Mar 28.

Thx @eurocontrol. #OOTT

2 · 1.1K

Dan Tsubouchi @Energy_Tidbits · 9h

US gasoline prices keep creeping higher.

US +$0.05 WoW, +$0.16 MoM to $3.68.

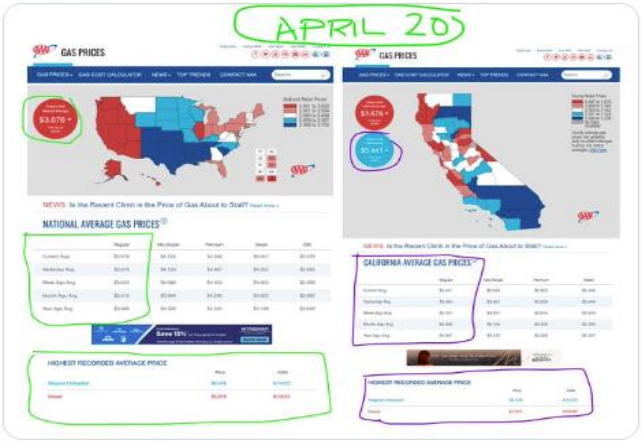
California -$0.01 WoW, +$0.50 MoM to $5.44.

Plus US gasoline prices normally seasonally increase into June.

Biden doesn't want $4 gas in election year.

...

Show more



2 2 1.4K

Dan Tsubouchi @Energy_Tidbits · 10h

Negative.

#Oil floating storage 74.14 mmb Apr 19.

Low 70s expected **BUT** big +17.02 revision to Apr 12 to 92.05 mmb.

1st +90 since Aug 18/23.

Last 7 wk ave 78.79 vs past 2 mths low 70s.

...

Show more

> **Dan Tsubouchi** @Energy_Tidbits · Apr 18
>
> 
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> 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 ...

1 · 2 · 2.2K

Dan Tsubouchi @Energy_Tidbits · Apr 19

Less than last week, but still positive support for WTI

WTI -$2.52 WoW to close $83.14.

321 crack spreads narrowed $2.09 WoW to $28.30.

Crack spread $28.30 still provides big margin for refiners, big incentive to buying crude to maximize runs.

#OOTT #Oil ...

Show more

1 · 4 · 2.3K

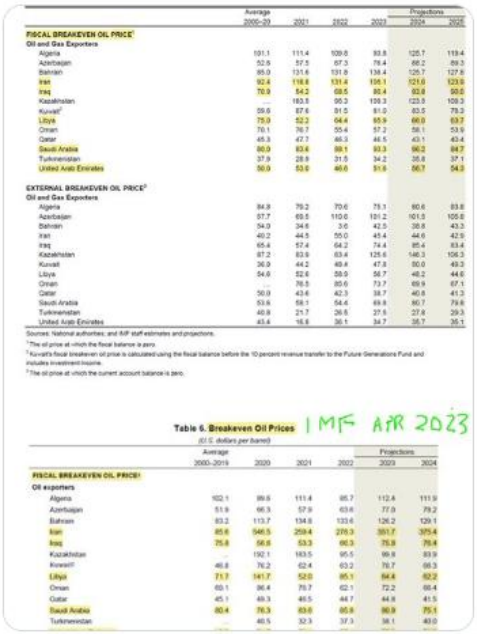
Dan Tsubouchi @Energy_Tidbits · Apr 19

#IMF Fiscal Breakeven #Oil Price.

Saudi up big YoY, now $96.20 for 2024, vs $75.10 in Apr 23. It's why need big OPM $$$ for Vision 2030.

Increasing #Oil #Condensate exports a huge boost to Iran. FBP now $121.00 BUT vs $375.40 in Apr 23.

See 👇 IMF Apr 24 vs Apr 23 est.
#OOTT



	Average 2000–20	2021	2022	2023	Projections 2024	2025
FISCAL BREAKEVEN OIL PRICE[1]						
Oil and Gas Exporters						
Algeria	101.1	111.4	109.6	93.8	125.7	119.4
Azerbaijan	52.6	57.5	67.3	78.4	66.2	69.3
Bahrain	85.0	131.6	131.8	138.4	125.7	127.9
Iran	92.4	118.8	131.4	106.1	121.0	123.0
Iraq	70.9	84.2	68.5	80.4	83.8	90.0
Kazakhstan		183.8	96.3	109.3	123.5	109.3
Kuwait[2]	59.6	87.6	91.5	81.0	83.5	79.3
Libya	75.9	92.3	94.4	95.9	96.0	93.7
Oman	70.1	76.7	55.4	57.2	58.1	53.9
Qatar	45.3	47.7	46.3	46.5	43.1	43.4
Saudi Arabia	80.9	83.4	89.1	93.3	96.2	94.7
Turkmenistan	37.9	28.9	31.5	34.2	35.8	37.1
United Arab Emirates	50.9	53.6	46.6	51.6	56.7	54.3
EXTERNAL BREAKEVEN OIL PRICE[3]						
Oil and Gas Exporters						
Algeria	84.9	79.2	70.6	79.1	80.6	83.8
Azerbaijan	87.7	69.5	110.6	101.2	101.5	105.8
Bahrain	54.0	34.6	3.6	42.0	38.8	43.3
Iran	40.2	44.5	55.0	45.4	44.6	42.9
Iraq	65.4	57.4	64.2	74.4	85.4	83.4
Kazakhstan	87.2	83.6	83.4	125.6	146.3	136.3
Kuwait	36.9	44.2	49.4	47.8	50.0	49.3
Libya	54.6	52.6	58.9	56.7	48.2	44.6
Oman		76.5	85.6	73.7	69.9	67.1
Qatar	50.9	43.6	42.3	38.7	40.8	41.3
Saudi Arabia	53.6	58.1	54.4	69.8	80.7	79.8
Turkmenistan	40.8	21.7	26.5	27.5	27.8	29.3
United Arab Emirates	43.4	16.8	36.1	34.7	38.7	35.1

Sources: National authorities; and IMF staff estimates and projections.
[1] The oil price at which the fiscal balance is zero.
[2] Kuwait's fiscal breakeven oil price is calculated using the fiscal balance before the 10 percent revenue transfer to the Future Generations Fund and includes investment income.
[3] The oil price at which the current account balance is zero.

Table 6. Breakeven Oil Prices | IMF Apr 2023

(U.S. dollars per barrel)

	Average 2000–2019	2020	2021	2022	Projections 2023	2024
FISCAL BREAKEVEN OIL PRICE[1]						
Oil exporters						
Algeria	102.1	89.6	111.4	85.7	112.4	111.9
Azerbaijan	51.9	66.3	57.9	63.6	77.0	79.2
Bahrain	83.2	113.7	134.6	133.6	126.2	129.1
Iran	85.6	546.5	259.4	270.3	351.7	375.4
Iraq	75.8	56.6	53.3	66.3	75.8	79.4
Kazakhstan	...	192.1	183.5	95.5	99.8	93.9
Kuwait[2]	46.8	76.2	62.4	63.2	76.7	66.3
Libya	71.7	141.7	52.0	85.1	64.4	62.2
Oman	69.1	86.4	79.7	62.1	72.2	68.4
Qatar	45.1	49.3	46.5	44.7	44.8	41.5
Saudi Arabia	80.4	76.3	63.6	85.8	86.9	75.1
Turkmenistan	...	46.5	32.3	37.3	38.1	40.0

> **Dan Tsubouchi** @Energy_Tidbits · May 3, 2023
>
> 
>
> #IMF fiscal Breakeven #Oil price.
>
> Saudi declining $85.80 in 22, $80.90 in 23, $75.10 in 24 with push on non-oil sectors.
> ...

6 10 2.8K

Dan Tsubouchi @Energy_Tidbits · Apr 19

Do #Oil markets effectively place zero risk premium for any Israel/Iran potential?

Brent price is back to where it was before Israel bombed Iran consulate, Iran launched its missile/drone attack and now Israel strike on Iran last night.

#OOTT

5 6 27 2.6K

Dan Tsubouchi @Energy_Tidbits · Apr 19

Here's a key reason why Brent down $4 since initial move up of Israel bombing of areas with Iran nuclear sites..

👇@iaeaorg ***"confirms no damage to Iran's nuclear sites"***.

#OOTT

> **IAEA - International Atomic Energy Agency** @iaeaorg · Apr 18
>
> IAEA can confirm that there is no damage to #Iran's nuclear sites. DG @rafaelmgrossi continues to call for extreme restraint from everybody and reiterates that nuclear facilities should never be a target in military conflicts. IAEA is monitoring the situation very closely.

1 3 2.1K

Dan Tsubouchi @Energy_Tidbits · Apr 18

Brent currently up $2.34 to $89.45 on reports israel has hit or targeted iran nuclear facilities in Isfahan. #OOTT

> **The Jerusalem Post** @Jerusalem_Post · Apr 18
>
> Explosions were heard in Isfahan in central Iran, in the As-Suwayda Governorate of southern Syria, and in the Baghdad area and Babil Governorate of Iraq early Friday morning, according to initial reports.
>
> jpost.com/breaking-news/...

2 14 3.5K

Dan Tsubouchi @Energy_Tidbits · Apr 18

Biden election year priority - don't let US gasoline prices hit $4.

Today, Biden new Iran sanctions do not include anything to hit Iran's cash flow: #Oil & #Condensate exports.

Yesterday, 👇 not renewing VEN sanctions relief didn't VEN oil exports to Gulf Coast.

#OOTT

https://www.whitehouse.gov/briefing-room/statements-releases/2024/04/18/statement-from-president-joe-biden-on-iran-sanctions/

THE WHITE HOUSE

APRIL 18, 2024

Statement from President Joe Biden on Iran Sanctions

Less than a week ago, Iran launched one of the largest missile and drone attacks the world has ever seen against Israel. Together with our allies and partners, the United States defended Israel. We helped defeat this attack. And today, we are holding Iran accountable—imposing new sanctions and export controls on Iran.

The sanctions target leaders and entities connected to the Islamic Revolutionary Guard Corps, Iran's Defense Ministry, and the Iranian government's missile and drone program that enabled this brazen assault. As I discussed with my fellow G7 leaders the morning after the attack, we are committed to acting collectively to increase economic pressure on Iran. And our allies and partners have or will issue additional sanctions and measures to restrict Iran's destabilizing military programs.

During my Administration, the United States has sanctioned over 600 individuals and entities—including Iran and its proxies, Hamas, Hezbollah, the Houthis, and Kataib Hezbollah. And we will keep at it. I've directed my team, including the Department of the Treasury, to continue to impose sanctions that further degrade Iran's military industries.

Let it be clear to all those who enable or support Iran's attacks: The United States is committed to Israel's security. We are committed to the security of our personnel and partners in the region. And we will not hesitate to take all necessary action to hold you accountable.

###

Dan Tsubouchi @Energy_Tidbits · Apr 17

Must Read!

Yes, US not renewing #Oil #NatGas sanctions relief for VEN.

...

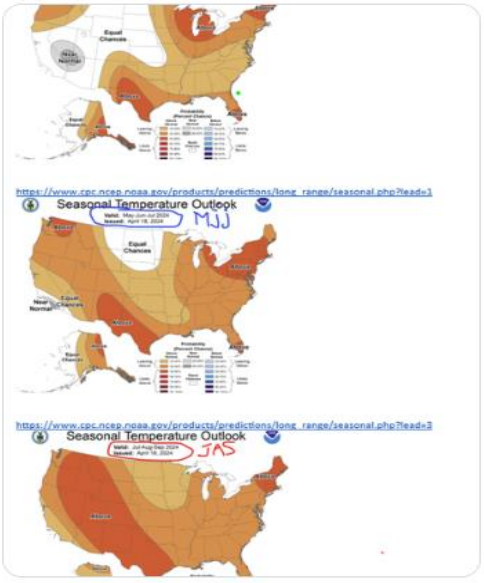
1 4 16 4.2K

Dan Tsubouchi @Energy_Tidbits · Apr 18

Won't drive up HH #NatGas prices today but @NOAA updated 30-day and summer temperature forecasts call for much warmer than normal temperatures.

But should provide some support over the summer for #NatGas prices.

#OOTT



1 2 5 2.4K

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 "s*truggling to find buyers in China*".

See 👇 SAF Group transcript.

Thx @Vortexa Jay Maroo, @gulf_intel....

Show more

"seen a little bit of a buildup .... in Iranian crude oil floating storage. In March we saw that go up by somewhere in the order of 10 million barrels or so. What that suggests ..... is a little bit of weakness coming in from China on the buying side of things." Vortexa's Jay Maroo.

SAF Group created transcript of comments by Jay Maroo (Head of Market Intelligence and Analytics MENA, Vortexa) on Gulf Intelligence's Daily Energy Markets Podcast April 17, 2024 hosted by Sean Evers (Founder, Managing Partner of Gulf Intelligence). [LINK]

Items in "*Italics*" are SAF Group created transcript.

At 6:30 min mark, Maroo "*... there is no imminent risk of closure of the Strait of Hormuz. There is no change in oil flows or production from Iran at this stage. Looking at the data that we have, Iran's been exporting plenty of oil recently. And I think our latest figure for March was somewhere in the order of 1.4 million barrels a day. So that's very high compared to year ago levels. That in itself is a sign that there is so much oil coming out from Iran at the moment. Most of it is going to China. And it really isn't in anyone's interest for an escalation in this to effect energy supply. And that's why it's clear given the response from the US and other nations everyone is calling for de-escalation. On the shipping side of things, we've seen Iran continue to export at normal levels. One interesting thing that I do want to point out though is on the Iranian side, we have seen a little bit of a buildup in floating storage, in Iranian crude oil floating storage. In March we saw that go up by somewhere in the order of 10 million barrels or so. What that suggests and I think we will probably come to this later on is a little bit of weakness coming in from China on the buying side of things. And I guess that probably feeds into the wider comment about bearishness on oil prices because of demand issues.*"

At 25:40 min mark, Maroo "China obviously, given the size of its oil imports, is the most important consumer for the market to look at. If we look at our own data and we try to understand what's happenkung with apparent oil demand. What we did is we looked at imports minus stock changes and actually what we see is China's apparent oil demand isn't looking great at the moment. That really suggests that there isn't that much growth n the economy taking place on oil demand. Somewhere in the order of 10.2, 10.3 million barrels per day, that's where we put crude import demand in March. And that's well within the seasonal range. And actually looking ahead to the second half of the year, we think, at best, it will be similar to year ago levels. So when it comes to China importing much more crude, we're not very bullish on that. The only thing that could change that is if there is a significant decrease in the price and obviously Chinese being very opportunistic buyers, they'd be quick to pick that up. But that hasn't really happened yet. Speaking to some of our wider network, we're hearing that some of the Iranian crude that is being offered, is being offered at deeper discounts than usual to some new buyers. And what that suggests to me is that, even with Iranian crude being priced so cheap, they're struggling to find buyers in China that are willing to pay even below market rates. So they are going to have dig deeper to get those barrels into China. "

Prepared by SAF Group https://safgroup.ca/news-insights/

3 6 4K

Dan Tsubouchi @Energy_Tidbits · Apr 18

#HEVs winning the day in EU new car registrations.

Mar & YTD % YoY change.

#EV: -11.3%, +3.8%
#PHEV: -6.5%, +7.5%
#HEV: +12.6%, +19.7%
Others: +8.1%, +13.5% [fuel cell, NGVs, LPG, E85/ethanol, others]
Petrol: -10.2%, -1.0%
Diesel: -18.5%, -10.6%...

Show more

2 3 1.8K

Dan Tsubouchi @Energy_Tidbits · Apr 17

Must Read!

Yes, US not renewing #Oil #NatGas sanctions relief for VEN.

"***However, the move did not impact Chevron's General License 41 and it leaves open the door for other companies to apply for similar individual licenses***" report @KateAnnWinston @MowerJeff

#OOTT

1 5 16 7.7K

Dan Tsubouchi @Energy_Tidbits · Apr 17

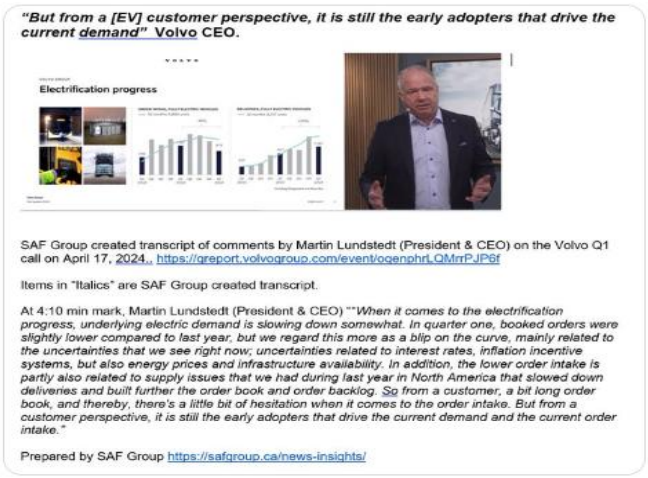
#EV market recap by @VolvoGroup CEO.

"*underlying electric demand is slowing down somewhat*"

""*regard this more as a blip on the curve*" [must be a long blip!]

"*from a customer perspective, i**t is still the early adopters that drive the current demand***"

#OOTT



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Dan Tsubouchi @Energy_Tidbits · Apr 17

Ultra Quiet/Gentle Luxury Chinese buyers are spending!

Brunello Q1 sales: "*significant growth achieved in all major Asian areas incl China, Japan, South Korea & the Middle East*" "*substantial growth prospects in the Chinese market are evident to our great satisfaction*"

#OOTT

> **Dan Tsubouchi** @Energy_Tidbits · Mar 20
>
> 
>
>
> China consumer.
>
> Great line on Gucci China sales drop from @FerroTV @lisaabramowicz1
>
> ...

1 · 1 · 1.7K

Dan Tsubouchi @Energy_Tidbits · Apr 17

More capital into Indonesia!

"I think the investment ability in Indonesia is endless" @tim_cook

"*These countries (ie. Indonesia). If you add up 5 of them, their growth is so much faster than China. I think we have to start thinking there is a mosaic ...*" @jimcramer

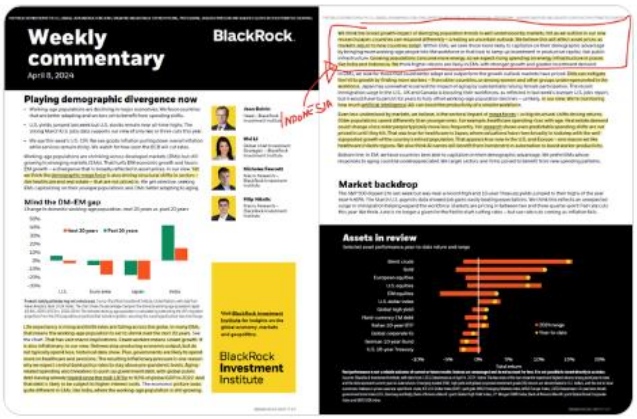
1/2

1 · 1 · 5 · 1.5K

Dan Tsubouchi @Energy_Tidbits · Apr 17

2/2 Indonesia!

"*Growing populations consume more energy, so we expect rising spending on energy infrastructure in places like India and* ***Indonesia****. We think higher returns are likely in EMs with stronger growth and greater investment demand.*" @BlackRock Apr 8 weekly commentary.



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Dan Tsubouchi @Energy_Tidbits · Apr 17

For those not near their laptop, @EIAgov just released at 8:30am MT its #Oil #Gasoline #Distillates inventory as of Apr 12. Table below compares EIA data vs @businessexpectations and vs @APIenergy yesterday. Prior to release, WTI was $84.40. #OOTT

Oil/Products Inventory Apr 12: EIA, Bloomberg Survey Expectations, API

(million barrels)	EIA	Expectations	API
Oil	2.74	1.65	4.09
Gasoline	-1.15	-1.00	-2.51
Distillates	-2.76	-0.90	-0.43
	-1.17	-0.25	1.15

Note: Oil is commercial. So excludes a +0.7 mmb in SPR for the Apr 12 week
Note: Included in the oil data, Cushing had a 0.03 mmb build for Apr 12 week
Source EIA, Bloomberg
Prepared by SAF Group https://safgroup.ca/news-insights/

3 8 1.5K

Dan Tsubouchi @Energy_Tidbits · Apr 17

Potential #Oil upside tomorrow.

Thurs is Deadline Day for US to decide if will reimpose #Oil sanctions on VEN.

US says "stay tuned". Expect Maduro to "**fully implement**" agreement. Highlighted blocked opposition candidates something "we take very seriously".

#OOTT

2 5 1.9K

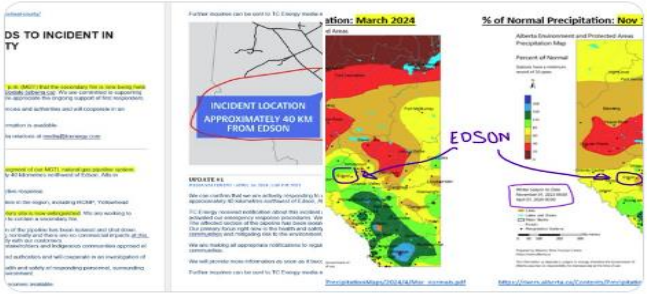
Dan Tsubouchi @Energy_Tidbits · Apr 17

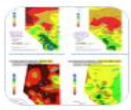
Reminder 04/16 of 2024 wildfire risk in Alberta.

@TCEnergy: secondary fire 40 km NW Edson is now being held. confirmed pipeline rupture 04/16 and "an initial ignition of natural gas at the rupture is now extinguished"

Very low precipitation Nov 1-Mar 31 is bad setup.

#OOTT



> **Dan Tsubouchi** @Energy_Tidbits · Apr 5
>
> 
>
> Bad setup for 2024 wildfire season in Alberta.
>
> Nov 1/23 thru Mar 31/24 precipitation is <60% of norm for half of Alberta incl a sizeable portion <40% of norm.
> ...

1 3 1.9K

Dan Tsubouchi @Energy_Tidbits · Apr 17

Saudi crown prince MBS/UAE President statement.

"urged all parties to exercise maximum restraint and prevent the region and its people from suffering the consequences of a wider conflict"

"need for determined international action to prevent further regional escalation of the

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https://wam.ae/en/article/13vbusi-uae-president-and-saudi-crown-prince-discuss

UAE President and Saudi Crown Prince discuss regional developments

- Wednesday, April 17, 2024 8:16 AM
- 1 minute Reading

1 / 1

- A+

ABU DHABI, 17th April, 2024 (WAM) -- President His Highness Sheikh Mohamed bin Zayed Al Nahyan and His Royal Highness Prince Mohammed bin Salman bin Abdulaziz Al Saud, Crown Prince and Prime Minister of Saudi Arabia, have discussed ways to strengthen bilateral ties and boost collaboration for the mutual benefit of the two nations. They also addressed key regional and international issues of common interest.

Their Highnesses reviewed the situation in the Middle East and the grave threats it poses to regional security and stability. They urged all parties to exercise maximum restraint and prevent the region and its people from suffering the consequences of a wider conflict.

The phone call also addressed efforts being made to enhance the response to the deteriorating humanitarian situation in the Gaza Strip, stressing the importance of intensifying endeavours to bring about an immediate ceasefire, provide full protection to civilians in accordance with the rules of international humanitarian law, and ensure the sustainable and unimpeded flow of sufficient humanitarian aid to the people of Gaza.

Their Highnesses stressed the need for determined international action to prevent further regional escalation of the conflict. They also highlighted the importance of establishing a clear political pathway towards achieving a just and comprehensive peace based on the two-state solution, to ensure the security and stability of the region's countries and people.

Esraa Esmail

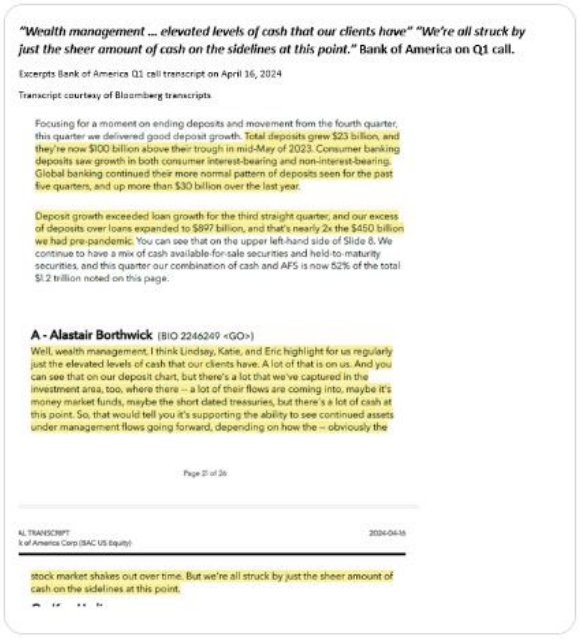
1 6 1.7K

Dan Tsubouchi @Energy_Tidbits · 10m

Positive for markets in 2024 is lots cash on sidelines

"*Wealth management ... elevated levels of cash that our clients have*" "***We're all struck by just the sheer amount of cash on the sidelines at this point***." BofA Q1 call.

Thx @business. #OOTT



***"Wealth management ... elevated levels of cash that our clients have" "We're all struck by just the sheer amount of cash on the sidelines at this point."* Bank of America on Q1 call.**

Excerpts Bank of America Q1 call transcript on April 16, 2024

Transcript courtesy of Bloomberg transcripts

Focusing for a moment on ending deposits and movement from the fourth quarter, this quarter we delivered good deposit growth. Total deposits grew $23 billion, and they're now $100 billion above their trough in mid-May of 2023. Consumer banking deposits saw growth in both consumer interest-bearing and non-interest-bearing. Global banking continued their more normal pattern of deposits seen for the past five quarters, and up more than $30 billion over the last year.

Deposit growth exceeded loan growth for the third straight quarter, and our excess of deposits over loans expanded to $897 billion, and that's nearly 2x the $450 billion we had pre-pandemic. You can see that on the upper left-hand side of Slide 8. We continue to have a mix of cash available-for-sale securities and held-to-maturity securities, and this quarter our combination of cash and AFS is now 52% of the total $1.2 trillion noted on this page.

A - Alastair Borthwick (BIO 2246249 <GO>)

Well, wealth management, I think Lindsay, Katie, and Eric highlight for us regularly just the elevated levels of cash that our clients have. A lot of that is on us. And you can see that on our deposit chart, but there's a lot that we've captured in the investment area, too, where there -- a lot of their flows are coming into, maybe it's money market funds, maybe the short dated treasuries, but there's a lot of cash at this point. So, that would tell you it's supporting the ability to see continued assets under management flows going forward, depending on how the -- obviously the

Page 21 of 26

AL TRANSCRIPT 2024-04-16
k of America Corp (BAC US Equity)

stock market shakes out over time. But we're all struck by just the sheer amount of cash on the sidelines at this point.

1 1 286

Dan Tsubouchi @Energy_Tidbits · 2h

Push for data centers to get operational!

👇Liberals Budget 2024: Move to immediate 100% deduction in yr becomes operational for Class 44, 46 & 50 used in "Productivity-Enhancing Assets"

At least for now, 100% deduction doesn't seem to cut out #NatGas #Coal powered data...

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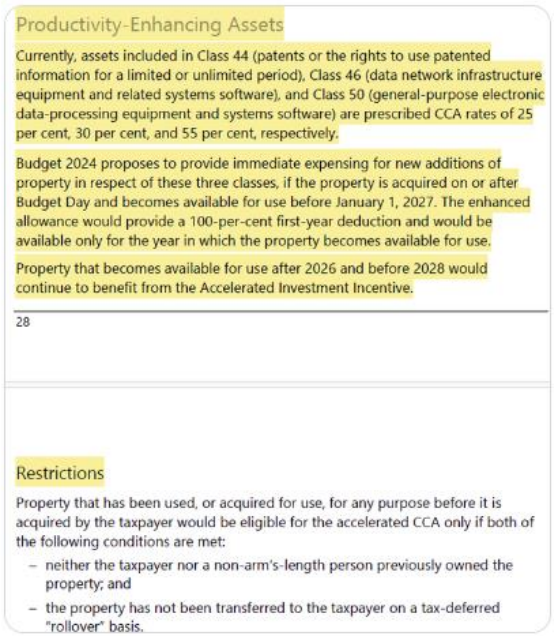

Productivity-Enhancing Assets

Currently, assets included in Class 44 (patents or the rights to use patented information for a limited or unlimited period), Class 46 (data network infrastructure equipment and related systems software), and Class 50 (general-purpose electronic data-processing equipment and systems software) are prescribed CCA rates of 25 per cent, 30 per cent, and 55 per cent, respectively.

Budget 2024 proposes to provide immediate expensing for new additions of property in respect of these three classes, if the property is acquired on or after Budget Day and becomes available for use before January 1, 2027. The enhanced allowance would provide a 100-per-cent first-year deduction and would be available only for the year in which the property becomes available for use.

Property that becomes available for use after 2026 and before 2028 would continue to benefit from the Accelerated Investment Incentive.

28

Restrictions

Property that has been used, or acquired for use, for any purpose before it is acquired by the taxpayer would be eligible for the accelerated CCA only if both of the following conditions are met:

- neither the taxpayer nor a non-arm's-length person previously owned the property; and
- the property has not been transferred to the taxpayer on a tax-deferred "rollover" basis.

1 · 7 · 1.5K

Dan Tsubouchi @Energy_Tidbits · 8h

US 2 yr 4.967%
US 10 yr 4.649%

👇Powell comments.
"recent data have clearly not given us greater confidence" that price increases are under control.
"instead indicate that it's likely to take longer than expected to achieve that confidence"
"If higher inflation does persist,...
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URGENT: Fed's Powell suggests that elevated inflation will likely delay rate cuts this year
2024-04-16 18:05:00.825 GMT

URGENT: Fed's Powell suggests that elevated inflation will likely delay rate cuts this year

By CHRISTOPHER RUGABER

WASHINGTON (AP) — Federal Reserve Chair Jerome Powell cautioned Tuesday that persistently elevated inflation will likely delay any Fed rate cuts until later this year because "recent data have clearly not given us greater confidence" that price increases are under control.

The most recent inflation reports "instead indicate that it's likely to take longer than expected to achieve that confidence," Powell said during a panel discussion at the Wilson Center. "If higher inflation does persist, we can maintain the current level of restriction for as long as needed."

The Fed chair's comments suggested that without further evidence that inflation is falling, the central bank will likely carry out fewer than the three quarter-point reductions its officials had forecast during their most recent meeting in March.

Powell's comments followed a speech earlier Tuesday by Fed Vice Chair Philip Jefferson, who also appeared to raise the prospect that the Fed would would not carry out three cuts this year in its benchmark rate, which stands at a multi-decade high after 11 rate hikes beginning two years ago.

-0- Apr/16/2024 18:05 GMT

To view this story in Bloomberg click here:
https://blinks.bloomberg.com/news/stories/SC1RKCTVI5MO

1 4 1.1K

Dan Tsubouchi @Energy_Tidbits · 12h

Will Budget will only hit top 1% of **earners** or also wealthy?

"*tax changes for individuals will affect a group of people smaller than the top 1% of* ***earners****, the sources said. They did not provide any details on what* ***income levels w****ould be subject to the tax changes."*

#OOTT
thx...
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> **Marieke Walsh** @MariekeWalsh · 15h
> Federal budget to include tax hikes for wealthiest Canadians, some corporations #cdnpoli theglobeandmail.com/politics/artic...

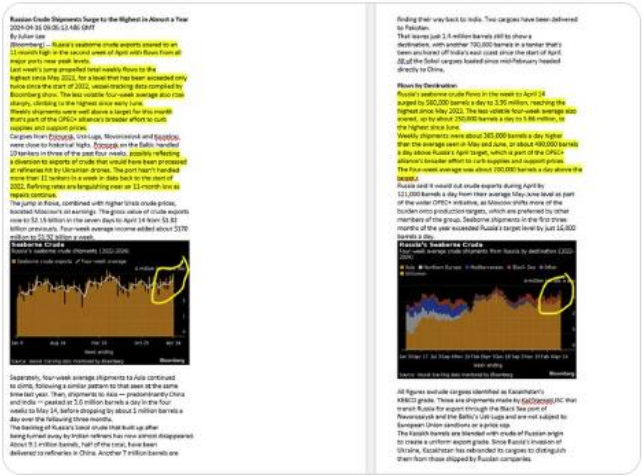
1 · 1 · 3 · 2.8K

Dan Tsubouchi @Energy_Tidbits · 13h

Ukraine drones impact.

Russian refinery capacity still not back on from drones means its "*seaborne crude exports soared to an 11-month high in the second week of April with flows from all major ports near peak levels.*" @business @JLeeEnergy's great weekly report.

#OOTT



3 · 4 · 1.7K

Dan Tsubouchi @Energy_Tidbits · 20h

Iran didn't warn Israel says White House.

See 👇 "*seen reporting that the Iranians meant to fail, that this spectacular and embarrassing failure was all by design. I've also seen Iran say that they provided early warning to help Israel prepare its defenses and limit any...*
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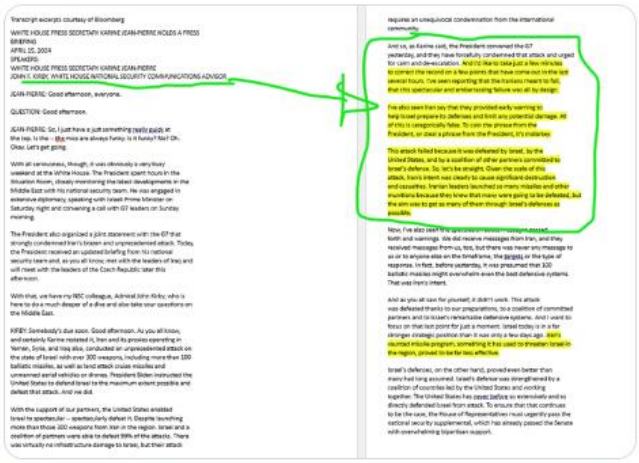

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Dan Tsubouchi @Energy_Tidbits · Apr 15

Brent back above pre Iran attack

"*We are looking ahead, we are considering our steps, and this launch of so many missiles, cruise missiles, and UAVs into the territory of the State of Israel will be met with a response,*" Israel.

Surely no one is surprised.

#OOTT...
Show more

7 · 17 · 4.2K

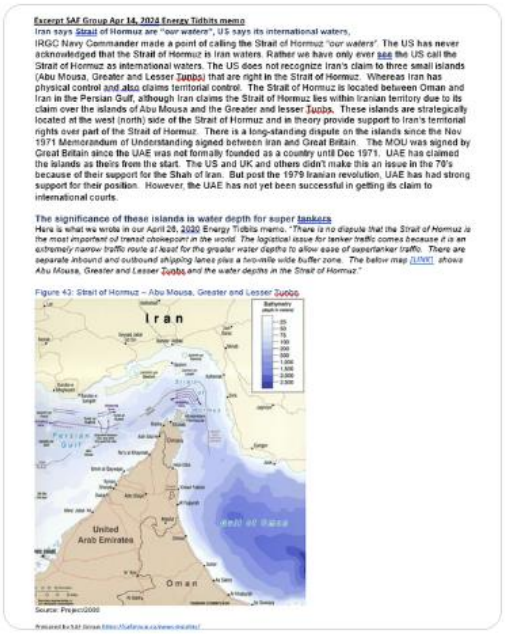
Dan Tsubouchi @Energy_Tidbits · Apr 15

Strait of Hormuz reference map.

Tankers just can't go anywhere in the Strait, they have to have sufficient water depth.

I have used 👇 map for years as it shows the water depths and why it is a narrow shipping lane in each direction for #Oil #LNG tankers.

#OOTT



1 3 17 3.5K

Dan Tsubouchi @Energy_Tidbits · Apr 14

Brent opens down.

Markets not seeing likelihood of Israel escalating into a broader regional war.

Cable news been asking its experts shouldn't Israel buy into Biden view that they should see it as a win that they defended well.

#OOTT

1 5 7 2.4K