Maybank Investment Bank

Malaysia Oil & Gas

A cyclical sector: always has been and always will be

POSITIVE *[Unchanged]*

Oil & Gas

Malaysia

Still expecting elevated crude oil prices in 2024E

The oil and gas sector is a cyclical one with recurring periods of boom and bust – as oil demand is relatively inelastic while oil supply is elastic. As we are now in a severely underinvested phase coupled with a record-high demand for oil in 2023-2024E, we view that the elevated oil price environment will be here to stay for the medium term. We maintain POSITIVE on the sector with in-house Brent ASP assumptions of USD85/80/bbl for 2023/2024E. Top sector BUYs are Yinson, BArmada and Wasco.

Crude supply and demand gap forecasted to be narrow in the medium term

In its latest (Sep 2023) Short-term Energy Outlook (STEO) report, the US Energy Information Administration (EIA) expects a net deficit in 4Q23 with world consumption slightly eclipsing production by 0.2mbpd. EIA forecasts the supply/demand gap to be narrow at 0.2mbpd/0.5mbpd in 2023/24 respectively. Meanwhile, OPEC+ has engaged in multiple rounds of production cuts over the past two years. We expect further output cuts from OPEC+ if oil prices do not hold above USD75/bbl.

Outlook for some local OGSE players to remain buoyant in 2023-2024E - based on PAO2023

Based on the Petronas Activity Outlook 2023-2025 (PAO2023) document, we are expecting some bright spots in specific OGSE sub-segments such as: i) drilling rigs, ii) MCM works, iii) CPP fabrication, and iv) well decommissioning projects. As such, in our view, local listed beneficiaries in these sub-segments that are worthy of mention include Velesto Energy, Dayang Enterprise, Carimin Petroleum, MMHE and Uzma.

Oil demand forecasted to peak only in 2032

Wood Mackenzie, in their latest "Energy Transition Outlook" report, estimates peak oil demand only in 2032 at 108mbpd (vs. 101-102mbpd currently), driven primarily by greater end-use efficiency and electrification. It forecasts fossil fuels to account for 53% of end-use energy demand in 2050 (from an estimated 69% in 2023) as the world moves towards significant development in the transport sector (mainly the shift towards electric vehicles and the related infrastructure). This implies that fossil fuels will still be a primary source of energy in the long term, albeit more skewed towards the use of natural gas.

Analysts

Desmond Ch'ng, BFP, FCA
(603) 2297 8680
desmond.chng@maybank-ib.com

Jeremie Yap
(603) 2297 8688
jeremie.yap@maybank-ib.com

Abbreviation

MCM = Offshore maintenance, construction and modification
CPP = Central Processing Platform

Other PLCs mentioned in this report

Dayang Enterprise (DEHB MK, Not Rated, CP: MYR1.86)
Carimin Petroleum (CARIP MK, Not Rated, CP: MYR0.865)
Malaysia Marine and Heavy Engineering (MMHE MK, Not Rated, CP: MYR0.535)
Uzma (UZMA MK, Not Rated, CP: MYR0.775)
Sapura Energy (SAPE MK, Not Rated, CP: MYR0.055)
Petra Energy (PENB MK, Not Rated, CP: MYR0.885)
Reach Energy (REB MK, Not Rated, CP: MYR0.045)
T7 Global (T7G MK, Not Rated, CP: MYR0.455)
Muhibbah Eng (MUHI MK, Not Rated, CP: MYR0.725)
KKB Engineering (KKB MK, Not Rated, CP: MYR1.42)
Perdana Petroleum (PETR MK, Not Rated, CP: MYR0.24)
Icon Offshore (ICON MK, Not Rated, CP: MYR0.13)
Hengyuan Refining (HYR MK, Not Rated, CP: MYR3.20)
Petron Malaysia (PETRONM MK, Not Rated, CP: MYR4.55)
Lotte Chemical Titan (TTNP, SELL, TP: MYR1.01, CP: MYR1.19)
Petronas Chemicals (PCHEM, HOLD, TP: MYR7.00, CP: MYR7.23)
Petronas Dagangan (PETD MK, Not Rated, CP: MYR22.68)

Stock	Bloomberg code	Mkt cap (USD'm)	Rating	Price (LC)	TP (LC)	Upside (%)	P/E (x) 23E	P/E (x) 24E	P/B (x) 23E	P/B (x) 24E	Div yld (%) 23E	Div yld (%) 24E
MISC	MISC MK	6,719	Hold	7.12	7.19	5	13.2	13.2	0.8	0.8	4.6	4.6
Dialog Group	DLG MK	2,566	Buy	2.15	2.43	15	23.0	22.0	2.1	2.0	1.7	1.6
Yinson Holdings	YNS MK	1,555	Buy	2.40	5.05	110	16.4	8.2	1.8	1.5	0.8	0.8
Bumi Armada	BAB MK	689	Buy	0.55	0.70	27	6.1	3.8	0.6	0.5	0.0	0.0
Hibiscus Petroleu	HIBI MK	477	Buy	1.12	1.90	70	3.9	4.5	0.6	0.6	2.9	0.0
Velesto Energy	VEB MK	452	Hold	0.26	0.24	(8)	30.2	15.1	0.9	0.9	0.0	0.0
Wasco	WSC MK	161	Buy	0.98	1.20	22	8.2	6.9	1.1	1.0	0.0	0.0

1. Investment Thesis

1.1 Maintain POSITIVE on the Oil and Gas Sector

The oil and gas sector is a cyclical one with recurring periods of boom and bust – as oil demand is relatively inelastic while oil supply is elastic. As we are now in a severely underinvested phase coupled with a record-high demand for oil in 2023-2024E, we view that the elevated oil price environment will be here to stay for the medium term. We maintain our POSITIVE view on the sector with in-house Brent ASP assumptions of USD85/80/bbl for 2023/2024E.

As at the point of writing, **we see a robust and an appealing outlook for OGSE players involved in: i) global FPSO; ii) regional ASEAN drilling rig; and iii) local OSV.** We see a severely tight supply in these sub-segments as there have been zero to minimal newbuilds considering high barriers to entry into these businesses and high capex involvements (should one decide to purchase/invest into newbuilds at current juncture).

Our top sector BUYs are Yinson, BArmada and Wasco.

- **Yinson.** We like Yinson for its strong track record, earnings growth prospects (3-year FY22-25E core net profit CAGR of 33%) and steadfast ESG initiatives. We expect a strong +77% growth in FY24E (FYE Jan) core net profit (1HFY24: +59% YoY), +9%/+5% in FY25/FY26E respectively driven by: i) the accelerated EPCIC billing for both FPSO Agogo and FPSO MQ (PDB); ii) commissioning of its Nokh project in Oct 2023 and we have assumed sail away and recognition of bareboat charter rates for both said FPSOs in mid-FY25E. Further re-rating catalysts include: i) more newbuild FPSO job wins; and ii) turnaround of its Renewable/GreenTech segments.

- **BArmada.** We think that BArmada is a "dark-horse" value-play within our coverage as the recent sell-off after the announcement of an unplanned shutdown of its heavyweight FPSO Armada Kraken in June 2023 looks pretty overdone. With the said FPSO now up and operational back to pre-shutdown levels, we think that BArmada will register sequential quarterly earnings growth in 2HFY23E and we expect record high profits for the group in FY24E (+58% YoY). We also applaud the group's discipline in its de-gearing exercise as it has successfully reduced its net gearing over 13 consecutive quarters to 0.7x as at end-2Q23 (from a peak of 2.9x in end-1Q20) with more to come.

- **Wasco.** We like Wasco for the following reasons: i) attractive valuations of about only 7x FY24E PER; ii) a robust global tender of c.4,100km of pipelines for carbon capture and storage projects planned for 2023-2027 with a total estimated value of >USD1b for pipe coating; iii) we expect FY23-24E to be strong profit bumper years (+50%/+19% YoY) with the recognition of the EACOP line pipe thermal insulation job win worth about MYR1.1b, and EPC of Agogo FPSO's topside modules for Yinson.

1.2 Stock valuations

Except for Dialog (please refer to separate note), we make no change to our earnings forecasts, TPs and recommendation for the OGSE stocks under our research coverage.

Figure 1: Malaysia Oil & Gas Sector peers comparison – valuation, rating and core earnings forecasts

	Rating	TP (MYR)	TP basis	CY22A CNP (MYR m)	CY23E CNP (MYR m)	CY24E CNP (MYR m)
MISC	HOLD	7.19	Sum of Parts (SOP)	2,374.3	2,414.9	2,409.8
Dialog Group	BUY	2.43	Sum of Parts (SOP)	506.1	530.7	565.5
Yinson Holdings	BUY	5.05	Sum of Parts (SOP)	442.8	852.1	966.0
Bumi Armada	BUY	0.70	Sum of Parts (SOP)	827.9	535.0	846.6
Hibiscus Petroleum	BUY	1.90	USD11/boe EV/2P reserves	391.6	474.3	517.8
Velesto Energy	HOLD	0.24	14x FY24E PER	(71.8)	70.7	141.0
Wasco	BUY	1.20	10x FY23E PER	61.7	92.3	109.7

CNP: Core net profit; source: Maybank IBG Research

1.3 The value chain, in a nutshell

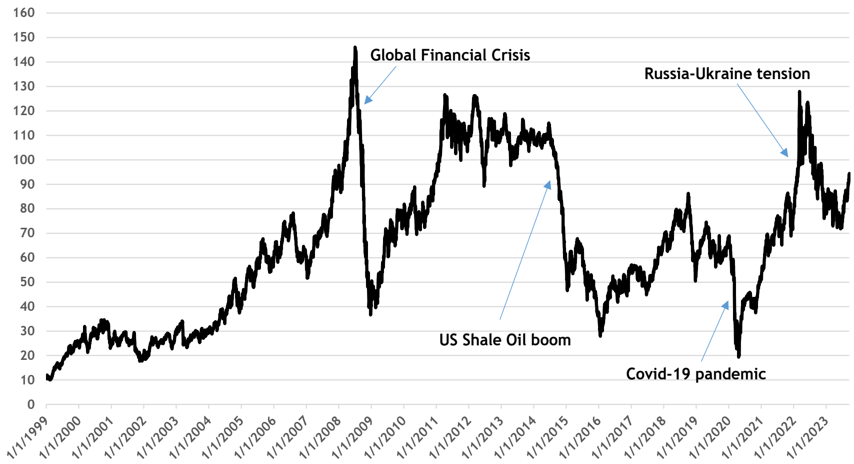
Figure 2: Malaysia Oil and Gas Sector Value Chain

Activities	Malaysian Listed Companies Involved
Upstream	
Drilling Rig	Velesto Energy, Sapura Energy
Hydraulic Workover Unit (HWU)	Velesto Energy, Uzma, T7 Global
Offshore Fabrication (WHP/CPP)	MMHE, Sapura Energy
FPSO	Bumi Armada, Yinson, MISC
MOPU	T7 Global
Offshore Support Vessel (OSV)	Perdana Petroleum, Dayang Enterprise, Icon Offshore, Petra Energy
Hook-up and Commissioning (HUC)	Carimin Petroleum, Dayang Enterprise, Petra Energy
Maintenance, Construction and Modification (MCM)	Carimin Petroleum, Dayang Enterprise, Petra Energy
Downstream Plant Turnaround	Dialog
Plugging and Abandonment	Velesto Energy, Uzma, T7 Global
Pipeline Services	Wasco
Midstream	
LNG Shipping / Petroleum Tankers	MISC
Tank Terminals	Dialog
Gas Pipelines	Petronas Gas
Downstream	
Refining	Heng Yuan, Petron Malaysia
Petrochemicals	Lotte Chemical Titan, Petronas Chemicals
Marketing and Distribution	Petronas Dagangan

Source: Maybank IBG Research

2. Industry Outlook

Figure 3: Oil Price Chart, 1995-current



Source: Bloomberg, Maybank IBG Research

2.1 A cyclical sector – always has been and always will be

The oil and gas sector is known for its cyclicality, which means that it experiences recurring periods of boom and bust. This can be driven by a number of factors:

1) **Global economic conditions:** There is a natural increase in demand for energy during periods of economic growth – which leads to higher oil and gas prices. On the flip side, the opposite will happen during economic downturns.

2) **Geopolitical events:** Conflicts/acts of war involving major oil-producing countries, or changes in government policies can have a significant impact on the sector. Supply disruptions due to geopolitical tensions can lead to significant energy price hikes.

3) **Investment cycles:** As oil and gas players require large and significant amounts of capex investments for exploration and production (E&P) activities, this can lead to periods of overinvestment or underinvestment – which can severely impact the industry.

4) **OPEC+ movements:** OPEC+ and its allies can severely influence oil prices and it has emerged as a "swing producer" by cutting production levels – which can cause oil price volatility.

2.2 Crude supply and demand gap forecasted to be narrow in the medium term

In the US Energy Information Administration's (EIA) latest Short-term Energy Outlook (STEO) report (Sep 2023), it expects a net crude oil deficit in 4Q23 with world consumption slightly eclipsing production by 0.2mbpd. EIA forecasts a back-to-back record-high crude oil consumption of 101.2mbpd and 102.9mbpd in 2023-2024E, with expectations that the supply/demand gap will be narrow at 0.2mbpd and 0.5mbpd for both forward years respectively.

Figure 4: Production and Consumption of Crude Oil Estimates for 2022-2024E

Production (mbpd)	2022				2023E				2024E				Year		
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	2022	2023E	2024E
Total OPEC	33.75	33.76	34.71	34.43	33.95	33.71	32.69	32.98	33.76	33.78	33.87	33.61	34.16	33.33	33.76
Total Non-OPEC	65.21	65.11	66.14	66.64	67.05	67.52	68.26	68.54	68.44	68.89	69.37	69.78	65.78	67.85	69.12
Total World Production	**98.96**	**98.87**	**100.85**	**101.07**	**101.00**	**101.23**	**100.95**	**101.52**	**102.20**	**102.67**	**103.24**	**103.39**	**99.94**	**101.18**	**102.88**
OPEC / World (%)	34%	34%	34%	34%	34%	33%	32%	32%	33%	33%	33%	33%	34%	33%	33%

Consumption (mbpd)	2022				2023E				2024E				Year		
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	2022	2023E	2024E
OECD	45.63	45.11	46.22	45.63	45.19	45.40	46.16	46.43	45.60	45.19	46.14	46.15	45.65	45.80	45.77
Non-OECD	52.83	53.49	53.86	53.86	54.63	55.35	55.37	55.33	56.21	56.72	56.67	56.63	53.51	55.17	56.56
Total World Consumption	**98.46**	**98.60**	**100.08**	**99.49**	**99.82**	**100.75**	**101.53**	**101.75**	**101.81**	**101.91**	**102.80**	**102.78**	**99.16**	**100.97**	**102.33**
Net surplus/(deficit)	0.50	0.27	0.77	1.58	1.18	0.48	-0.58	-0.23	0.39	0.76	0.44	0.61	0.78	0.21	0.55

Source: EIA

2.3 OPEC+ expected to prioritise balance in oil markets

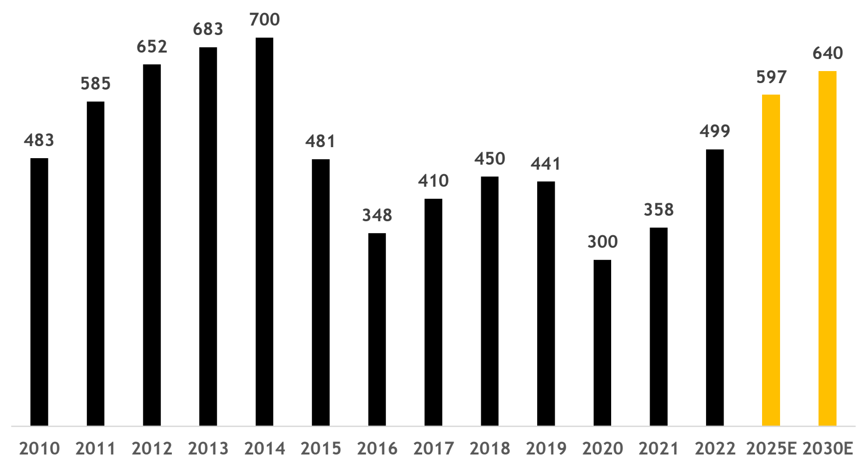
Over the past year, OPEC+ has been unambiguous in its intentions – which is to prioritise a balance in oil prices. The organisation and its allies remain a relevant "swing producer", having engaged in multiple rounds of production cuts as follows: (i) 2mbpd cut from Nov 2022; (ii) 1.66mbpd cut from May 2023; (iii) 1mbpd cut from Jul 2023; (iv) Russia cut exports by 0.5mbpd in Aug 2023; (v) Saudi Arabia extends 1mbpd cut till end-2023; and (vi) Russia extends its reduction in oil exports by 0.3mbpd in Sep 2023. Going forward, we expect further output cuts from OPEC+ if oil prices do not hold above USD75/bbl.

OPEC constituted a substantial c.35% of global oil production in 2022. With the organisation and its allies' efforts to continue curtailing production in 2024, we expect oil supply to remain tight for the foreseeable future. In the past, tight markets have been relieved by: (i) using excess production capacity; (ii) drawing on inventory; or (iii) increasing short-cycle output (U.S. shale). Over the past year, markets relied heavily on all three options but have yet to find sustainable breathing room that would ease the said supply concerns.

2.4 Global upstream investments need to be drastically ramped up to ensure adequate supply

According to International Energy Forum (IEF) and S&P Global Commodity Insights, annual upstream investment will need to increase to USD640b in 2030 (from USD499b in 2022 i.e. +28% or an 8-year CAGR of 3.2%) to stave off a global supply shortfall this decade. This translates to a whopping cumulative value of USD4.9t between 2023 and 2030 to meet future demand and offset declining production. We highlight that increased capex spending here reflects two notions: (i) increased costs in the sector due to inflationary pressures (by about 15-20% vs. the world economy's weighted inflation of about c.10%); and (ii) increased activity in the oil and gas industry. While it is no secret that the industry has achieved significant improvements in capital efficiency over the past decade (forced to operate in a suboptimal oil price environment), a high-cost environment also means that the sector will need even more investments than previously expected to ensure adequate supplies.

Figure 5: Projected Global Oil and Gas Upstream Capex Requirement (USD b)



Source: IEF, S&P Global Commodity Insights

2.5 Underinvestment in the global upstream space

Oil and gas companies globally (including PETRONAS) are facing pressure to reduce their emissions and invest more in lower carbon options such as renewables/hydrogen to meet the world's net-zero targets. This is making oil companies less willing to invest in new oil production, as there are huge concerns about the long-term future of oil demand, as newly producing oil fields could be stranded assets in the future. Quoting IEF, short-term demand and supply concerns have overshadowed long-term concerns recently and long-term demand uncertainty remains a key constraint on investment. What may be profitable in today's environment may no longer be tomorrow as investment decision-makers must also consider if demand will still be there over the lifetime of a specific project and the impact of both short-term and long-term government policy changes.

3. Energy Transition – where does fossil fuel stand?

In line with the global decarbonisation journey and reduction in greenhouse gas (GHG) emissions, we are already seeing a somewhat worldwide synchronised broad shift in investors' behaviours in phasing down fossil fuels in response to environmental, economic and geopolitical factors. Reasons for energy transition include:

1) **Climate Change:** Human activities have been the main driver of climate change – primarily due to the usage of fossil fuels like coal, oil and gas. Fossil fuel generates greenhouse gas emissions (mainly carbon dioxide), which ultimately leads to Earth's rising temperatures. The primary driver for energy transition is the need to reduce greenhouse gas emissions to mitigate climate change.

2) **Energy Security:** Reducing dependence on finite fossil fuel resources and volatile energy markets enhances energy security.

And with that, we are seeing fast-growing new trends such as: i) Renewable Energy (RE) – which includes solar, wind, hydro energy sources as they are sustainable and produce little to no GHG emissions during operation; and ii) Electrification – a massive boom in transportation such as promoting Electric Vehicles (EVs) and electrifying public transportation. Malaysia's National Energy Transition Roadmap (NETR), launched on 27 Jul 2023, aims to transform the country's energy mix towards RE, open up the hydrogen gateway, and put in place the framework for carbon capture, utilisation & storage (CCUS) in the country's 2050 net zero carbon commitment.

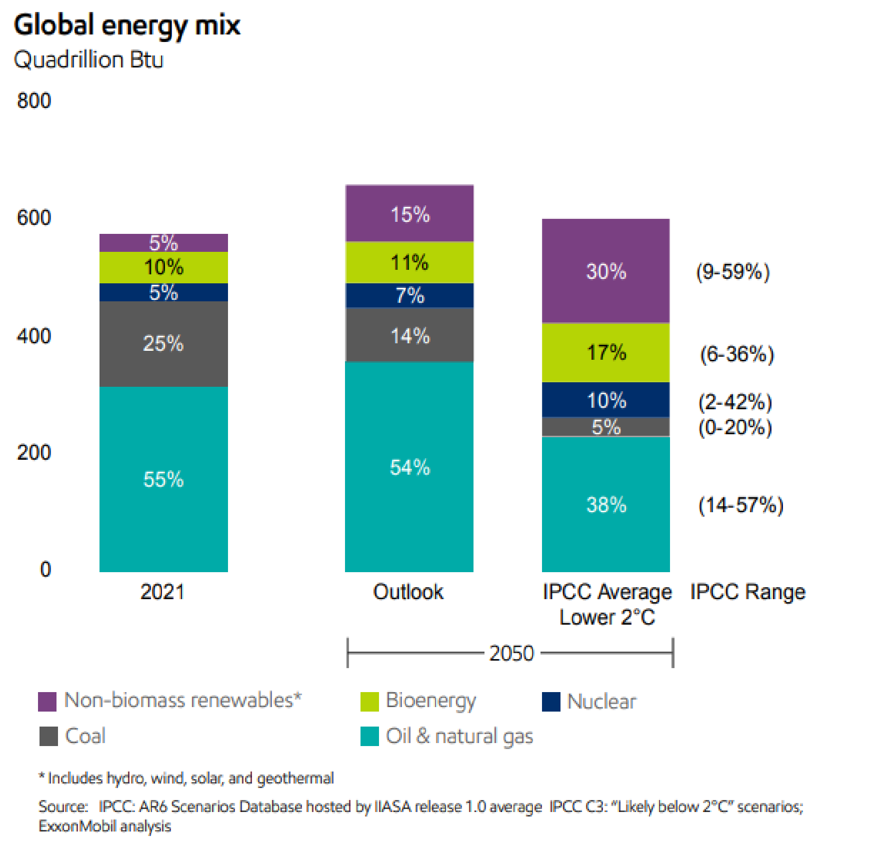
3.1 Energy Mix in 2050 – peak oil demand seen in 2032?

From ExxonMobil's Global Outlook report titled "Our View to 2050", oil and natural gas are expected to still make up for more than half of the world's energy supply – as the utility of oil and natural gas in meeting the world's needs remains unrivalled. Coal will increasingly be replaced by lower-emitting fuel sources (not just renewables but also natural gas – which has about half the carbon intensity of coal). In its base case scenario, ExxonMobil expects <u>oil and natural gas to still account for 54% of total global energy mix in 2050</u> (vs. 55% in 2021) and will continue to be very relevant and be the bulk of energy supply in the long term.

According to the report, oil use is expected to decline significantly in personal transportation but will remain essential for industrial processes and heavy-duty transport like shipping, long-haul trucking, and aviation that underpin economic growth. If every new passenger car sold in the world in 2035 were an electric vehicle, oil demand in 2050 would still be 85mbpd, the same as it was around 2010.

Natural gas usage is projected to increase by more than 20% by 2050 given its utility as a reliable and lower-emissions source of fuel for electricity generation, hydrogen production, and heating for both industrial processes and buildings.

Figure 6: Energy Mix Outlook (ExxonMobil Global Outlook)



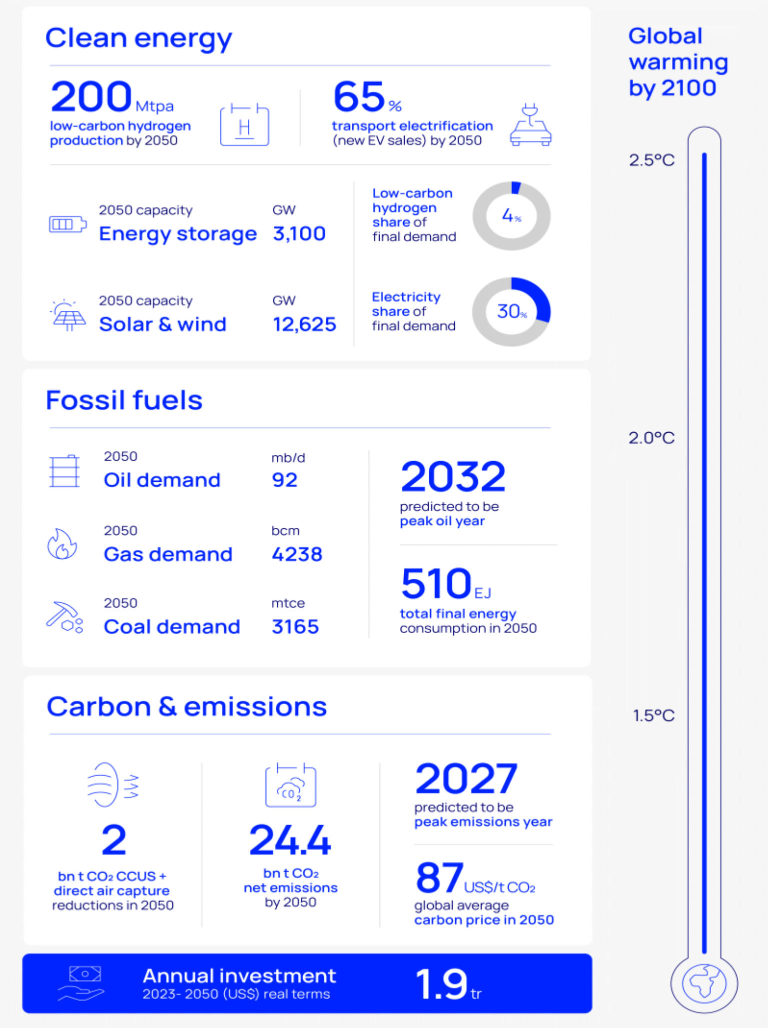
Source: ExxonMobil Global Outlook "Our View to 2050"

Meanwhile, Wood Mackenzie, via their latest "Energy Transition Outlook" report also has a similar long-term view, that fossil fuels will account for 53% of end-use energy demand in 2050 (from an estimated 69% in 2023) – triggered by greater end-use efficiency and electrification.

Wood Mackenzie also estimates that **peak oil demand will come in 2032 at 108mbpd and will fall to 90mbpd in 2050** – and this will be primarily driven by significant development in EVs and their infrastructures. It also views that electricity will become the largest energy market, overtaking oil and gas as a fast-response, low-cost and efficient energy source.

With that, we think that the usage of fossil fuels as a primary source of energy will still be here to stay for the long term – albeit more skewed away from coal and more towards the usage of natural gas. For Malaysia, natural gas will remain a transitionary fuel in balancing the practicalities of raising the country's RE capacity addition, under the NETR.

Figure 7: Energy Transition Outlook - Wood Mackenzie



Source: Wood Mackenzie

4. Industry Information

The Oil and Gas industry comprises three main segments: upstream, midstream and downstream.

4.1 Upstream

Typically consists of companies involved in the E&P (exploration and production) of oil and gas. This involves the search for reservoirs for natural crude oil or natural gas fields to recover oil and gas.

Malaysian listed companies that are involved in E&P include: (i) Hibiscus Petroleum; (ii) Dagang Nexchange (via 90%-owned Ping Petroleum); (iii) Dialog Group; (iv) Sapura Energy (via its 50%-JV entity SapuraOMV); (v) Petra Energy; (vi) Reach Energy.

We highlight that E&P companies do not usually own all of their own equipment. For example, they contract out the drilling of wells to other companies – and these companies typically bill E&P companies based on the length of time they spend working for them. We call these players the Oil and Gas Services and Equipment (OGSE) players. These OGSE players do not generate revenue that is tied directly to oil and gas production but will indirectly benefit from the capex/opex spending of the pure-play E&P companies.

We classify upstream into four different sub-segments:

(i) **Exploration:** Exploration activities are processes and methods used to locate potential oil and gas drilling and extraction sites via three methods: (a) geophysical surveys; (b) geological surveys; (c) geochemical surveys.

(ii) **Development:** Involves the process of preparing an oil and gas field for production. This involves building the necessary infrastructure, such as wells, pipelines, and processing facilities. The development process begins with the creation of a field development plan. The field development plan outlines the steps that will be taken to prepare the field for production. This includes the selection of well locations, the design of the production system, and the construction of the necessary infrastructure. This infrastructure may include pipelines, processing facilities, and storage facilities. The infrastructure must be designed to handle the volume and quality of oil and gas that is expected to be produced from the field.

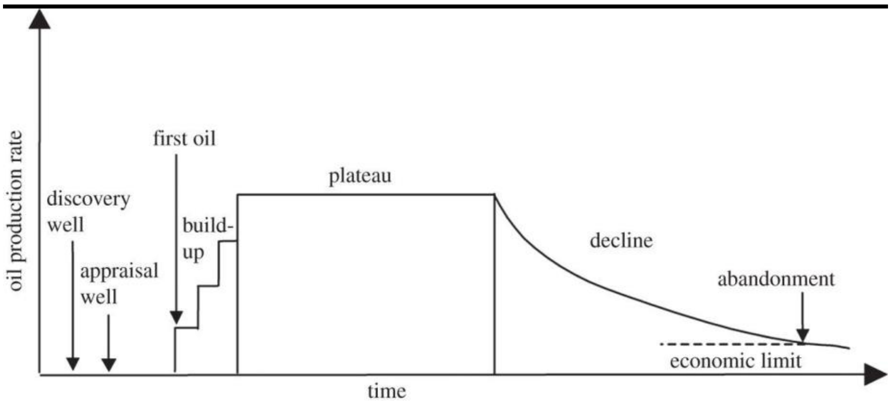
(iii) **Production:** The process of extracting oil and gas resources from the reservoir. As production begins, hydrocarbons extracted can now be sold commercially, making this the turning point for cash flow generation. However, we highlight that a typical hydrocarbon production profile can be broken down into three phases: (a) Build-up period – ramping up of production; (b) Plateau period – relatively stable production rate; and (c) Decline period – a natural decline in production rates due to shrinking reserves.

Figure 8: OGSE subsegments throughout different activity phases

	Exploration	Development	Production	Decommissioning
Drilling Rig	✓	✓	✓	✓
Hydraulic Workover Unit (HWU)			✓	✓
Offshore Fabrication (WHP/CPP)		✓		
FPSO			✓	
Offshore Support Vessel (OSV)	✓	✓	✓	✓
Hook-up and Commissioning (HUC)		✓		
Maintenance, Construction and Modification (MCM)			✓	
Downstream Plant Turnaround			✓	
Plugging and Abandonment				✓

Source: Maybank IBG Research

Figure 9: Typical Oil and Gas Production Curve



Source: Royal Society Publishing

(iv) Decommissioning: The process of shutting down and removing all infrastructure associated with an oil and gas field once it has reached the end of its productive life. This process is essential to protect the environment to prevent oil and gas spills, groundwater contamination, and surface subsidence. Wells are plugged and abandoned to prevent oil and gas from leaking into the environment. This involves filling the wellbore with cement and placing a cap on the top of the well. Infra and pipelines will also be dismantled and removed from the site.

4.2 Midstream

After pumping hydrocarbons out of the production wells, crude oil and natural gas will need to be transported or stored in a proper manner in ~~to~~ processing/storage facilities. Midstream companies typically own and operate the infrastructure that connects the oil and gas producers' fields/wells to refineries and consumers. The midstream sector uses very long-lasting assets and investors in this segment are usually focused on steady, recurring and predictable income – where growth is minimal and returns will mostly come from dividends.

4.3 Downstream

Hydrocarbons extracted during the upstream phase are filtered – involving processes like refining crude oil and purifying natural gas so that the final products will be useful to consumers and end users. This includes refineries turning crude oil into fuel, and also gas liquefaction facilities or the petrochemical industry producing plastic, fertilisers and other chemicals.

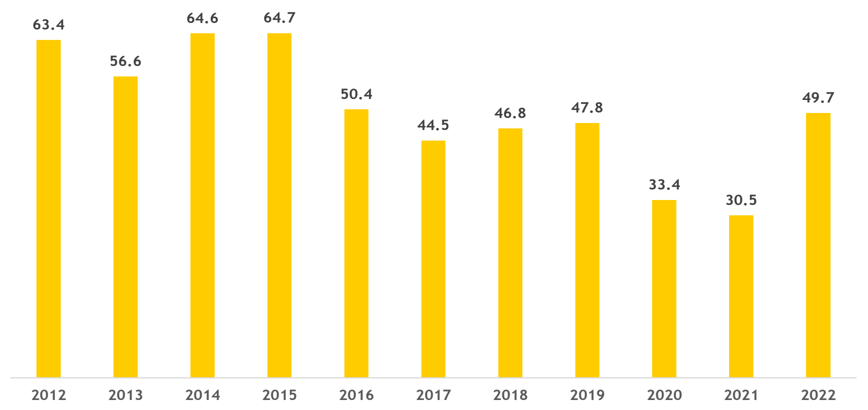
5. On home ground: PETRONAS

PETRONAS, the acronym for Petroliam Nasional Berhad is a Malaysian multinational integrated petroleum corporation – which is a wholly-owned subsidiary of the Malaysian government. The group is involved in almost all aspects of the oil and gas industry – from E&P, all the way to refining and marketing.

Most of the Malaysian listed OGSE players depend on PETRONAS as the latter ~~group~~ is usually the largest customer for them (besides multinationals like Shell, Conoco Philips, ExxonMobil and Murphy Oil). Annually, PETRONAS awards billions of dollars in contracts to Malaysian OGSE companies for a wide range of services – including exploration, drilling, maintenance, construction, decommissioning, etc.

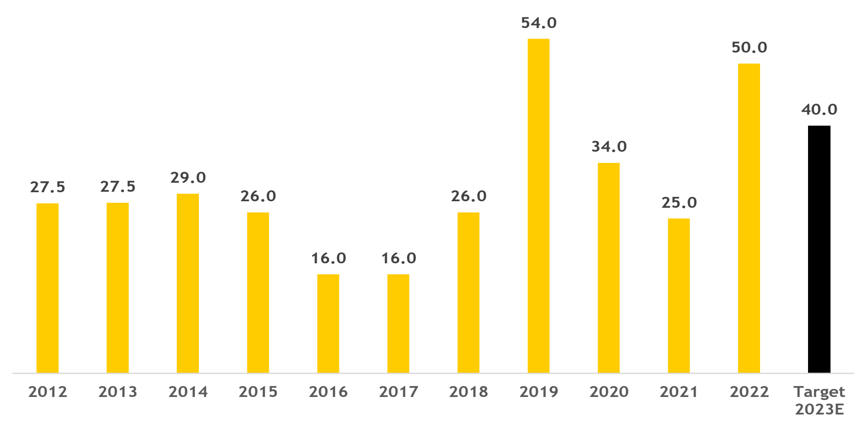
Annually, based on our observation, PETRONAS has to decide on how it would strike a balance between 3 major decisions: i) capex spending; ii) dividend commitment to the Malaysian government; and iii) balance sheet preservation. For 2023, PETRONAS has decided on a dividend commitment of MYR40b. As at end-Jun 2023, it sits on a net cash position of MYR106.8b – the highest level in over a decade. Outlook-wise, PETRONAS has a capex plan of MYR300b over the next 5 years (2023-2027) – which averages out to about MYR60b annually, a level not seen since 2015.

Figure 10: PETRONAS' Capex (2012-2022, MYR billion)



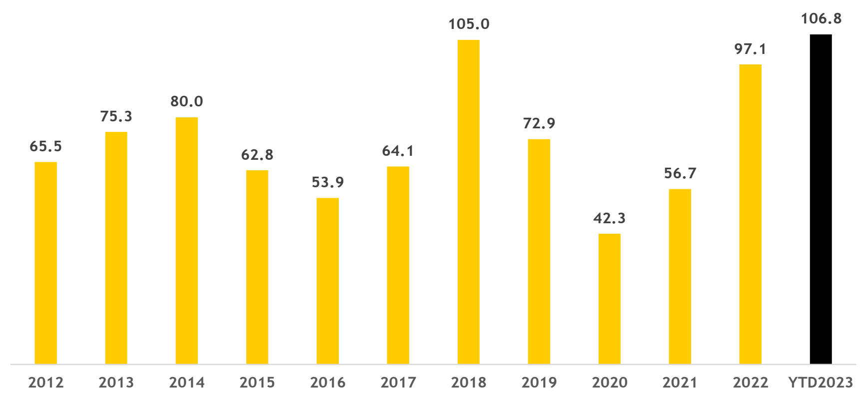
Source: PETRONAS

Figure 11: PETRONAS' Dividends (2012-2023E, MYR billion)



Source: PETRONAS

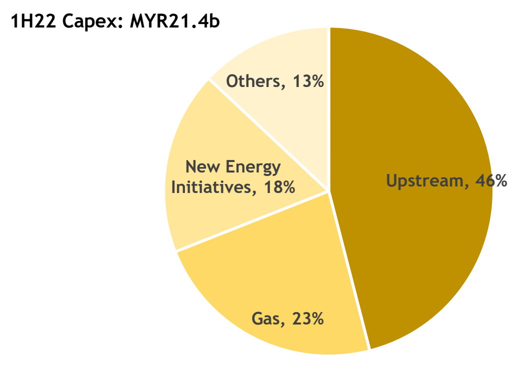
Figure 12: PETRONAS' Net Cash Position (2012-1H2023, MYR billion)



Source: PETRONAS

In 1H23, Petronas' capex was MYR21.4b (+13% YoY) with the following allocations:

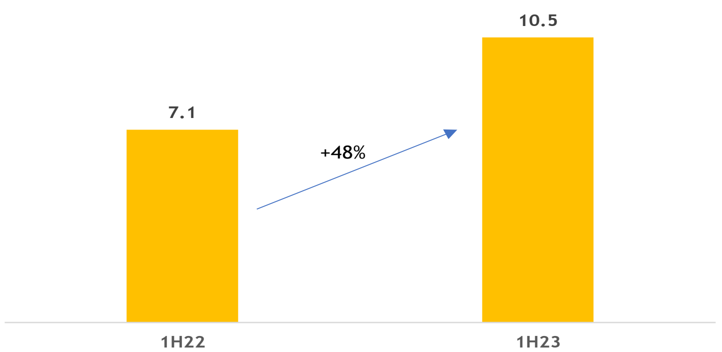
Figure 13: PETRONAS' 1H2023 Capex Breakdown



Source: PETRONAS

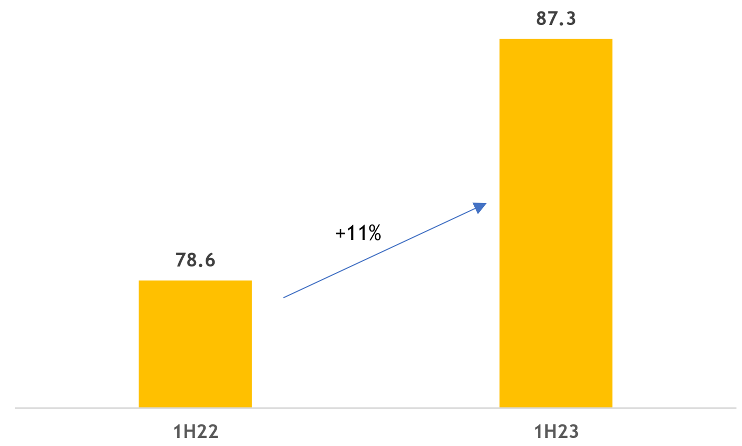
We highlight that the domestic portion of the group's capex rose by a whopping 48% YoY in 1H2023 but it was partially to account for an 11% increase in costs (predominantly due to higher production expenses, purchased services and exploration costs) due to inflationary pressures.

Figure 14: PETRONAS' 1H2023 Domestic Capex (MYR billion)



Source: PETRONAS

Figure 15: PETRONAS' 1H2023 Domestic Group Costs (MYR billion)



Source: PETRONAS

6. Upstream OGSE Subsegments and Outlook

Annually, PETRONAS publishes a document – known as the Petronas Activity Outlook report, which provides insights on industry trends, demand outlook and forecasted activities/capex allocation for the next three years for each subsegment. We will break down the activity of each subsegment and the outlook as per the latest published document (6th Edition – Petronas Activity Outlook 2023-2025).

6.1 Drilling rigs

A drilling rig is a complex equipment used to drill holes for the purpose of extracting oil and gas. Drilling rigs come in a variety of sizes and types. The type of drilling rig that is used depends on: (i) the depth of the well; (ii) the type of rock that is being drilled through; and (iii) the location of the well.

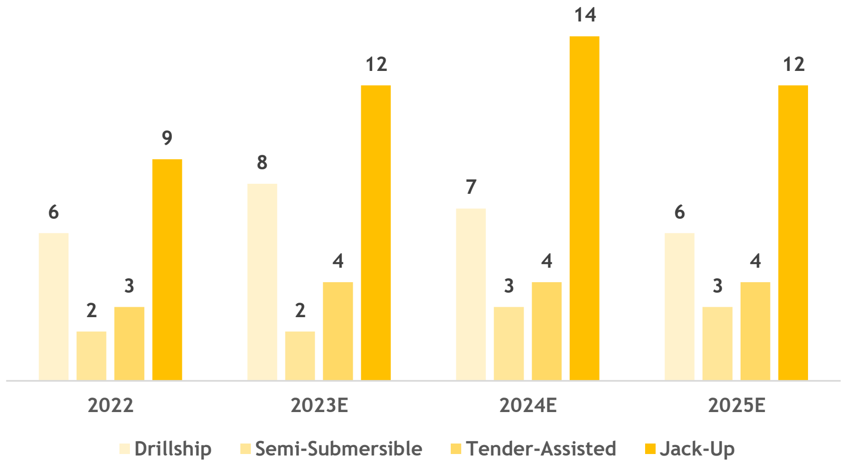
Figure 16: Types of Drilling Rigs

	Jack-Up	Tender-Assisted	Semi-Submersible	Drillship
Activity Phase	- Exploration - Development - Abandonment	- Development - Production - Abandonment	- Exploration	- Exploration
Application	The most common type of offshore rig due to its flexibility. Typically used for drilling in shallow waters.	More common in shallow waters. Allows drilling from smaller platforms.	The most stable type of rig, typically used for drilling in deepwater and/or harsh environments.	Typically used for drilling in deepwater/ultra deepwater. Can also be used for well maintenance, completion and capping works.
Water Depth	Up to 500 feet	Up to 6,000 feet	Up to 10,000 feet	Up to 12,000 feet

Source: Velesto Energy, Sapura Energy

PETRONAS expects a total requirement of 26 and 28 drilling rigs in 2023-2024E, which is a 30%/8% YoY increase with the following breakdowns (for 2023): (i) 8 drillships; (ii) 2 semi-submersibles; (iii) 4 tender-assisted; and (iv) 12 jack-up rigs. Malaysian listed players involved in this segment are Velesto Energy (VEB MK) and Sapura Energy (SAPE MK).

Figure 17: Petronas Activity Outlook 2023-2025 - Drilling Rigs

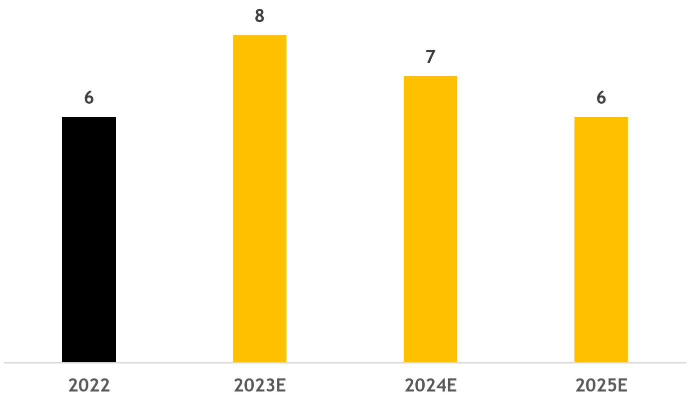


Source: PETRONAS

6.2 Hydraulic Workover Unit (HWU)

A HWU is an equipment used for the maintenance, repair and intervention, and plugging and abandonment operations on oil and gas wells. HWU is a cost-effective solution for well maintenance as they allow E&P players to extend the life of existing wells and optimise production without the need for expensive drilling rigs.

Figure 18: Petronas Activity Outlook 2023-2025 - HWUs



Source: PETRONAS

PETRONAS expects a total requirement of 8 and 7 HWUs in 2023-2024E, which is a +33%/-13% YoY change. Malaysian listed players involved in this segment are Velesto Energy (VEB MK), Uzma (UZMA MK) and T7 Global (T7G MK).

6.3 Offshore fabrication – fixed structures

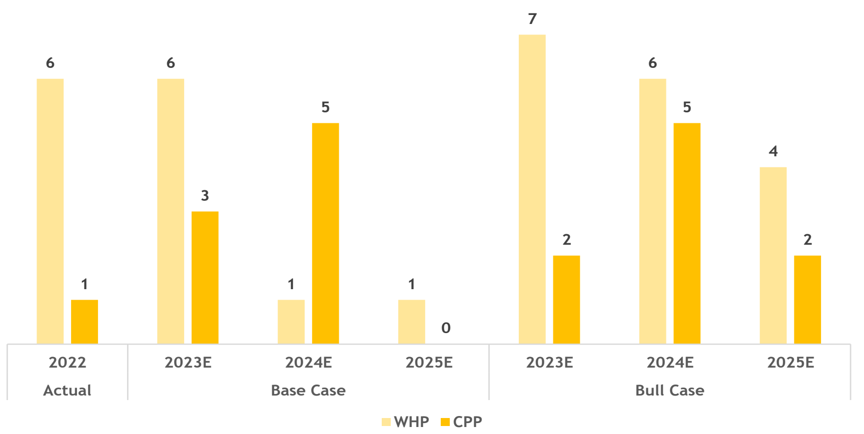
Offshore fixed structures in oil and gas are man-made platforms that are anchored to the seabed and are typically used in shallow waters (less than 500 meters). They can withstand harsh weather conditions and are designed to last for many years and can support a wide range of equipment and activities.

Wellhead Platform (WHP) and Central Processing Platform (CPP) are platforms that are located on fixed structures.

WHP: Used to house wellheads and equipment that extract oil and gas from the seabed and serve as a platform for drilling activities. It is typically linked to other fixed/floating structures for oil and gas processing.

CPP: Used to house wellheads and equipment that extracts and processes oil and gas from WHPs and piped to the point of export. CPP typically acts as the central hub for the entire field complex.

Figure 19: Petronas Activity Outlook 2023-2025 – WHP/CPP



Source: PETRONAS

Notable players involved in the fabrication space are MMHE (MMHE MK) and Sapura Energy (SAPE MK). Other PETRONAS-licensed fabricators such as Muhibbah Engineering (MUHI MK) and Sarawak-based KKB Engineering (KKB MK) are also beneficiaries of PETRONAS' fixed structures play.

6.4 Offshore Support Vessels (OSVs)

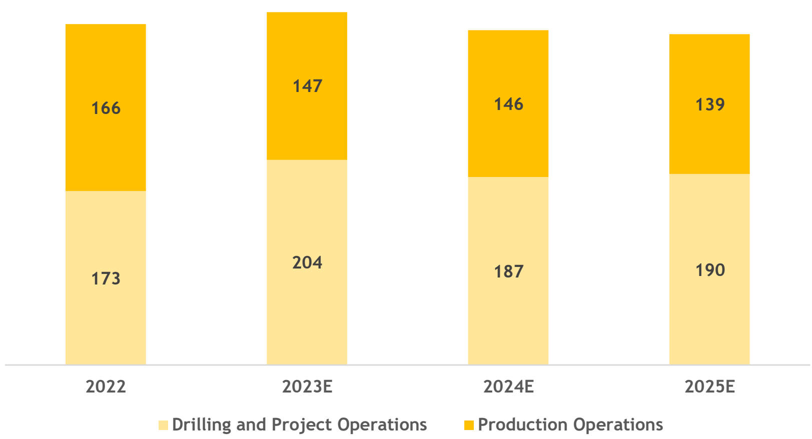
OSVs are vessels that are used to provide support to offshore oil and gas operations. There are many different types of OSVs, each of which is designed to perform a specific task, as shown below:

Figure 20: Types of OSVs and respective designated use

Type of OSV	Activity Phase	Application
Anchor Handling Tug Supply (AHTS)	- Exploration - Development	Used to assist in anchor handling operations, towing and transport supplies to and from offshore platforms/drilling rigs.
Platform Supply Vessel (PSV)/Straight Supply Vessel (SSV)	- Production - Abandonment	Transport equipment and supplies to offshore platforms/drilling rigs.
Fast Crew Boat (FCB)	- Development - Production - Abandonment	High speed vessel for the transportation of crew to offshore facilities and inter rigs.
Workboat/Work Barge	- Development - Production - Abandonment	Accomodation for personnels/workers.
General Purpose Vessel (GPV)/Standby Vessel (SBV)	- Development	Standby, support, rescue and emergency duties.
Utility Vessel (UV)	- Production	Standby, support, rescue and emergency duties.
Landing Craft Tank (LCT)	- Production	Transport equipment and supplies to offshore platforms/drilling rigs.

Source: PETRONAS

Figure 21: Petronas Activity Outlook 2023-2025 - OSVs



Source: PETRONAS

PETRONAS expects a total requirement of 351 (204 for drilling/project ops + 147 for production ops) and 333 (187 for drilling/project ops + 146 for production ops) OSVs in 2023-2024E, which is relatively stable against 340 in 2022. Malaysian listed players involved in this segment are Perdana Petroleum (PETR MK), Dayang Enterprise (DEHB MK), Icon Offshore (ICON MK) and Petra Energy (PENB MK).

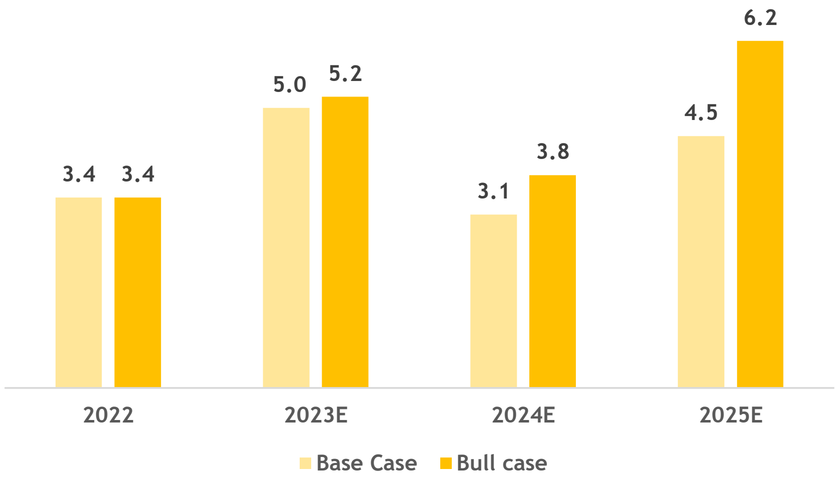
6.5 Hook-up and Commissioning (HUC)

Hook-up and Commissioning (HUC) is the process of connecting and testing all of the systems and equipment on an oil and gas facility. This is to ensure that they are ready to operate safely and efficiently. Note that it is a labour-intensive process.

Hook-up: Physically connecting all of the systems and equipment on the facility – such as pipelines, pumps, compressors and valves.

Testing and Commissioning: All systems and equipment are tested and then commissioned.

Figure 22: Petronas Activity Outlook 2023-2025 - HUC (Man-Hours in million)



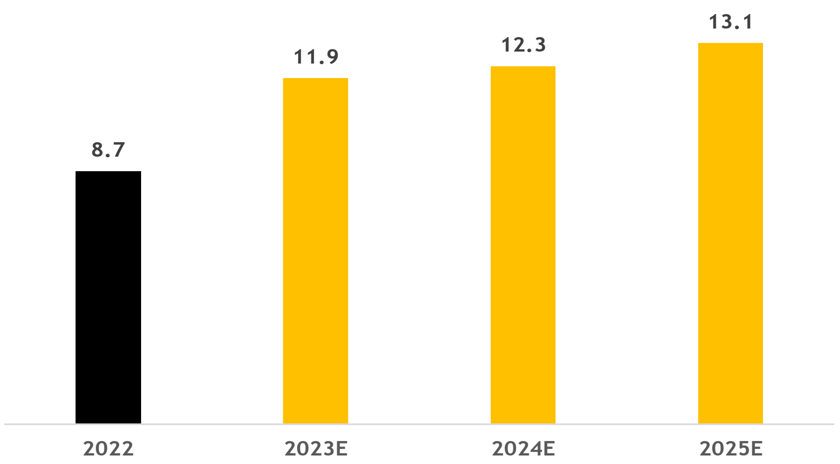
Source: PETRONAS

Notable local listed players in the HUC subsegment are Dayang Enterprise (DEHB MK), Petra Energy (PENB MK), Sapura Energy (SAPE MK) and Carimin Petroleum (CARIP MK).

6.6 Offshore Maintenance, Construction and Modification (MCM)

Offshore MCM involves the upkeep, expansion and modification of offshore oil and gas facilities such as existing offshore platforms, rigs and other infrastructures/equipment.

Figure 23: Petronas Activity Outlook 2023-2025 - MCM (Man-Hours in million)



Source: PETRONAS

Notable local listed players in the MCM subsegment are Dayang (DEHB MK), Petra Energy (PENB MK) and Carimin Petroleum (CARIP MK) - largely similar to HUC players.

6.7 Floating structures: FPSO, FSO, MOPU

Floating structures are non-fixed structures involved in processing and/or storage of hydrocarbons. They are usually used as relocatable production facilities, generally to enable monetisation of marginal or isolated oil and gas fields without existing export facilities (pipeline) in the vicinity.

Floating Production, Storage and Offloading (FPSO): Vessel used for the processing of hydrocarbons and oil storage facility before being offloaded onto a tanker for transportation to shore.

Floating Storage and Offloading (FSO): A simplified FPSO without the processing capability for oil and/or gas.

Mobile Offshore Production Unit (MOPU): Portable structure in offshore well production, referring to portable wellhead platform, self-elevating production (including water injection) facilities.

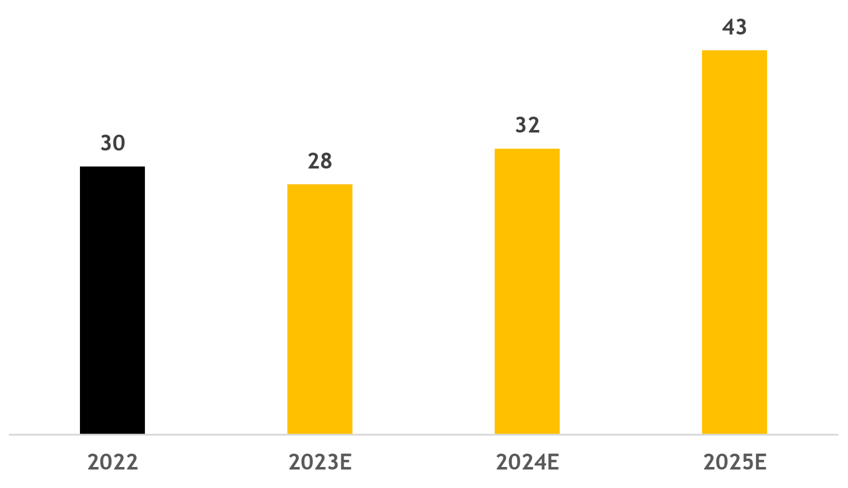
Notable local listed players in this subsegment are Bumi Armada (BAB MK), Yinson (YNS MK) and T7 Global (T7G MK)

6.8 Decommissioning

Decommissioning refers to activities to restore previously producing sites to safe and environmentally stable conditions.

Well Plugging and Abandonment: Permanently isolate the wellbore from surface/seabed and removal of associated completion/accessories. This involves sealing the wellbore with cement or other materials to prevent the release of hydrocarbons and the migration of fluids between geological formations. Proper plugging is essential to prevent groundwater contamination and the escape of hydrocarbons. Malaysian listed players involved in this segment are Velesto Energy (VEB MK), Uzma (UZMA MK) and T7 Global (T7G MK).

Figure 24: Petronas Activity Outlook 2023-2025 – Well Decommissioning



Source: PETRONAS

7. Midstream Space

7.1 Liquefied Natural Gas (LNG) Shipping

LNG is natural gas that has been converted to liquid form for the ease and safety of natural gas transport. After the extraction of natural gas, there are mainly two methods of transportation of said natural gas: 1) pipelines; and 2) LNG shipping.

In its liquid state, natural gas takes up about 1/600th of the space – which means that natural gas is shrunk 600x, making it easier to ship and store when pipeline transportation is not feasible.

7.2 Petroleum Tankers

Petroleum tankers are specialised ships designed for the bulk transportation of liquid petroleum – be it crude oil or refined petroleum products. These petroleum tankers facilitate the movement of said products from their point of extraction to production facilities, refineries and distribution centres to various markets and consumers around the world. Based on MISC's latest annual report 2022, we understand that the group has about 60 petroleum tankers in its fleet with about 70-80% of them being long-term charters.

7.3 Gas Pipelines

Midstream gas pipelines are used to transport natural gas from production sites to processing facilities, storage facilities and various consumption points. For example – the Nord Stream which runs along the Baltic Sea floor.

7.4 Tank Terminals

Tank terminals are industrial facilities designed for the storage, handling, and distribution of various petroleum products - including crude oil, refined products, and chemicals are stored and handled. These terminals play a crucial role in the supply chain, serving as intermediate storage points between production and distribution to end-users. Dialog has tank terminals in Kertih, Tanjung Langsat and Pengerang.

Figure 25: Dialog's Tank Terminals

Source: Dialog

8. Downstream

Includes activities such as processing, refining, distribution and marketing of petroleum products derived from crude oil and natural gas.

Refining: The process of processing crude oil to separate it into various fractions – such as gasoline, diesel, jet fuel etc. Refining also remove impurities. Listed refiners include Heng Yuan (HYR MK) and Petron Malaysia (PETRONM MK).

Petrochemical: Chemical compounds derived from crude oil and natural gas. Petrochemical products are used in a wide range of products include plastics, chemicals and synthetic materials. Lotte Chemical Titan (TTNP MK) and Petronas Chemicals (PCHEM MK) are players in this segment.

Marketing and distribution: Downstream oil and gas companies distribute their products to end-consumers and businesses including retail petrol stations, supplying fuel to airports etc. Petronas Dagangan (PETD MK) has about 1.1k petrol stations throughout the country.

Research Offices

ECONOMICS

Suhaimi ILIAS
Chief Economist
Malaysia | Philippines | Global
(603) 2297 8682
suhaimi_ilias@maybank-ib.com

CHUA Hak Bin
Regional Thematic Macroeconomist
(65) 6231 5830
chuahb@maybank.com

Dr Zamros DZULKAFLI
Malaysia | Philippines
(603) 2082 6818
zamros.d@maybank-ib.com

Erica TAY
China | Thailand
(65) 6231 5844
erica.tay@maybank.com

Brian LEE Shun Rong
Indonesia | Singapore | Vietnam
(65) 6231 5846
brian.lee1@maybank.com

Fatin Nabila MOHD ZAINI
(603) 2297 8685
fatinnabila.mohdzaini@maybank-ib.com

Luong Thu Huong
(65) 6231 8467
hana.thuhuong@maybank.com

FX

Saktiandi SUPAAT
Head of FX Research
(65) 6320 1379
saktiandi@maybank.com

Fiona LIM
(65) 6320 1374
fionalim@maybank.com

Alan LAU
(65) 6320 1378
alanlau@maybank.com

Shaun LIM
(65) 6320 1371
shaunlim@maybank.com

STRATEGY

Anand PATHMAKANTHAN
ASEAN
(603) 2297 8783
anand.pathmakanthan@maybank-ib.com

FIXED INCOME

Winson PHOON, FCA
Head of Fixed Income
(65) 6340 1079
winsonphoon@maybank.com

SE THO Mun Yi, CFA
(603) 2074 7606
munyi.st@maybank-ib.com

PORTFOLIO STRATEGY

ONG Seng Yeow
(65) 6231 5839
ongsengyeow@maybank.com

MIBG SUSTAINABILITY RESEARCH

Jigar SHAH
Head of Sustainability Research
(91) 22 4223 2632
jigars@maybank.com

Neerav DALAL
(91) 22 4223 2606
neerav@maybank.com

REGIONAL EQUITIES

Anand PATHMAKANTHAN
Head of Regional Equity Research
(603) 2297 8783
anand.pathmakanthan@maybank-ib.com

WONG Chew Hann, CA
Head of ASEAN Equity Research
(603) 2297 8686
wchewh@maybank-ib.com

MALAYSIA

Anand PATHMAKANTHAN *Head of Research*
(603) 2297 8783
anand.pathmakanthan@maybank-ib.com
• Strategy

WONG Chew Hann, CA
(603) 2297 8686
wchewh@maybank-ib.com
• Equity Strategy
• Non-Bank Financials (stock exchange)
• Construction & Infrastructure

Desmond CH'NG, BFP, FCA
(603) 2297 8680
desmond.chng@maybank-ib.com
• Banking & Finance

ONG Chee Ting, CA
(603) 2297 8678
ct.ong@maybank-ib.com
• Plantations - Regional

YIN Shao Yang, CPA
(603) 2297 8916
samuel.y@maybank-ib.com
• Gaming – Regional
• Media • Aviation • Non-Bank Financials

TAN Chi Wei, CFA
(603) 2297 8690
chiwei.t@maybank-ib.com
• Power • Telcos

WONG Wei Sum, CFA
(603) 2297 8679
weisum@maybank-ib.com
• Property • Glove

Jade TAM
(603) 2297 8687
jade.tam@maybank-ib.com
• Consumer Staples & Discretionary

Nur Farah SYIFAA
(603) 2297 8675
nurfarahsyifaa.mohamadfuad@maybank-ib.com
• Renewable Energy • REITs

LOH Yan Jin
(603) 2297 8687
lohyanjin.loh@maybank-ib.com
• Ports • Automotive • Technology (EMS)

Arvind JAYARATNAM
(603) 2297 8692
arvind.jayaratnam@maybank.com
• Technology (Semicon & Software)

Jeremie YAP
(603) 2297 8688
jeremie.yap@maybank-ib.com
• Oil & Gas • Petrochemicals

TEE Sze Chiah *Head of Retail Research*
(603) 2082 6858
szechiah.t@maybank-ib.com
• Retail Research

Nik Ihsan RAJA ABDULLAH, MSTA, CFTe
(603) 2297 8694
nikmohdihsan.ra@maybank-ib.com
• Chartist

Amirah AZMI
(603) 2082 8769
amirah.azmi@maybank-ib.com
• Retail Research

SINGAPORE

Thilan WICKRAMASINGHE *Head of Research*
(65) 6231 5840
thilanw@maybank.com
• Banking & Finance - Regional
• Consumer

Eric ONG
(65) 6231 5849
ericong@maybank.com
• Healthcare • Transport • SMIDs

Kelvin TAN
(65) 6231 5837
kelvin.tan1@maybank.com
• Telcos • Industrials

LI Jialin
(65) 6231 5845
jialin.li@maybank.com
• REITs

Jarick SEET
(65) 6231 5848
jarick.seet@maybank.com
• Technology

Krishna GUHA
(65) 6231 5842
krishna.guha@maybank.com
• REITs

PHILIPPINES

Jacqui de JESUS *Head of Research*
(63) 2 8849 8840
jacqui.dejesus@maybank.com
• Strategy • Conglomerates

Rachelleen RODRIGUEZ, CFA
(63) 2 8849 8843
rachelleen.rodriguez@maybank.com
• Banking & Finance • Transport • Telcos
• Utilities

Daphne SZE
(63) 2 8849 8847
daphne.sze@maybank.com
• Consumer

Alexa Mae CARVAJAL
(63) 2 8849 8838
alexamae.carvajal@maybank.com
• Consumer • Gaming • Property • REITs

THAILAND

Chak REUNGSINPINYA *Head of Research*
(66) 2658 5000 ext 1399
chak.reungsinpinya@maybank.com
• Strategy • Energy

Jesada TECHAHUSDIN, CFA
(66) 2658 5000 ext 1395
jesada.t@maybank.com
• Banking & Finance

Wasu MATTANAPOTCHANART
(66) 2658 5000 ext 1392
wasu.m@maybank.com
• Telcos • Technology • REITs
• Consumer Discretionary

Surachai PRAMUALCHAROENKIT
(66) 2658 5000 ext 1470
surachai.p@maybank.com
• Auto • Conmat • Contractor • Steel

Suttatip PEERASUB
(66) 2658 5000 ext 1430
suttatip.p@maybank.com
• Food & Beverage • Commerce

Natchaphon RODJANAROWAN
(66) 2658 5000 ext 1393
natchaphon.rodjanarowan@maybank.com
• Utilities

INDONESIA

Jeffrosenberg CHENLIM *Head of Research*
(62) 21 8066 8680
jeffrosenberg.lim@maybank.com
• Strategy • Banking & Finance • Property

Willy GOUTAMA
(62) 21 8066 8500
willy.goutama@maybank.com
• Consumer

Etta Rusdiana PUTRA
(62) 21 8066 8683
etta.putra@maybank.com
• Telcos • Internet • Construction

William Jefferson W
(62) 21 8066 8563
william.jefferson@maybank.com
• Property

Adi WICAKSONO
(62) 21 8066 8686
adi.wicaksono@maybank.com
• Plantations

Satriawan HARYONO, CEWA, CTA
(62) 21 8066 8682
satriawan@maybank.com
• Chartist

VIETNAM

Quan Trong Thanh *Head of Research*
(84 28) 44 555 888 ext 8184
thanh.quan@maybank.com
• Strategy • Banks

Hoang Huy, CFA
(84 28) 44 555 888 ext 8181
hoanghuy@maybank.com
• Strategy • Technology

Le Nguyen Nhat Chuyen
(84 28) 44 555 888 ext 8082
chuyen.le@maybank.com
• Oil & Gas • Logistics

Nguyen Thi Sony Tra Mi
(84 28) 44 555 888 ext 8084
trami.nguyen@maybank.com
• Consumer Discretionary

Tran Thi Thanh Nhan
(84 28) 44 555 888 ext 8088
nhan.tran@maybank.com
• Consumer Staples

Nguyen Le Tuan Loi
(84 28) 44 555 888 ext 8182
loi.nguyen@maybank.com
• Property

Nguyen Thanh Hai
(84 28) 44 555 888 ext 8081
thanhhai.nguyen@maybank.com
• Industrials

Nguyen Thanh Lam
(84 28) 44 555 888 ext 8086
thanhlam.nguyen@maybank.com
• Retail Research

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Malaysia

Maybank Investment Bank Berhad
(A Participating Organisation of
Bursa Malaysia Securities Berhad)
33rd Floor, Menara Maybank,
100 Jalan Tun Perak,
50050 Kuala Lumpur
Tel: (603) 2059 1888;
Fax: (603) 2078 4194

Stockbroking Business:
Level 8, Tower C, Dataran Maybank,
No.1, Jalan Maarof
59000 Kuala Lumpur
Tel: (603) 2297 8888
Fax: (603) 2282 5136

Singapore

Maybank Securities Pte Ltd
Maybank Research Pte Ltd
50 North Canal Road
Singapore 059304

Tel: (65) 6336 9090

London

Maybank Securities (London) Ltd
PNB House
77 Queen Victoria Street
London EC4V 4AY, UK

Tel: (44) 20 7332 0221
Fax: (44) 20 7332 0302

Hong Kong

MIB Securities (Hong Kong) Limited
28/F, Lee Garden Three,
1 Sunning Road, Causeway Bay,
Hong Kong

Tel: (852) 2268 0800
Fax: (852) 2877 0104

Indonesia

PT Maybank Sekuritas Indonesia
Sentral Senayan III, 22nd Floor
Jl. Asia Afrika No. 8
Gelora Bung Karno, Senayan
Jakarta 10270, Indonesia

Tel: (62) 21 2557 1188
Fax: (62) 21 2557 1189

India

MIB Securities India Pte Ltd
1101, 11th floor, A Wing, Kanakia
Wall Street, Chakala, Andheri -
Kurla Road, Andheri East,
Mumbai City - 400 093, India

Tel: (91) 22 6623 2600
Fax: (91) 22 6623 2604

Philippines

Maybank Securities Inc
17/F, Tower One & Exchange
Plaza
Ayala Triangle, Ayala Avenue
Makati City, Philippines 1200

Tel: (63) 2 8849 8888
Fax: (63) 2 8848 5738

Thailand

Maybank Securities (Thailand) PCL
999/9 The Offices at Central World,
20th - 21st Floor,
Rama 1 Road Pathumwan,
Bangkok 10330, Thailand

Tel: (66) 2 658 6817 (sales)
Tel: (66) 2 658 6801 (research)

Vietnam

Maybank Securities Limited
Floor 10, Pearl 5 Tower,
5 Le Quy Don Street,
Vo Thi Sau Ward, District 3
Ho Chi Minh City, Vietnam

Tel : (84) 28 44 555 888
Fax : (84) 28 38 271 030

Sales Trading

Indonesia

Helen Widjaja
helen.widjaja@maybank.com
(62) 21 2557 1188

London

Greg Smith
gsmith@maybank.com
Tel: (44) 207-332-0221

Philippines

Keith Roy
keith_roy@maybank.com
Tel: (63) 2 848-5288

India

Sanjay Makhija
sanjaymakhija@maybank.com
Tel: (91)-22-6623-2629

www.maybank.com/investment-banking
www.maybank-keresearch.com