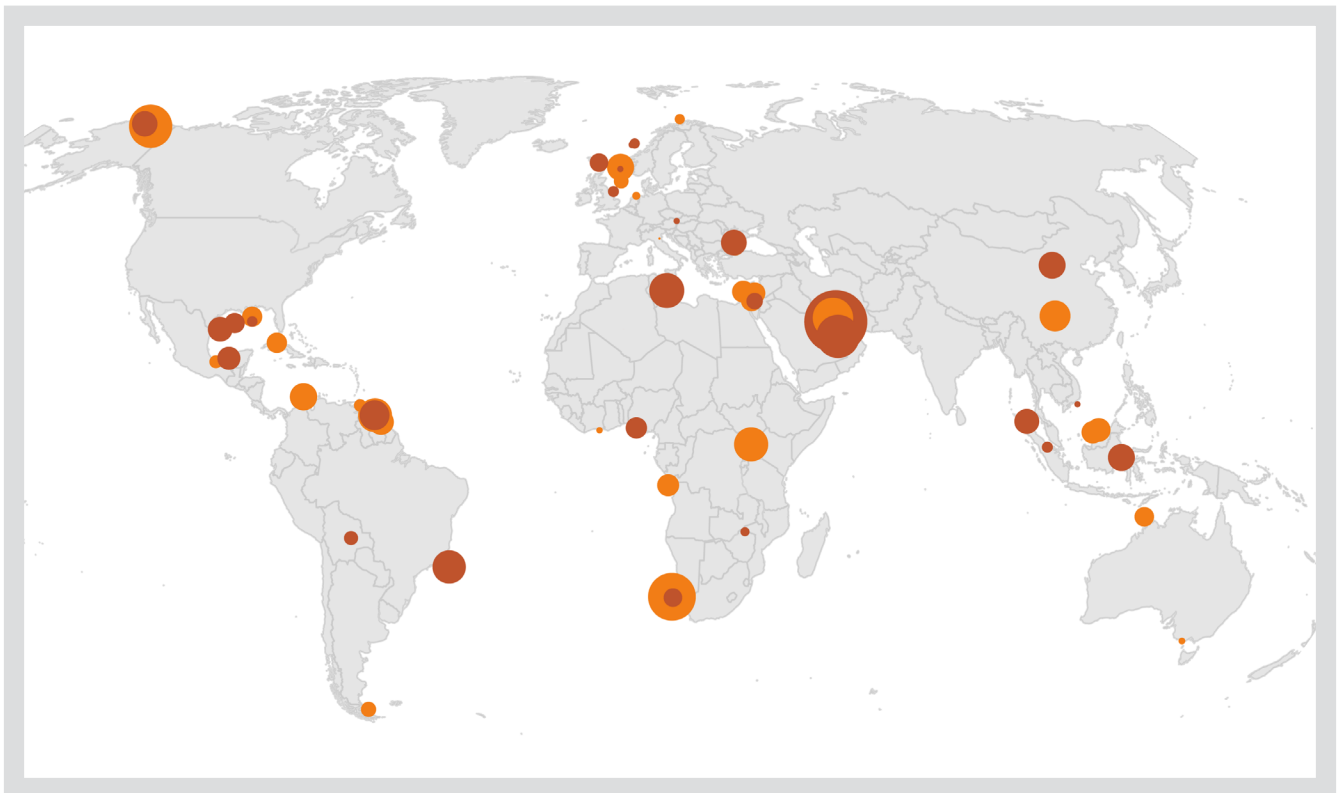


# Drilling Deeper

# 2024

**GLOBAL OIL AND GAS EXTRACTION TRACKER**





## ABOUT GLOBAL ENERGY MONITOR

Global Energy Monitor (GEM) develops and analyzes data on energy infrastructure, resources, and uses. We provide open access to information that is essential to building a sustainable energy future. Follow us at [www.globalenergymonitor.org](http://www.globalenergymonitor.org) and on Twitter/X @GlobalEnergyMon.

## ABOUT THE GLOBAL OIL AND GAS EXTRACTION TRACKER (GOGET)

GOGET is an information resource on gas oil extraction projects. The internal GOGET database is updated continuously throughout the year, and the annual release is published and distributed with a data download, summary tables, and unit-level wiki pages. The data are released under a creative commons license. Commercial datasets exist but are prohibitively expensive for many would-be users. Global Energy Monitor developed GOGET so that high-quality data on these projects is available to all.

## AUTHOR

Scott Zimmerman is the project manager for the Global Oil and Gas Extraction Tracker.

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## ON THE COVER

The cover image is a map of extraction sites discovered and sanctioned in 2022 and 2023.

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April 4, 2024: This report has been amended to clarify its definition of project approvals.

# Drilling Deeper 2024

OIL AND GAS PRODUCERS' CONTINUAL PUSH TO DISCOVER AND SANCTION MORE OIL AND GAS RESERVES RUNS AFOUL OF CLIMATE WARNINGS

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## KEY POINTS

- The oil and gas industry remains steadfast in its plans to continue developing new fields, even while the consensus is still affirmed that no new oil and gas projects are compatible with limiting warming to 1.5°C.
- At least 20.3 billion barrels of oil equivalent (boe) of new oil and gas discoveries have been announced since the 2021 publication of the International Energy Agency (IEA) Net Zero roadmap said no new developments were needed in its 1.5 degree scenario.
- At least 20 fields were approved for development in 2023, sanctioning the extraction of 8 billion boe. By the end of the decade, companies are aiming to sanction nearly four times that amount (31.2 billion boe) across 64 additional fields.
- The majority of the top oil and gas producing countries anticipate increasing their production through 2030 relative to 2021, fueled in part by the discovery and sanctioning of new projects as well as expansions within existing fields.
- All company types – majors, national oil companies, and independents – are searching for and sanctioning new fields.
- South America and Africa are global hotspots for new conventional oil and gas projects.
- While 2022 represented a rebound year for the industry after COVID-19, 2023 discoveries and sanctioning appear to be in line with pre-COVID levels.

## SUMMARY

Reserves associated with sanctioned oil and gas projects contain enough potential emissions to take the world past 1.5 degrees of warming. Yet oil and gas promoters continue to sanction new projects and search for more hydrocarbon reserves, furthering the risk of blowing past warming limits or those assets becoming stranded assets — meaning premature or unanticipated closing, [due to market or other forces](#).

Global Energy Monitor's Global Oil and Gas Extraction Tracker (GOGET) is a survey of oil and gas extraction areas, including data on in-development and operating fields. Many of the known entities in oil and gas production, on both the country and company levels, are pushing forward with new fields. These fossil fuel promoters sanctioned 16 billion barrels of oil equivalent in the past two years, more than the proven oil reserves of Europe.<sup>1</sup> At the field-by-field and regional levels, producers continue to justify bucking the scientific consensus and risking climate breakdown. Some companies argue that their fields would produce fewer emissions than the rest, while others proclaim they are ensuring diversity of supply. These explanations can't all be justified, as current production pathways are significantly higher than 1.5 degree compatible scenarios.

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1. European proven oil reserves were 13.6 billion boe in 2022.

## EXPLORATION AND DISCOVERIES CONTINUE

In 2021, the International Energy Agency (IEA) issued an unequivocal signal about the future of oil and gas in its Net Zero by 2050 (NZE) roadmap: “Beyond projects already committed as of 2021, there are no new oil and gas fields approved for development in our pathway.” Since then, a number of international organizations have [backed the IEA’s conclusion](#). Despite this clear warning, oil and gas promoters are actively investing in exploration and continuing to discover new oil and gas fields. (Figure 1)

Since the publication of the IEA NZE roadmap, oil and gas companies have announced 50 new projects,<sup>2</sup> 19 of which were discovered in 2023, accounting for around 7.7 billion barrels of oil equivalent (boe). This is about 35% lower than in 2022, when at least 12.6 billion boe

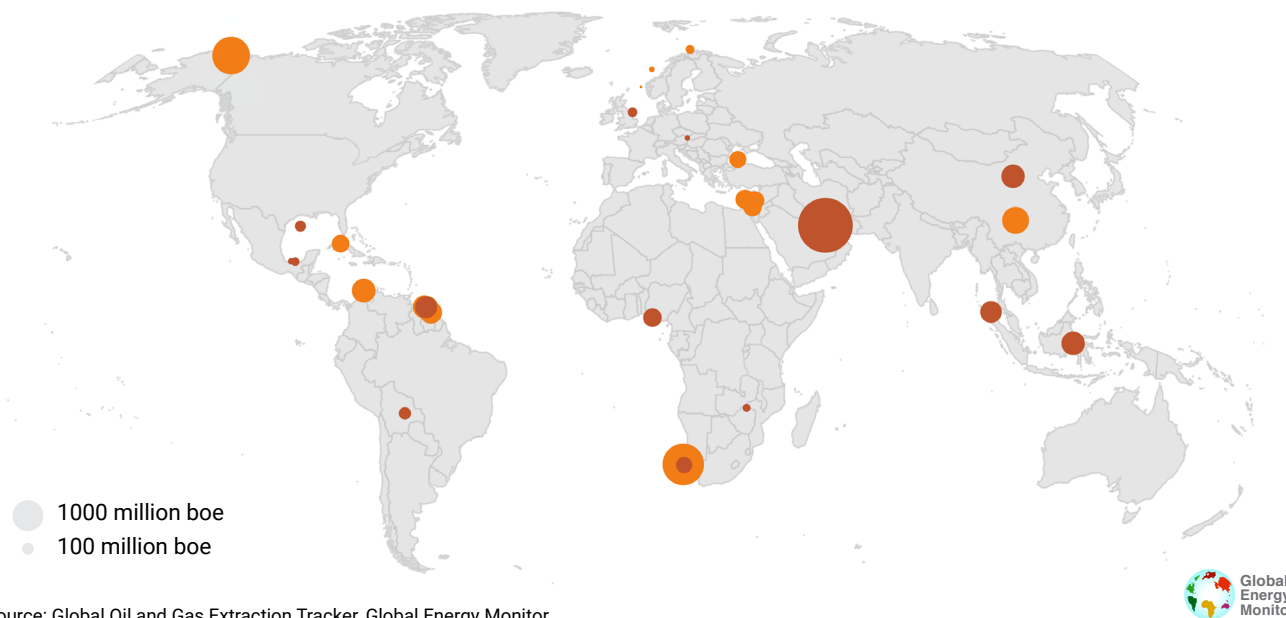
from 31 discoveries were announced.<sup>3</sup> In total, these represent 20.3 billion boe and 50 discoveries that fly in the face of the scientific consensus. (Table 1)

**Table 1: Discoveries by Year**

	Project Count (#)	Resources (billion boe)
2022	31	12.6
2023	19	7.7
<b>Total</b>	<b>50</b>	<b>20.3</b>

Iran’s [Shahini gas field](#) is the largest discovery of the past two years. Little has been reported about the field, but it is supposedly the largest dry gas field ever found in Iran, potentially “[containing](#)” 623 billion

**Figure 1: Guyana, Iran and Namibia’s discoveries of oil and gas top charts 2022 and 2023 discoveries of oil and gas fields**



2. GOGET tracks projects with resources of 25 million barrels of oil or greater. Due to this threshold, newly discovered projects without appraisals and reserve estimates, such as [Saudi Arabia’s 2022 gas fields](#), are not included. Therefore, this is an underestimate of the number of fields that have been discovered.

3. S&P Global, a commercial data provider, stated 2023 discoveries were [~9.8 billion boe](#) as of December 11, 2023, with the possibility of an additional 2.3 billion boe yet to be announced before the close of the year. According to that dataset, the 2022 yearly discovery figure was around [18 billion boe](#). GOGET and S&P Global agree that 2023 was a slight downturn in discoveries from the year prior, but that 2023 is [in line with the 2020 and 2021](#) years prior to the start of GOGET.

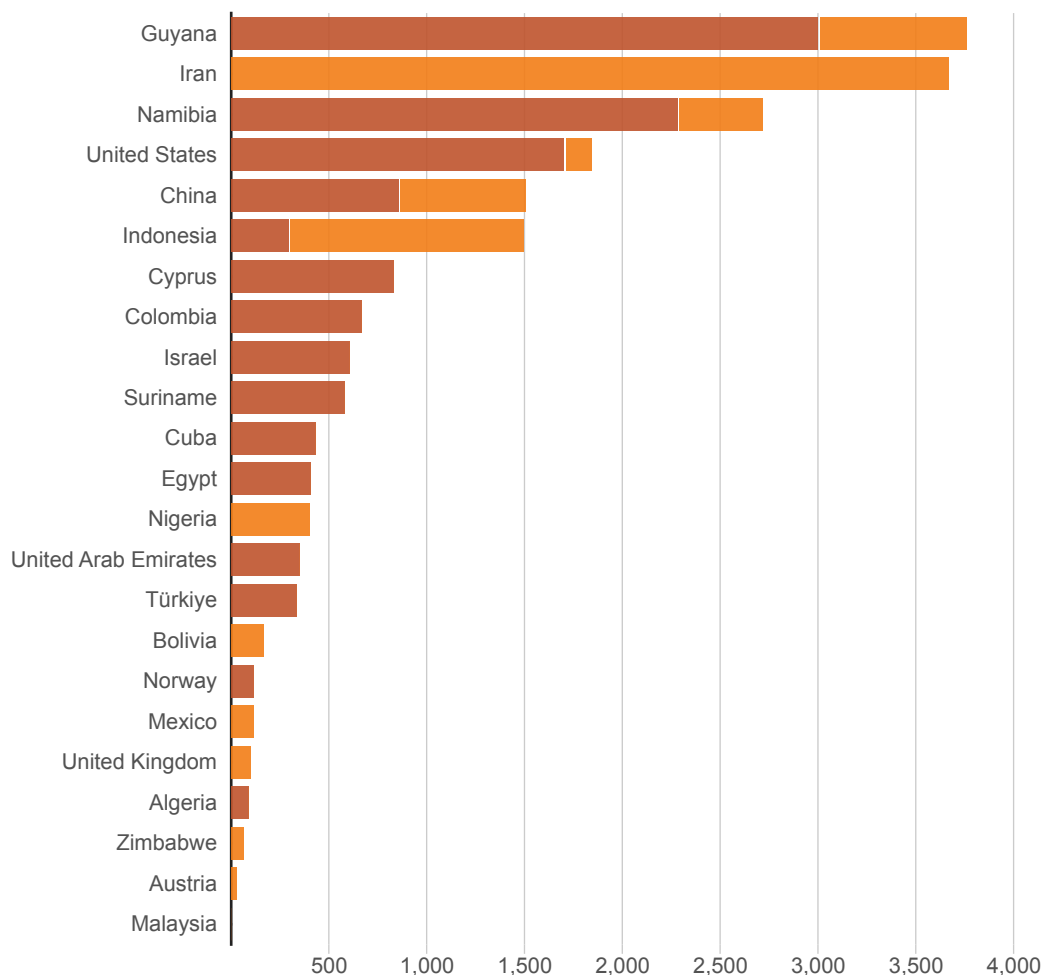
cubic meters (bcm) of gas. Shahini is closely followed by TotalEnergies’s [Venus](#) in Namibia. Discovered in February 2022, [initial estimates](#) put the field with “at least 3 billion barrels of recoverable oil.” Industry excitement about the field was high as the field’s recoverable reserves were estimated to be anywhere from [1.45 billion boe](#) to exceeding 13 billion boe. GOGET’s central estimate comes from a Namibian official who [stated](#) the reserves as two billion barrels of recoverable oil. Namibia has been considered a “key exploration hotspot” by the oil and gas industry and its promoters due to Venus as well as other large

discoveries. Pantheon Resources’ [Kodiak project](#) in Alaska, United States, rounds out the top three discoveries. The project, formerly known as “Theta West,” has recoverable resources (2C) of 962.5 million barrels of oil and NGL, plus an additional 4,465.2 billion cubic feet of gas, for a combined total of 1.7 billion boe.

Four of the twenty-two countries with 2022 and 2023 discoveries produced little or no oil and gas until recently. These four countries, Cyprus, Guyana, Namibia, and Zimbabwe account for ~37% of the total discovered volumes. (Figure 2)

**Figure 2: Significant 2022 and 2023 discoveries were made in countries with little to no historical production**

Oil and gas discoveries (million barrels of oil equivalent) by country and year



Source: Global Oil and Gas Extraction Tracker, Global Energy Monitor



Latin America discoveries in Cuba, Colombia, Guyana, and Suriname contributed to the region accounting for the highest percentage (37.3%) of discoveries in 2022. Shahini in Iran is responsible for Southern Asia holding this title in 2023. (Figure 3) (See also Table A6: “Discoveries by region and subregion, count and resources” in the Appendix.)

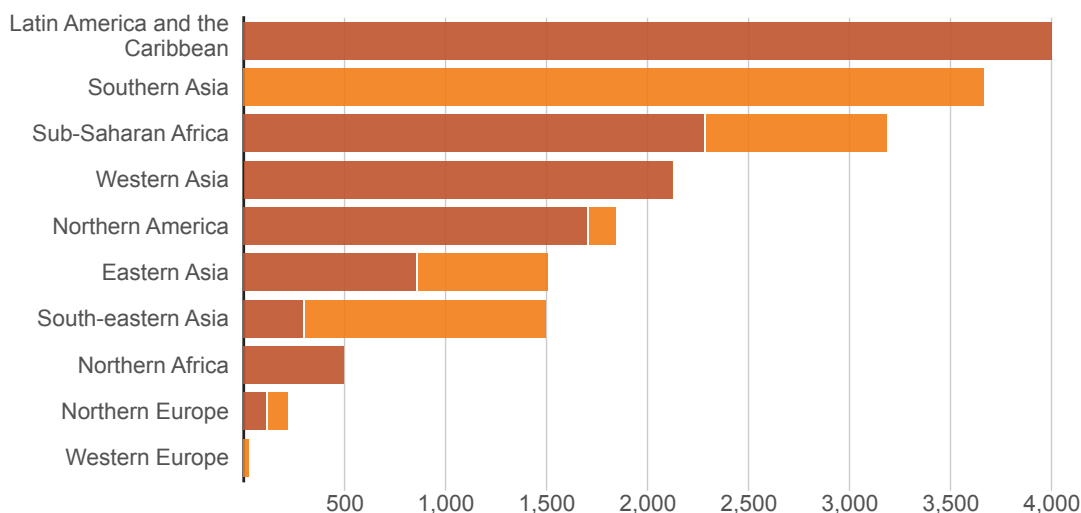
Oil and gas majors hold 26.7% of shares in these newly discovered reserves. National oil companies hold 31.1%, independents hold roughly 9.8%, and international national oil companies hold 13.3%. As noted by the IEA, new field developments are “[risky and complex processes](#),” so ownership of these projects is often split in order to “spread the risk and reward and to encourage technical and operational collaboration.” (Figure 4, on the next page)

Holding 100% of Shahini, the National Iranian Oil Company (NIOC) has the highest total resources of these new discoveries. ExxonMobil, via its stake in projects in Guyana,<sup>4</sup> has the next highest total resources with just over 1.6 billion boe. TotalEnergies’ resources come from its stake in Venus (45.2%), [Cronos](#) and [Zeus](#) in Cyprus (50%), and [Ntokon](#) in Nigeria (40%).

Companies involved in these projects are expecting some of them to start up within a year or two, but historically, according to GOGET data, fields take an average of eleven years from discovery to production. Assuming that trend holds, many of these projects would not start producing until well into the 2030s, despite that decade being when new fossil fuel production plans “[will need to be axed](#)” and all production has to fall by 40%.

**Figure 3: Guyana and Iran drive Latin America and Southern Asia to regionally lead 2022 and 2023 oil and gas discoveries**

Oil and gas discoveries (million barrels of oil equivalent) by region and year



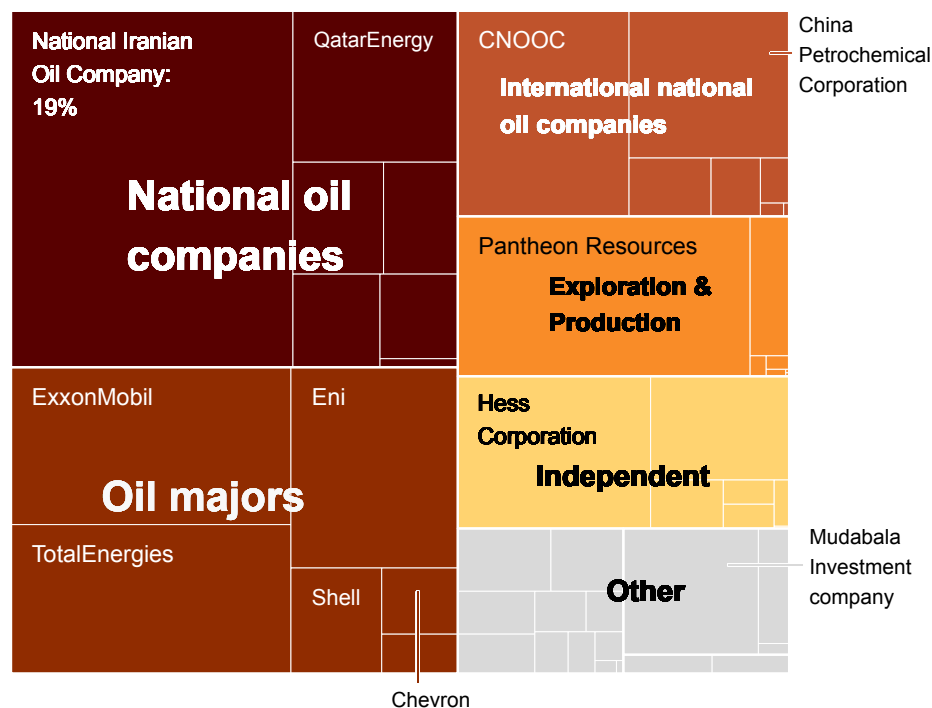
Source: Global Oil and Gas Extraction Tracker, Global Energy Monitor



4. Exxon holds 45% of the Stabroek Block, which includes the [Barreleye](#), [Fangtooth](#), [Fangtooth South East](#), [Lau Lau](#), [Sailfin](#), and [Seabob](#) discoveries.

**Figure 4: National oil firms & majors dominate discoveries**

Volume of oil and gas reserves discovered in 2022 and 2023 by company



Note: Other includes investor or exploration companies, or where the type of company is unclear. Company type is based on the Global Oil & Gas Exit List 2023.

Source: Global Oil and Gas Extraction Tracker, Global Energy Monitor



## NEW PROJECTS ARE STILL BEING SANCTIONED

Reaching the final investment decision (FID) is a key part of a field’s development. FID is reached when companies involved in a project make the decision to sanction the project, essentially stating that they have decided it is a worthwhile investment and have been able to obtain the necessary permits and capital. GOGET considers the announcement of FID the main turning point from a field’s status being “discovered” to “in-development.”

GOGET identifies 45 projects, with 16 billion boe of reserves, that were sanctioned since the initial IEA NZE roadmap was released. The [IEA’s 2023 report](#)

specifically refers to “new long lead-time conventional oil and gas projects,” therefore, unconventional and expansion projects are excluded from the aforementioned 45 projects. Including unconventional and expansion projects, 56 projects were greenlit in 2022 and 2023 with 58.5 billion boe of reserves. (Table 2)

**Table 2: Sanctionings by Year**

	Project Count (#)	Reserves (billion boe)
2022	25	7.9
2023	20	8.0
<b>Total</b>	<b>45</b>	<b>15.9</b>

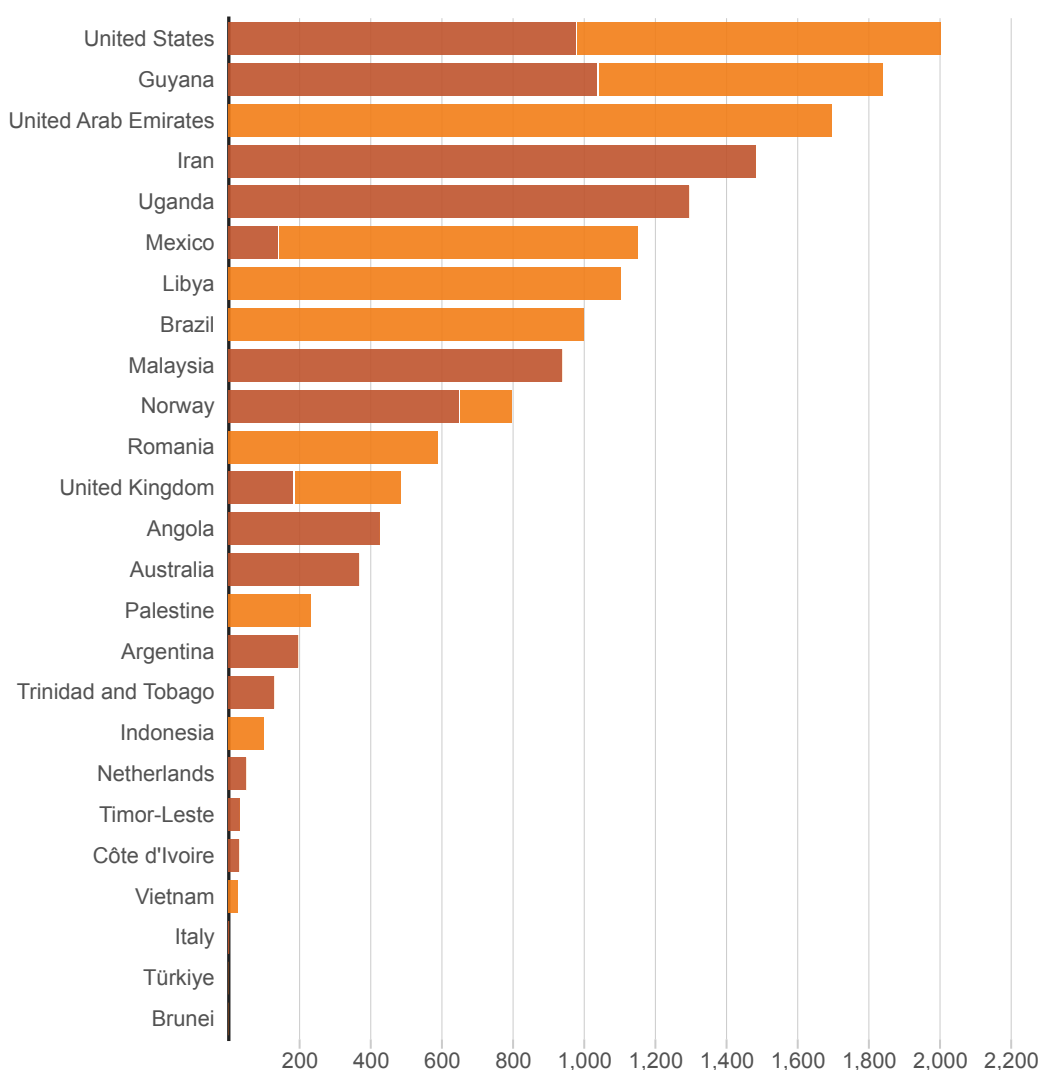


In 2023, fewer counts of FIDs were reached compared to 2022, despite early 2023 predictions for “a slight uptick” in projects reaching FID. These approved volumes were largely driven by national oil companies and oil and gas majors. 2022 sanctioned charts were topped by the National Iranian Oil Company’s [Halegan](#), TotalEnergies’s [Tilenga](#), and ExxonMobil’s [Yellowtail](#). The latter two are listed as “highly

[controversial](#)” by Oil Change International (OCI) and face local community and international opposition. 2023 volumes are driven by Abu Dhabi National Oil Company (ADNOC)’s [Hail and Ghasha](#) in the United Arab Emirates, the Libyan National Oil Corporation’s [Bahr Es Salam](#), and Equinor’s [BM-C-33](#) project, consisting of the Raia Manta and Raia Pintada<sup>5</sup> fields in Brazil. (Figure 5)

**Figure 5: Nearly 40% of oil and gas sanctioned in 2022 and 2023 was in the Americas**

Volume of oil and gas reserves sanctioned (million barrels of oil equivalent) by country and year



Source: Global Oil and Gas Extraction Tracker, Global Energy Monitor

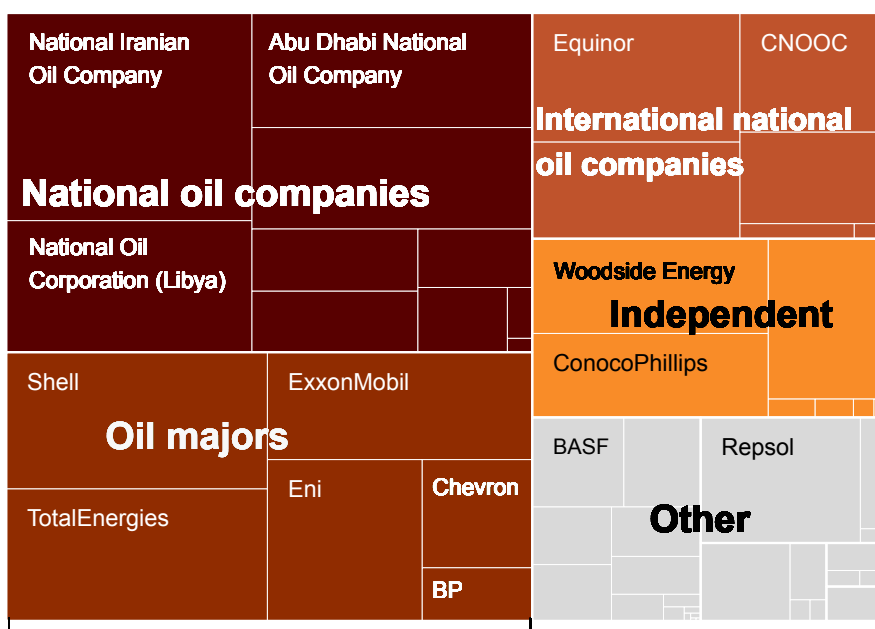


5. Formerly known as the Pão de Açúcar, Gávea, and Seat discoveries.

Between 2024 and the end of the century, oil and gas companies are aiming to sanction at least another 31.2 billion boe of reserves across 64 projects. This number is only inclusive of projects with announced FID target dates or those that have been estimated publicly in the media. The total number of projects is surely much higher.

National oil companies and oil and gas majors are responsible for the majority of the resources that were approved, with 33% and 26% respectively.<sup>6</sup> (Figure 6) Sanctionings are taking place across the globe, but the Americas and Asia lead in terms of the most approvals of reserves. (Figure 7, on the next page)

**Figure 6: National oil firms & majors have sanctioned the majority of new oil and gas**  
Volume of oil and gas reserves sanctioned in 2022 and 2023 by company



60% of new oil and gas projects sanctioned were by oil majors and national oil companies

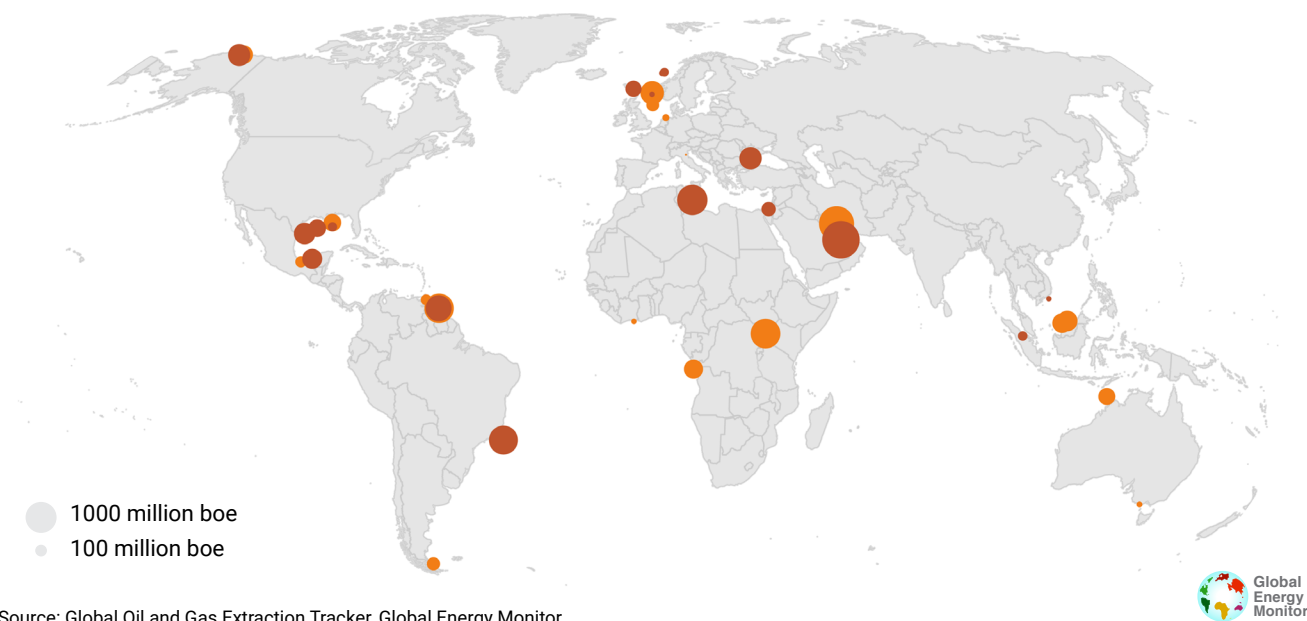
Note: Other includes integrated, industrial, exploration & production, and investor firms. Company type is based on the Global Oil & Gas Exit List 2023.

Source: Global Oil and Gas Extraction Tracker, Global Energy Monitor



6. Of fields where ownership data is available. Of all fields in data, NOCs and majors — 32.4% and 25.7% respectively.

**Figure 7: United States, Guyana, and United Arab Emirates sanctioned more than a third of recent volumes**  
2022 and 2023 sanctionings of oil and gas fields



Source: Global Oil and Gas Extraction Tracker, Global Energy Monitor

## INCONSISTENCY OF OIL AND GAS TRAJECTORIES WITH LIMITING WARMING

In 2023, the IEA doubled down on its assertion in the 2020 NZE roadmap, stating in its Paris-compliant scenario, “declines in demand are sufficiently steep that [no new long-lead-time conventional oil and gas projects are needed](#). Some existing oil and gas production would even need to be shut in.” However, as of the start of last year, reserves from [committed oil and gas reserves alone](#) were greater than the remaining 1.5°C carbon budget. Researchers at OCI found that nearly 20% of oil and gas fields must be shut down, “even if no new fields are developed and coal extraction stops tomorrow.”

From the production rather than the reserve side, the United Nations Environment Programme (UNEP) and

Stockholm Environment Institute (SEI) have repeatedly sounded the alarm that oil and gas production projections are completely out of line with climate goals. Fossil fuel producers are [targeting oil and gas production](#) 29% and 82% higher, respectively, than what is consistent with limiting warming to 1.5°C. In a review of many modeled pathways, the International Institute for Sustainable Development (IISD) found that global oil and gas production and consumption must decrease by [at least 65% by 2050](#) to keep warming below 1.5°C, compared to 2020 levels. Unless existing fields are shut down early, there is no room or need for any new fields to be approved.

## SQUARING THE EMISSIONS CIRCLE

Emissions from the fossil fuel supply must be cut. In 2022, scope one and two emissions from oil and gas operations were responsible for 5.1 gigatons (Gt) CO<sub>2</sub>-eq, about 15% of all energy-related greenhouse gas (GHG) emissions and equivalent to all

energy-related greenhouse gas emissions from the United States. Reductions in these emissions play a key role in the IEA NZE scenario, with emissions intensities falling by more than 50% by 2030, as all operators come in line with today’s lowest intensity producers.

Focusing on this subset of emissions can be misleading as scopes one and two don't include [about 80% percent of oil and 85% percent of gas](#)' full life cycle emissions.

The largest conventional project that reached FID in 2023 is the United Arab Emirates' [Hail and Ghasha](#) with nearly 1.7 billion boe of reserves. Abu Dhabi National Oil Company (ADNOC) announced FID on the project – partially located in the Marawah Protected Area – on October 5, 2023. Eni and ADNOC together hold 80% of the project, with Wintershall DEA, OMV, and Lukoil holding the remaining 20%. ADNOC claims it is the [world's first](#) project to try and operate with net zero carbon dioxide (CO2) emissions via a [carbon capture and storage](#) scheme.

## EXTRACTION JUSTIFICATIONS

Some amount of oil and gas production is still included in the IEA's NZE (for hydrogen and petrochemicals). However, this amount of production is quite small, and as recognition increases that most proposed projects cannot be justified, many different approaches to justify continued exploration and extraction are taking shape as each producer wants that [last bit of production to be their production](#). Therefore, a myriad of arguments are being put forth, such as lowering costs, ensuring diversity of supply, reducing emissions, and fostering economic development.

While Norway, the U.S., and the UAE have justified their continued extraction based on low production emissions, other arguments abound. For example, when [Rosebank](#) was approved and reached FID in 2023, the UK government welcomed the decision, with a minister saying it makes sense to approve new projects allowing for "[greater energy independence](#), making us more secure against tyrants like (Vladimir) Putin."

But ADNOC's net zero claim ignores scope three emissions from burning the fossil fuels extracted from the site. According to Urgewald and partners, when those emissions are included, the project will emit [many times](#) more carbon than it captures. The project has potential [CO2 emissions of 618](#) megatonnes. Additional supply chain methane leakages must also be considered.

Hail and Ghasha is indicative of how companies obscure project impacts by referring to scope one and two emissions while ignoring scope three.<sup>7</sup> Similarly, Norway has [defended its exclusion](#) of scope three emissions from its field approval process. However, a January 2024 court decision found that scope three emissions must be considered, [overturning](#) the energy ministry's approval of several projects. The state is [appealing](#) the judgment.

In the United States, Senator Lisa Murkowski supported ConocoPhillips' [Willow](#) oil field, [arguing](#) that the Alaskan oil and gas industry has a "better environmental track record," and not approving the project "impoverish[es] Alaska Natives and blame them for changes in the climate that they did not cause."

Similarly, the Africa Energy Chamber (AEC) urged "African countries to reject any and all anti-fossil fuel policy that may arise" at COP28, arguing, among other things, that doing so would be "[abandoning any chances of economic growth](#)."

The IEA examined the tradeoffs of these cases and aims to find a middle ground between them. It concludes that "increases in one part of the world must be matched by faster declines elsewhere." In all cases, the IEA warns that any new projects are likely to face major commercial risks.

7. Scope one emissions are those that come directly from any extraction, processing, transport or combustion at the extraction site. Scope two emissions are those associated with the generation of energy that is purchased for the purpose of oil and gas extraction. Scope three emissions are inclusive of end use cases, mainly the fuel's combustion by end users.

## COUNTRY PROFILES

### Americas

#### Brazil

Already Latin America's [top oil producer](#), the Brazilian government plans show a [doubling of production](#) by 2029, peaking at 5.4 million barrels of oil per day. This ties Brazil with Russia for the [third-highest projected near-term increase](#) of existing producers. Brazil's Petrobras is aiming to "replicate the massive offshore discoveries made in neighboring Guyana" in the [sensitive Foz do Amazonas Basin](#). If successful in this

increase, Brazil would become [the fourth-largest oil producer](#) in the world, up from eighth in 2021. Brazil is also aiming to [increase its gas production by 124%](#). This comes as the Organization of the Petroleum Exporting Countries (OPEC) announces that Brazil will be [joining](#) the "OPEC+ Charter of Cooperation," in a move that ["contradicts climate goals."](#)

#### Guyana

Guyana has the [highest expected oil production growth](#) in the world through 2035, due to more than ten billion barrels of recoverable oil resources having been discovered since 2015. The country was listed as the "furthest along" new producer economy, of those covered in a recent [IEA report](#), and proclaimed to be "at the [forefront of the fight to save the planet](#) from oil and gas."

operating. A final investment decision was announced for Yellowtail in 2022 and the Uaru Project (comprising the Uaru, Mako and Snoek fields) in 2023. The remaining twelve are still considered discoveries in GOGET.

Much of Guyana's resources are located in the offshore Stabroek Block, operated by ExxonMobil, which holds a 45% interest. Hess Corporation and CNOOC Limited have 30% and 25% interest respectively. Of the sixteen fields covered in GOGET, two (Liza and Payara) are

By the mid-2030s, the [IEA expects](#) Guyana to produce around two million barrels per day, about as much as Colombia, Ecuador, Peru, Trinidad & Tobago, and Venezuela produced altogether in 2022. ExxonMobil faces significant opposition to its plan to exploit these resources. On human rights and [environmental](#) grounds, opponents of the projects are taking the oil companies to court in the ["fight to save the planet from oil and gas."](#)

#### United States

The United States produced 978.6 bcm of gas in 2022, more than all of the Middle East (721.3 bcm) and Africa (249.0 bcm) combined. The U.S. produced 17.7 million barrels per day (bbl/d) of oil, more than South and Central America (6.3 million bbl/d), Europe (3.3), and Asia Pacific (7.3) combined according to the Statistical Review of World Energy Data. Even so, the US Energy Information Administration (EIA) forecasts that [gas production will continually increase](#), reaching 1,200 bcm in 2050, and oil production will reach and then remain at record high levels between 19 and 21 million bbl/d from 2024 to 2050.

disconnect between rhetoric and action came into sharp focus this year when ConocoPhillip's 576 million barrel Willow project was approved. While most of the United States' production and expansion is tied to the Permian unconventional basins, [Willow](#) has the ninth-largest reserves amongst conventional oil and gas projects reaching FID last year.

This increase is occurring despite the country's announced goal of net-zero emissions by 2050. This

The U.S. is responsible for [~37% of all potential carbon emissions](#) from new oil and gas production between 2023 and 2025 (72.5 GtCo<sub>2</sub>). The U.S.'s neighbor to the north, Canada, is a distant second in emissions from new projects, with just under 10% (18.6 GtCo<sub>2</sub>) of global potential emissions.

## Asia

### Azerbaijan

Azerbaijan's role as COP29 host and its [appointment](#) of Mukhtar Babayev, a [longtime veteran](#) of Azerbaijan's oil company SOCAR, as COP president has drawn a lot of attention to the country's record of [human rights abuses](#) and its status as a [petrostate](#).

Most of Azerbaijan's oil production comes from the [Azeri-Chirag-Gunashli](#) (ACG) complex. It is operated by BP, which has the largest participating interest (30.4%). SOCAR has 25%, while the MOL Group, INPEX,

Equinor, ExxonMobil, TPAO, Irochu, and ONGC all hold less than 10% each. Most of the country's gas reserves are held in the [Shah Deniz](#) field, which is also operated by BP (30%). Lukoil holds the next largest interest (20%), followed by TPAO, SOCAR, and NIOC. Azerbaijan is currently [increasing](#) its gas production, with a commitment to [double its gas exports](#) to Europe by 2027. Absheron gas field, which started up in 2023, alongside Umid, ACG, and Shah Deniz, is expected to contribute to the boost.

### Saudi Arabia

In 2022, Saudi Arabia produced about twelve [million barrels of oil per day](#). As of early 2024, it was producing [about nine million bbl/d](#). A 2021 document from the state-owned oil company, Saudi Aramco, projected an annual rate of production increase of one percent from 2015 to 2050. By 2027, the company had plans to reach thirteen million barrels per day. However, in January 2024, Saudi Aramco announced the government had instructed the company to maintain its oil production capacity at twelve million barrels per day, [abandoning a planned increase](#). Analysts [declared](#) this was a sign that the country "is moderating its expectations of global oil demand growth in the coming years," but this is [not a universally held opinion](#).

Many analysts [concluded](#) that the Saudi Aramco declaration meant that the [Safaniya](#) and [Manifa](#) expansion projects "[are most likely to be deferred](#)." Manifa's expansion was targeting 300,000 bbl/d, raising the project's production to 1.2 million bbl/d in 2027–28.

Safaniya's expansion was set for an increase of 700,000 bbl/d by 2027.

Analysis at Evercore ISI predicted that "Marjan, Berri, and Zuluf will continue to move forward" despite the lower production target. The [Marjan](#), [Berri](#), and [Zuluf](#) expansion projects target 300, 250, and 600 thousand bbl/d, respectively. The Marjan production additionally aims to extract an additional 2.5 billion cubic feet of gas by 2025. (Table 3)

**Table 3: Potential Impact of Saudi Aramco Announcement on Expansion Plans**

Expansion Project	Additional Production Design Capacity of Oil (thousand bbl/d)	Status
Safaniya	700	Deferred
Manifa	300	Deferred
Marjan	300	Expected
Berri	250	Expected
Zuluf	600	Expected

### United Arab Emirates

Between 2023 and 2027, the Abu Dhabi National Oil Company (ADNOC) plans to spend 150 billion USD "to [ramp up oil production](#) capacity to five million barrels per day," potentially moving the UAE to become the [seventh-largest expander of oil and gas production](#) by 2050. The ADNOC CEO, Sultan al-Jaber, chairing COP28, brought the role of oil and gas executives in the energy transition into stark focus,

raising questions about [conflicts of interest](#).

ADNOC hopes to achieve its goals by expanding the production profiles at some of its largest offshore existing oil fields, tapping gas cap reserves, and exploiting unconventional resources. ADNOC's Hail and Ghasha project, targeting 1,697 million barrels of oil equivalent, is the largest project approved in 2023.

## Europe

### Norway

Norway is Europe's largest producer of oil and gas and has the [lowest production emissions](#) intensity in the world. However, the country's arctic drilling and other "[environmentally-questionable practices](#)" has led executives to admit the "[contradictions are becoming more obvious](#)" for the self-styled green country.

While Norway's approval of the [Breidablikk](#), [Yggdrasil](#), and [Tyrving](#) oil and gas fields was recently overturned, its exploration and extraction activities continue

domestically, while its majority state-owned company, Equinor, continues to hold stakes in projects across the world. The company is searching for more oil and gas in Angola, Argentina, Azerbaijan, Brazil, Canada, Suriname, Tanzania, the UK, and the U.S., and is extracting resources from Algeria, Ireland, Libya, and Nigeria. The largest projects Equinor operates outside of Norway are the [Peregrino field](#) in Brazil and the [Mariner field](#) in the UK.

## Oceania

### Australia

With 367 million boe approved in 2023 and 3.4 billion boe more targeted for FID between 2024 and 2030, Australia is aiming to maintain its role as a top gas exporter. The Woodside Energy operated [Browse to North West Shelf](#) project is the largest of these projects

with resources of 13.9 trillion cubic feet of gas and 390 million barrels of condensate. BP holds the largest share of the project with 44%. Shell, MIM, and PetroChina are also involved in the joint venture promoting the project.

## Africa

### Namibia

With at least eight billion boe of discoveries in 2022 and 2023, Namibia's Orange Basin has become a "[global exploration hotspot](#)." GOGET's resource figures are based exclusively on projects where estimates have been released. In August 2023, preliminary data from state-owned oil firm NAMCOR [indicated](#) that "11 billion barrels of light oil and up to 8.7 trillion cubic feet of gas" had been discovered by Shell and TotalEnergies, putting the southern African country "[on par with offshore Guyana](#)."

However, in January 2024, the resource estimates for [Graff](#) and [Jonker](#), two of the larger recently discovered fields, were downgraded to 200 and 300 million bbl. The African Energy Chamber in late 2023 cited a Rystad "conservative estimate" that Graff had resources of [735 million boe](#) (mostly liquids). Upstream had,

in 2022, put Graff's recoverable reserves [as high a two billion boe](#). Compared to even the more conservative figure, this is a 70% reduction in recoverable volume estimates. Without inside knowledge it's impossible to know the reason for the downgrade, but a possible explanation might be [reduced permeabilities](#). This might impact the recoverable resources of the other discoveries as well.

According to the Petroleum Commissioner of Namibia's Ministry of Mines and Energy, the country, which [currently does not produce any oil or gas](#), plans to "accelerate development of these discoveries and to see first oil in Namibia." Shell and TotalEnergies activity has sparked interest in the area from other international companies such as [Chevron, GALP, and Woodside](#).



## BENCHMARKING GOGET

**Table 4: GOGET Compared to Commercial Datasets**

	GOGET All (conventional, excluding expansions) <sup>8</sup>	WoodMackenzie	S&P Global <sup>9</sup>	Rystad <sup>10</sup>
2022 Approval Count	34 (25)	30	-	-
2023 Approval Count	22 (20)	21	-	-
2022 Approval Reserves (billion boe)	49.5 (7.9)	18.3	-	-
2023 Approval Reserves (billion boe)	9 (8)	16	-	21.5
2022 and 2023 Approval Reserves (billion boe)	58.5 (16.0)	-	-	39
2022 Discoveries (count)	31	-	280	-
2022 Discovered resources (billion boe)	12.6	-	18	-
2023 Discoveries (count)	19	-	189	-
2023 Discovered resources (billion boe)	7.7	-	9.8	-

## METHODOLOGY, FUTURE RESEARCH AND KNOWN GAPS

### Methodology

GOGET uses a two-level system for organizing information, consisting of both a database and wiki pages with further information. The database tracks individual oil and gas units and includes operator and ownership structure, unit status, fuel type, production levels, reserves, and location. A full listing of attributes tracked can be found in the [downloadable dataset](#).

Oil and gas unit data is collected from and validated through five main sources:

1. Government data on individual units, country energy and resource plans, and government websites tracking extraction permits and applications;
2. Reports by state-owned and private companies;
3. News and media reports;
4. Local non-governmental organizations tracking extraction permits and operations;
5. On-the-ground contacts who can provide firsthand information about a project.

A partial list of data sources can be found [here](#), but the full listing of citations for each unit can be found on GEM.wiki. GOGET is released in English, but research is done in Russian, Arabic, Chinese, Spanish, and English by a global team of researchers.

The primary statuses discussed above are defined as follows:

- **Discovered**— A field is typically considered to be discovered when there has been a well drilled into a particular formation and it yielded some significant quantity of oil and/or gas. Discovered fields are not necessarily economic to exploit.
- **In Development**— Following discovery, the process of moving toward commercial production has begun. This means that a company is planning to develop the project, as evidenced by one or more of the following criteria being reached: the company has applied for approval for commercial production (if needed in the jurisdiction), the project

8. For the purposes of this report, unconventional and expansion projects were excluded for reasons outlined above.

9. These numbers were extracted from figure 1.

10. Extracted from publicly available data.



has reached the final investment decision (FID),<sup>11</sup> a final environmental impact statement has been published, and/or the drilling of development (not appraisal) wells and/or adding takeaway capacity (infrastructure such as pipelines, storage tanks, etc.) to enable commercial production has begun.

- Operating — The field has commercial production of oil/gas (that is, quantities that are being sold to market).

A full listing of statuses can be found in the data download and in GOGET's [methodology page](#).

After data is collected, an inclusion threshold is applied resulting in a smaller dataset being published.

Only units with reported reserves of 25 million boe or greater, or units with production greater than 1 million boe per year are included in the dataset. Conversions used in GOGET are listed on the project's [methodology page](#). GOGET does not fill in or estimate values that are not directly reported, besides basic arithmetic when needed. This leads to some discrepancies between GOGET and other datasets that estimate reserves and production values. Companies and countries define and report reserves differently. GOGET provides the reserves data and classifications as reported by the original sources. These values are classified and mapped but not converted. Care is taken when comparing data, but this is an imperfect approach with inherent limitations.

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11. FID is the most common evidence used to justify this status change. This methodology matches with the one used by the [International Gas Union](#).

## APPENDIX

Table A1: 2022 and 2023 oil and gas discoveries

Unit Name	Country	Discovery Year	Operator	Parent	Reserves - Total (Oil, Gas, and Hydrocarbons - million boe)
Shahini	Iran	2023		National Iranian Oil Company (100%)	3665 <sup>12</sup>
Venus	Namibia	2022	TotalEnergies	TotalEnergies (45.2%); QatarEnergy (30%); Impact Oil and Gas (9.5%); National Petroleum Corporation of Namibia (10%)	2085
Kodiak	United States	2022	Pantheon Resources	Pantheon Resources (100%)	1706
Qijiang	China	2022	Sinopec Xinan Oil and Gas Field Branch	China Petrochemical Corporation (Sinopec Group) (100%)	859
Uchuva	Colombia	2022	Petrobras	Ecopetrol S.A. (55.6%); Petrobras (44.4%)	666
Lau Lau	Guyana	2022	ExxonMobil	ExxonMobil (45%); Hess Guyana Exploration Ltd (30%); CNOOC Nexen Petroleum Guyana Ltd (25%)	658
Geng North	Indonesia	2023	Eni	Eni S.P.A. (50.2%); Neptune Energy (38%); Agra Energi I Pte Ltd (11.7%)	648
Shenfu	China	2023	CNOOC Limited	CNOOC Limited (100%)	647
Fangtooth	Guyana	2022	ExxonMobil	ExxonMobil (45%); Hess Guyana Exploration Ltd (30%); CNOOC Nexen Petroleum Guyana Ltd (25%)	620
Seabob	Guyana	2022	ExxonMobil	ExxonMobil (45%); Hess Guyana Exploration Ltd (30%); CNOOC Nexen Petroleum Guyana Ltd (25%)	591
Narges-1X	Egypt	2022	Chevron	Chevron (45%); International Egyptian Oil Company (45%); Tharwa (10%)	408 <sup>13</sup>
Baja-1	Suriname	2022	APA Corporation	Petronas (30%); APA Corporation (45%); Cepsa (25%)	582
Barreleye	Guyana	2022	ExxonMobil	ExxonMobil (45%); Hess Guyana Exploration Ltd (30%); CNOOC Nexen Petroleum Guyana Ltd (25%)	572
Fangtooth SE-1	Guyana	2023	ExxonMobil	ExxonMobil (45%); Hess Guyana Exploration Ltd (30%); CNOOC Nexen Petroleum Guyana Ltd (25%)	567
Sailfin	Guyana	2022	ExxonMobil	ExxonMobil (45%); Hess Guyana Exploration Ltd (30%); CNOOC Nexen Petroleum Guyana Ltd (25%)	563
Layaran-1	Indonesia	2023	Mubadala Petroleum	Mubadala Petroleum (80%); Harbour Energy (20%)	550
XF-002	United Arab Emirates	2022	Eni	Eni S.P.A. (70%); PTTEP International Limited (30%)	350
Cronos	Cyprus	2022	Eni S.P.A.	Eni S.P.A. (50%); TotalEnergies (50%)	416
Zeus	Cyprus	2022	Eni S.P.A.	Eni S.P.A. (50%); TotalEnergies (50%)	416
Katlan	Israel	2023	Energean	Energean	400
Ntokon	Nigeria	2022	TotalEnergies E&P	Nigerian National Petroleum Corporation (60%); TotalEnergies Upstream Nigeria Limited (40%)	400
Alameda	Cuba	2022	Melbana Energy	Melbana Energy (30%); Sonangol (70%)	362
Çaycuma	Türkiye	2022	TPAO	Türkiye Petrolleri AO	333

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12. There is some ambiguity with how this value is reported. It is given as an “**estimated volume**” and stated to be what the field “**contains.**” If this is a gas-in-place figure, applying an average recovery factor of **65%** this would amount to 405 bcm or 2,382 million boe recoverable.

13. Some ambiguity regarding report value’s classification. **70%** recovery factor applied to reported value.

**Table A1: 2022 and 2023 oil and gas discoveries** (continued)

Unit Name	Country	Discovery Year	Operator	Parent	Reserves - Total (Oil, Gas, and Hydrocarbons - million boe)
<u>Timpman-1</u>	Indonesia	2022	Harbour Energy	BP (30%); Mubadala Petroleum (30%); Harbour Energy (40%)	300
Jonker	Namibia	2023	Shell plc	QatarEnergy (45%); Shell plc (45%); National Petroleum Corporation of Namibia (10%)	300
<i>Other fields</i>					1618
<b>Total</b>					<b>20283</b>

**Table A2: Top 15 companies by ownership share in 2022 and 2023 oil and gas discoveries**

Company	Company Type <sup>14</sup>	Discovered Resources (million boe)
National Iranian Oil Company	NOC	3665
ExxonMobil	Major	1607
TotalEnergies	Major	1519
Eni S.P.A.	Major	1222
CNOOC Limited	INOC	1284
Pantheon Resources	E&P Company	1706
Hess Corporation	Independent	1071
QatarEnergy	NOC	910
China Petrochemical Corporation	INOC	859
Mubadala Investment Company	Investor	622
APA Corporation	Independent	524
Ecopetrol S.A.	NOC	370
Shell plc	Major	349
Sonangol Group	NOC	303
Petróleo Brasileiro S.A. (Petrobras)	NOC	296
<i>Others</i>		2499
<b>Total</b>		<b>18806<sup>15</sup></b>

14. Based on “Rystad Upstream Industry Segment” as shown in the [Global Oil & Gas Exit List 2023](#)

15. Sum differs in this table from total discovered resources due to missing ownership data.

Table A3: Top 25 2022 and 2023 project sanctionings

Unit Name	Country	Approval Year	Operator	Parent	Reserves - Total (Oil, Gas, and Hydrocarbons - million boe)
Hail and Ghasha	United Arab Emirates	2023	Abu Dhabi National Oil Company	Abu Dhabi National Oil Company (55%); Eni S.P.A. (25%); BASF SE (7.3%); LetterOne Holdings (2.7%); OMV Aktiengesellschaft (5%); Lukoil (5%)	1697
Halegan	Iran	2022	National Iranian Oil Company	National Iranian Oil Company (100%)	1483
Bahr Es Salam (Structures A&E)	Libya	2023	Mellitah Oil & Gas	Eni S.P.A. (15%); National Oil Corporation (Libya) (85%)	1105
Tilenga	Uganda	2022	TotalEnergies	TotalEnergies (56.7%); CNOOC Limited (17.1%); HKSCC Nominees Limited (9.4%); China State-owned Enterprises Mixed Ownership Reform Fund (0.1%); CNPC (0.1%); Others (1.6%); Uganda National Oil Company (15%)	1055
Yellowtail	Guyana	2022	ExxonMobil	ExxonMobil (45%); Hess Corporation (30%); CNOOC Limited (25%)	1038
BM-C-33	Brazil	2023	Equinor	Repsol SA (35%); Petróleo Brasileiro S.A. (30%); Equinor ASA (35%)	1000
Uaru	Guyana	2023	ExxonMobil	ExxonMobil (45%); Hess Corporation (30%); State-owned Assets Supervision and Administration Commission of the State Council (SASAC) (25%)	800
Yggdrasil	Norway	2022	Aker BP	Equinor ASA; Polskie Górnictwo Naftowe i Gazownictwo SA (PGNiG); Aker Group; BP; Other	650
<a href="#">Neptun Deep</a>	Romania	2023	OMV Petrom S.A.	Romgaz (50%); OMV Aktiengesellschaft (50%)	588
Willow	United States	2023	ConocoPhillips Alaska	ConocoPhillips (100%)	576
<a href="#">Trión</a>	Mexico	2023	Woodside Petroleum Ltd.	Petróleos Mexicanos (40%); Woodside Energy Group (60%)	542
<a href="#">Kasawari</a>	Malaysia	2022	Petronas Carigali	Petroleum Nasional Berhad (Petronas) (100%)	495
<a href="#">Pit</a>	Mexico	2023	PEMEX	Petróleos Mexicanos (100%)	469
<a href="#">Rosmari-Marjoram</a>	Malaysia	2022	Sarawak Shell Berhad	Shell plc (80%); Petroleum Nasional Berhad (Petronas) (20%)	443
<a href="#">Quiluma/Maboqueiro</a>	Angola	2022	Azule Energy	Eni S.P.A. (25.6%); Chevron (31%); Sonangol Group (19.8%); Sonangol Group (19.8%); BP P.L.C. (11.8%); TotalEnergies (11.8%)	425
<a href="#">Pikka</a>	United States	2022	Santos Limited	Santos Limited (51%); Repsol SA (49%)	397
<a href="#">Ballymore (MC607) - Chevron</a>	United States	2022	Chevron U.S.A. Inc	Chevron (60%); TotalEnergies (40%)	357
<a href="#">Sparta (GB959) - Shell</a>	United States	2023	Shell	Shell plc (51%); Equinor ASA (49%)	357 <sup>16</sup>
<a href="#">Crux</a>	Australia	2022	Shell Australia	Shell plc (82%); Seven Group Holdings Energy (15%); Osaka Gas CO., LTD. (3%)	333
Rosebank	United Kingdom	2023	Equinor	Equinor ASA (80%); Delek Group Limited (20%)	300

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16. Additional reserve estimate from the same year lists reserves of 244 mmboe.

**Table A3: Top 25 2022 and 2023 project sanctionings** (continued)

Unit Name	Country	Approval Year	Operator	Parent	Reserves - Total (Oil, Gas, and Hydrocarbons - million boe)
<a href="#">Kingfisher South</a>	Uganda	2022	CNOOC	TotalEnergies (56.7%); CNOOC Limited (17.1%); HKSCC Nominees Limited (9.4%); China State-owned Enterprises Mixed Ownership Reform Fund (0.1%); CNPC (0.1%); Others (1.6%); Uganda National Oil Company (15%)	240
<a href="#">Gaza Marine</a>	Palestine	2023 <sup>17</sup>		Palestine Investment Fund (55%)	233
<a href="#">Fenix</a>	Argentina	2022	TotalEnergies Austral S.A.	TotalEnergies (37.5%); BASF SE (27.3%); LetterOne Holdings (10.2%); Bidas Corp. (6.2%); BP (12.5%); CNOOC (6.2%)	197
<a href="#">Jackdaw</a>	United Kingdom	2022	Shell plc	Shell plc (74%); ONE-Dyas B.V. (26%)	185
<a href="#">Lakach</a>	Mexico	2022	PEMEX	Petroleos Mexicanos (100%)	141
<i>Other fields</i>					866
<b>Total</b>					<b>15971</b>

**Table A4: Top 15 companies by ownership share in 2022 and 2023 oil and gas sanctioning**

Company	Company Type <sup>18</sup>	Discovered Resources (million boe)
National Iranian Oil Company	NOC	1483
Shell plc	Major	1038
TotalEnergies	Major	1001
National Oil Corporation (Libya)	NOC	939
Abu Dhabi National Oil Company	NOC	933
ExxonMobil	Major	827
Petroleos Mexicanos	NOC	827
Equinor ASA	INOC	780
Eni S.P.A.	Major	726
Woodside Energy Group Ltd	Independent	650
Petroliaam Nasional Berhad (Petronas)	INOC	584
Repsol SA	Integrated	583
ConocoPhillips	Independent	576
Hess Corporation	Independent	551
CNOOC Limited	INOC	508
<i>Others</i>		3549
<b>Total</b>		<b>15554<sup>19</sup></b>

17. As of January 2024, “the legal status of the field **remains unclear**, and the 2023 Israel– Hamas war further complicated this matter.”

18. Based on “Rystad Upstream Industry Segment” as shown in the [Global Oil & Gas Exit List 2023](#).

19. Sum differs in this table from total sanctioned resources due to missing ownership data.

Table A5: Top 25 oil and gas projects FID post-2024

Unit Name	Country	FID Year	Operator	Parent	Reserves - Total (Oil, Gas, and Hydrocarbons - million boe)
<a href="#">Dorra</a>	Kuwait-Saudi Arabia-Iran	2025	Khafji Joint Operations	Kuwait Petroleum Corporation (50%); Saudi Aramco (50%)	3632
<a href="#">Block 1 and Block 4</a>	Tanzania	2025	Shell plc	Medco Daya Energi (10%); Temasek (20%)	2941
Browse to North West Shelf	Australia	2024	Woodside Energy	Woodside Energy Group (30.6%); BP P.L.C. (44.3%); Mitsubishi Corporation (nan%); Mitsui & Co Ltd (nan%); China National Petroleum Corporation (8.6%); HKSCC Nominees Limited (1.2%); CITIC Securities (0.2%); Sinopec (0.1%); Others (0.5%)	2706
<a href="#">Abadi</a>	Indonesia	2027	INPEX Corporation	INPEX Corporation (65%); PT Pertamina (Persero) (20%); Petroliam Nasional Berhad (Petronas) (15%)	2118
Venus	Namibia	2025	TotalEnergies	TotalEnergies (45.2%); QatarEnergy (30%); Africa Oil Corp (9.5%); National Petroleum Corporation of Namibia (nan%)	2085
<a href="#">Jupiter</a>	Brazil	2026	Petrobras	Petróleo Brasileiro S.A. (80%); Galp Energia, SGPS, S.A. (20%)	2022
<a href="#">Orca</a>	Mauritania	2025	BP	BP P.L.C. (62%); Kosmos Energy (28%); Société Mauritanienne Des Hydrocarbures et de Patrimoine Minier (10%)	1300
<a href="#">Elk-Antelope</a>	Papua New Guinea	2024	TotalEnergies	TotalEnergies (40.1%); ExxonMobil (37.1%); Santos Limited (22.8%)	865
<a href="#">Mzia</a>	Tanzania	2026	Shell plc	Medco Daya Energi (10%); Temasek (20%); Shell plc (60%)	835
<a href="#">Bonga Southwest Aparo</a>	Nigeria	2026	Shell Petroleum Development Company of Nigeria	Nigerian National Petroleum Corporation (30.3%); Shell plc (16.5%); TotalEnergies (5.5%); Eni (2.8%); Nigerian Agip Oil Company limited (NAOC) (nan%); ExxonMobil (20%); TotalEnergies (12.5%); Eni S.P.A. (12.5%)	745
Geng North	Indonesia	2024	Eni	Eni S.P.A. (50.2%); China Investment Corporation (18.6%); The Carlyle Group (11.6%); CVC Capital Partners (7.8%); PT Agra Energi (11.7%)	648
<a href="#">Block B</a>	Vietnam	2024	PetroVietnam	Vietnam Oil and Gas Group (65.9%); Mitsui & Co (25.6%); PTT PLC (8.5%)	647
<a href="#">Aphrodite</a>	Cyprus	2025	Noble Energy	Chevron (35%); Shell plc (35%); Delek Group (30%)	610
<a href="#">Lang Lebah</a>	Malaysia	2024	PTTEP HK Offshore Ltd	PTT PLC (42.5%); Kuwait Petroleum Corporation (42.5%); Petroliam Nasional Berhad (Petronas) (15%)	575
<a href="#">Zabazaba and Etan</a>	Nigeria	2028	Eni S.P.A.	Eni S.P.A. (50%); Eni S.P.A. (50%)	560
<a href="#">Owovo West</a>	Nigeria	2027	ExxonMobil	ExxonMobil (27%); Chevron (27%); TotalEnergies (18%); CNOOC Limited (18%); Nigerian National Petroleum Corporation (10%)	550
<a href="#">Ca Voi Xanh</a>	Vietnam	2024	ExxonMobil	Vietnam Oil and Gas Group (36%); ExxonMobil (64%)	519
<a href="#">Zama</a>	Mexico	2024	PEMEX	Petróleos Mexicanos (50%); Talos Energy Inc. (17%); BASF SE (6.5%); LetterOne Holdings (4.8%); BASF SE (13%); LetterOne Holdings (7%)	518
<a href="#">Pecan</a>	Ghana	2025	Aker Energy	Aker Group (50%); Lukoil (38%); Fueltrade (2%); Ghana National Petroleum Corporation (10%)	500
<a href="#">BirAllah</a>	Mauritania	2025	BP Mauritania Investments	BP P.L.C. (62%); Société Mauritanienne des Hydrocarbures et de Patrimoine Minier (10%); Kosmos Energy Ltd. (28%)	479
<a href="#">Yakaar-Teranga</a>	Senegal	2024	Kosmos Energy Ltd.	Kosmos Energy Ltd. (90%); Societé des Petroles du Sénégal (Petrosen) (10%)	456

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Table A5: Top 25 oil and gas projects FID post-2024 (continued)

Unit Name	Country	FID Year	Operator	Parent	Reserves - Total (Oil, Gas, and Hydrocarbons - million boe)
<a href="#">Akkas</a>	Iraq		Korea Gas Company (KOGAS)	Korea Gas Corporation (KOGAS) (75%); Qatar Petroleum (nan%); TotalEnergies (nan%)	455
<a href="#">Sagitario</a>	Brazil	2024	Petrobras	Petróleo Brasileiro S.A. (60%); Shell plc (20%); Repsol Resources UK (nan%)	424
<a href="#">Bay du Nord</a>	Canada	2027	Equinor Canada	Equinor ASA (65%); BP P.L.C. (35%)	407
<a href="#">Equus Gas</a>	Australia	2024	Western Gas	Western Gas Partners, LP (100%)	375
<i>Other fields</i>					4918
<b>Total</b>					<b>31887</b>

Note: Total is inclusive of fields where FID was assumed based on production start year. Excluding these fields, the total is slightly lower: 31,221.2 million boe.

Table A6: Discoveries by region and subregion, count and resources

Year	Region	Subregion	Discovery Count	Reserves- Total (Million boe)	Percentage of Yearly Total
2022	Africa	Northern Africa	4	497.4	4.0%
		Sub-Saharan Africa	2	2285.1	18.2%
		<i>Total</i>	6	2782.5	22.1%
	Americas	Latin America and the Caribbean	9	4685.1	37.3%
		Northern America	1	1706.3	13.6%
		<i>Total</i>	10	6391.5	50.8%
	Asia	Eastern Asia	1	858.7	6.8%
		South-eastern Asia	2	300.0	2.4%
		Western Asia	8	2123.7	16.9%
		<i>Total</i>	11	3282.4	26.1%
	Europe	Northern Europe	4	117.4	0.9%
<i>Total</i>		4	117.4	0.9%	
	<b>Yearly Total</b>		<b>31</b>	<b>12573.8</b>	
2023	Africa	Sub-Saharan Africa	4	897.5	11.6%
		<i>Total</i>	4	897.5	11.6%
	Americas	Latin America and the Caribbean	5	1039.6	13.5%
		Northern America	3	135.0	1.8%
		<i>Total</i>	8	1174.6	15.2%
	Asia	Eastern Asia	1	647.1	8.4%
		South-eastern Asia	3	1197.7	15.5%
		Southern Asia	1	3664.9	47.5%
		<i>Total</i>	5	5509.8	71.5%
	Europe	Northern Europe	1	99.0	1.3%
		Western Europe	1	28.0	0.4%
		<i>Total</i>	2	127.0	1.6%
		<b>Yearly Total</b>		<b>19</b>	<b>7708.9</b>