ABIS Energy

Suriname Updates

Exploration & Production (E&P)

Power System

June 2022

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Suriname E&P - Power System Updates: May 2022

Introduction

ABIS Energy has been directly involved with the Suriname Oil and Gas story since August 2021. We spent 10 days in country meeting the various stakeholders. We have built relationships both in country and internationally with the Suriname business community and the Diplomatic Corps in Europe and the US.

In terms of the economy Suriname is recovering from the 2020 net negative net growth of -13.4%. The Suriname GDP is projected to trend around USD $ 4.20bn in 2022 and USD $ 4.49 USD Billion in 2023.

Staatsolie the National Oil Co is an ISO 9001 company has been an Oil and Gas producer since 1982. The domestic market is largely self-sufficient.

Offshore, there has been significant Deepwater activity, in particular Block 58, the Maka field where operatorship has passed from Apache to TotalEnergies.

Tullow has relinquished all licenses on the Suriname CS.

Staatsolie expects to make a final investment decision next year for Deepwater Block 58 – adjacent to Stabroek – with a view to producing first oil in 2025.

Other Deepwater blocks to note for 2023 are: 42 Shell, 52 Petronas and 53 Apache.

Deepwater License Holders

ExxonMobil

Shell

Petronas

Cairn

Apache

Shallow Offshore West

TotalEnergies Blocks 6 & 8

Chevron Block 7

Chevron POC Shell Block 5

Suriname Deepwater would seem to be a natural extension of the Stabroek chain of discoveries. Maka, Kwaskwasi and Keskesi East are all oil-bearing discoveries, Sapakara West is Oil Gas and Condensate.

Shallow water Blocks 5 6 7 & 8 hold a great deal of interest.

In terms of timeline, it would appear that 2025 is the earliest we can expect Deepwater production. Shallow water production being less demanding on development time, cost and infrastructure could also be achieved in 24 to 36 months.

There is a ready tendency to make direct comparisons between the separate Guyana Suriname acreage. We are not sure that they are comparable.

Stabroek is unique, EEPGL is the only developer. For Suriname, in the case of Block 58, culturally TotalEnergies is different to ExxonMobil. The Europeans have already demonstrated a differing emphasis in terms of tone and compliance.

The next 18 to 24 months of exploration will likely confirm the quality of the basin. It is no bad thing for Suriname that, post COVID global events and the renewal of demand will most likely play out before Deepwater production comes onstream.

Suriname Transition Net Zero Energy Security

We have included, with this update, the latest iteration of the Suriname Power System. The Suriname Govt has committed to maintain the share of electricity from renewable sources above 35% by 2030

Investment in Oil & gas in 2014 was $800bn pa. In 2020 it was £400bn pa. Securing international investment for O&G projects against a backdrop of planned reduction in hydrocarbon reliance and the firming up of transition targets should be a matter of concern.

The commitments made by many Governments, to the Energy Transition and Net Zero require major reductions in the oil and gas consumption. Organisations such as the International Energy Agency (IEA) have projected dramatic decreases with the consequence that future oil and gas prices would fall very substantially.

It is likely that the Suriname Deepwater reservoir accumulations contain Oil Gas and Condensate in differing ratios. The Suriname PSC is not clear as to the treatment of associated or, non-associated gas. Gas to Power is a powerful engine of change. Gas process plant, gas fractionator, gas products, gas as a feedstock, is a sensible capacity builder. Integrated into the value chain, controlling and offsetting emissions it creates tools that play to Transition and Net Zero and Energy Security.

Investors in long-term projects in Suriname need to consider the risks. Environmental issues relating to climate change are likely to become increasingly important. Risks relating to security of supply will be important in the short- and medium-term. Investors have to demonstrate that they are being proactive in pursuing projects in the oil and gas sector, in renewables and CCS.

F J Kiernan

June 2022

Suriname E&P Update
May 2022

News

Suriname has taken another stride towards rivalling emerging hydrocarbons powerhouse and neighbour Guyana after TotalEnergies revealed another oil and gas discovery on Block 58. They have hit paydirt at the Krabdagu-1 wildcat, extending a string of exploration successes

The Krabdagu-1 well was drilled in 780 meters of water east of the Keskesi discovery Block 58, flanking Petronas's Block 52. Kravdagu-1 is one of the most successful wells in terms of net pay encountered 50 meters of net pay within the shallower Campanian section and 73 meters in the deeper Santonian section.

Sapakara West encountered a cumulative column of 79 meters within the shallower and the deeper sections.

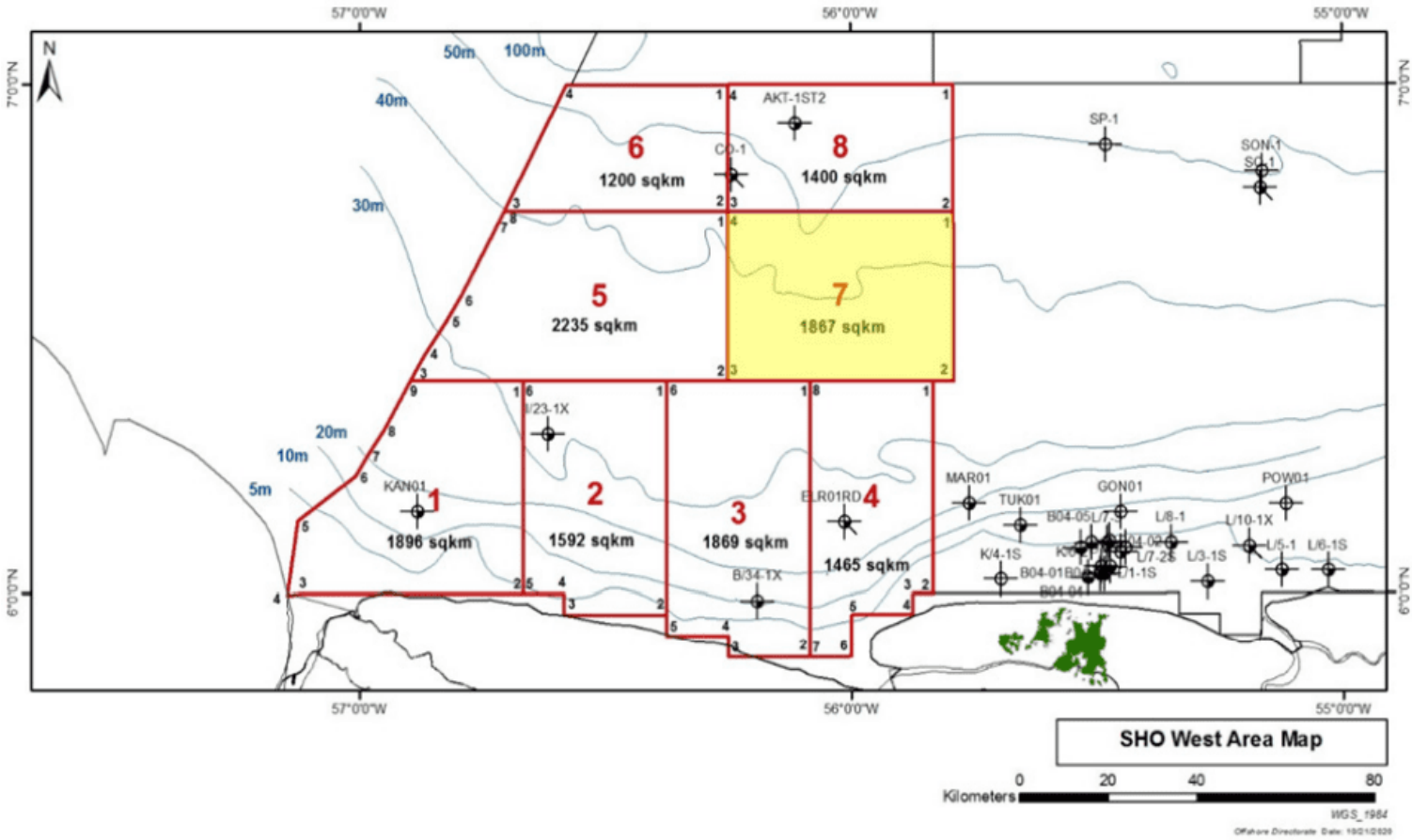
Kwaskwasi, the benchmark, encountered a cumulative column of about 278 meters, 149 in the shallower section and 129 in the deeper section.

On further news

Chevron has acquired a 1,867-square-kilometre shallow water acreage, called Block 7, offshore Suriname, the state oil producer announced.

With an 80% participating interest, Chevron has obtained exploration, development, and production rights in Block 7. Staatsolie has the remaining 20% interest, through its subsidiary Paradise Oil Company N.V. (POC).

"The agreements enable Staatsolie to play an active role in the block partnership from day one. The costs in the exploration phase will be carried by Chevron. The exploration period, as set out in Chevron's PSC, will last eight years, divided into three phases," Staatsolie said.



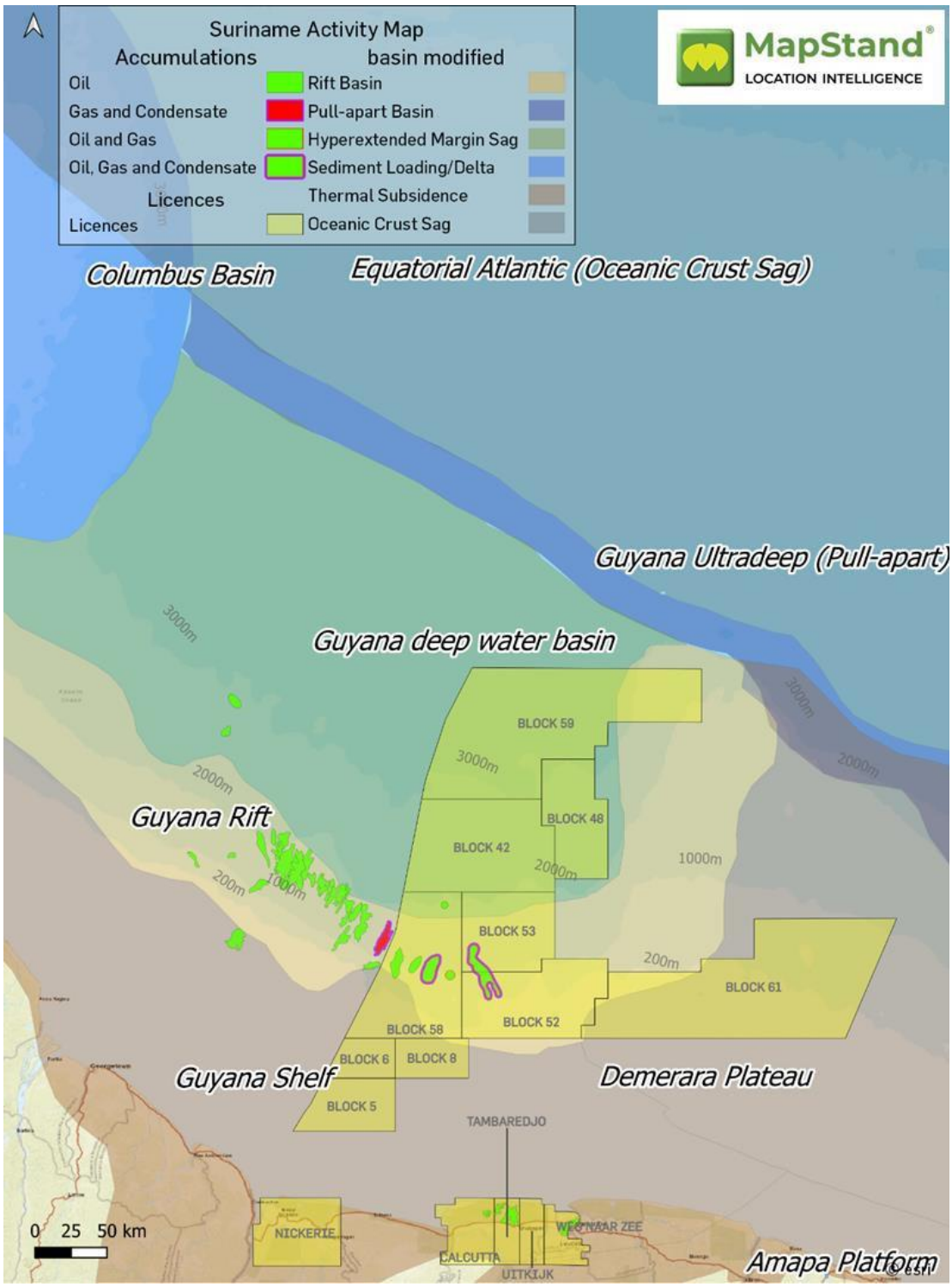
The shallow offshore west area map with blocks on offer.

Staatsolie and Chevron are also partners in the offshore Block 5, in which POC has the right to 40% participation and Chevron has 40%. Shell owns the remaining 20% stake through affiliate, KE Suriname BV.

Several discoveries have been made offshore Suriname in recent years, building on excitement from ExxomMobil's discoveries offshore its neighbour in the basin, Guyana.

Suriname E&P Update

BASIN OVERVIEW



Conceptual main source rock Albian-Cenomanian-Turonian aged oil window indicated in green dashed line for reference.

The Suriname-Guyana basin extends towards the west up to the Columbus basin (Barbados accretionary prism) and is limited to the north by the North Atlantic Oceanic crust, and to the east by the Demerara Plateau. Its sedimentary system wedges out to the south against the Suriname Craton basement.

BASIN OVERVIEW

Three main geological events where responsible for the present configuration of the basin: The North Atlantic rift (occurred during the Late Triassic-Early Jurassic), the South Atlantic rift (occurred within the Early Cretaceous), and the Equatorial Atlantic drift (initiated in Late Cretaceous).

Although oil companies have been searching for hydrocarbons in the Guyana-Suriname Basin for many decades, exploration efforts have only really intensified in the last decade. ExxonMobil's world-class Liza discovery in Guyana's Stabroek Block in 2015 paved the way for a string of subsequent discoveries, initially in Guyana, but also now in Suriname. A run of five consecutive discoveries in Suriname during 2020 and early 2021 suggest that Guyana's prolific plays – where around 9 bn barrels of oil equivalent have been discovered to date – extend across the border.

The basin had been known to be petroliferous for years, and Suriname has been producing small volumes of oil from onshore fields since 1982. Geological and geochemical studies suggest the hydrocarbons in the onshore Tambaredjo and Calcutta fields, which currently produce around 15,000 bpd, were originally generated from source rocks offshore. It is only very recently, though, that the offshore geology and broader petroleum system have started to be properly understood.

The first field to come onstream in the basin, in 1982, was the Tambaredjo oil field, discovered in 1968, following to the Calcutta field discovery in 1965, discovered by accident while drilling for water on a school yard, where oil was struck at 160m depth. Calcutta field came onstream in 2006. The Tambaredjo NW field, an extension of Tambaredjo field discovered in 2002, started producing in 2010. All three fields are located onshore and are still producing from Paleocene, Eocene and Miocene reservoirs, with a combined oil in place estimated around 1.1 billion barrels (bbls). The oil produced in these fields by means of artificial lift (tertiary methods) range from 16 to 19 API degrees (heavy oil type), with a recovery factor of around 20%. These accumulations are situated in a gentle structural nose, occurring as laterally extensive unconsolidated delta plain and fluvial sands, mostly stratigraphic trapping working mechanism, sealed by intraformational shales.

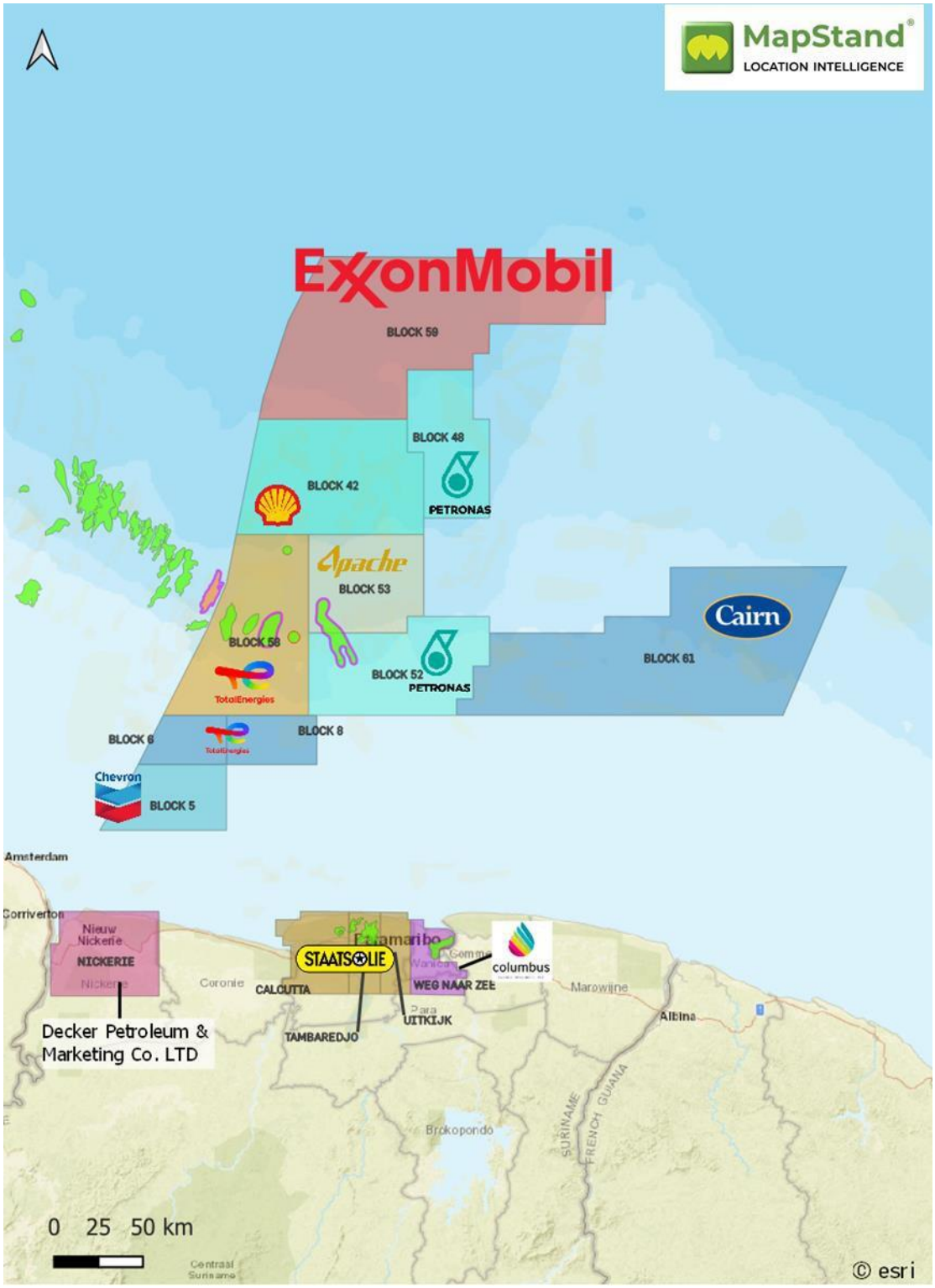
The accepted main source rock feeding the petroleum system of Suriname basin is the Albo-Cenomano-Turonian Canje formation, which is mature in the deep offshore area. *This formation is thought to be coeval with a worldwide anoxic event that generated other Cretaceous source rocks widespread throughout the Equatorial and South Atlantic margins*. The hydrocarbon migration towards the onshore is expected to have occurred through sand carrier beds overlaid by shales, with distances ranging up to 200 km from the oil window zone to the onshore reservoir accumulations.

In recent years, the exploration scope was driven towards the deep-water areas, in search for cretaceous turbiditic deposits analogue to the latter discoveries made at the Atlantic Conjugate margins.

As with other Atlantic Margin basins in the region, analysts and geologists have drawn comparisons with working petroleum systems off West Africa. According to IHS Markit, the Guyana-Suriname Basin is analogous with the MSGBC Basin. The main reservoir targets are Upper Cretaceous and Lower Tertiary basin floor fans, shelf-margin deposits and turbidites directly overlying the world-class mature source.

The USGS's latest undiscovered resource assessment, carried out in 2012, estimated the basin contained 13.6 bn barrels of risked, technically recoverable conventional oil, 32 billion cubic feet (bcf) of gas (around two-thirds associated), and 863 million boe of natural gas liquids (NGLs).

KEY PLAYERS



Suriname Operators Map.
Main operators of current block areas under contract agreement in Suriname

Whereas ExxonMobil dominates the offshore exploration picture in Guyana and has had almost all of the success there, the picture is somewhat more fragmented in Suriname, where there are more blocks and more companies involved. Nonetheless, some keys players have started to emerge.

TotalEnergies in particular looks set to become a major player in Suriname. It is a relative newcomer, having only entered in December 2019, although it has participating interests in three active blocks in Guyana so has experience of the basin.

It has assumed operatorship from Apache of Block 58, where four of Suriname's five discoveries have been made, in what Rudolf Elias, former CEO of Staatsolie, called the 'Golden Lane of Oil'. It is very likely to be the first company to develop an offshore asset.

KEY PLAYERS

Outside of TotalEnergies and Apache, Petronas and Shell seem to be geographically and operationally best placed to achieve near-term success. Petronas is active on Block 48 and in particular on Block 52, where it has drilled two wells and made one discovery. It has partnered there with ExxonMobil. As well as partnering TotalEnergies on Block 58, Apache is operator on block 53, partnered by Petronas and Cepsa.

Shell only entered Suriname in December 2020, acquiring Kosmos' shares of Blocks 42 and 45 and assuming operatorship, partnered by Chevron and Hess. But it is likely to breathe new life into the two blocks, where Kosmos had previously drilled two unsuccessful wells in 2018. Shell has experience in French Guiana, but no current interests in Guyana. It had previously partnered with ExxonMobil in its prolific Stabroek block, only to pull out in 2014, just months before the transformational, play-opening Liza discovery there.

Tullow is also active, and is operator on three blocks – 47, 54 and 62 – where is it partnered variously with Equinor, Pluspetrol, Ratio and Noble. It has drilled two wells in Suriname (in addition to two in Guyana as operator and another one as a partner), but has had very limited success in the basin to date. At the other end of the spectrum, ExxonMobil acquired the ultra-deepwater Block 59 in 2017, which sits on the border, along with Hess and Equinor. But the company's main focus is on Guyana for now.

Tullow has relinquished all license commitments in Suriname effective from 31 December 2021.

Equinor and Cairn operate one block each in what is currently peripheral acreage, and both are in relatively early stages of exploration.

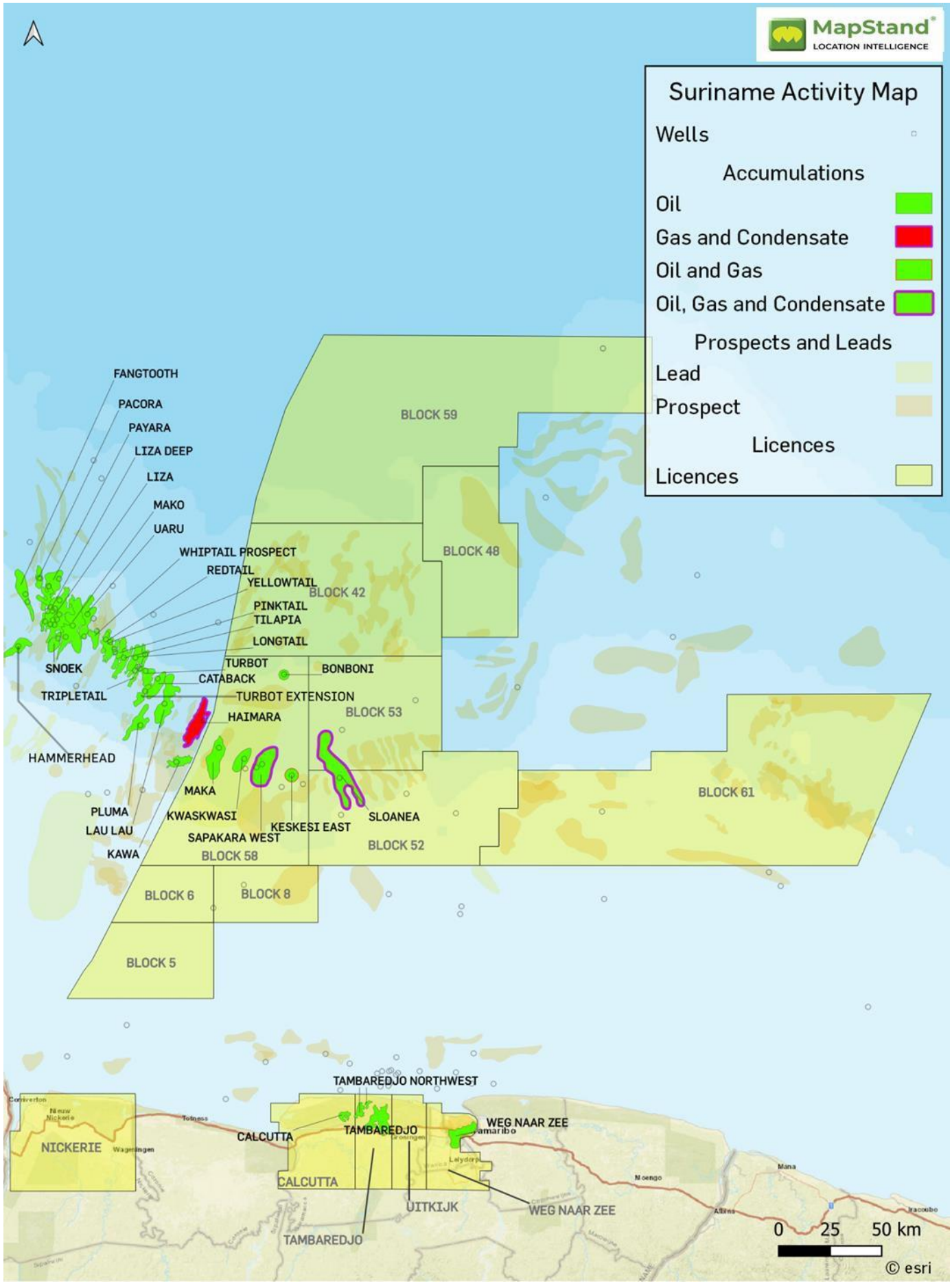
The national oil company, Staatsolie, has three material onshore Oil fields, but does not have a direct interest in any of the major offshore blocks. Nonetheless, most of the PSCs signed with IOCs – including those for Blocks 58 and 52 – give Staatsolie the option to back into the contract with an interest of up to 20% upon approval of any development plans.

OFFSHORE DISCOVERIES

In late 2019 the exploration well Maka Central-1 was spudded by the Noble Sam croft drillship in block 58, under Apache operatorship, targeting upper Cretaceous-aged Campanian and Santonian stratigraphic intervals. In early 2020 a discovery for this well was announced by Apache, almost simultaneously with the farm-in agreement with TotalEnergies, taking over as the new operator.

The Maka Central discovery was a breakthrough that proved a working petroleum system akin to that of previous discoveries in the Guyana basin was functioning as well in the deepwater section of Suriname, casting away the setbacks of previous exploration in the basin. Apache itself had drilled in the adjacent block 53 the Popokai-1 well, in 2015, which results have not been disclosed but is believed to bear hydrocarbons in a tight formation, and the Kolibrie-1 well in 2017, that failed to hit commercial hydrocarbons.

The Maka Central discovery was then succeeded by Sapakara West, Kwaskwasi, Keskesi East and Sloanea discoveries, shared in between block 58 (operated by TotalEnergies) and block 52 (operated by Petronas).



Suriname Activity Map showing current block areas under contract agreement, accumulations and prospects in the Suriname basin.

OFFSHORE DISCOVERIES

Staatsolie Hydrocarbon Institute is mandated to attract qualified international oil companies to sustainably explore and develop Suriname's hydrocarbon resources. As of December 2020, there are 12 production sharing contracts for offshore and the onshore blocks active.

Year	Area	Block	Operator	Partner(s)	PSC Effective Date	PSC Status	Well Aliase	Well(s) Drilled	Spud Date	Total Depth (m)
1957	Onshore	N/A	Colmar Surinam Oil Company		30 Jan 1957	Relinquished				
1993	Offshore	Contract Area	Pecten Suriname Ltd		15 Nov 1993	Relinquished				
1999	Offshore	Inboard and Outboard area	Burlington Resources Suriname Ltd	Shell EP Suriname B.V. Totalfina Exploration Suriname Korea National Oil Corporation	23 Aug 1999	Relinquished				
2000	Onshore	Wayambo	Koch Exploration International B.V.		15 Mar 2000	Relinquished				
2004	Offshore	30	Repsol Exploracion, S.A		24 Apr 2004	Relinquished	WT-1	West Tapir-1	16 Apr 2008	4080m MD
2004	Offshore	31	Maersk oil Suriname B.V.		25 Nov 2004	Relinquished	AKT-1ST2 Spari-1ST1	Aitkantie-1(ST2) Spari-1(ST1)	14 Apr 2011 (26 May 2011) 14 May 2015	5483m MD 3830m MD
2005	Offshore	32	Occidental of Suriname LLC		25 Oct 2005	Relinquished				
2007	Onshore	Uitkijk	Paradise Oil Company N.V.	Hardman Oil and Gas PTY Ltd	23 Jul 2007	Staatsolie Operated				
2007	Onshore	Coronie	Paradise Oil Company N.V.	Hardman Oil and Gas PTY Ltd	23 Jul 2007	Relinquished				

OFFSHORE DISCOVERIES (cont)

2007	Offshore	37	Murphy Suriname Oil Company Ltd		6 July2007	Relinquished	CRC-1 ARC-1	Caracara-1 Aracari-1	2 Nov 2010 13 Mar 2011	2705m MD 2450m MD
2010	Offshore	47	Tullow Suriname B.V.	Petroandina Resources Corporation N.V. Chevron Suriname Exploration Limited	30 Sep 2010	Active	GVN-1*	Goliath-Voltzberg North-1	30 Jan 2021	5060m MD
2011	Offshore	42	B.V. Dordtsche Petroleum Maatschappij ("Shell")	Hess Suriname Exploration Limited	13 Dec 2011	Active	PON-1*	Pontoenoe-1	12 Aug 2018	6194m MD
2011	Offshore	45	Kosmos Energy Suriname	Chevron Suriname Exploration Limited	13 Dec 2011	Relinquished	ANA-1(A)	Anapai-1(A)	5 Apr 2018	3577m MD
2012	Offshore	48	Petronas Suriname E&P B.V.		18 Jan 2012	Active				
2013	Offshore	52	Petronas Suriname E&P B.V.	ExxonMobil Exploration and Production Suriname B.V.	26 Apr 2013	Active	RS-1X* SLO-1*	Roselle-1 Sloanea-1	9 May 2016 8 Oct 2020	4908m MD 4780m MD
2013	Offshore	53	Apache Suriname Corporation LDC	Cepsa Suriname S.L.	1 Apr 2013	Active	POP-1* KOL-1*	Popokai-1 Kolibrie-1	4 Feb 2015 3 Mar 2017	7200m MD 5212m MD
2014	Offshore	54	Tullow Oil Suriname B.V.		14 Feb 2014	Active	ARA-1*	Araku-1	1 Oct 2017	2685m MD

OFFSHORE DISCOVERIES (cont)

2015	Offshore	58	Total E&P Suriname B.V.	Apache Suriname 58 Corporation LDC	1 Jul 2015	Active	MKC-1* SPW-1* KWA-1* KEE-1* SPW-2* SPS-1* KES-1*	Maka Central-1 Sapakara West-1 Kwaskwasi-1 Keskesi East-1 Sapakara West-2 Sapakara South-1 Keskesi South-1	24 Sep 2019 7 Jan 2020 19 Apr 2020 14 Sep 2020 8 Feb 2021 23 Mar 2021 2 Jun 2021	6285m MD 6326m MD 6644m MD 6675m MD N/A N/A N/A
2018	Offshore	59	ExxonMobil Exploration and Production Suriname B.V.	Hess (Suriname II) Exploration Limited Equinor Suriname B59 B.V.	9 Jul 2018	Active				
2018	Offshore	61	Capricorn Suriname B.V.		26 Jun 2018	Active				
2018	Offshore	60	Equinor Suriname B60 B.V.		11 Jul 2018	Relinquished				
2018	Offshore	62	Tullow Suriname B.V.	Petroandina Resources Corporation N.V.	2 Oct 2018	Relinquished				
2019	Onshore	Nickerie	Decker Petroleum and Marketing Co. Ltd.		1 Oct 2019	Active				
2019	Onshore	WnZ	Challenger Energy Group PLC		3 Oct 2019	Active				
2021	Offshore	Block 5	Chevron Suriname Exploration Limited	Paradise Oil Company N.V.	13 Oct 2021	Active				
* Well data not publicly available										

BLOCK 58 (TotalEnergies)

Announced	Discovery	Drillship	Water Depth (m)	Total Depth (m)	Net Pay (m)	Play Targeted
Jan 2021	Keskesi East	Noble Sam Croft	725	-	63	Upper Cretaceous
July 2020	Kwaskwasi	Noble Sam Croft	1,000	6,644	278	Upper Cretaceous
April 2020	Sapakara West	Noble Sam Croft	1,000	6,326	79	Upper Cretaceous
Jan 2020	Maka Central	Noble Sam Croft	1,000	6,285	123	Upper Cretaceous
Nov 2021	Bonboni (sub-commercial)	Maersk Valiant	2000	-	16	Upper Cretaceous

BLOCK 58 (TotalEnergies)

Announced	Discovery	Drillship	Water Depth (m)	Total Depth (m)	Net Pay (m)	Play Targeted
Dec 2020	Sloanea	Maersk Developer	-	4,780	-	Upper Cretaceous

UNSUCCESSFUL WELLS

Note: historical and onshore wells excluded

Date	Block	Well	Operator	Drillship	Water Depth (m)	Total Depth (m)
March 2021	Block 47	Goliathberg-Voltzberg North-1	Tullow	Stena Forth	1,856	5,060
Oct 2018	Block 42	Pontoenoe-1	Kosmos (now Shell)	Ensco/Valaris DS-12	2,497	6,194
June 2018	Block 45	Anapai-1	Kosmos (now Shell)	Ensco/Valaris DS-12	1,500	4,556
Oct 2017	Block 54	Araku-1	Tullow	Noble Bob Douglas	~1,000	-

UNSUCCESSFUL WELLS

April 2017	Block 53	Kolibrie-1	Apache	Noble Bob Douglas	-	5,212
May 2016	Block 52	Roselle-1	Petronas	Rowan/Valaris JU-117 (Ralph Coffman)	-	4,908
May 2015	Block 31 (relinquished)	Spari-1	Maersk	-	52	3,830
Feb 2015	Block 53	Popokai-1	Apache	Stena DrillMAX	1,492	7,200
May 2011	Block 31 (relinquished)	Aitkantie-1	Maersk	-	-	5,483
March 2011	Block 37 (relinquished)	Aracari-1	Murphy Oil	-	-	2,450
Nov 2010	Block 37 (relinquished)	Caracara-1	Murphy Oil	-	-	2,705
April 2008	Block 30 (relinquished)	West Tapir-1	Repsol	-	-	4,080

2019 Nearshore Drilling Project

Staatsolie drilled an additional six wells as part of a Nearshore Drilling project between April and December 2019. The Marai, Electric Ray, Kankantrie, Powisi, Gonini and Tukunari wells reached total depths of between 1,000m and 3,000m in shallow water 8m to 25m deep. The presence of oil was demonstrated in four of the wells, but there were no commercial finds. The wells were drilled by Seadrill's West Castor jackup.

BLOCK DEVELOPMENTS

TotalEnergies	**Block 58** Total 50% Apache 50% *Water Depth:* *55-2,250m* *5,844 km2*	• Apache signed PSC with Staatsolie in June 2015 and farmed out 50% to Total in December 2019. TotalEnergies assumed operatorship on 1st Jan 2021 in a pre-planned switch. • Partners have made four consecutive discoveries on the block since January 2020: Maka Central, Kwaskwasi, Sapakara West and Keskesi East. All four wells encountered stacked reservoirs, uncovering oil and condensate in the shallower play and oil in the deeper play. Keskesi East encountered pressure issues when continuing to deeper targets. • Block is located on the Guyana-Suriname border, directly adjacent to ExxonMobil's prolific Stabroek Block in Guyana where the partners have found around 9 bn boe across 19 discoveries. • Appraisal drilling campaign is being carried out in 2021, alongside further exploration work (Maersk Developer and Maersk Valiant). Partners have identified Bonboni prospect in north of the block as their next target. • Rystad has estimated the first three discoveries (excluding Keskesi East) contain around 1.4bn boe (Maka Central ~400m, Kwaskwasi 728m, Sapakara West ~250m) • A 2020 Morgan Stanley report estimated that Block 58 contained recoverable resource of around 6.5 bn boe (5.9 bn of oil). • Partners are targeting FID on existing discoveries by end of 2021 and first oil by 2025. Apache says the projects would offer return to investors at sub-$40 WTI prices. • Partners have no relinquishment requirements on the block until June 2026.
Apache	**Block 53** Apache 45% Petronas 30% Cepsa 25% *Water Depth:* *500-1,800m* *3,509 km2*	• Apache signed PSC in 2012 following competitive bid round. • It has drilled two unsuccessful wells on the block: Popokai-1 (2015) and Kolibrie-1 (2017). It did not report the results of Popokai and Kolibrie found no commercial hydrocarbons.

BLOCK DEVELOPMENTS

Petronas via **Petronas Suriname E&P BV (PSEPBV)**	**Block 52** Petronas 50% ExxonMobil 50% *Water Depth: 50-1,100m* *4,749 km2*	• Petronas signed the PSC in April 2013 and ExxonMobil farmed in in May 2020. • Partners made the Sloanea-1 discovery in December 2020. It is currently being evaluated to determine its resource potential. • Petronas had previously drilled the Roselle-1 well in 2016 which, although unsuccessful, provided useful information and data on the subsurface and indicated multiple geological play types in the block. • Petronas contracted Shearwater GeoServices in September 2020 conduct a new 6,200 km2 3D seismic survey on the block, using the Geo Caribbean vessel. It was due to begin in Q4 2020 and take 4 months.
	Block 48 Petronas 100% *Ultra-Deepwater* *~3,200 km2*	• Petronas signed a PSC in January 2012, but is yet to drill any wells on the block. • 3D seismic conducted in 2017. • Fugro conducted a seep survey and geochemical campaign on the block during Q1 2021, from the survey vessel MV Fugro Brasilis. It involved geophysical data collection, heat flow measurements, core sampling and onboard geochemical analyses. • Subsequent geochemical analyses and final reports were due to be delivered in May 2021.
Shell	**Block 42** Shell 33.33% Chevron 33.33% Hess 33.33% *Water Depth: ~2,000-2,700m* *6,175 km2*	• Kosmos originally acquired the block in December 2011 and farmed out stakes to Chevron (2012) and Hess (2016). • Shell acquired Kosmos' share in December 2020, assuming operatorship. • There has been one well drilled on the block to date – the unsuccessful Pontoenoe-1 well, drilled by Kosmos in October 2018. It encountered high quality reservoirs, but no commercial hydrocarbons, and the primary exploration objective proved to be water bearing. • 3,900 km2 of 3D seismic was acquired over parts of blocks 42 and 45 in 2012, and another 6,500 km2 3D seismic survey was completed on the blocks in January 2017. • The partners have met all commitments under second exploration phase of the PSC, which expires in September 2021.
	Block 45 Shell 50% Chevron 50% *Water Depth: 200-2,000m* *5,125 km2*	• Kosmos originally acquired the block in 2011, and farmed out 50% to Chevron in November 2012, at the same time as the deal for Block 42. • Shell acquired Kosmos' share in December 2020, at the same time as Block 42. • There has been one well drilled on the block to date – the unsuccessful Anapai-1 well, drilled by Kosmos in June 2018. It encountered high quality reservoirs but was dry. It was plugged and abandoned. • The partners have met all commitments under second exploration phase of the PSC, which expires in September 2021.

BLOCK DEVELOPMENTS (cont)

Tullow	**Block 47** Tullow 50% Pluspetrol 30% Ratio 20% *Water Depth:* *1,300-3,000m* *2,369 km2*	• Tullow signed PSC in September 2010. Ratio farmed in in 2017 and Pluspetrol farmed in in 2018. The partners were recently granted a two-year extension for the block. • The partners completed the first well on the block, the Goliathberg-Voltzberg North-1 well, in March 2021. It targeted two prospective intervals and encountered good quality reservoirs, but only minor oil shows. It has been plugged and abandoned.
	Block 54 Tullow 30% Equinor 50% Noble 20% *Water Depth:* *200-1,300m* *8,480 km2*	• PSC signed in February 2014. Noble acquired 20% from Tullow in 2015. • Partners drilled the unsuccessful Araku-1 well in October 2017. It encountered gas condensate but did not find significant reservoir rocks and was abandoned. Tullow said that it did prove the presence of a new petroleum system in the Demerara plateau, though.
	Block 62 Tullow 80% Pluspetrol 20% *Water Depth:* *1,600-2,400m* *4,061 km2*	• Tullow signed PSC in October 2018, following the 2017-2018 open bid round. Pluspetrol farmed in in April 2019. • Tullow is carrying out initial geological work on the area ahead of 2D seismic.
ExxonMobil via **ExxonMobil Exploration and Production Suriname B.V.**	**Block 59** ExxonMobil 33.33% Hess 33.33% Equinor 33.33% *Water Depth:* *2,900-3,500m* *~11,000km2*	• Partners signed PSC in July 2017. • 2D seismic carried out in 2019. • Partners planned to shoot more focused 3D survey ahead of drilling, likely in 2022.
Equinor	**Block 60** Equinor 100% *Water Depth:* *700-1,300m* *~6,200 km2*	• PSC signed in 2017. • 3D seismic survey conducted in 2018.
Cairn	**Block 61** Cairn 100% (via Capricorn Suriname BV) *Water Depth:* *60-1,100m* *13,080 km2*	• PSC signed in June 2018 as part of an open bid round in September 2017-September 2018 • Around 12,000 km2 of 2D seismic has been carried out and processed on the block • Cairn say they have identified multiple targets across the block in 100-800m water depths, targeting the Upper Cretaceous play. • Company is high-grading most prospective prospects and is planning focused 3D seismic for H2 2021 (as of investor presentation in March 2021) • Cairn investor presentation in September 2020 suggested contingent drilling would take place in 2023 onwards

NEAR TERM DEVELOPMENTS

Picking up where they left off in 2020, TotalEnergies and Apache will continue to lead offshore activity in Suriname this year. The partners have contracted two Maersk drilling rigs to drill appraisal wells on their recent Block 58 discoveries and begin a second exploration programme. The semi-submersible Maersk Developer arrived in January from Block 52 and the drillship Maersk Valiant arrived in March. The Noble Sam Croft, which had drilled all of the partners' previous exploration wells, has moved to ExxonMobil's Stabroek Block in neighbouring Guyana.

Apache President and CEO John Christmann told investors last November that they planned to maintain the pace of exploration in 2021. The partners are expected to drill the Bonboni prospect, in deeper waters within the central northern part of Block 58, later this year. Apache has previously said it had identified over 50 prospects in seven distinct play types on Block 58.

In the meantime, Tullow has drilled the unsuccessful Goliath Berg-Voltzberg North-1 well in Block 47. The company announced in March that it had encountered good quality reservoirs, but only minor oil shows. Coming on the back of three other disappointing wells in Guyana in 2019, and the broader challenges the company is facing, Tullow's focus is likely to be elsewhere for the foreseeable future. In a press release, the company said it would "assess the data gathered from the well and carefully consider next steps."

Elsewhere, Wood Mackenzie reported in January 2021 that Petronas and Shell would also drill in Suriname this year. Shell is likely to focus on Block 42 and Petronas on Block 52, following up the success of Sloanea at the end of last year. Last September, Petronas had contracted Shearwater GeoServices to conduct a new 3D seismic survey covering the whole of Block 52 in Q1 2021. Cairn is also planning a focused 3D seismic survey, on Block 61, in the second half of this year, with a view to drilling in 2023. ExxonMobil is unlikely to drill in Block 59 in 2021, but may start to focus more in Suriname from next year.

Staatsolie recently announced that it had received ten bids on three shallow water blocks. Eight blocks in an underexplored area covering 13,524 km2 had been offered via the Suriname Shallow Offshore (SHO) Bid Round 2020/2021, which ran from 16th November 2020 to 30th April 2021. The company said it would evaluate the bids and communicate with the successful bidders by 30th May 2021, before awarding PSCs.

RESOURCE AND PRODUCTION POTENTIAL

Given the recent drilling successes on both sides of the border, it now seems very likely that the Guyana-Suriname basin contains materially more than the 13.6 bn barrels of oil estimated by the USGS in 2012. ExxonMobil has already found more than 9 bn boe of recoverable resource in Guyana, and in March said that the basin could contain more than double that, or 18 bn boe. Morgan Stanley estimated in August 2020 that Block 58 alone in Suriname would ultimately yield 6.5 bn boe, of which 5.9 bn was oil.

There had previously been some concerns – based on results from ExxonMobil's Haimara discovery just across the border – that Block 58, and the Suriname half of the basin in general, might contain primarily gas condensate fields. The Maka Central discovery, which is seven miles from the border, and the other subsequent finds, dispelled most of these fears.

Although TotalEnergies and Petronas' discoveries are still being fully evaluated, initial signs are very positive. Rystad Energy estimated last year that TotalEnergies's first three discoveries alone could contain 1.4bn barrels of oil equivalent.

TotalEnergies has said that it plans to take FID on a development plan for Block 58 later this year, with a view to achieving first oil in 2025 – which would represent an impressive five years from discovery to first oil. Given the low breakeven costs for projects in the basin – broadly understood to be around $45 in Suriname and even lower in Guyana – even low oil prices are unlikely to derail the development of Suriname's offshore industry.

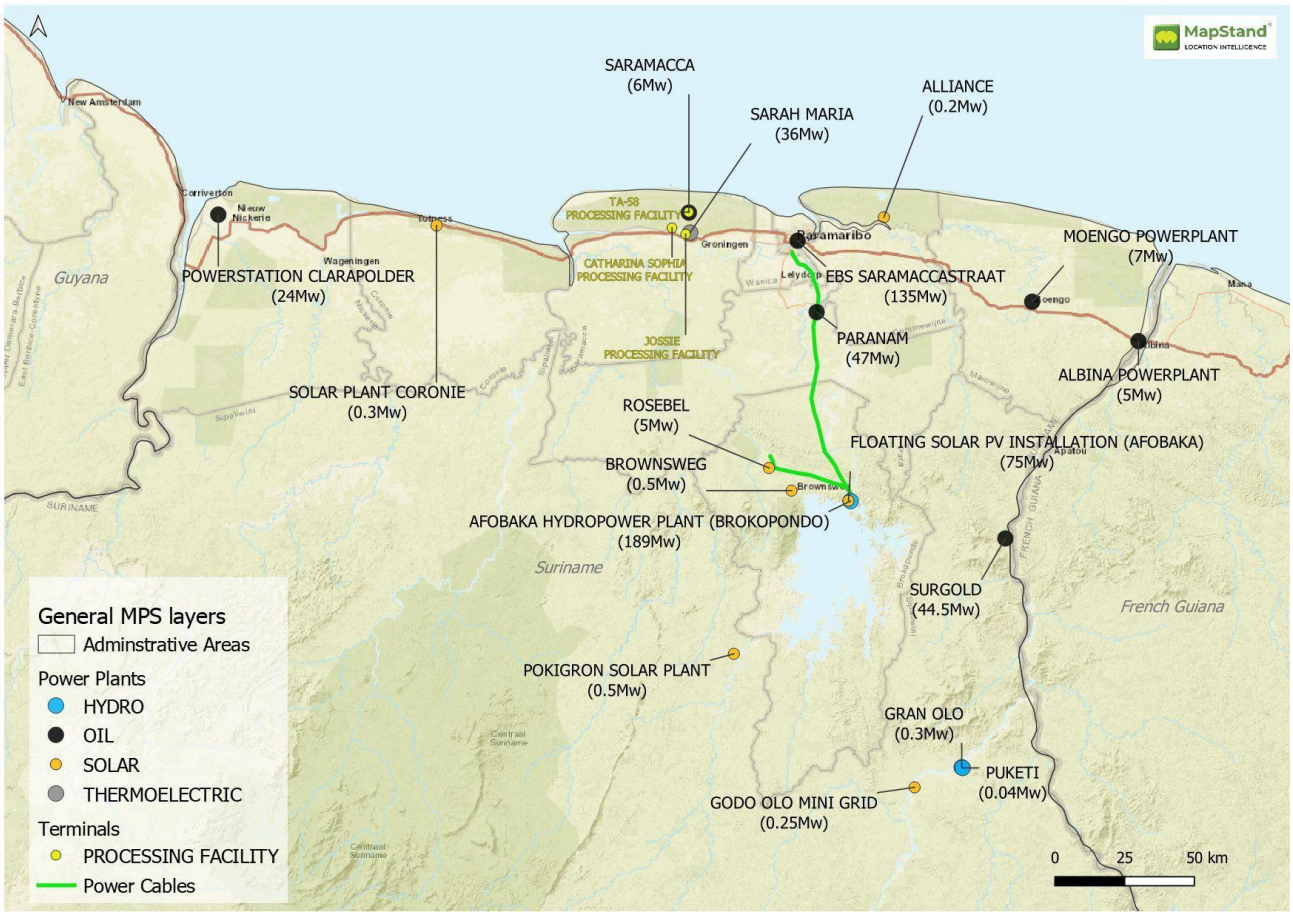
Rystad has said it expects combined production from Blocks 58 and 52 to reach about 650,000 bpd by early 2030. As in Guyana, Suriname's fields are likely to be developed via high-capacity floating production complexes, with crude oil exported directly without ever making landfall in Suriname itself. Even though Suriname has an existing refinery, it is only very small and volumes would far exceed its capacity, which is set up to process Saramacca crude from Suriname's small onshore fields. It is not yet clear whether the gas and condensate intervals will be economically viable to produce.

Suriname Power System

Renewable Energy

The biggest solar plant in Suriname was commissioned in 2014 to supply power to the IAMGold Rosebel gold mine, providing 5MW capacity to the mining operation. Other examples of renewable energy projects being developed in Suriname are the solar power plants of Brownsweg (500Kw), located nearby Brownsweg village and aimed to be commissioned by 2023, the Alliance project (200Kw), located in the Commewijne district and planned to be completed by 2024, and the Coronie solar power plant (300Kw), located in the Coronie district. A floating solar PV installation in the Afobaka hydropower dam is now undergoing feasibility studies, in order to support the establishment of a proper regulatory framework, based on strategies and technologies used in Japan.

Energy Transition



Target: Maintain the share of electricity from renewable sources above 35% by 2030.[10]

Suriname Power System

Energy Transition

Notes

[i](2021) *Ewsdata.rightsindevelopment.org*. Available at: https://ewsdata.rightsindevelopment.org/files/documents/55/IADB-SU-L1055_zbxMxXC.pdf (Accessed: 10 November 2021).

[ii] Ibidem. Diesel power generators are normally operated with certain limitations, supplying electricity during a few hours a day.
The Afobaka hydropower plant is operating since 1965 “which makes it one of the oldest large hydropower plants that is still operational in the Amazon region. The water reservoir has an area of 1560 km2 . Currently there are 3 Kaplan turbines and 3 fixed blade turbines installed. During normal operation 4 out of the 6 turbines are working.” (2021) Fga.unb.br. Available at: https://fga.unb.br/articles/0002/3737/Alimoestar_Thesis_8_maart_2020.pdf (Accessed: 9 November 2021).
[iii] State of the Climate Report: Suriname | Publications (2021). Available at: https://publications.iadb.org/publications/english/document/State-of-the-Climate-Report-Suriname.pdf (Accessed: 9 November 2021).

[iv] Puketi facility operated from 1981 to 1988, supplying the villages of Puketi and Futupasi of electricity, and is non-operative at the present time. Gran Olo construction took place from 2005 to 2017, located in the Tapanahony River, nearby Puketi site, nevertheless malfunctioning problems were discovered during the commissioning phase and rendered the facility non-operative.
V Suriname has the third lowest electrification rate in Latin America. (2021) Ruralelec.org. Available at: https://www.ruralelec.org/sites/default/files/Status%20of%20the%20off-grid%20renewable%20energy%20market%20in%20Latin%20America%20%26%20the%20Caribbean_0.pdf (Accessed: 10 November 2021).

(2021) Energy.gov. Available at: https://www.energy.gov/sites/default/files/2020/09/f79/ETI-Energy-Snapshot-Suriname_FY20.pdf (Accessed: 10 November 2021).

(2021) Ewsdata.rightsindevelopment.org. Available at: https://ewsdata.rightsindevelopment.org/files/documents/55/IADB-SU-L1055_zbxMxXC.pdf (Accessed: 10 November 2021).

vi Punwasi, S. (2019) A roadmap for energy transition in Suriname: Backcasting scenarios for a sustainable electricity generation by 2040, Repository.tudelft.nl. Available at: https://repository.tudelft.nl/islandora/object/uuid:65b2fee9-d729-4e4c-8b1a-715041f144d4?collection=education (Accessed: 10 November 2021). Financing for Pokigron solar project was provided by the Inter-American Development Bank (IDB).

The system “consists of 1680 solar PV panels (each 300 Wp) and a group of 8 battery banks with a total capacity of 8000 Ah. However, this power plant uses diesel generators as backup in case the batteries deliver insufficient power during the night.”

Suriname Power System

Energy Transition

Notes (cont)

Part of the energy generated during the day by the solar panels is stored in batteries for use in the evening. EBS's Solar Energy project provides 1x24 hours of power to approximately 494 households and other end-users in Atjoni and Pokigron, including 9 local shops, the civic center and 7 local businesses. (2021) Unstats.un.org. Available at: https://unstats.un.org/unsd/envstats/Compendia/Suriname9thEnvironment2020.pdf (Accessed: 10 November 2021).

[vii] Such projects had its permit application submitted or are under construction phase

[viii] Project being developed by the Government of Suriname and Staatsolie Power Company Suriname NV (SPCS) with funds from the Inter-American Development Bank. TC Document.pdf | IADB (2021). Available at: https://www.iadb.org/projects/document/EZSHARE-975627404-21?project=SU-T1138 (Accessed: 10 November 2021).

Funded projects like these are aiming to pave the way for future projects, removing main obstacles as the lack of a clear policy and regulatory framework for the electricity sector, and therefore attract more investment to the country.

[ix] (2021) Energy.gov. Available at: https://www.energy.gov/sites/default/files/2020/09/f79/ETI-Energy-Snapshot-Suriname_FY20.pdf (Accessed: 10 November 2021).