



RYSTAD ENERGY

GUYANA UPSTREAM

INDUSTRY AND COUNTRY BENCHMARKING UPDATE



JULY 21, 2022

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- Rystad Energy is the premier independent energy knowledge house offering consulting services, global databases, and research products.
- Headquartered in Norway, Rystad Energy was established in 2004 and has ~450 employees with regional offices in Houston, London and Singapore, as well as supporting offices in most energy hubs, including in South America.
- Over the last 18 years, Rystad Energy has completed over 2,500 consulting projects for more than 500 clients, ranging from energy companies, investment banks, private equity and venture funds, service companies and governments in all regions of the world.
- In preparing the report, Rystad Energy has relied on its broad suite of proprietary research products and tools, its independent expertise and judgment. This report reflects our current view at the time of publication and is subject to change.

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Deepwater oil and gas in Guyana represents material and long-lasting value to oil companies, the Guyanese government, and the country of Guyana

Key Message

Supporting Statements

1

Guyana will go from a frontier exploration play to a top 5 global offshore producer in the next decade

- Guyana leads in offshore discoveries since 2015 with 11.2 billion boe, accounting for 18% of discovered resources and 32% of discovered oil. The vast majority of discoveries have been made in the Stabroek block, but recent discoveries highlight potential elsewhere.
- With current developments and discoveries, we forecast Guyana to reach 1.5 million boe/d of production by 2035, propelling Guyana to become the #4 offshore oil producer, ahead of the U.S., Mexico and Norway.

2

Guyana represents material value and growth for both the government of Guyana and international oil companies

- Oil and gas development will generate material value for Guyana. The government take from oil and gas production will reach \$7.5Bn per year by 2030, amounting to a cumulative \$157 Bn by 2040.
- Guyana’s fiscal regime is on the higher end with peers and global benchmarks, with the government receiving 59% of the total value for Stabroek block. Applying the U.S. fiscal regime to the Stabroek block, the government would receive 40% of the value. Norway, in contrast, has the highest illustrative government take with 79%. Brazil and Nigeria are in line with Guyana, with 61% and 58%, respectively.

3

Guyanese deepwater production is advantaged in the energy transition, with lower emissions intensity and low-cost resources

- With breakevens averaging \$28 per bbl, when including future developments, Guyana is well positioned as an advantaged supply source in all Rystad Energy’s energy transition oil demand scenarios.
- The emissions intensity of Guyana’s production is only half of the global average, at ca 9 kg CO2/boe. We expect emissions to decline further, as future developments will continue to use state-of-the-art FPSOs.

4

Guyana is taking steps to implement best governance practices in order to harness O&G revenues to promote broader economic development

- 2022 is a landmark year for Guyana - with government revenues from oil production forecasted to surpass \$1 Bn and average \$3.6 Bn per annum through 2030 (and \$12.4 Bn annually between 2031 and 2040)
- Guyana has implemented several governance mechanisms and strengthened key institutions in recent years, including the establishment of a sovereign wealth fund with diverse fiduciary oversight and broader economic development objectives.
- Guyana is ranked higher than most other non-OECD countries in World Bank governance dimensions, but more work is required, as shown by its low EITI ranking in 2022.

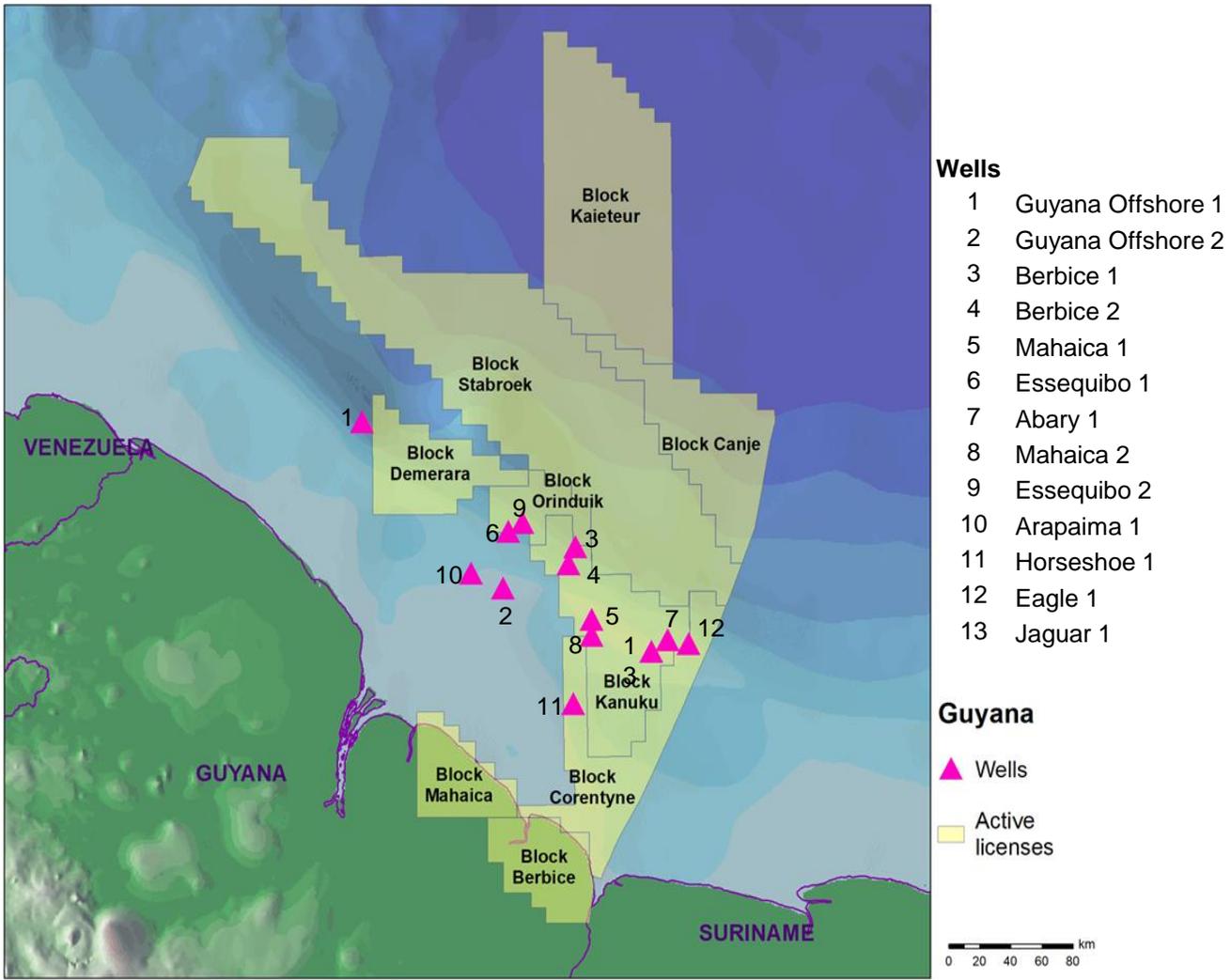
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After nearly 60 years of elusive exploration results, Exxon's Liza discovery in 2015 opened a new world-class deepwater basin and established Guyana as a major oil producer in the future

- Offshore exploration in Guyana began in 1958, when the California Oil Company conducted several seismic surveys but did not drill a well. The country's first offshore well was drilled by Conoco and Tenneco in 1967.
- Over the next 35 years, through 2012, a total of 12 more attempts were made to find offshore hydrocarbons, but each well was either dry or offered only uncommercial oil and gas shows. Including onshore spuds, the number of disappointing wells in Guyana swelled to 40 without a single commercial discovery.
- A pivotal move occurred in 1999, when ExxonMobil was awarded, a license covering Stabroek, a block to the north of the 13 disappointing offshore wells, but the company did not drill a single well until 2015.
- Offshore activity in Guyana has been negatively affected by disputes with its neighbors to the east and west, Suriname and Venezuela, respectively.
- One prominent example was CGX Energy's Eagle-1 well, which had to suspend operations in 2000 when Surinamese gunboats forced the drilling rig off location while its crew was preparing to spud the prospect. It was only after a 2007 agreement between Suriname and Guyana that CGX returned in 2012 to drill the well.

Offshore wells drilled before the Liza discovery (2015)

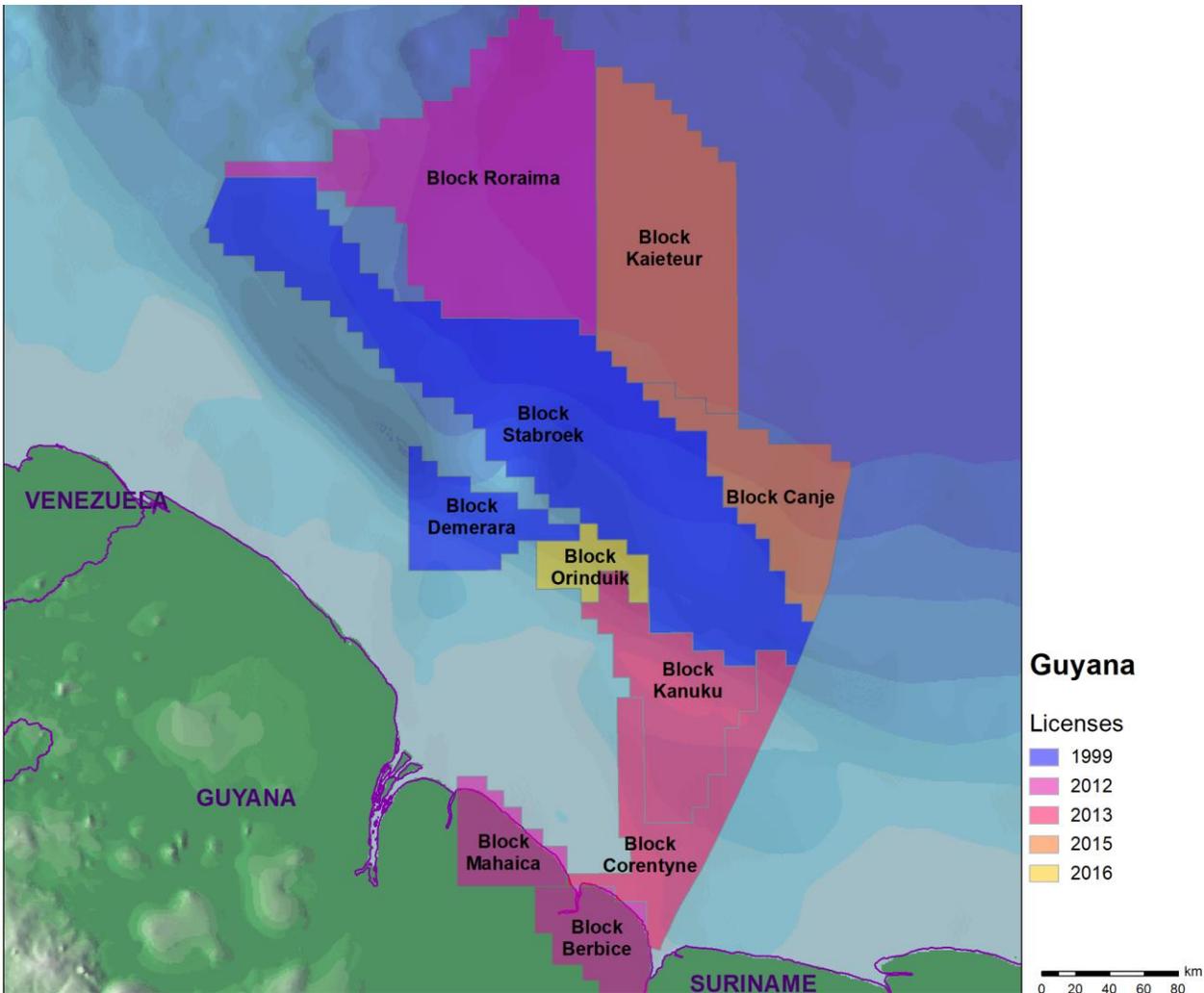


Source: Rystad Energy research and analysis

Guyana blocks are awarded under Production Sharing Agreements; Stabroek was the first, awarded to ExxonMobil in 1999

- Guyana blocks are awarded under production or production sharing agreements (PSAs).
- The first PSA was signed in 1999 between the government and Esso Exploration & Production Guyana Limited (EEPGL), an ExxonMobil subsidiary for operations in Guyana, in accordance with the Petroleum Act 1986. This deal included what turned out to be the highly prolific Stabroek block.
- After a hiatus of 13 years, two PSAs were signed in 2012. The Roraima block was awarded to Anadarko and the Mahaica-Mahaicony block to Nabi Oil and Gas.
- CGX, already present in Demerara block, signed its second PSA (Corentyne block) in 2013. During the same year, Repsol entered Guyana and signed up for the Kanuku block, situated just south of Stabroek.
- Shell farmed into Stabroek twice, first in 2009 and then in 2012. On both occasions, Shell acquired 25% to increase its partnership to 50% in 2012. However, in 2014 Shell exited Stabroek and returned its 50% to ExxonMobil.
- Hess and CNOOC farmed into stakes of 30% and 25%, respectively, in Stabroek in 2014.

Guyana awarded blocks since 1999

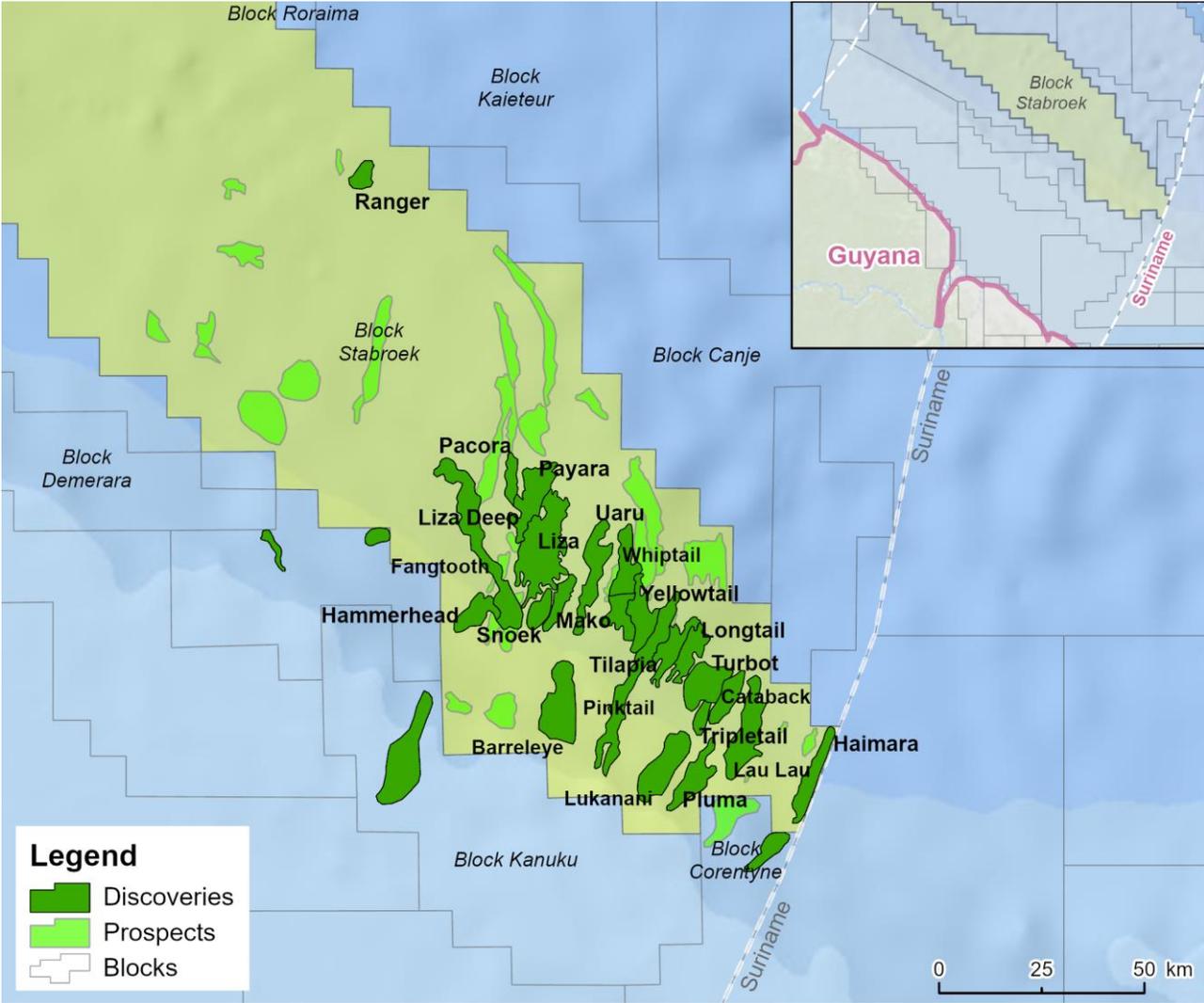


Source: Rystad Energy research and analysis

Guyana and the Exxon-led consortium have seen tremendous success in the Stabroek block since 2015, with 26 discovered fields and over 11 billion boe discovered resources

- Guyana has continued with its tremendous success since the first discovery Liza in 2015. The Barreleye, Lukanani and Patwa finds, announced in April 2022, added to the Fangtooth and Lau Lau discoveries on the same block earlier in 2022, and takes the total tally of discovered fields to 26.
- The announced independent finds to-date have propelled Guyana’s cumulative discovered volumes to over 11 billion boe. The sheer scale of success has propelled Guyana to the top spot globally in terms of discovered offshore hydrocarbon volumes since 2015.
- Although the wells are targeting similar reservoirs within the multiple stacked Cretaceous section, the reduction in average volumes could be related to the size of the remaining prospects compared to the earlier finds rather than to reservoir deliverability.
- Nonetheless, the industry is focused on a new emerging discovery trendline parallel to the primary trend, thereby increasing the probability of encountering commercial hydrocarbons within yet-to-be-drilled wells.

Discoveries within the Stabroek block

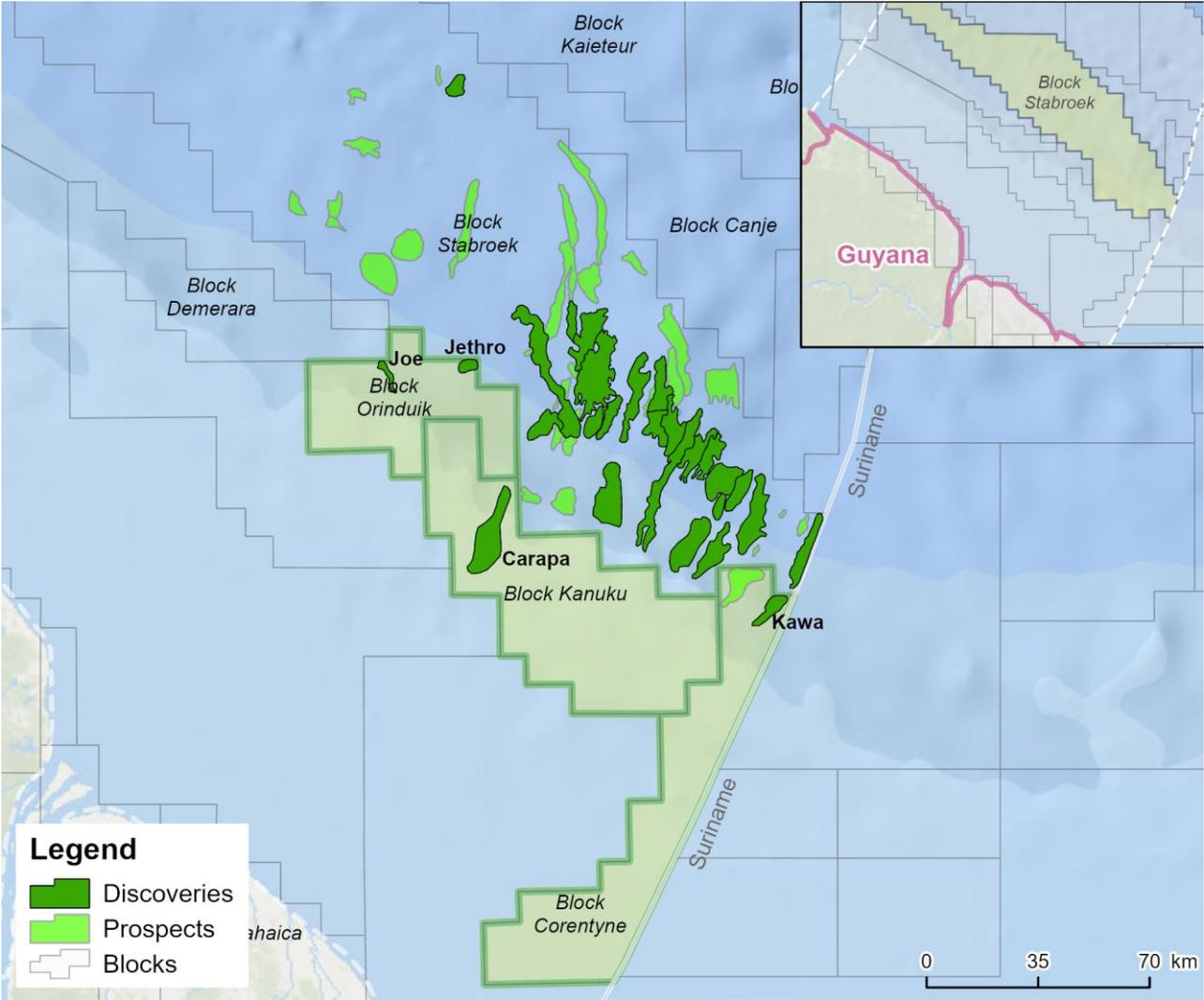


Source: Rystad Energy research and analysis

Exploration success outside the Stabroek block has been limited to only four discoveries, although play opening prospects remain within the Guyanese / Surinamese border

- Success outside Stabroek has been limited, which only four discoveries offshore Guyana - Jethro, Joe, Carapa and Kawa.
- The optimism around Jethro and Joe finds of 2019 soon perished with test results indicating heavy oil grade with high sulfur content. The next discovery Carapa in the Kanuku block which targeted around 200 million boe of hydrocarbons, was also uncommercial. Nonetheless, the find proved the presence of the cretaceous petroleum system extending outside Stabroek.
- These disappointments have been reversed by the recent Kawa discovery made by CGX in partnership with Frontera Energy. The well which has now been plugged and abandoned, as part of its exploration plan, has become the most successful one outside Stabroek. Following this, the Corentyne block partners plan to continue their exploration pursuit with Wei-1 expected to be spud in 3Q'22.
- Furthermore, there remain several undrilled prospects within the Guyanese and Surinamese waters. If successful, these prospects, will certainly result to an upward revision of USGS's initial estimates of 13.6 billion boe.

Discoveries outside the Stabroek block

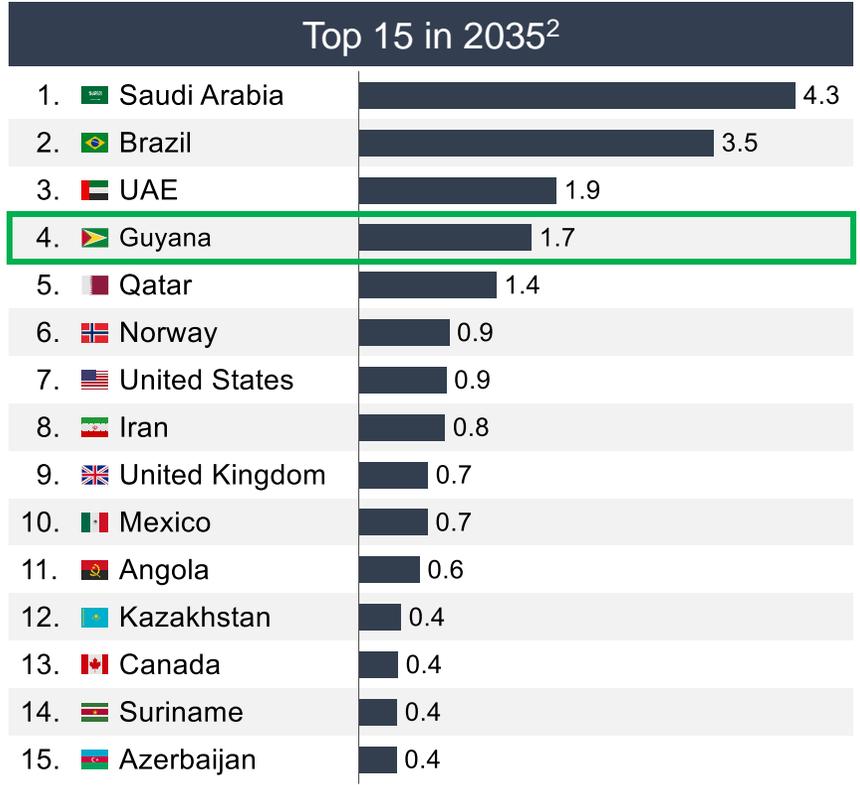
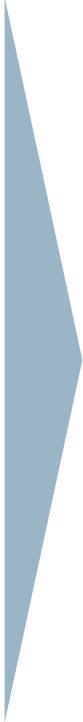
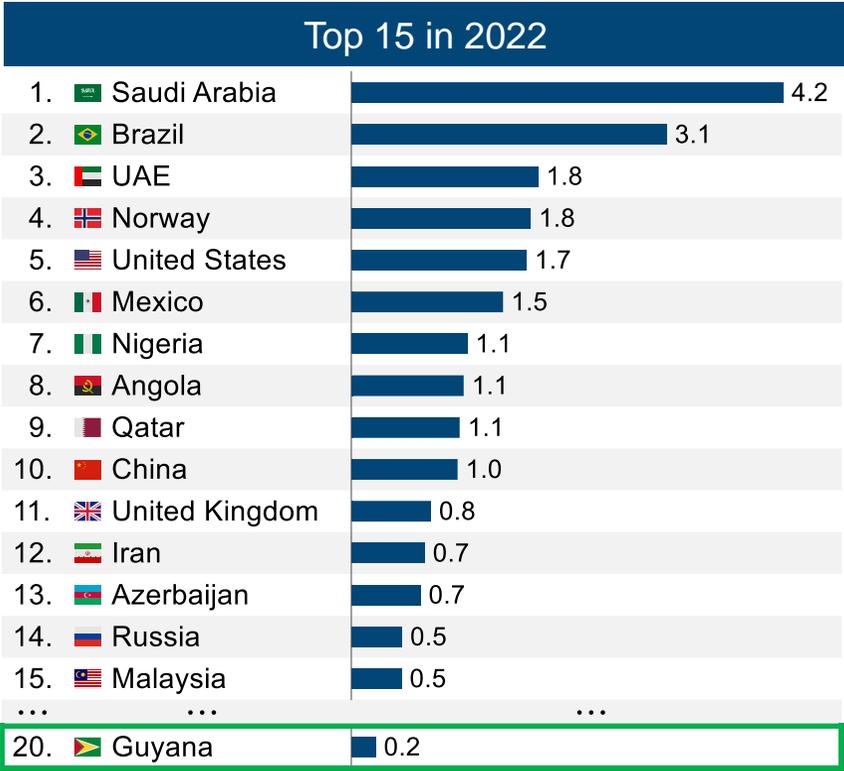


Source: Rystad Energy research and analysis

Guyana poised to become a top five offshore oil producing country globally, propelled by recent deepwater discoveries and the rapid acceleration of developments

Top 15 offshore oil¹ producing countries

Million barrels per day



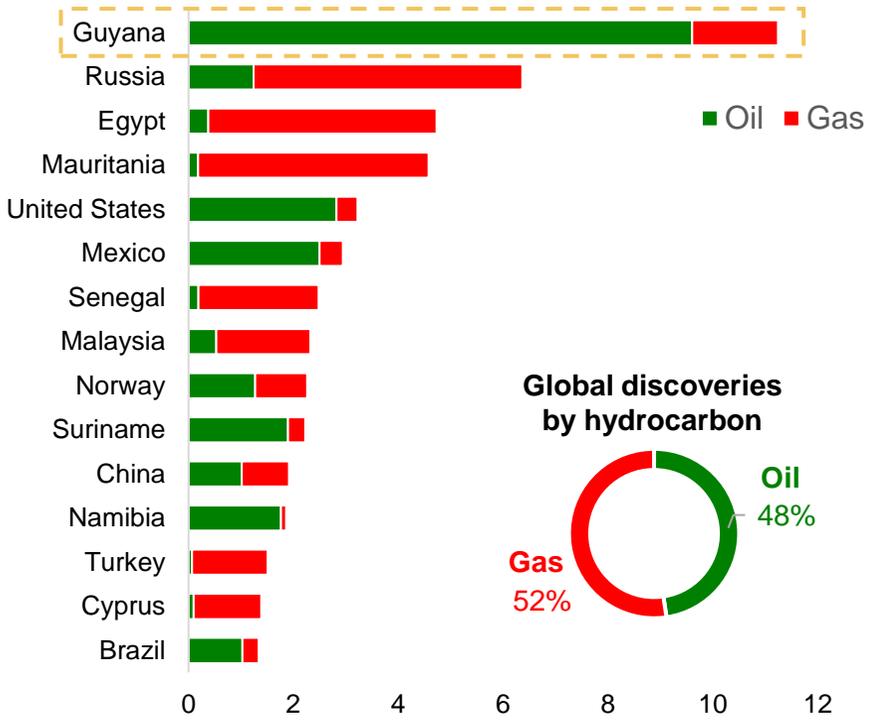
Prolific exploration success and a steady pace of project FIDs will propel Guyana to be the world's #4 offshore oil producer by 2035, with an estimated 1.7 million b/d of oil production. Guyana will surpass historically major offshore producers such as the US, Mexico and Norway.

1: Includes crude oil and condensate production
 2: Excludes Yet-To-Find volumes.
 Source: Rystad Energy UCube

Guyana leads in discovered offshore volumes since 2015, accounting for ca. 20% of discovered resources and more than 30% of discovered oil globally

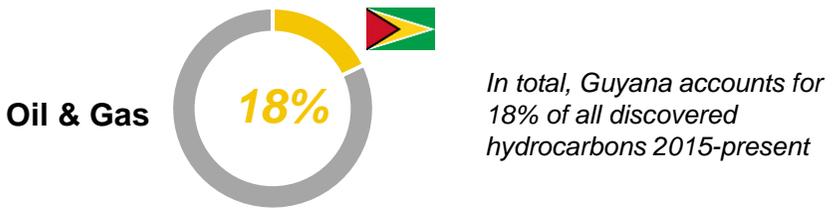
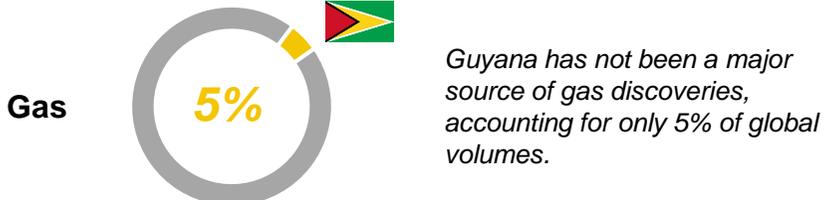
Top 15 countries, discovered offshore resources 2015-2022

Billion boe



Guyana share of global offshore discoveries, 2015-2022

Billion boe



Guyana leads the world in offshore discoveries since 2015, with 11.2 billion boe discovered to date.

Exploration success in Guyana is even more impressive in terms of oil discoveries. Guyana has accounted for 32% of all offshore oil discoveries since 2015, with 9.6 billion bbls discovered. The US is a distant second at 2.8 billion bbls.

Note: 2022 discoveries include announced discoveries through 1H 2022
Source: Rystad Energy research and analysis

Guyana accounts for 18 of the top 30 largest offshore oil discoveries¹ globally since 2015

- The exploration success in Guyana since 2015 is even more impressive when put in the context of global oil offshore discoveries in that timespan.
- Guyana accounts for 18 of the top 30 largest oil discoveries since 2015, a timespan in which most of the largest discoveries in the world have been gas discoveries.

Top 30 oil discoveries, 2015-2022				Discovery	
Rank	Asset		Country	year	Oil resource (million bbl)
1.	Venus Phase 2 ²		Namibia	2022	889
2.	Zama		Mexico	2017	651
3.	Yellowtail		Guyana	2019	650
4.	Kwaskwasi		Suriname	2020	640
5.	Neptune		Russia	2017	632
6.	Liza Phase 2			2015	591
7.	Longtail		Guyana	2018	549
8.	Liza/Payara contingent			2016	536
9.	Uaru			2020	529
10.	Venus Phase 1		Namibia	2022	525
11.	Hammerhead			2018	501
12.	Liza Phase 1		Guyana	2015	481
13.	Snoek			2017	461
14.	Payara			2017	456
15.	Araucaria		Brazil	2020	451
16.	Tilapia		Guyana	2019	450
17.	Ranger			2018	432
18.	Whale		United States	2017	419
19.	Baleine Phase 2			2021	400
20.	Turbot		Guyana	2017	399
21.	Maka Central		Suriname	2020	350
22.	Graff		Namibia	2022	349
23.	Mako			2019	329
24.	Pluma			2018	327
25.	Tripletail			2019	325
26.	Lau Lau		Guyana	2022	321
27.	Cataback			2021	315
28.	Whiptail			2021	315
29.	Faskar		Saudi Arabia	2015	300
30.	Afina		Ghana	2019	281

1: Includes non-commercial discoveries

2: Venus phase 2 includes potential upside from phase 1 based on company executive statements

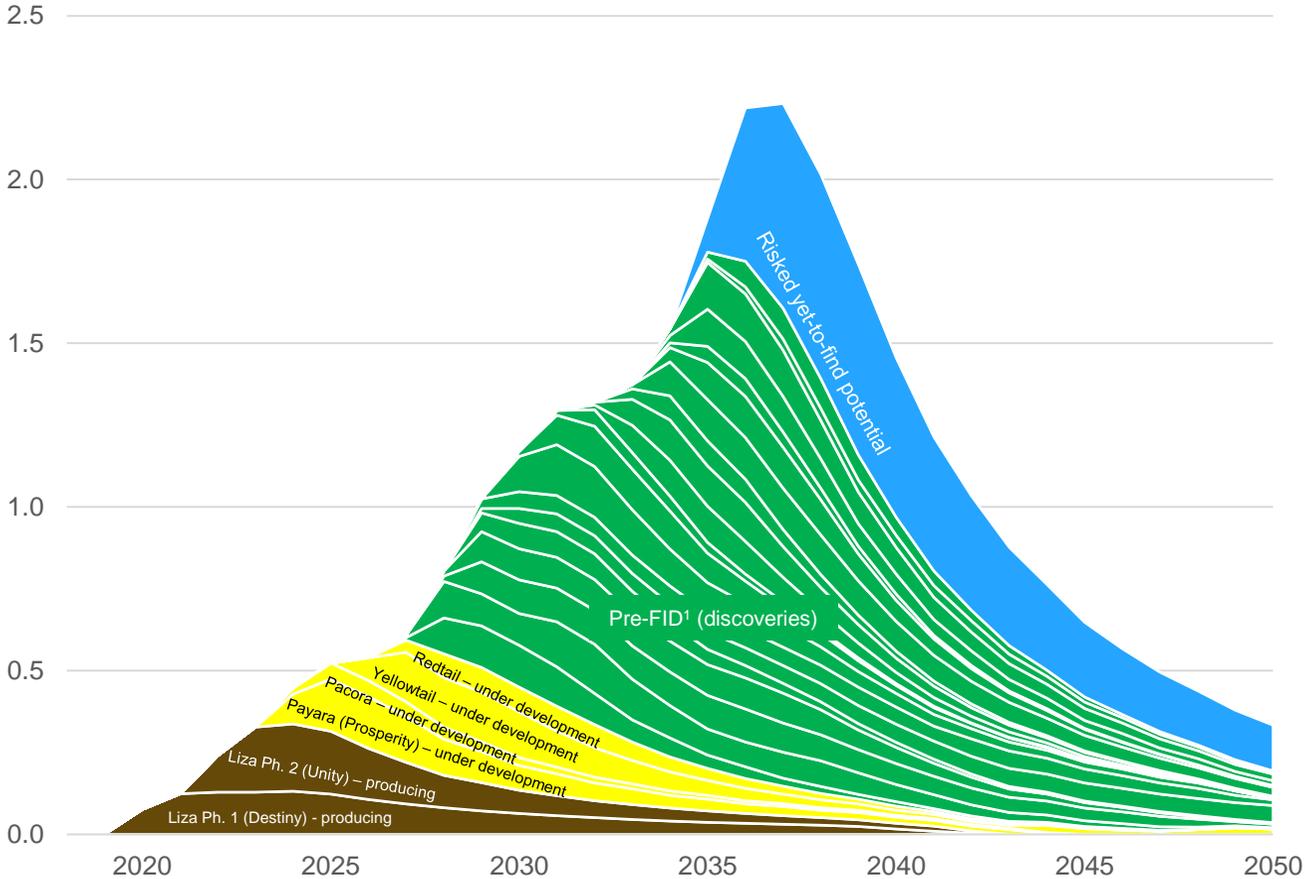
Source: Rystad Energy research and analysis

Already-sanctioned deepwater assets will yield over a half million b/d in production; pre-FID discoveries may propel production to 1.7 million b/d by 2035

Production outlook for Guyana

Million barrels of oil per day

- Guyana’s forecasted production, is expected to reach 1.7 million barrels per day in 2035 based.
- The production forecast, all of which is associated with the Stabroek block, consists of producing assets, projects under development and pre-FID¹ commercial discoveries.
- Production from already-sanctioned assets will peak at 600 thousand barrels per day in 2027. These include the currently-producing Liza Phase 1 and Phase 2 and the under-development Payara, Pacora, Yellowtail, and Redtail.
- Future discoveries, denoted as “yet-to-find,” could propel production further to over 2 million barrels per day.

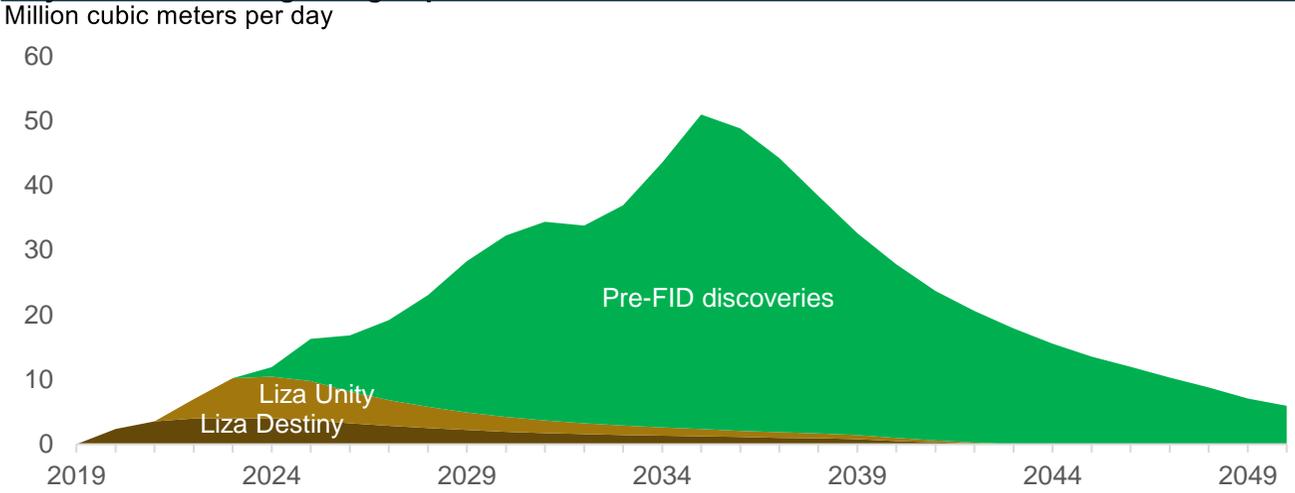


1. Final investment decision (FID)
 2. Discoveries are to be confirmed and are not guarantees of future development.
 Source: Rystad Energy UCube

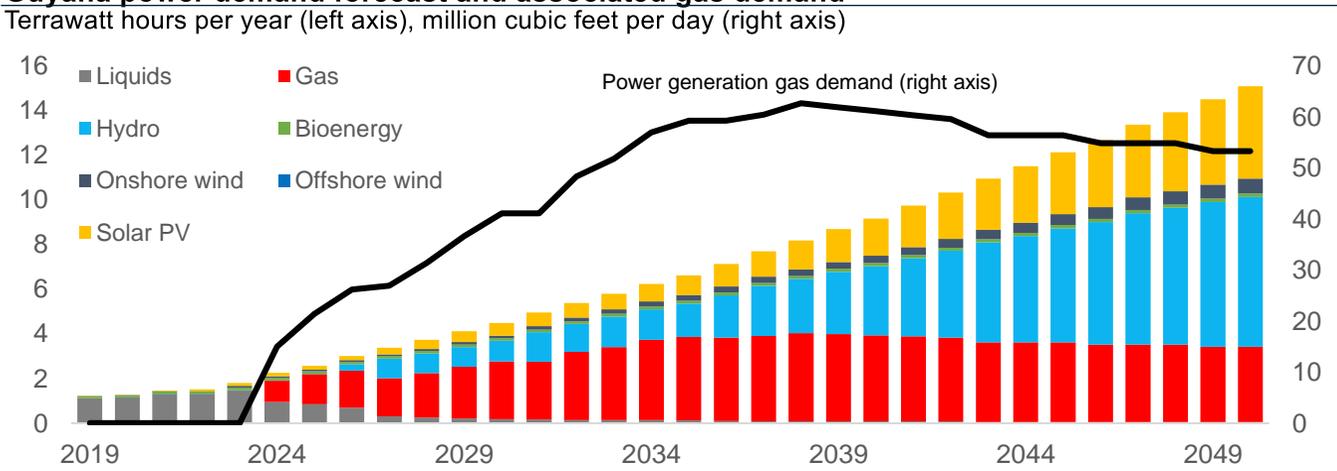
Guyana seeks to utilize associated gas from Liza through a domestic gas-to-power project, with significant gas export potential as gas volumes ramp up from pre-FID oil projects

- Gas production in Guyana is associated with the production of oil, with both oil and associated gas volumes expected to grow sharply in coming years.¹ The vast majority of gas currently produced is reinjected back into the reservoir to avoid flaring and maintain pressure to enhance oil recovery.
- To anchor the development of its gas market and to address growing power demand, Guyana is seeking to develop its first gas-to-power project² using associated gas production from the Liza.
- More than 90% of Guyana's power demand is currently supplied by generation using imported diesel or heavy fuel oil, which are both expensive and involve higher emissions.
- Even when taking all these potential local gas consumption options into consideration, there would still be significant excess associated gas to potentially supply future export projects.
- For this to materialize, all the projects currently under development and pre-FID would need a robust commercial framework to support the investment of an associated gas transport infrastructure and resulting gas prices that are competitive globally.

Guyana associated gross gas production¹



Guyana power demand forecast and associated gas demand



1: Based on the estimated initial gas-to-oil ratio (GOR) of the Liza field, we estimate that for every barrel of oil produced, 1,100 cubic feet of associated gas is also extracted.. Assuming the GOR is illustrative across all fields.

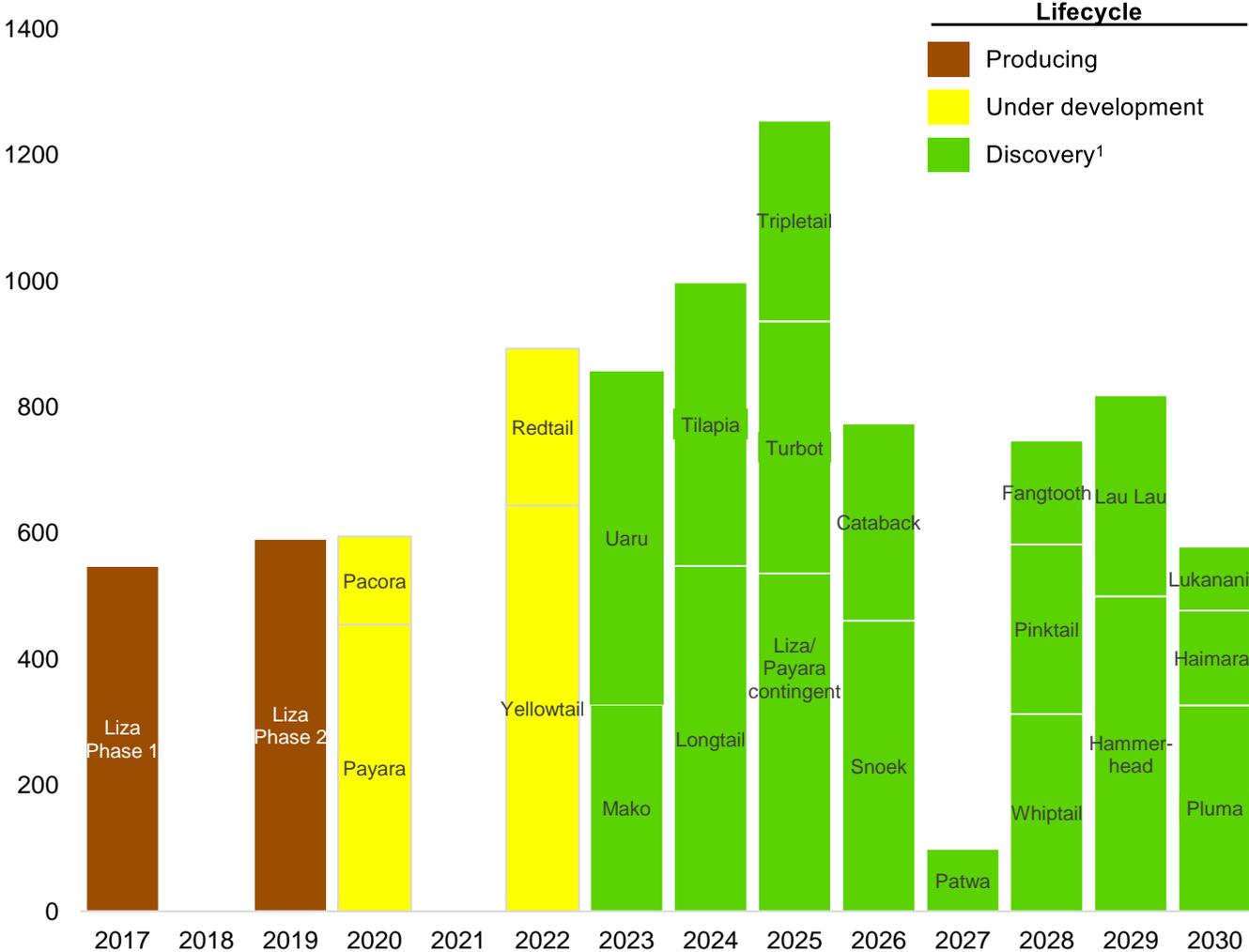
2: A 300 megawatts combined-cycle thermal power generation power plant to be located outside of Georgetown.

Source: Rystad Energy research and analysis; UCube

A steady pace of project sanctions will continue to support production growth into the 2030s

Guyana resource per field by FID year

Million barrels of oil



- We forecast 5.6 billion barrels of oil resource to be sanctioned in Guyana, all located on the Stabroek block, from 2023 through the end of the decade.
- 2.6 billion barrels has already been sanctioned across four assets as of June 2022.
- “Yet-to-find” discoveries could be discovered in this timeframe and receive FID alongside or instead of existing discoveries.
- The subsequent two slides will detail each field in more depth.

1: Discoveries are to be confirmed and are not guarantees of future development.
 Source: Rystad Energy research and analysis; UCube

Guyana has 8.8 billion barrels of resources from discoveries between 2015-2022, all of which are located on the Stabroek block (1/2)

Guyana asset details (table 1 of 2)

Life cycle category	Asset	Facility Type	Discovery year	Approval year	Start-up year	Breakeven oil price ¹ USD/bbl	Resources ² Million barrels of oil
Producing	Liza Phase 1	FPSO	2015	2017	2019	\$17	475
	Liza Phase 2	FPSO	2015	2019	2022	\$22	591
Under development	Payara	FPSO ³	2017	2020	2024	\$35	455
	Pacora	Subsea tie back ³	2018	2020	2024	\$30	140
	Yellowtail	FPSO ³	2019	2022	2026	\$39	644
	Redtail	Subsea tie back ³	2020	2022	2026	\$26	249
Discovery ⁴	Mako	Subsea tie back ³	2019	2023	2027	\$29	328
	Uaru	FPSO ³	2020	2023	2027	\$40	529
	Tilapia	Subsea tie back ³	2019	2024	2028	\$22	450
	Tripletail	FPSO ³	2019	2025	2028	\$40	319
	Longtail	FPSO ³	2018	2024	2028	\$30	548
	Snoek	FPSO ³	2017	2026	2029	\$29	461
	Liza/Payara Contingent	Subsea tie back ³	2016	2025	2029	\$27	536

1: Breakeven prices are based on forecasted crude production and does not consider other extraneous factors such as abandonment costs.

2: Estimated remaining resources as of January 1, 2022

3: Projected facility type

4: Discoveries are to be confirmed and are not guarantees of future development.

Source: Rystad Energy research and analysis; UCube

Guyana has 8.8 billion barrels of resources from discoveries between 2015-2022, all of which are located on the Stabroek block (2/2)

Guyana asset details (table 2 of 2)

Life cycle category	Asset	Facility Type	Start-up year	Discovery year	Approval year	Breakeven oil price ¹ USD/bbl	Resources ² Million barrels of oil
Discovery ⁴	Turbot	Subsea tie back ³	2029	2017	2025	\$25	400
	Cataback	Subsea tie back ³	2030	2021	2026	\$19	313
	Patwa	Subsea tie back ³	2031	2022	2027	\$42	99
	Whiptail	Subsea tie back ³	2032	2021	2028	\$19	313
	Pinktail	Subsea tie back ³	2032	2021	2028	\$19	269
	Hammerhead	FPSO ³	2033	2018	2029	\$31	500
	Fangtooth	Subsea tie back ³	2033	2022	2028	\$32	165
	Ranger	FPSO ³	2034	2018	2031	\$29	432
	Pluma	FPSO ³	2034	2018	2030	\$31	327
	Lau Lau	Subsea tie back ³	2034	2022	2029	\$24	319
	Lukanani	Subsea tie back ³	2034	2022	2030	\$39	102
	Haimara	Subsea tie back ³	2035	2019	2030	\$27	150
	Barreleye	Subsea tie back ³	2035	2022	2031	\$35	215

1: Breakeven prices are based on forecasted crude production and does not consider other extraneous factors such as abandonment costs.

2: Estimated remaining resources as of January 1, 2022

3: Projected facility type

4: Discoveries are to be confirmed and are not guarantees of future development.

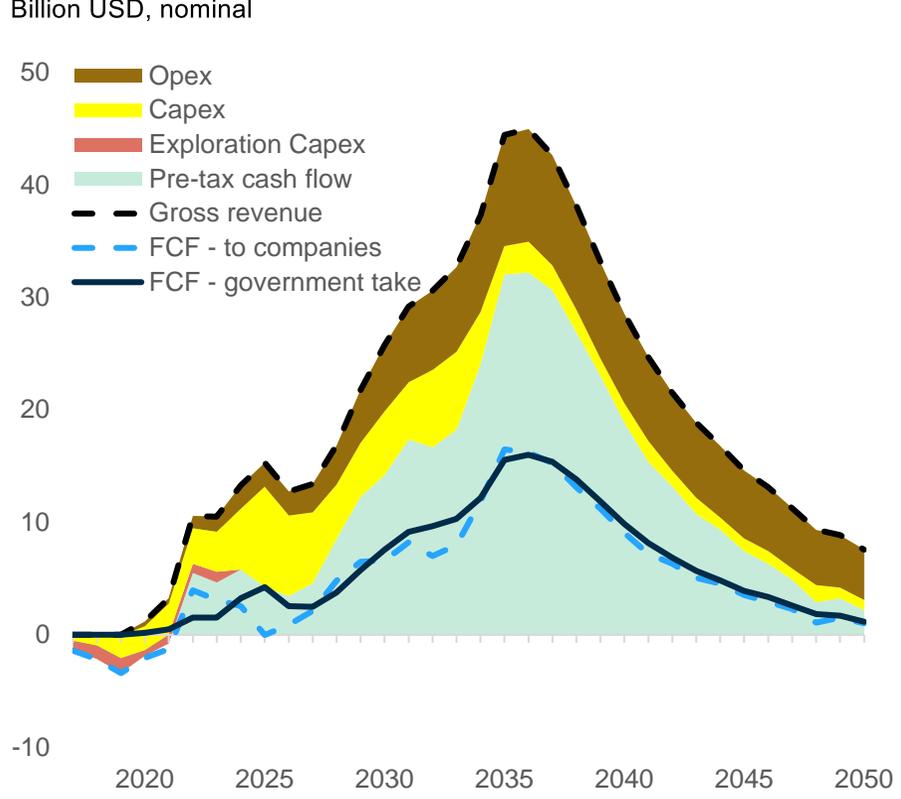
Source: Rystad Energy research and analysis; UCube

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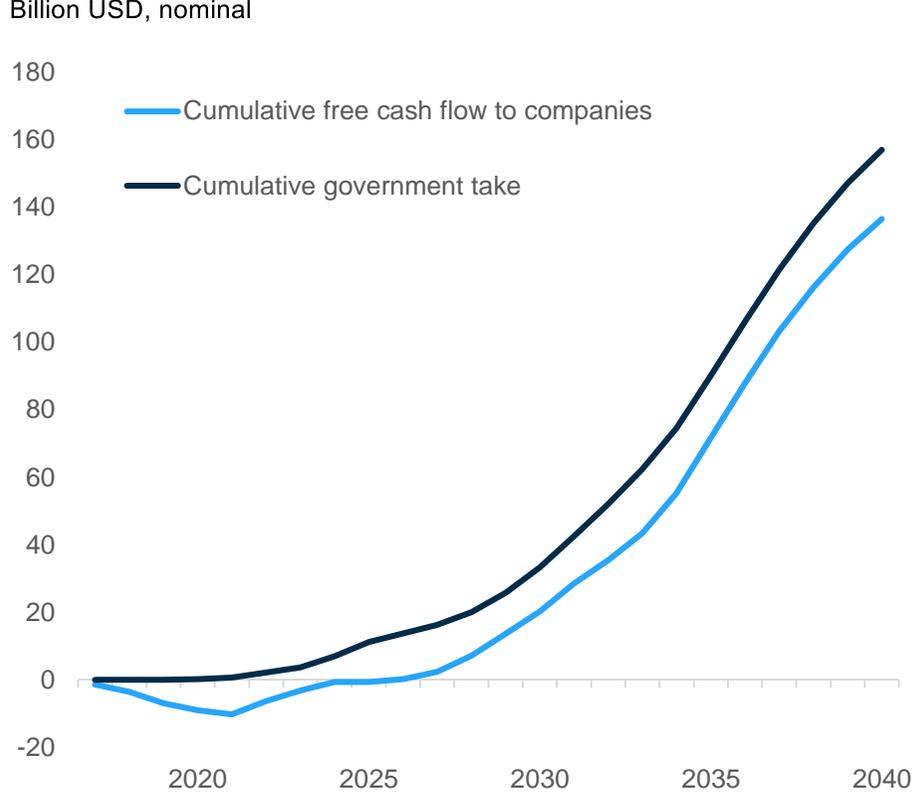
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Guyana government take to reach ~\$7.5 Bn per year by 2030, cumulatively \$157 Bn by 2040

Cash flow outlook for Guyana upstream oil sector^{1, 2}



Government take³ and company free cash flow¹



- With the prolific discoveries in Guyana and the steady pace of FIDs, oil and gas will create significant value for both the government and the companies.
- We forecast the government take¹ in Guyana to ramp up to ~\$7.5 Bn per year in 2030 and to peak at \$16 Bn per year in 2036. Cumulatively, this amounts to \$157 Bn in government take for Guyana by 2040.

1: Yet-to-find potential and non-commercial discoveries are excluded from the cash flows and government take
 2: Upstream sector to-date consists of projects, developments and discoveries located on the Stabroek block
 3: Government take is the total value received by the government over the life of a license in the form of royalties, profit sharing and taxes
 Note: Rystad Energy's base case oil price scenario is used for the forecast; see appendix for further details
 Source: Rystad Energy UCube

Existing leases in Guyana are governed by Production Sharing Agreements

Overview of Guyana's Production Sharing Agreement

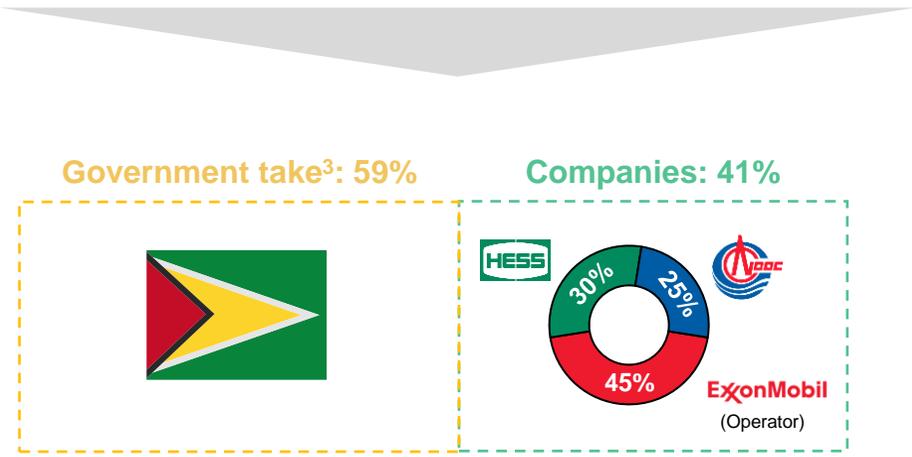
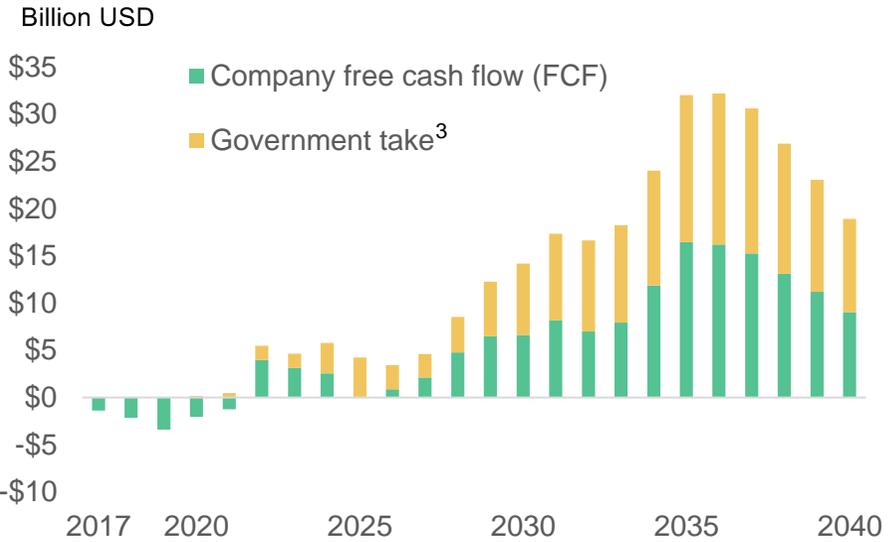
- Main Elements:
 - **Royalty:** 2% on gross revenue
 - **Profit Oil:** 50%
- Allowances:
 - Capex depreciation: 5 years straight line depreciation
 - Cost Recovery ceiling: 75% of gross revenue
- *Profit Oil = Gross revenue - Opex - Cost Oil*
- *Profit Oil is split between the government and the companies*
- **Total Government take¹ = 0.02*(Gross revenue) + 0.5*(Profit Oil)**

Commentary

- Production Sharing Agreements (PSAs) are among the most common arrangement for petroleum exploration and production, especially outside of North America. Under a PSA, the government remains the owner of any petroleum and the companies are entitled to a specified share. In PSAs, the companies carry the entire exploration risk.
- Under Guyana's PSA for Stabroek, the government retains 2% of production in the form of a royalty. The remaining production is split into cost oil and profit oil. Cost oil, which is capped at 75% of gross production, goes to the companies and allows for the recovery of costs. Profit oil is the production that remains after accounting for the cost oil, and operating expenses. Profit oil is split 50/50 between the companies and government.
- Based on our current oil price assumptions, these fiscal terms result in a 59% government take for the Stabroek block.

1: Royalty is subtracted from the portion of profit oil going to the consortium
 2: Net government take will vary significantly under different price scenarios
 3: Government take is the total value received by the government over the life of a license in the form of royalties, profit sharing and taxes
 Note: NPVs represent a 10% discount rate and are shown for 2017, when Liza Phase 1 received FID. Forecast uses Rystad Energy's base case oil price scenario, see appendix for further detail
 Source: Rystad Energy research and analysis

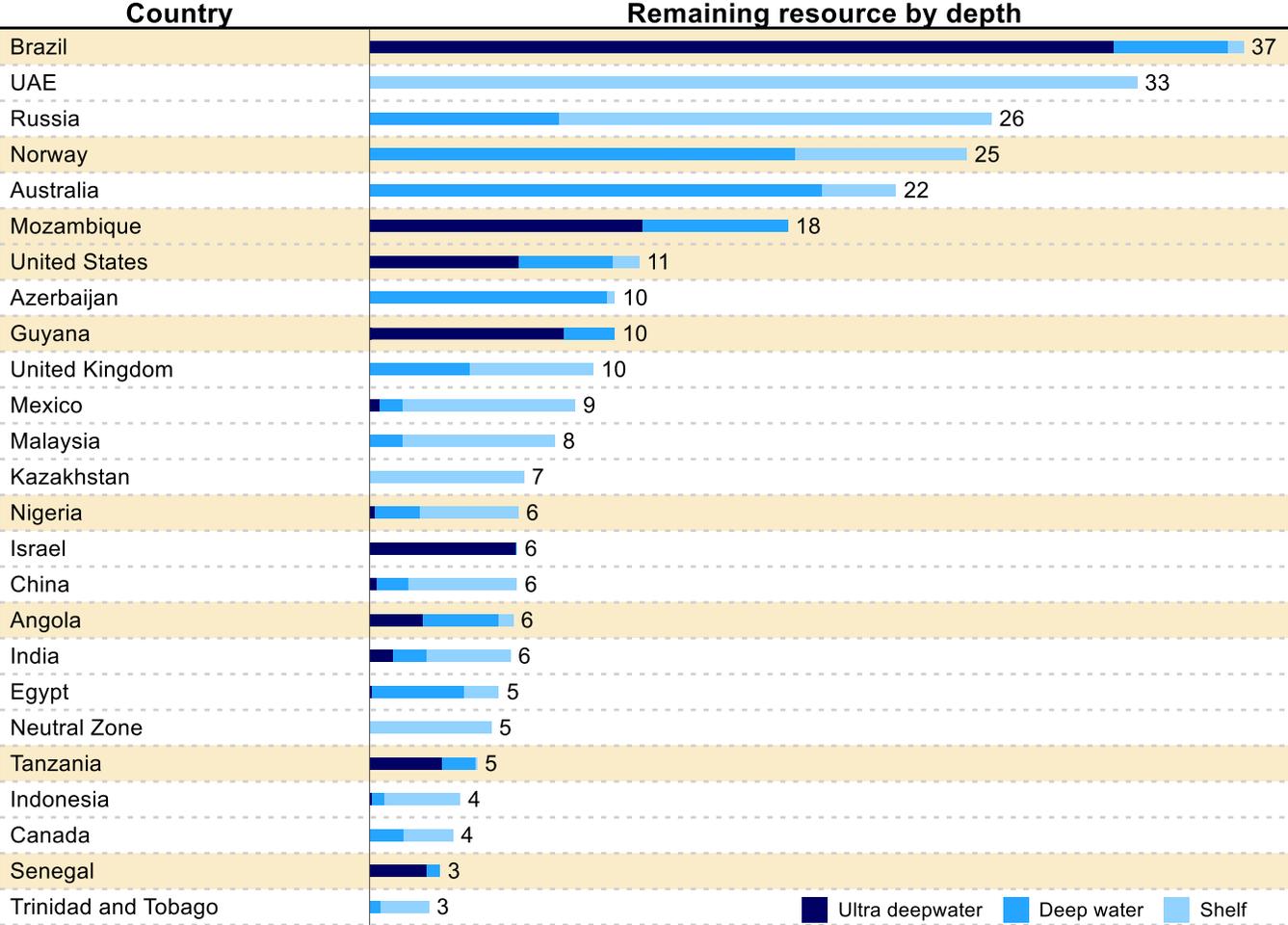
Stabroek: profit sharing between government and companies



We have selected a peer group – based on selected offshore producers – to benchmark Guyana’s fiscal regime and governance measures

- The countries highlighted are used as the peer group for fiscal regime benchmark comparison.
- Guyana’s fiscal benchmarking involves selecting countries that have similar resource characteristics as well as established offshore regions and frontier regions.
- Many of the selected countries represent significant ultra deepwater (>1,500 meters) offshore resource: Brazil, Mozambique, the United States, and Senegal.
- Suriname and the Falkland Islands are included in the peer group, given that these countries are early-stage oil and gas provinces in South America.
- Angola, Nigeria, and Norway are also added as to the peer group as incumbent deepwater producers, and as they will be further analyzed in the governance section.

Top 25 countries by offshore resources remaining
Billion boe



*Excludes Saudi Arabia, Iran, and Qatar
Source: Rystad Energy research and analysis; UCube

With 59% estimated government take, Guyana's fiscal regime is on the higher end of the peer group

- We have applied the production and costs profiles of the Stabroek block under selected fiscal regimes from the peer group countries.
- For Guyana, the average government take is 59%, which is higher than the peer group average of 54%.
- Rystad Energy estimates the present value¹ of the Stabroek block, using the Guyana fiscal regime, at \$41 billion (in 2022 dollars). The valuation across the peer group ranges from \$24 billion to \$55 billion.
- Traditionally, governments in frontier hydrocarbon regions offer more favorable terms to oil companies to attract initial exploration investment, and gradually increase government take on subsequent lease awards as the basin is derisked following commercial hydrocarbon discoveries.

Key definitions

Government Take: the value received by the government over the life of a license in the form of royalties, profit sharing and taxes.

1. Government Take Percentage: the split of the value the government receives of the total value of the block.

2. Government Take Total Value: the value (NPV) of the Stabroek block from the approval year of Liza Phase 1 (2017) using a discount rate of 10%, in 2022 dollars. The differences in value are driven by the fiscal regime.

Stabroek block under selected fiscal regimes

Country	1. Government Take: Percentage	2. Government Take: Total Value ¹ Billion USD
Mozambique	35%	\$24
United States	40%	\$27
Tanzania	40%	\$27
Falkland Islands	43%	\$31
Suriname	47%	\$33
Nigeria	58%	\$41
Guyana	59%	\$41
Brazil	61%	\$43
Senegal	65%	\$44
Angola	66%	\$46
Norway	79%	\$55

1. NPV of consortium free cash flows as at 1.1.2017 (year of Liza Phase 1 sanctioning) using Rystad Energy's base case oil price (see appendix) and 10% discount rate, adjusted to 2022 dollars
Source: Rystad Energy research and analysis; UCube

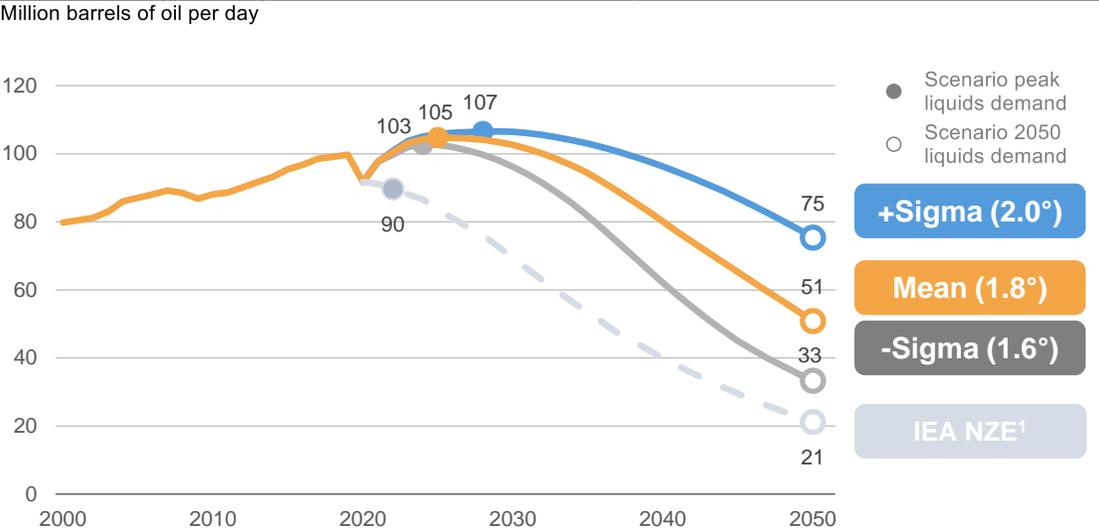
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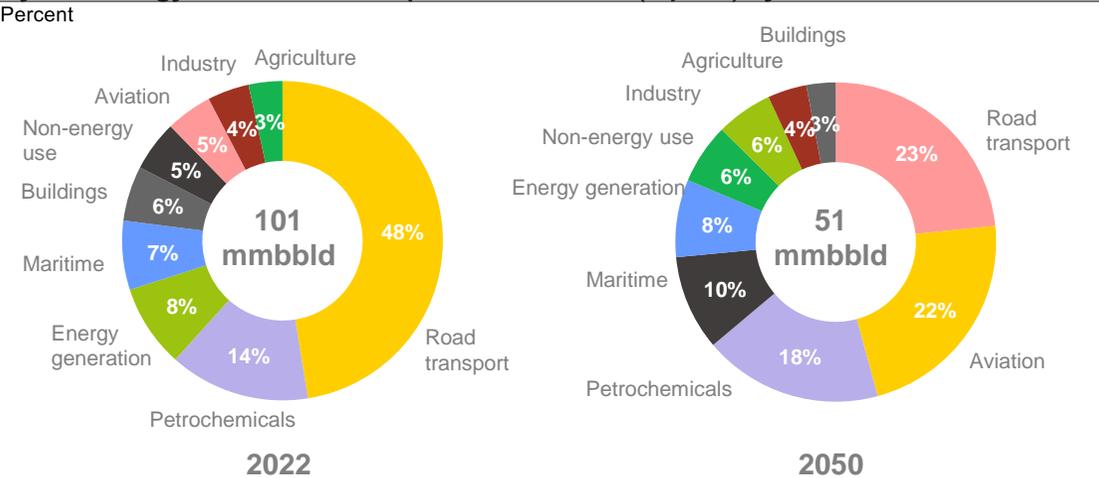
Rystad Energy's three energy transition scenarios result in a wide range of oil demand outcomes

- Future oil demand faces significant uncertainty over the long-term, notwithstanding uncertainty related to Russia's invasion of Ukraine in the near to medium term, resulting in a wide fan of potential outcomes in Rystad Energy's three energy transition scenarios.
- Rystad Energy views the Mean scenario as the most likely long-term trajectory. The Mean case is characterized by:
 - Electric vehicle (EV) adoption rate based on current manufacturers' targets, risked for supply chain bottlenecks and other constraints.
 - Oil substitution follows current decarbonization policies.
 - Increase in recycling for some plastics and some feedstocks sourced from green hydrogen.
- The +Sigma scenario assumes slower EV adoption in non-OECD countries and more limited acceleration in plastics recycling and oil substitution.
- The -Sigma scenario assumes unconstrained EV adoption, high recycling rates for plastics, green hydrogen becomes the primary feedstock, and rapid oil substitution across sectors.
- The IEA's NZE scenario, which IEA's view on what is required to achieve net zero ambitions, rather than a specific outcome of current/expected policies and actions, is provided for reference.

Rystad Energy's long term oil demand scenarios, plus IEA NZE¹



Rystad Energy's Mean scenario products demand (liquids) by sector



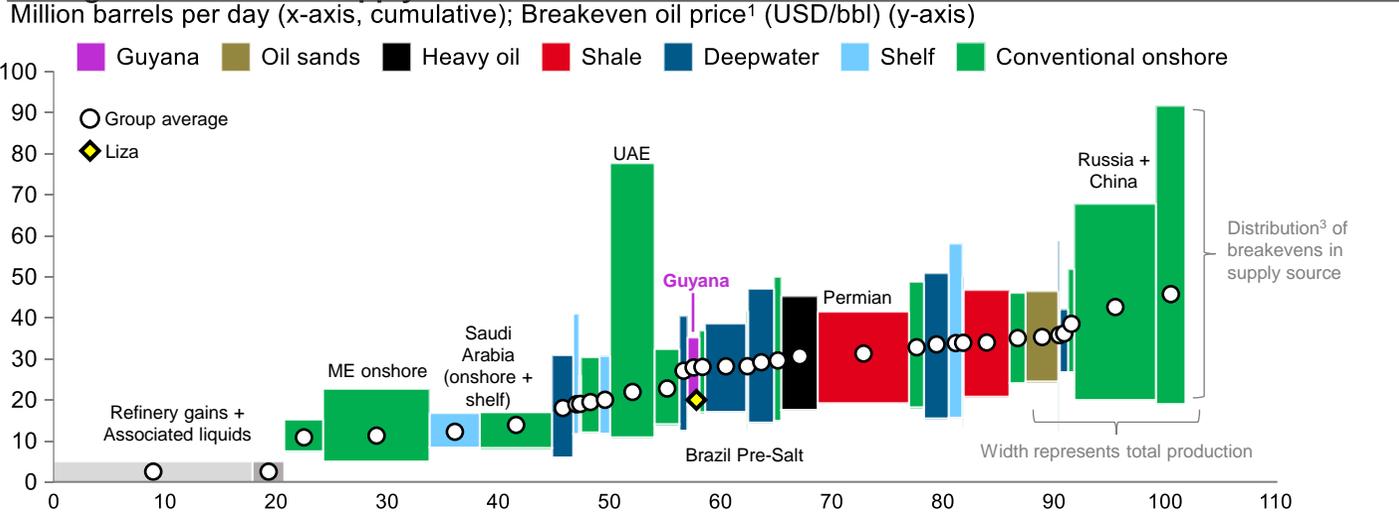
1. IEA Net Zero Scenario
Source: Rystad Energy OilMarketCube



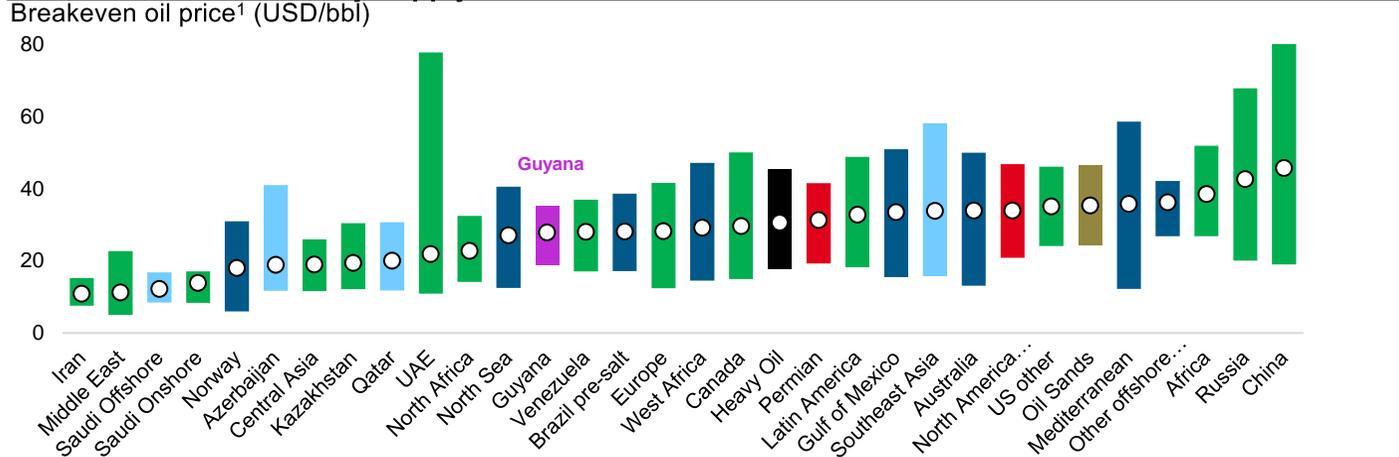
Guyana offshore production is positioned favorably relative to other supply sources, with an overall liquids breakeven² of ca. \$28.0 (including future developments) and \$18 for Liza

- The cost of supply – measured by a field’s point-forward breakeven oil price – is an important factor when assessing the resiliency of producing assets across regions and supply sources.
- Guyana offshore oil fields, with a weighted breakeven of US\$28/bbl, stack up well against other large oil sources.
- Guyana is one of the most competitive supply sources outside of core Middle East and offshore Norway production, beating out the Permian, Russia, and many other offshore sources.
- Liza, the currently producing offshore asset in Guyana, performs particularly well, with a weighted breakeven oil price of slightly under US\$20/bbl, which is better than almost all other deepwater fields outside of Norway; the second phase of Liza also has a low breakeven of US\$21.9/bbl.
- Guyana’s middle 80% of assets have breakevens ranging from ~\$18/bbl to ~\$35/bbl; the higher breakevens are for the more costly, pre-FID projects, while producing projects will have lower breakevens.

2030 global oil cost of supply^{1,2,3}



Breakeven distribution by supply source^{1,2,3}

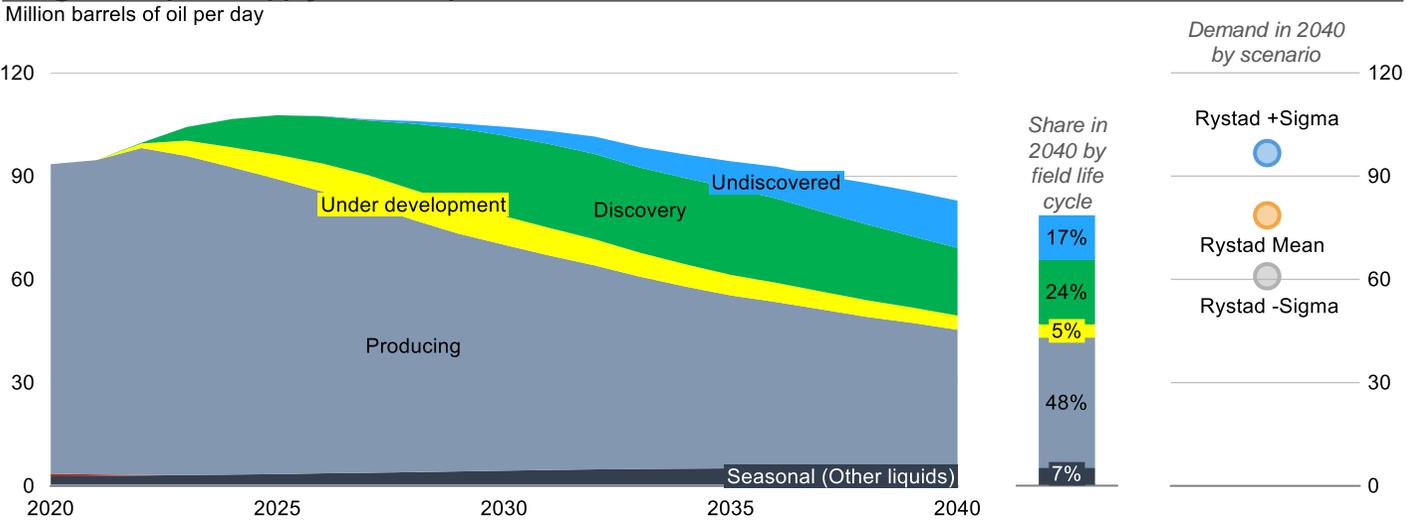


1. Liquids includes crude oil and condensate
 2. Point-forward breakeven required to achieve NPV-10 of 0 as of 1.1.2022, weighted by remaining discovered resources
 3. Height of the boxes is defined by the middle 80% interval (10th to 90th percentile) of breakevens for each supply group
 4. Includes midwater (>125 meter water depth)
 Source: Rystad Energy UCube

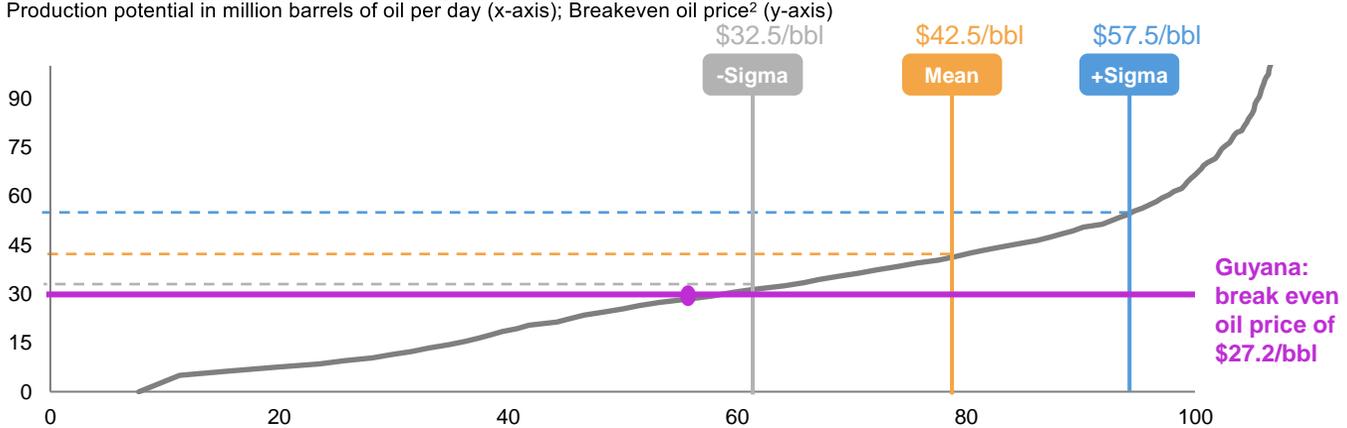
Guyana is well positioned as an advantaged supply source in all Rystad Energy's energy transition oil demand scenarios

- Production from currently producing fields will only provide ca. 50% of expected oil demand in Rystad Energy's mean energy transition scenario (see top graph).
- Future fields with break even costs below \$42.5/bbl, which is the intersection of the cost of supply for potential oil production in 2040, and the expected oil demand in the mean energy transition scenario, will be advantaged.
- Rystad Energy estimates the break-even oil price for deepwater projects in Guyana, including future developments, at ca. \$27/bbl, which is advantaged under all three Rystad energy transition scenarios.

Long term liquids supply¹ and comparison to demand scenarios



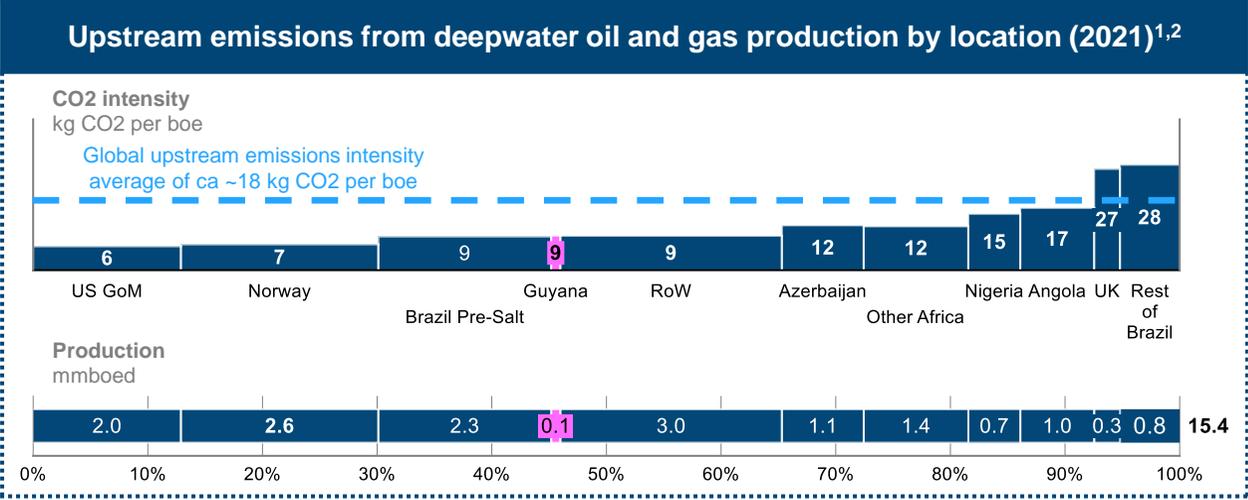
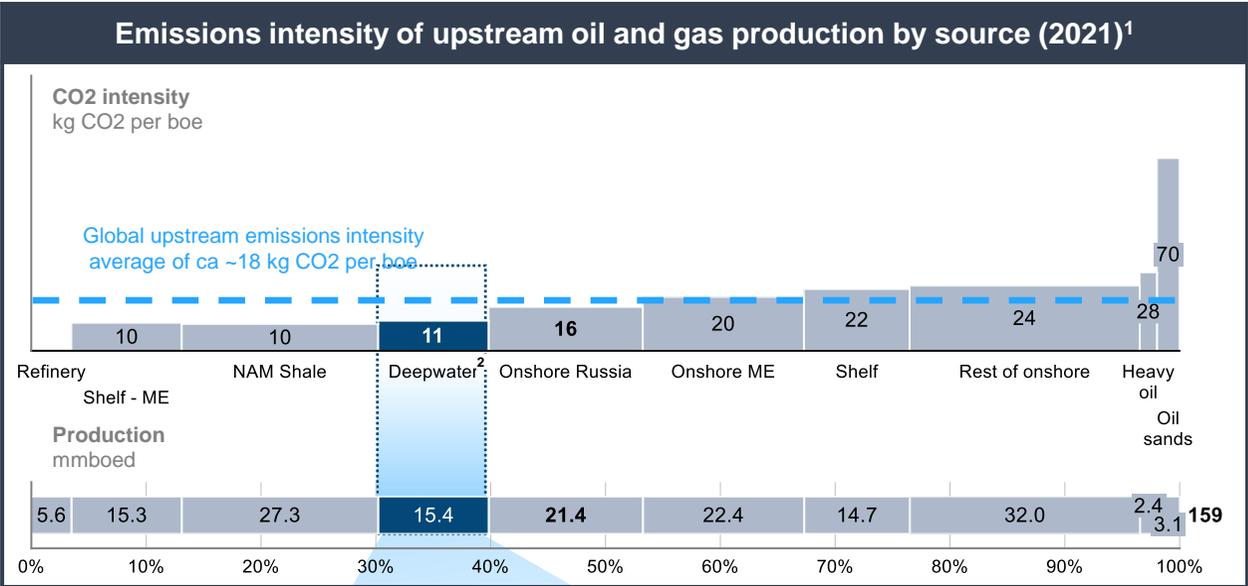
Cost of supply for liquids production in 2040



1. Includes crude oil, condensate, natural gas liquids (NGLs), refinery gains and biofuels
 2. Point-forward breakeven required to achieve NPV-10 of 0 as of 1.1.2022
 Source: Rystad Energy UCube

The emissions intensity of Guyana's production is 9 kgCO₂/boe – half of the global average

- Deepwater has lower emissions intensity, on average, than ca. 60% of other sources of global oil and gas production, with Guyana offshore production emissions intensity lower than the deepwater average.
- This is due to several factors, including larger scale developments with fewer wells with high rates of productivity, more specialized technical solutions to limit emissions, such as gas reinjection, and more stringent regulations, such as flaring in some regions.
- The current estimated emissions from Liza, which remains the only producing project in Guyana, are indicative of what emissions will be at future Guyanese projects due to the factors listed above as well as the fact that the most state-of-the-art FPSOs will be used at future developments.
- Guyana's emissions intensity for producing assets outperforms ca. ~75% of global producing assets.
- Upstream emissions from deepwater oil and gas is modeled utilizing historical data, industry interviews, and data from similar assets.

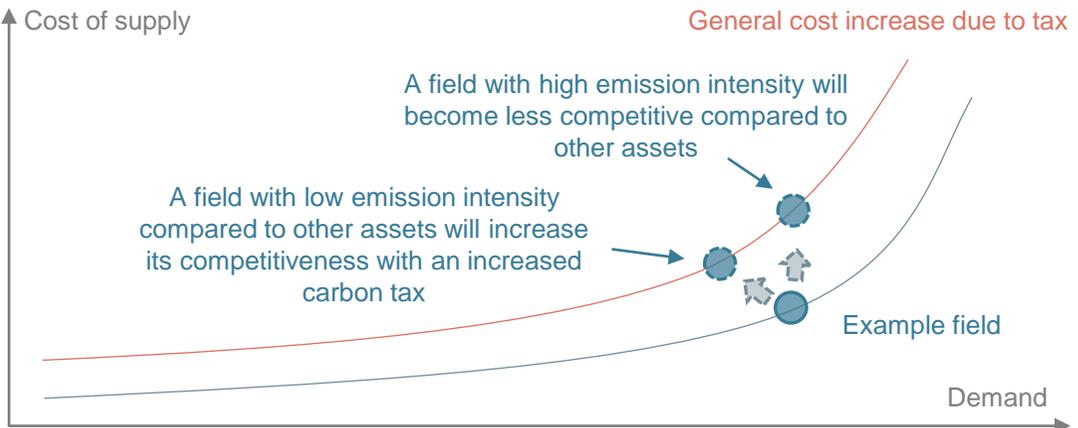


1: Includes Scope 1 emissions only. Width represents oil and gas production contribution while emissions intensity is calculated based on total oil and gas production
 2: Includes midwater (>125 meter water depth)
 Source: Rystad Energy UCube

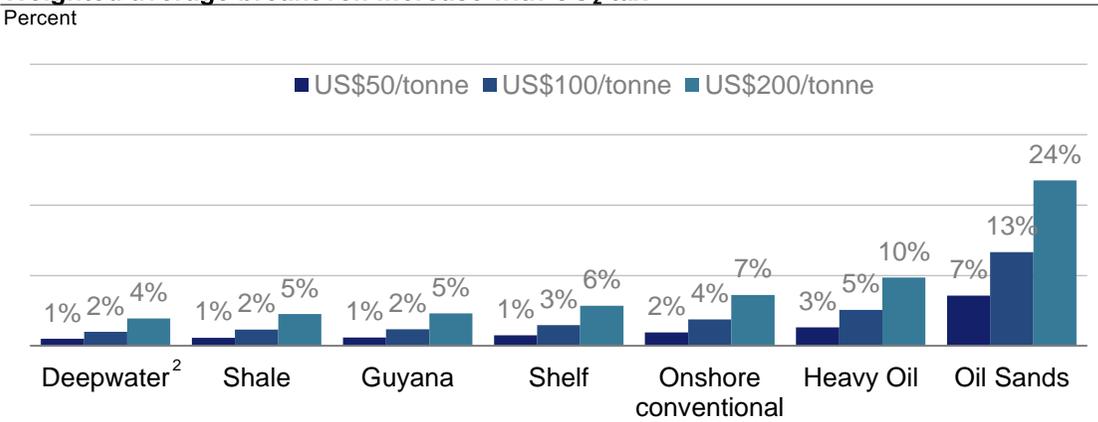
Guyana offshore is one of the most resilient segments under carbon tax scenarios

- Carbon taxes are set to increase over the next several decades in some regions and have the potential to be implemented in new regions where they have not historically been in place.
- While a carbon tax would raise overall cost levels, assets with lower emissions intensities would be less affected and could stand to benefit from an increase in its relative competitiveness.
- Rystad Energy analyzed the potential impacts of US\$50 per tonne, US\$100 per tonne, and US\$200 per tonne carbon taxes on all major supply segments, targeting upstream emissions – thus, the evaluation looks exclusively at the relative change in cost due to emissions from production and upstream flaring, including emissions which stem from the production facility.
- Under each carbon tax scenario, Guyana’s average breakeven remains resilient with only minimal increases in cost due to the segment’s lower relative carbon intensity compared to other sources.

Illustrative impact of carbon tax on asset competitiveness



Weighted average breakeven increase with CO₂ tax¹



1. Analysis includes volumes classified as producing, under development and discovery lifecycles. The carbon tax analysis applies only to CO₂ emissions stemming from upstream production and includes production facility emissions.

2. Includes midwater (>125 meter water depth)
Source: Rystad Energy UCube

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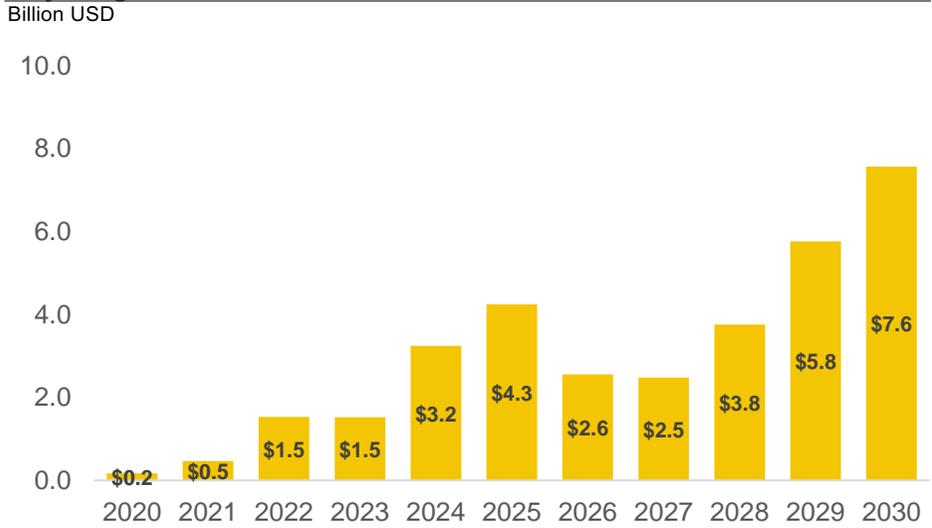
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Good governance is key for Guyana to unlock the full societal benefits of its natural resource wealth as oil revenues ramp up

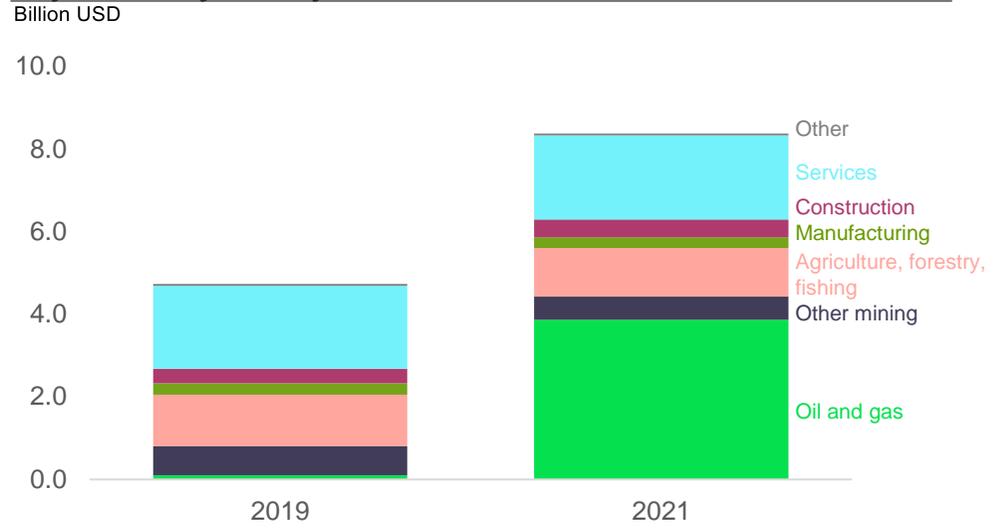
Governance

- According to the UNCHR, governance refers to all the processes of governing, the institutions, processes and practices through which issues of common concern are decided upon and regulated; likewise, the IMF defines governance as the broad concept covering all aspects of how a country is governed, including its economic policies, regulatory framework, and adherence to rule of law.
- Good governance is particularly important for resource rich nations so that the full potential of the societal benefits associated with resource wealth may be experienced by the population of the country.

Guyana government take^{1,2}



Guyana GDP by industry³

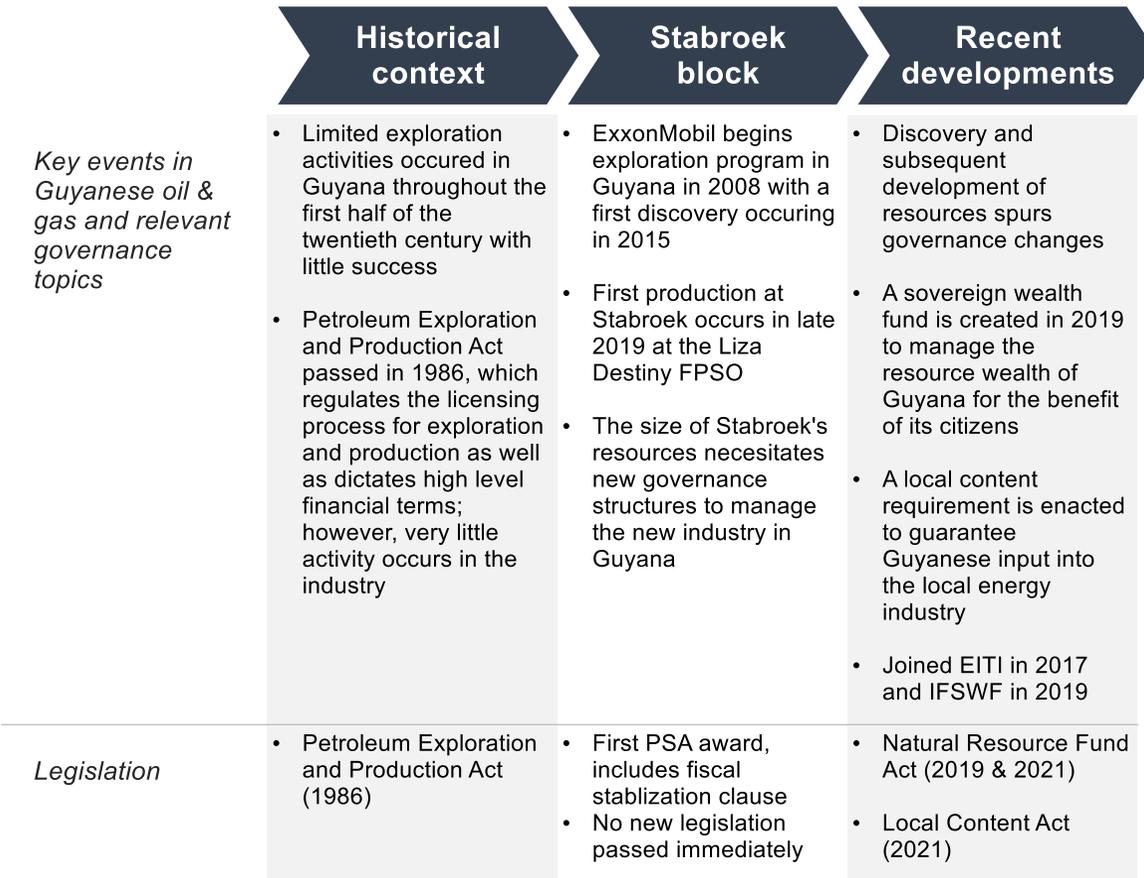


Guyana is just beginning to extract and monetize its vast resource wealth; the existence and maintenance of strong governance institutions and practices will be key to unlocking the full potential of the resource wealth for the broader Guyanese society

1: Ucube, based on the Stabroek block using Rystad's standard oil price deck (see appendix).
 2: Government take is the value received by the government over the life of a license in the form of royalties, profit sharing and taxes.
 3: Guyana Ministry of Finance Budget Speech 2022
 Source: Rystad Energy research and analysis; UCube

Guyana has implemented several governance mechanisms and institutions in recent years

Guyanese oil and gas governance evolution



Key current governance institutions, laws, and regimes

Institutions	
Ministry of Presidency	Management of hydrocarbon sector
Ministry of Natural Resources	Manages natural resource sectors
Guyana Revenue Authority	Conducts tax collection for oil and gas
National Insurance Scheme	Collects social security contribution from energy companies
Environmental Protection Agency	Manages environmental protection in Guyana
Ministry of Finance	Runs the Natural Resource Fund
EITI Member	Organization monitoring governance for resource rich nations
Fiscal regime	
Royalties	Payments related to oil production
Annual license	Annual license rental fee
Signature bonus	One time fee for securing a production license
Training fees	Yearly fee for training fund
License fee	Fee associated with different licenses
Profit oil	Profit oil shared with Guyanese government
Legislation	
Petroleum Exploration & Production Act	Regulates various parts of the oil and gas field development process
Natural Resource Fund Act	Creates a natural resource fund
Local Content Act	Implements a gradual increase in local content requirements

Guyana is implementing new governance mechanisms and institutions based on global standards and best practices to manage its natural resource wealth; these new governance structures will continue to develop in the coming years.

Source: Rystad Energy research and analysis; Guyana EITI Report #3

Guyana's Natural Resource Fund and low carbon development strategy demonstrate a proactive approach to governance in the energy sector

Guyana Natural Resource Fund overview



Guyana sets forth several goals for its Natural Resource Fund

- 1 Ensure volatility in natural resource revenue does not result in volatile spending
- 2 Ensure that natural resource revenue does not lead to loss of economic competitiveness
- 3 Fairly transfer natural resource wealth across Guyanese generations
- 4 Use natural resource wealth to finance national development priorities



Guyana notes that the fund shall be managed utilizing the Santiago Principles

Guyana low carbon development strategy



Guyana enacting a strategy to develop a low carbon economy

- 1 Create new incentives for a low carbon economy
- 2 Protect against climate change and biodiversity loss
- 3 Stimulate future growth through clean energy and low carbon development
- 4 Align with global climate and biodiversity goals



Guyana will help finance the transition to a low carbon economy with capital from the Natural Resources Fund

- **Guyana's updated Natural Resource Fund (2021) will control government revenue from the oil and gas industry on behalf of all Guyanese and follow the Santiago Principles,¹ the international standard for sovereign wealth funds.**
- **As noted by the IFSWF, whose members endorse the Santiago Principles, "Guyana established the NRF prior to extracting its first oil which is a strong signal to the world of its commitment to upholding good governance principles."²**
- **Guyana also has a roadmap for transitioning to a low carbon economy in the future that will utilize funding from the Natural Resource Fund. The proposed domestic gas-to-power project is a first step to reducing emissions in the power generation sector.**

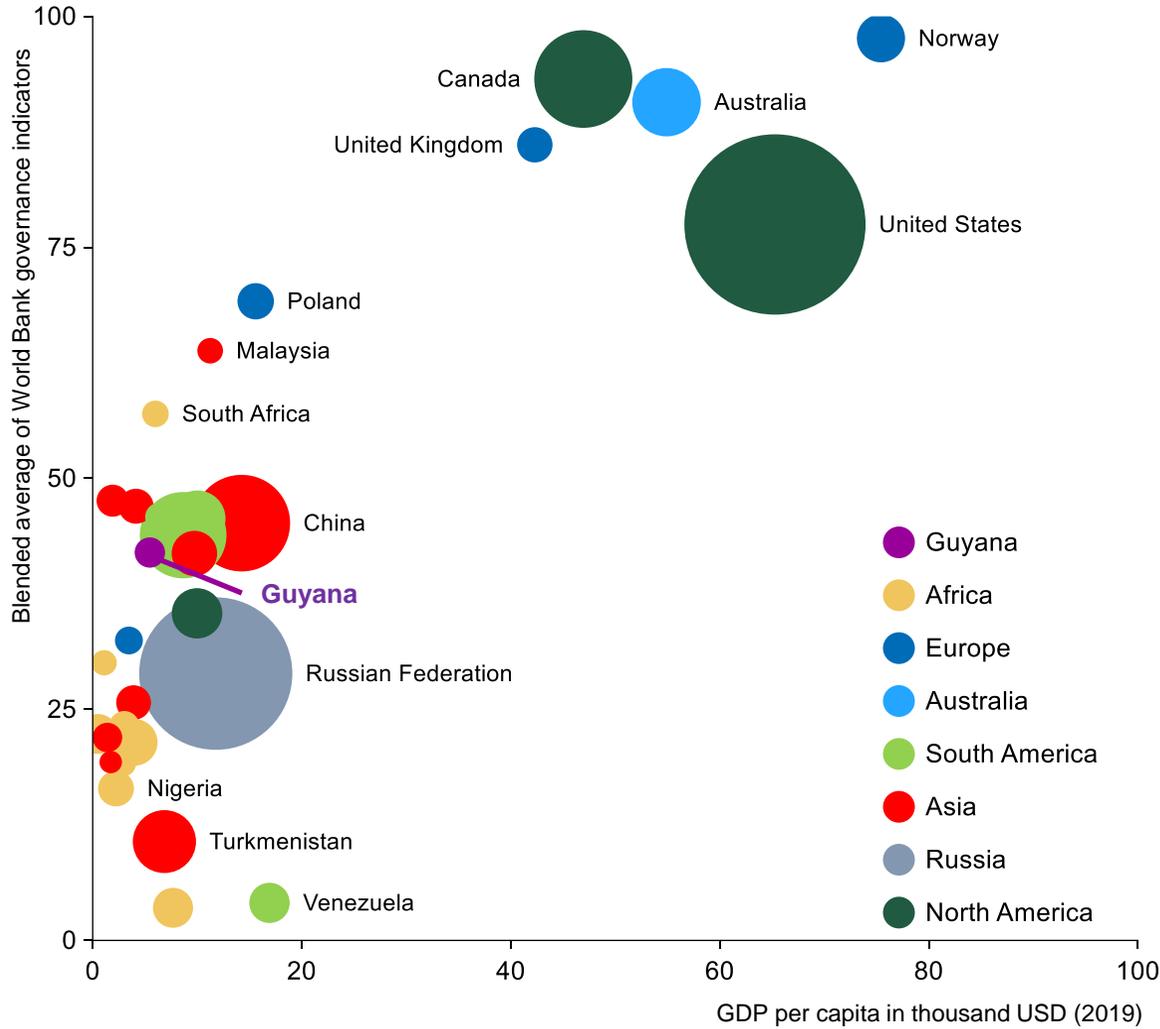
1. The Santiago Principles consists of 24 generally accepted principles and practices promote transparency, good governance, accountability and prudent investment practices.
 2. International Forum of Sovereign Wealth Funds - <https://www.ifswf.org/santiago-principles-landing/santiago-principles>
 Source: Rystad Energy research and analysis; Guyana Natural Resource Fund Act of 2021; Low Carbon Development Strategy – Government of Guyana

Guyana outperforms most other non-European/North American countries in World Bank governance dimensions

- The graph to the right shows top oil and gas producing countries by their blended average score of World Bank governance metrics, GDP per capita, and resource size
- There are two distinct groups:
 - Highly developed, energy producing countries such as Norway and the United States, which score highly on governance metrics
 - Other energy producing countries with varying scores for governance and lower GDP per capita
- Guyana ranks towards the top of its peer group of energy producing, outperforming most of Africa and Russia
- Guyana will have opportunity to improve its score in the future by addressing concerns related to elections and implementing additional energy governance structures.

Countries^{1,2} by World Bank governance indicators and GDP per capita

GDP per capita in thousand USD (x-axis), blended average of six world bank governance indicators (y-axis), resource size (bubble size)



World Bank Governance Indicators

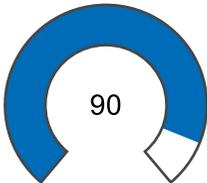
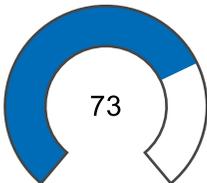
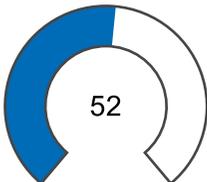
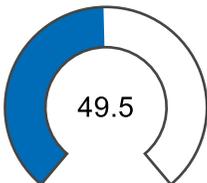
The World Bank compiles a yearly report that ranks each country in six distinct areas of governance: 1) voice and accountability, 2) political stability and absence of violence/terrorism, 3) government effectiveness, 4) regulatory quality, 5) rule of law, and 6) control of corruption

Each country is given a percentile within each governance dimension. Numerous underlying data sources, such as surveys, commercial business information providers, NGOs, and public sector organizations, are compiled to generate a score in each of the six areas

1: Middle East countries excluded from chart
 2: Includes top 40 countries by 2022 resources
 Source: Rystad Energy research and analysis; UCube; World Bank

Guyana's 2021 EITI score will likely improve substantially in coming years as newly implemented regulations and governance structures are reflected in future reports

- The Extractives Industries Transparency Initiative is an organization that helps resource rich member countries understand resource management by providing information and data which can be used to build up strong corporate governance and accountability.
- The EITI developed a standard that contains principals, requirements which member countries must adhere to, a timeframe, validation of implementation, expectations, and maintenance of open data.
- EITI's validation process ranks countries with a numerical score that falls into 5 groups: low, fairly low, moderate, high, and very high.
- The validation process determines the country's current ability to implement the EITI standard and repeats every 12-36 months based on score. It is broken into three categories outcomes and impact, stakeholder engagement, and transparency.
- We have used these numbers as a benchmark to determine where Guyana fits on the scale of resource governance and accountability.
- A new validation process was implemented in April 2021, so data is limited to select member countries that have been validated since then.

Country	Score	Category	Commentary
 United Kingdom	 90	High	The UK has received a high EITI score based on improvement of data management. The UK's improvement in transparency regarding ownership has inspired other EITI countries' best practices. The UK seems to have improved its efforts since its last EITI validation in 2019 which helps its case for receiving such a high score.
 Argentina	 73	Moderate	Argentina's score is largely due to progress in the mining sector. Company reporting practices in mining have been established. The EITI is being used to help digitize industry information which also helps the score. Argentina has also created a platform for governance discussion in the extractive industry. Argentina only implements the EITI standard only to extractive industries that are under direct jurisdiction by the federal government.
 Guyana	 52	Fairly low	The EITI found weaknesses in company reporting and tax administration processes that prevent public supervision of oil and gas extraction revenues. However, there has been transparency around the contracts with the Stabroek block. Guyana has ample opportunity to improve its score for its next validation by displaying material progress in the outcomes and impact category where it has scored low. EITI assesses both the energy and mining industries; Guyana's mining industry lacks substantial oversight, resulting in a lower score.
 Mexico	 49.5	Low	Mexico is currently suspended due to a breach of protocol in civil society engagement. Mexico scored the highest in the transparency category with 59 points by making progress on information disclosure in the oil and gas sector. However, the mining sector still has a lack of transparency with information reporting. Mexico scored the lowest in the outcomes and impact category. Mexico lacks funding for EITI implementation and has done little planning and reviewing outcomes from EITI implementation. Communication and outreach has declined since funding constraints began.

Source: EITI.org; Rystad Energy research and analysis

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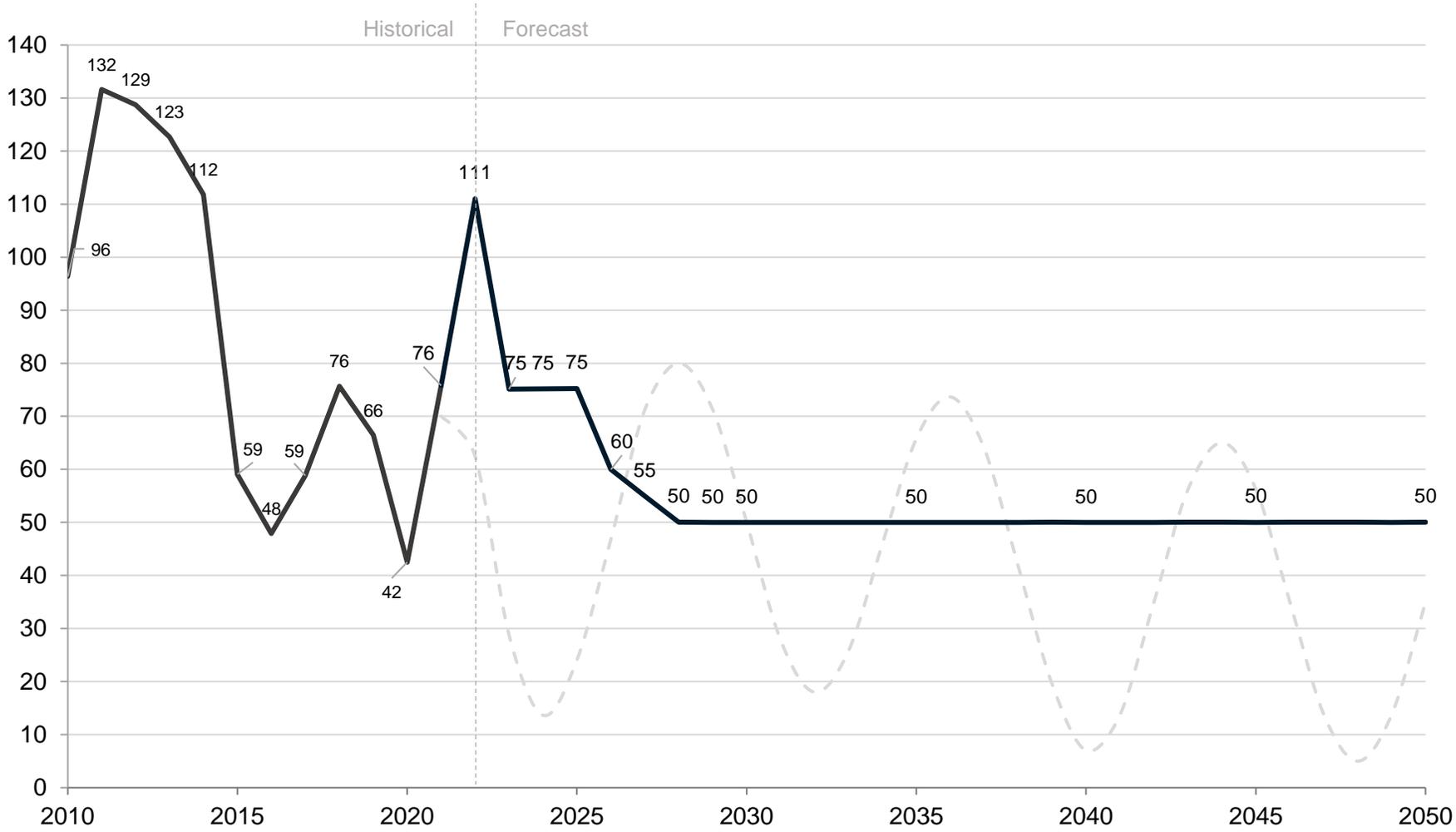
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Overview of Rystad Energy oil demand scenarios and key assumptions

Brent oil price (real 2022-terms) UCube long-term assumption¹

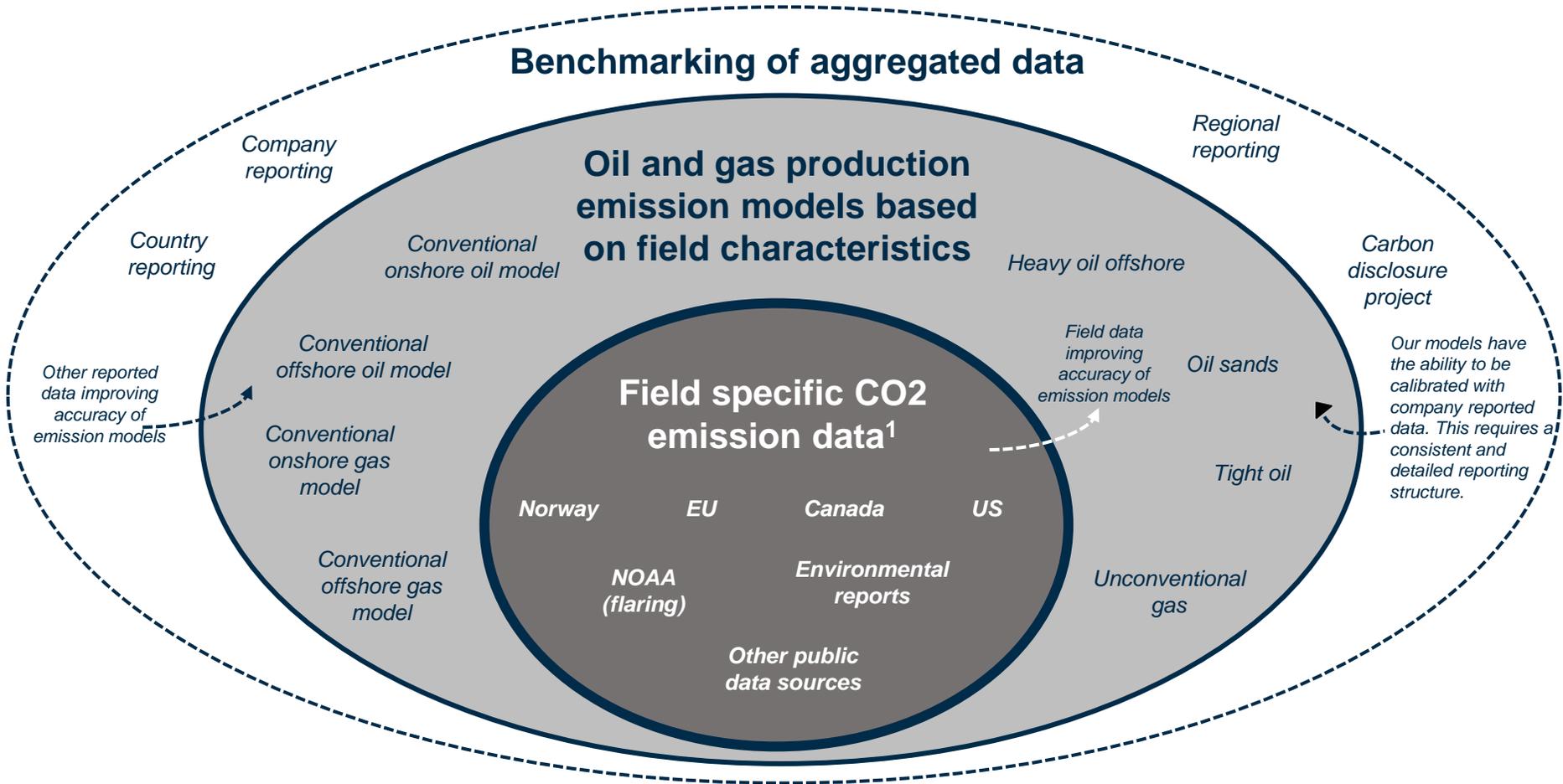
USD per barrel, real 2022-terms



1. This price assumption is not to be confused with a price forecast, but reflects a reasonable long-term average price used as an input to our supply model to avoid supply shortages in the long-run
Source: Rystad Energy UCube

Rystad Energy methodology complements and incorporates a wide range of other sources

Upstream		Midstream			End-use combustion
Exploration	Production	Transport	Processing	Transport	



1. Selected examples
Source: Rystad Energy research and analysis



RYSTAD ENERGY

Rystad Energy is an independent energy consulting services and business intelligence data firm offering global databases, strategy advisory and research products for energy companies and suppliers, investors, investment banks, organizations, and governments. Rystad Energy's headquarters are located in Oslo, Norway.

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