SECTOR STUDY | 1 JANUARY 2026

Together. Creating Value.

Exploration & Production

Research Team

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Oil Exploration & Production

Introduction

Oil Exploration & Production

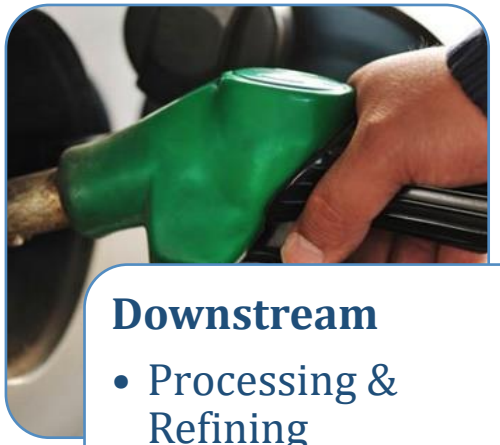
Oil Value Chain

Upstream

- Exploration
- Field Development
- Production Operations

Midstream

- Transportation
- Storage & Distribution



Downstream

- Processing & Refining
- Wholesale & Marketing
- Storage & Distribution

- The oil value chain is divided into three segments, i.e., the **Upstream**, **Midstream,** and **Downstream** segments.
- The upstream segment encompasses the Exploration and Production (E&P) of oil.
- The midstream segment includes the transportation and storage of crude oil and natural gas from production sites to processing plants and refineries through pipelines, tankers, rail, and trucks.
- The downstream segment comprises the processing and refining of hydrocarbons, as well as the storage, distribution, wholesale, and marketing of refined POL products.

Source: EIA, OPEC

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Value Chain

Crude oil is a mixture of hydrocarbons in the liquid phase in natural underground reservoirs and remains liquid at atmospheric pressure after passing through surface separating facilities.

Crude oil is extracted and transported across the globe to be converted into oil derivatives. Exploration, extraction and production of crude oil takes in the upstream.

Refineries break crude oil down into its various components, which are then selectively reconfigured into new products. All refineries have three basic steps: Separation, Conversion, and Treatment.

POL products include MOGAS, distillates such as HSD fuel and heating oil, jet fuel, petrochemical feed stocks, waxes, lubricating oils, and asphalt. They are marketed, distributed and retailed at downstream sector through oil marketing companies and dealers.

Source: EIA

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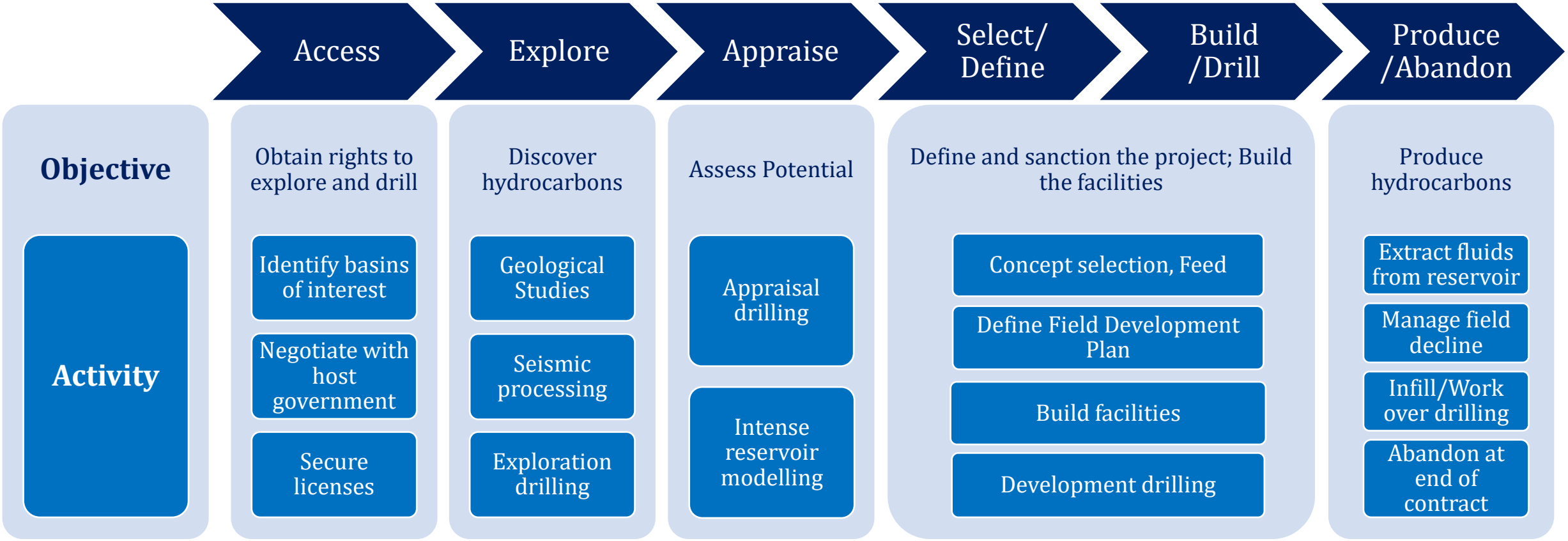
E&P Value Chain

- The upstream segment, also referred to as “Exploration and Production”, is concerned with discovering oil reserves, developing facilities to extract oil, and producing commercial quantities of oil from those sites. It is the highest-risk segment of the oil value chain, primarily due to significant geological and commercial uncertainty and the need for substantial upfront capital investment.



Source: BCG

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Oil well categories (E&P asset types)

- Globally, oil production is distributed between onshore (roughly two-thirds) and offshore (one-third) developments. From a resource perspective, unconventional sources like shale and tight oil account for about one-quarter of total output, while the vast majority (the remaining three-quarters) continues to come from conventional assets.

- Globally, oil recovery factors range from about 15% to 50% of original oil in place, depending on reservoir characteristics and recovery methods.

Conventional onshore

Hydrocarbons that have migrated from source rock, trapped by a seal

a) Project life: 18-40 years

b) Development cost/well: USD ~6-7 Mn

Unconventional onshore

Hydrocarbons in an impermeable layer, unable to migrate

a) Project life: 5-12 years

b) Development cost/well: USD ~8-12 Mn

Offshore

Hydrocarbons located under the seafloor

a) Project life: Up to 30 years

b) Development Cost/well
i) Shallow water: USD ~30-50 Mn
ii) Deepwater: USD ~100-150 Mn

Source: BCG, EIA

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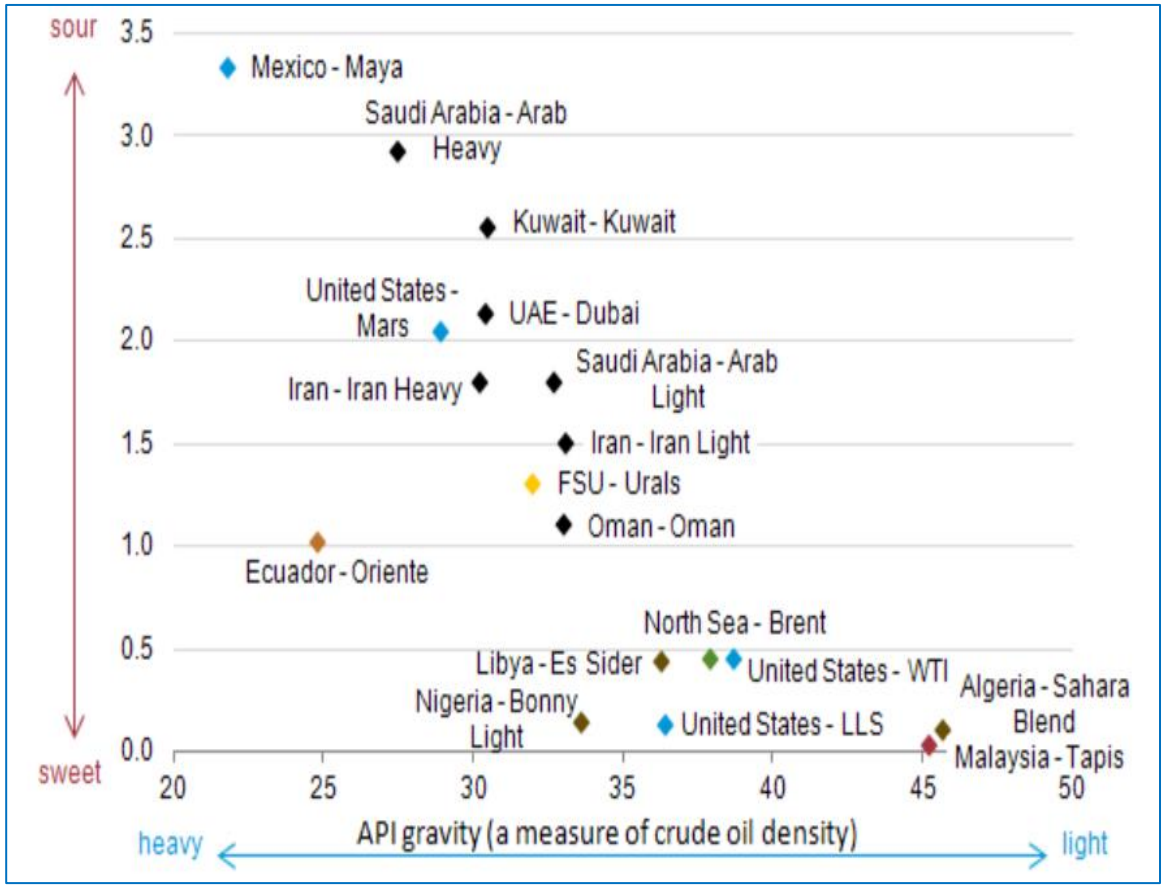
Types of Crude Oil

- Crude Oil is usually a black liquid, extracted from underground geological formations; It is formed from dead organisms buried under immense pressure and heat (hence called fossil fuel). It is rich in hydrocarbons (long and short) and also contains small amounts of substances such as sulfur, nitrogen, oxygen, and some heavy metals.
- The Grade of Crude oil extracted from different locations vary, depending upon the specific mix of hydrocarbons and other substances present in it. Two of the most widely accepted parameters for classifying the grade of crude oil are: i) density measured via American Petroleum Institute (API) Gravity, and ii) sweetness measured via its sulfur content.
- **Density:** The more dense the crude oil, the heavier it is, the lower its API gravity and heavier the yielded refined product (i.e., residuals). Conversely, the lower the density of crude, the higher the API gravity and the lighter the yielded product (i.e., Gasoline blend).
- **Sweetness:** The sweetness or sourness of crude oil is dependent upon its sulfur content. Crude oil with below 1.0% sulfur is considered sweet and the yielded product requires less treating and are cheaper to produce. Meanwhile, products driven from crude oil with higher sulfur content (i.e., sour) require more treating to meet emissions/safety standards.

Density & Sulfur Content of Select Crude Oil



A variety of crude oils are traded globally and are often labeled by region of origin. Three of the most widely used benchmarks are WTI (produced in the USA), Brent (produced in the UK North Sea), and the OPEC Reference Basket (a weighted average of crude oils from OPEC member countries).

Source: EIA, Kimray, API, ExxonMobil

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Types of Crude Oil – By Density & By Sweetness

By Density

API Gravity Range	Avg. Sulfur Content	Avg. Fraction Volume (%)						
		Butane and Lighter IBP - 60F	Light Naphtha C5 - 165F	Heavy Naphtha 165 - 330F	Kerosene 330 - 480F	Diesel 480 - 650F	Vacuum Gas Oil 650 - 1000F	Vacuum Residue 1000F+
> 20 and ≤ 25	2.18%	0.70%	4.35%	6.68%	9.27%	16.13%	34.93%	27.93%
> 25 and ≤ 30	0.80%	1.38%	3.92%	12.46%	13.85%	17.76%	31.24%	19.39%
> 30 and ≤ 35	0.64%	1.67%	4.85%	14.08%	14.04%	18.99%	30.46%	15.91%
> 35 and ≤ 40	0.35%	2.28%	7.01%	18.82%	16.37%	18.96%	26.41%	10.15%
> 40 and ≤ 45	0.16%	2.43%	8.48%	20.90%	17.78%	19.85%	24.08%	6.43%
> 45 and ≤ 50	0.12%	3.47%	17.13%	29.30%	15.27%	13.43%	16.17%	5.20%
> 50 and ≤ 55	0.05%	3.17%	19.30%	39.63%	16.97%	11.67%	7.97%	1.37%
> 55	0.01%	2.55%	35.85%	42.53%	9.93%	5.25%	3.60%	0.33%

By Sweetness

Fractional Cuts	Avg. API Gravity	Sulfur Content Range		
		>0.0% & ≤0.6%	>0.6% & <2.0%	>2.0% & ≤4.0%
		Sweet	Sour	
Butane and Lighter IBP - 60F	121.4	0.00%	0.00%	0.00%
Light Naphtha C5 - 165F	83.6	0.00%	0.00%	0.01%
Heavy Naphtha 165 - 330F	55.1	0.01%	0.02%	0.05%
Kerosene 330 - 480F	42.0	0.03%	0.11%	0.41%
Diesel 480 - 650F	33.1	0.14%	0.56%	1.81%
Vacuum Gas Oil 650 - 1000F	24.0	0.34%	1.32%	3.60%
Vacuum Residue 1000F+	10.9	0.71%	2.58%	6.56%

Source: ExxonMobil Assays

GLOBAL SYNOPSIS

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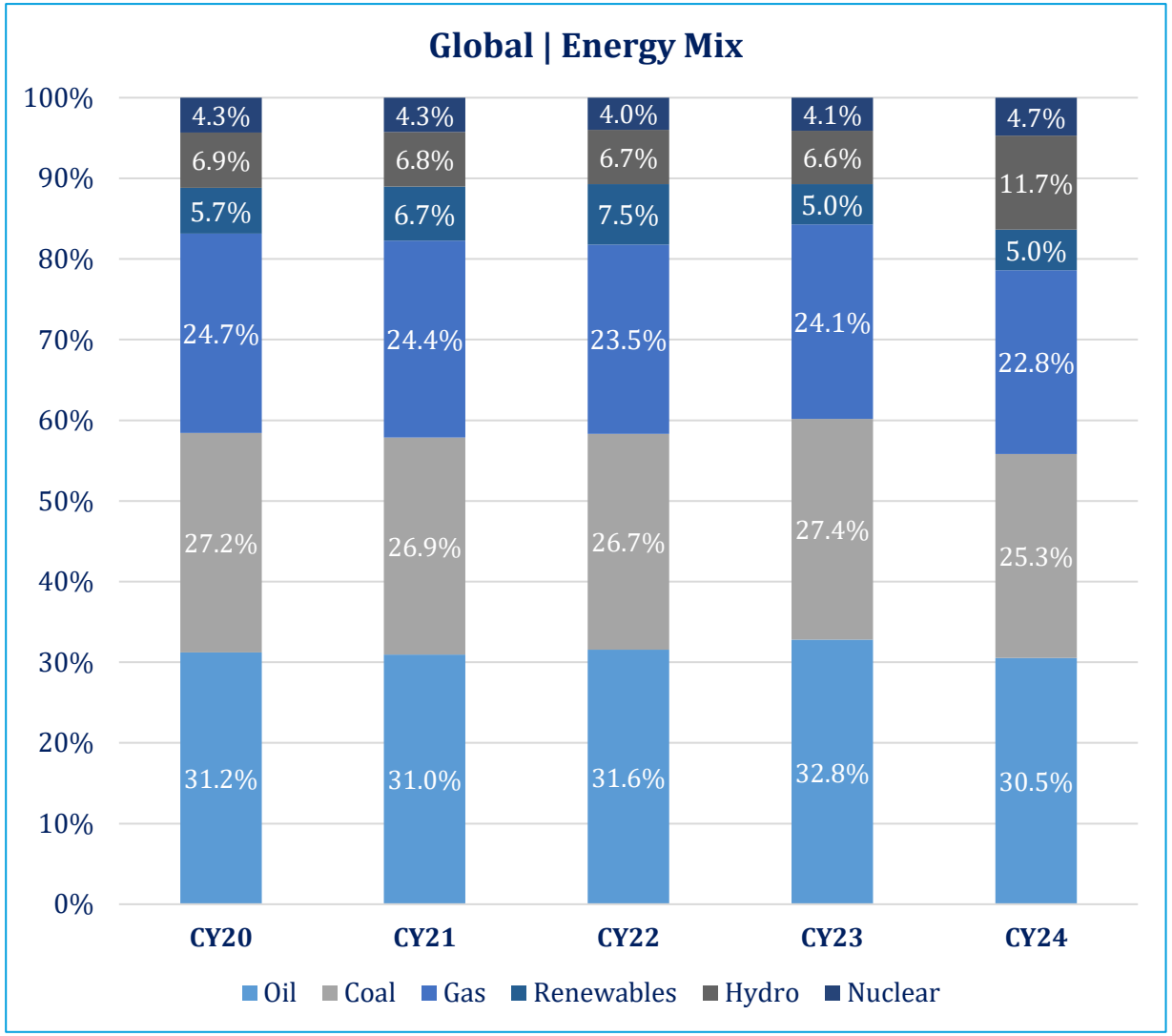
Global | Energy Mix

- The global energy mix (CY20-24), has been dominated by fossil fuels, with oil being the major contributor. It is followed by coal and gas. These comprised the lion's share in the global energy mix at ~78.6% in CY24.

- Oil demand is expected to peak by CY30 with natural gas and oil forecasted to remain a core part of the global energy mix beyond CY50. Post CY30, a gradual but continuous decline in oil demand is envisaged driven by factors such as improved engine efficiency, continued electrification of road transportation, and international efforts for environmental sustainability.

- LNG imports are expected to contribute to the growing use of natural gas in developing economies, accounting for ~65-75% of the increase in Asia by CY40. Power and industrial sectors are considered to be major users of gas in this region.

- Global energy demand is projected to rise through CY30, underpinned by population growth, improving living standards, and accelerating industrialization in emerging markets such as India, ASEAN, and Africa. While demand in developed economies is expected to remain relatively flat, new consumption drivers including electrification, data centers, and industrial expansion will support incremental growth. Electrification is likely to reshape the demand profile, shifting consumption toward power, even as efficiency gains partially offset growth. The ability to meet rising demand sustainably will depend on timely investments in renewables, grids, and low-carbon capacity amid affordability and supply-chain constraints.



Source: BP, McKinsey & Company

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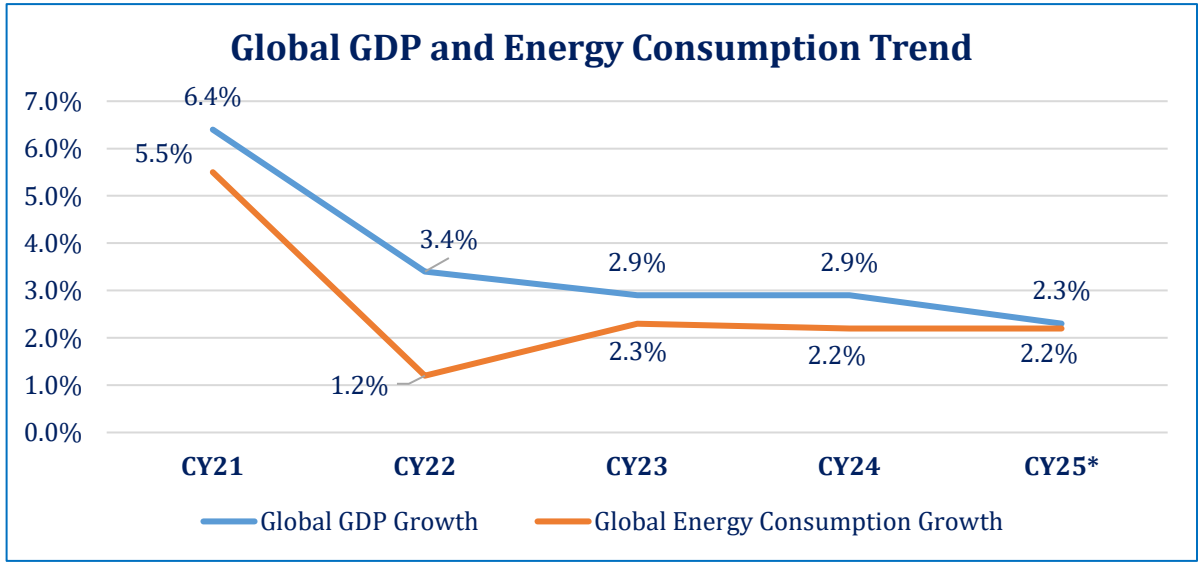
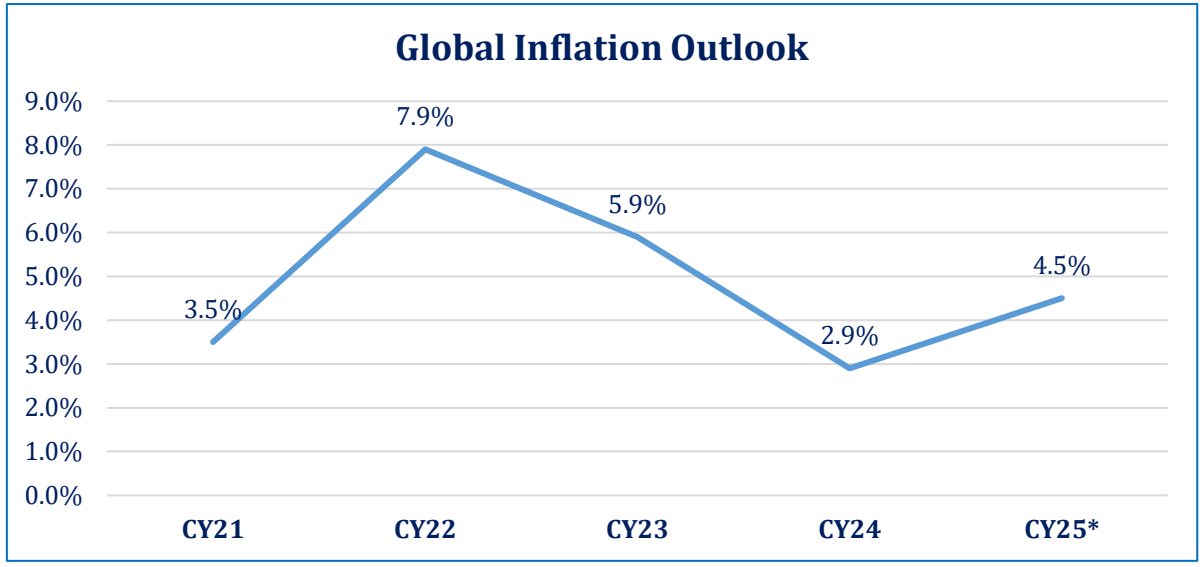
Global | Outlook

- **Global GDP growth** remained broadly stable at ~2.9% in CY24 and is estimated at ~2.3% in CY25. In the United States, output growth is estimated at ~1.4% in CY25 amid weakening external conditions and trade frictions, following ~2.8% growth in CY24. China's economy grew by ~5.0% in CY24 and is estimated at ~4.5% in CY25, with further slowdown to ~4.2% anticipated due to trade barriers and a softer global environment. India maintained strong momentum, with GDP growth of ~6.5% in CY24 and estimated at ~6.3% in CY25. Pakistan's GDP grew by ~3.2% in CY24, with the World Bank estimating moderation to ~2.7% in CY25.
- **Global energy consumption** continues to exhibit a strong linkage with macroeconomy and world GDP. Historically, energy demand accelerates alongside economic expansion, particularly in industry and mobility driven sectors. For CY25, global energy consumption growth is projected to remain near ~2.2%, broadly aligned with the softer GDP outlook. The uncertainty due to conflicts and trade wars are affecting energy demand.
- **Global Headline Inflation** is projected to rise to approximately~4.5%, reflecting renewed commodity price pressures. This development may delay the pace of monetary easing in advanced economies.





Projected.* ***Note:* *Energy consumption forecast for CY25 is latest available.*

Source: World Bank, IEA

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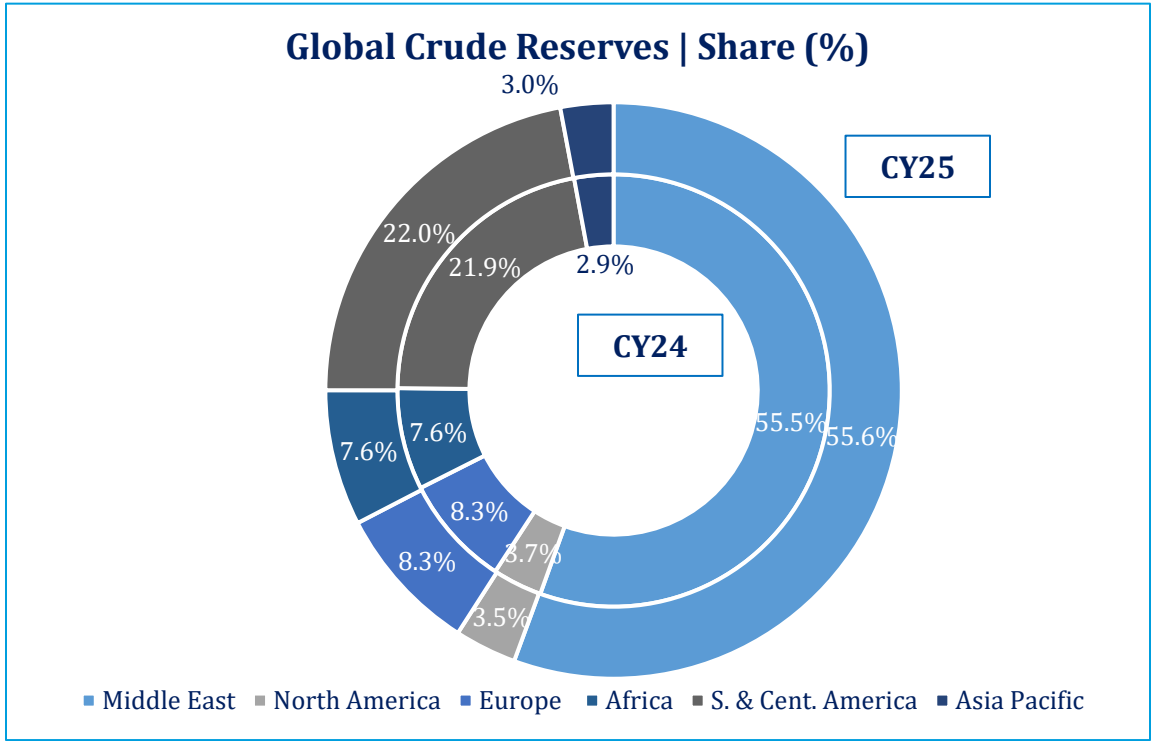
Global | Crude Oil Reserves

- During CY24, global crude oil reserves stood at ~1,567Bn barrels or ~213,094Mn MT (CY23: ~1,565Bn barrels or 212,776Mn MT). The largest reserves were registered in the Middle East (CY24:~55.6%; CY23: ~55.5%).
- A further breakdown concerning the Middle Eastern countries reveals that Saudi Arabia has ~17.1% of the global reserves in CY24 (CY23: ~17.0%), while Iran comprised ~13.3% of the share (CY23: ~13.3%).
- South & Central American countries together accounted for ~21.9% (CY24: ~21.9%) of the total crude reserves in CY24. Meanwhile, Venezuela alone had ~19.3% (CY23: ~19.3%) of the global crude reserves.
- Russia's crude oil reserves formed ~8.4% (CY23: ~8.3%) of the world total in CY23. Africa accounted for ~8.4% (CY24: ~8.3%) of the world's total crude oil reserves during the year.

Global Crude Oil Reserves (Mn MT)

Time Period	CY20	CY21	CY22	CY23	CY24
World Total	209,931	211,968	212,618	212,776	213,094



***Note**: Oil Sands are not considered in Crude Reserves*

Source: OPEC, EIA

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Global | Crude Oil Supply and Demand

- In CY24, global crude oil production, as a share of total available reserves, stood at ~1.7% (CY23: ~1.7%). Saudi Arabia accounted for ~12.3% of the world crude produced (CY23: ~13.1%), clocking in at ~444.53Mn MT (or ~8.95mbpd) (CY23: ~476.9Mn MT or ~9.61mbpd).
- Meanwhile, the USA made up ~18.2% of the global crude oil produced (CY23: ~17.6%), with a ~2.1% YoY increase to ~655.6Mn MT or ~13.2mbpd (CY23: ~12.9mbpd or ~642.7Mn MT). Overall, the Middle East and North America comprised ~31.8% and ~22.1% of the global crude oil production in CY24 (CY23: ~32.5%, and ~21.6%, respectively).
- The global crude consumption was up ~2.5% YoY in CY24, clocking in at ~3,481Mn MT (CY23: ~3,457Mn MT). North America formed ~35.6% of the global crude consumption, recording ~1,242Mn MT.
- China was the highest consumer in Asia Pacific, making up ~8.0% of the global crude consumption at ~109.0Mn MT. Meanwhile, the USA was the biggest consumer globally, forming ~6.0% of the global crude oil consumption, recording ~90.9Mn MT.

Crude Oil Extraction (mln MT/year)					
Region	**CY20**	**CY21**	**CY22**	**CY23**	**CY24**
Total Extraction	**3,417**	**3,447**	**3,620**	**3,641**	**3,603**
Middle East	1,095	1,104	1,244	1,183	1,144
North Americas	704	703	737	785	795
Europe	614	621	620	613	590
Others	429	426	421	424	419
Latin America	275	277	299	330	348
Africa	291	308	292	301	303
Asia Pacific	8	7	6	5	5

Crude Oil Consumption (mln MT)					
Period	**CY20**	**CY21**	**CY22**	**CY23**	**CY24**
Crude Consumption	**3,121**	**3,307**	**3,415**	**3,457**	**3,481**
Asia Pacific	355	364	364	361	359
North America	1,106	1,196	1,231	1,244	1,242
Europe	619	652	675	670	673
Middle East	371	388	413	430	441
S. & Cent. America	294	311	320	333	336
Russia	169	180	187	191	198
Africa	208	215	224	227	231

***Note**: mbpd stands for Mn barrels per day.*

Source: OPEC

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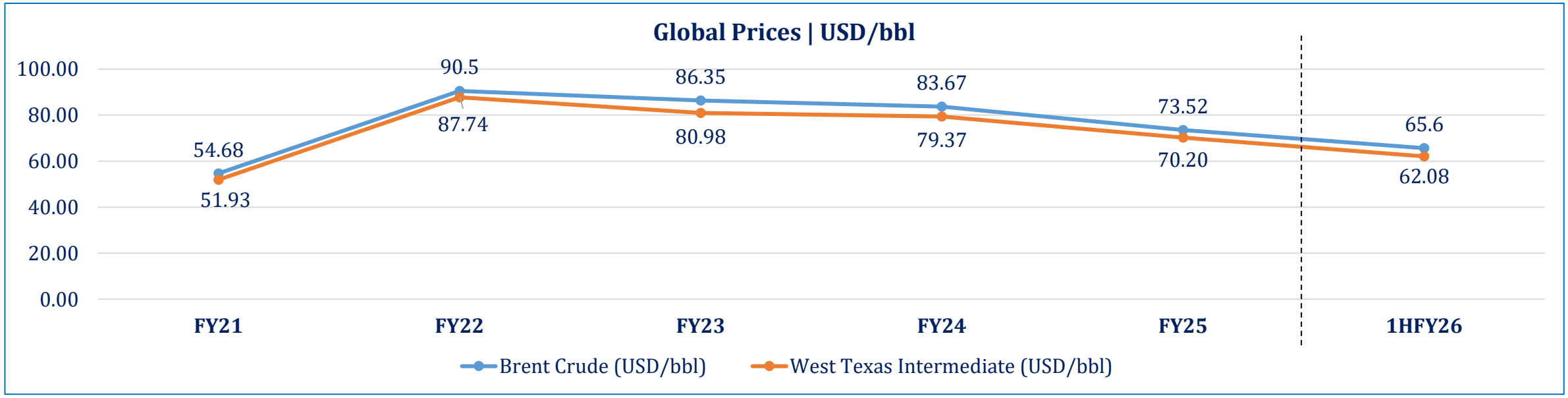
Global | Prices

- Global POL product prices (MOGAS and HSD) move in tandem with the global crude oil prices. Global crude benchmarks, Brent and WTI, have retraced from their FY22 highs of USD~90.5/bbl (Brent) and USD~87.74/bbl (WTI) to USD~73.5/bbl and USD~70.2/bbl, respectively, in FY25. The crude oil prices reduced further to USD~61.6/bbl in December 2025. Oil prices are expected to remain range bound (USD~55-65/bbl) barring unforeseen events.
- Despite several conflicts globally, most notably Russai-Ukraine war, oil prices have softened as no serious supply side disruptions were witnessed. Heavy tariffs or boycott of Russian oil could disrupt supplies but that has not materialized with other oil producing countries ready to pick the load.
- Global oil inventories are expected to rise through CY26, keeping downward pressure on prices. OPEC+ production policies and continued inventory builds in China are likely to temper these declines.



Source: Investing, BP, Fitch, IFS, EIA

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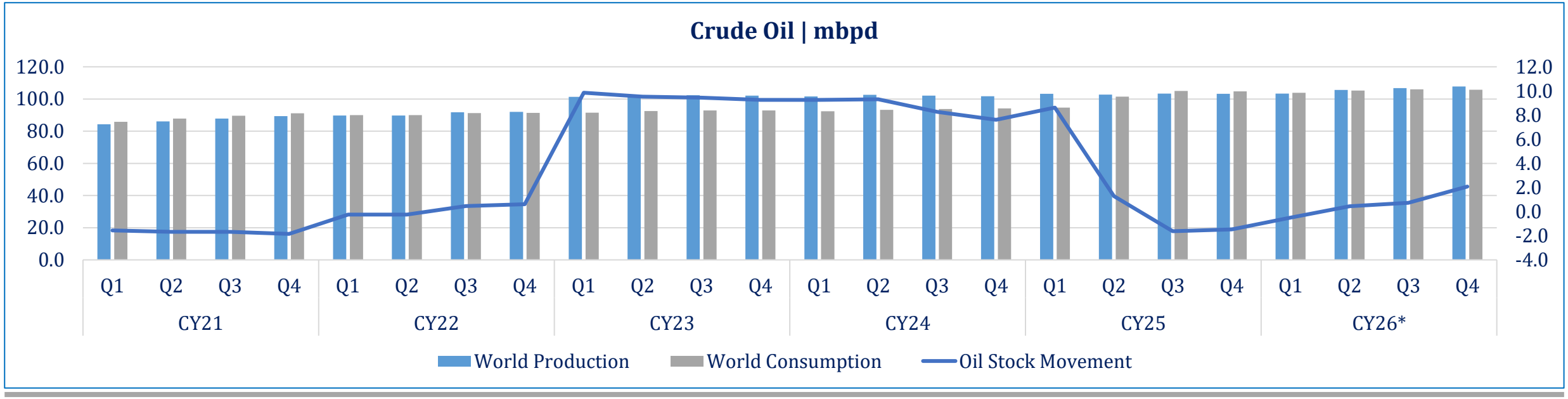
Global | Crude Stock Analysis

- Global crude oil inventories are a function of crude oil production and consumption levels for a given period. A positive inventory drawdown indicates greater production than consumption, whereas a negative drawdown indicates the opposite.
- In CY25, average global crude production rose ~1.0% to ~103.2mbpd (CY24: ~102.0), while average crude consumption was recorded at ~101.4.0mbpd, up ~8.7% YoY. leading to an average drawdown of ~1.2mbpd. Stock levels generally rise due to lack of demand or oversupply, and thus is followed by a price reduction.
- For CY26, average crude oil consumption and production is forecasted at ~105.9mbpd and ~105.2mbpd, respectively, while average drawdown is expected to record at ~0.7mbpd.
- The graph shows a sharp drawdown in oil stocks during CY24, early CY25, followed by a gradual rebuild starting mid-CY25 and continuing into CY26. This forecasted recovery is primarily driven by non-OPEC supply growth outpacing consumption, especially from the U.S. shale sector, Brazil, and Guyana.



*Forecast. **Note**: mbpd stands for Mn barrels per day.*

Source: EIA, OPEC

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Global | Crude Oil Trade

- Global Crude trade remained almost stable increasing by ~0.2% YoY to ~2.3Bn MT in CY24. Saudi Arabia has a ~13.2% share in total global exports amounting to ~300.3Mn MT in CY24. Meanwhile, top three importing countries namely China, Europe, and the US cumulatively accounted for ~62.6% of the global imports. Despite crude oil consumption exceeding domestic production, North America remains a net exporter because exports are drawn from total crude availability (including domestic output, imports and inventory stocks) rather than current production alone.

Country	Exports | Mn MT		Share, Global Exports (%)	YoY Δ
	CY23	CY24		
Saudi Arabia	330.6	300.3	13.2%	-9.2%
Russia	227.7	224.6	9.9%	-1.4%
Canada	168.8	177.2	7.8%	5.0%
US	202.6	204	9.0%	0.7%
Iraq	172.1	167	7.3%	-3.0%
UAE	131.6	134.9	5.9%	2.5%
ROW	1,035.5	1,066.3	46.9%	3.0%
World	**2,268.9**	**2,274.3**	**100.0%**	**0.2%**

Country	Imports | Mn MT		Share, Global Imports (%)	YoY Δ
	CY23	CY24		
China	561.1	549.6	24.2%	-2.0%
Europe	555.0	550.3	24.2%	-0.8%
US	321.6	327.0	14.4%	1.7%
Asia Pacific	281.0	271.0	11.9%	-3.6%
India	232.0	238.0	10.5%	2.6%
Japan	126.4	115.2	5.1%	-8.9%
ROW	191.8	223.2	9.8%	16.4%
World	**2,268.9**	**2,274.3**	**100.0%**	**0.2%**

** Includes Asia pacific regions except China*

Source: BP, EIA

Local Synopsis | Crude Oil

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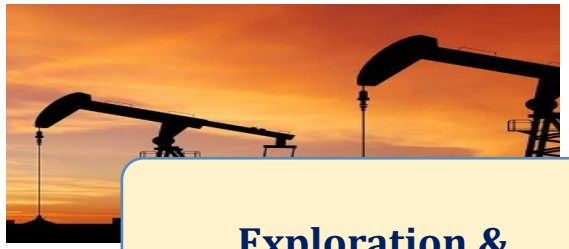
Oil Value Chain



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- Oil & Gas Development Company Limited (OGDCL)
- Orient Petroleum Incorporation (OPL)
- United Energy Pakistan Limited (UEPL)
- Pakistan Petroleum Limited (PPL)
- Mari Energies Company Limited (MPCL)
- Pakistan Oilfields Limited (POL)

Processing & Refining

- Cynergyico (Formerly Byco)
- Pak Arab Refinery Limited (PARCO)
- National Refinery Limited (NRL)
- Attock Refinery Limited (ARL)
- Pakistan Refinery Limited (PRL)

Wholesale & Marketing

- Pakistan State Oil (PSO)
- PARCO Gunvor Limited (PGL)
- Wafi Energy Pakistan Limited (WEPL)
- Gas and Oil Pakistan Limited (GO)
- Attock Petroleum Limited (APL)

Source: OCAC, PACRA Internal Database

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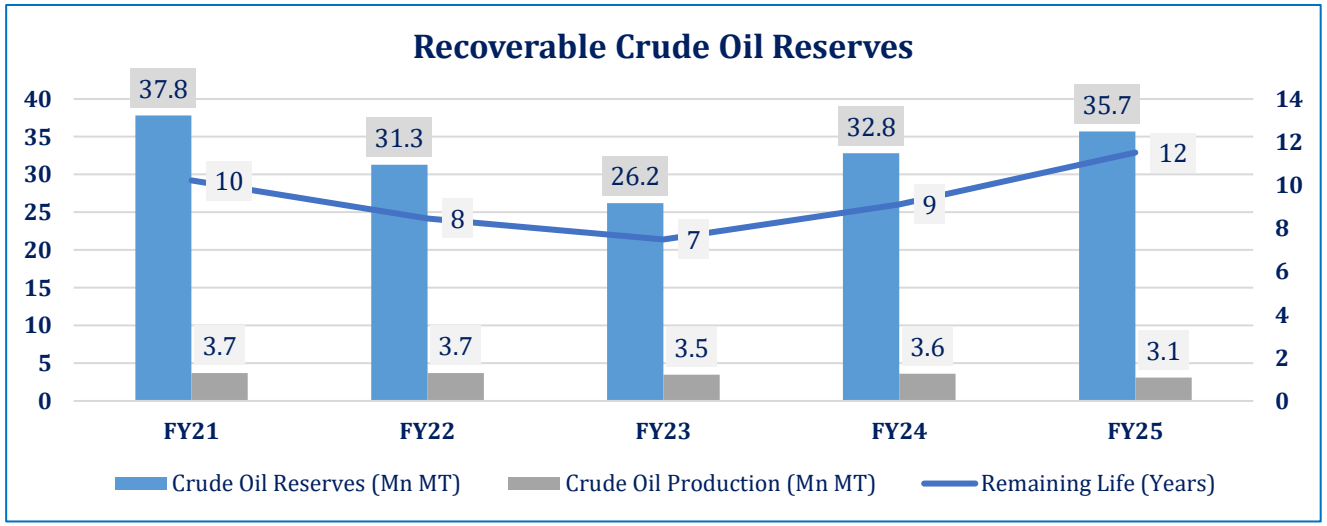
Crude Oil Reserves

- Pakistan's recoverable crude oil reserves are estimated at ~36.2Mn MT as at End-Jun'25 (SPLY: ~32.9Mn MT). These rose due to increase in reserve size of major oil fields coupled with the inclusion of new reserves, particularly in Sindh and KPK.
- OGDCL holds the largest crude oil reserves base, accounting for ~49.0% of Pakistan's total reserves in FY25 (FY24: ~51%).
- While total crude oil reserves rose by ~10.0% YoY in FY25, crude oil production reduced by ~16.7% YoY. The decline in oil production is attributed to natural depletion of mature reserves, which has outpaced the exploration and development of new reserves.

Recoverable Crude Oil Reserves & Extraction					
Period	**FY21**	**FY22**	**FY23**	**FY24**	**FY25**
Crude Oil Reserves (Mn MT)	38.4	31.8	26.3	32.9	36.2
Local Crude Production (Mn MT)	3.7	3.5	3.5	3.6	3.0*
Remaining Life (Years)	10	9	8	9	12



Note: 1 MT Crude = 7.331 bbl. *Est. Local Crude Production prorated from 9MFY25.

Source: OGDCL, PES

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Local | Crude Oil Industry Snapshot | Upstream | Downstream

Upstream	FY21	FY22	FY23	FY24	FY25
Est. Local Crude Production	3.7	3.7	3.5	3.6	3.0
Imported Crude (Mn MT)	8.8	9.3	7.9	8.4	9.3
Crude Condensate Exports (Mn MT)	0.3	0.4	0.3	0.3	0.3
Crude Supply (Mn MT)	12.2	12.6	11.1	11.7	12.1
Major Players	6				
Structure	Oligopoly				
Regulator	Ministry of Energy (Petroleum Division)				
Association	OCAC				

Downstream	FY21	FY22	FY23	FY24	FY25
Local POL Production (Mn MT)	10.3	10.3	9	10.1	10.5
POL Imports (Mn MT)	10.1	13.1	8.2	6.6	7.8
POL Exports (Mn MT)	0.1	0	0.3	1	1.4
POL Storage (Mn MT)	4.6	4.8	4.7	5.7	-*
POL Consumption (Mn MT)	20.4	23.4	17.2	16.7	18
Refinery Offtake/ Crude Supply (Mn MT)	12.2	12.6	11.1	11.7	
Refinery Production (Mn MT)	11.6	11.7	10.2	11.3	11.7
Regulator	OGRA				

Note: 1 MT Crude = 7.331 bbl. * Storage data available till FY24.

Source:, OCAC, PBS, PES

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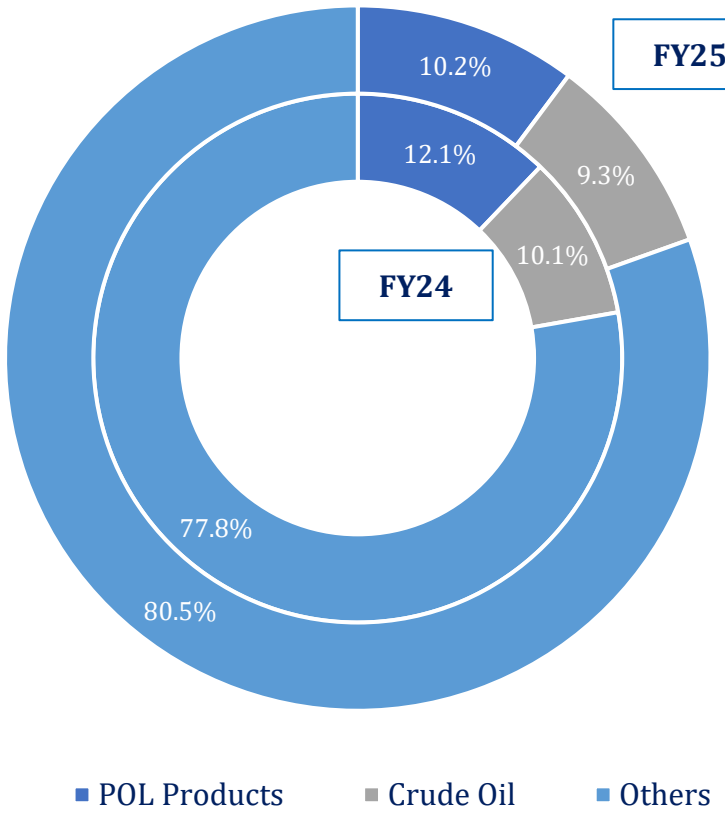
Local | Imports

- Pakistan heavily relies on imports to meet its crude oil and POL product demand. During FY21–FY25, crude oil imports totaled ~8.7Mn MT while POL imports for the period clocked in at ~9.1Mn MT. POL and crude oil imports formed ~19.5% of the Country's total import bill (FY24: ~22.2%).

- Crude imports peaked in FY22, dipped to ~7.8Mn MT in FY23, and rebounded sharply to a new high of ~9.3Mn MT in FY25.

- In value terms, crude oil imports remained broadly stable at USD~5.4Bn in FY25 (FY24: USD~5.5Bn), supported by a decline in the average Brent price from USD~74/bbl in FY24 to USD~67/bbl in FY25 (~10.4% drop).

- Pakistan's crude oil import volumes are likely to continue increasing in FY26 as domestic demand and refinery processing recover, while global market oversupply and subdued crude prices are expected to help contain the total import cost, softening pressure on the country's import bill.



Note: 1 MT Crude = 7.331 bbl. * Storage data available till FY24.

Source:, OCAC, PBS, PES

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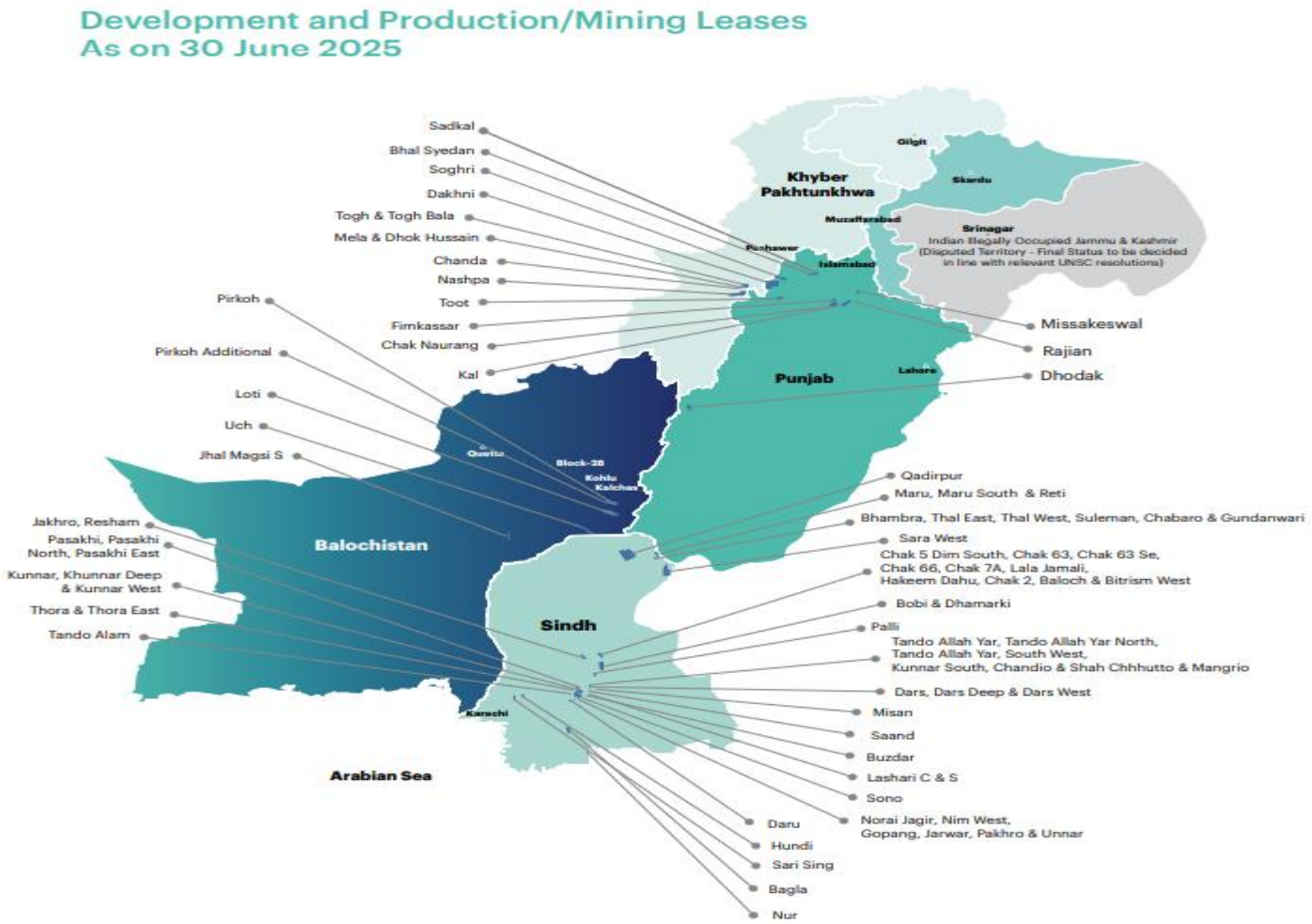
Development & Production Activities | OGDCL



Oil & Gas Development Company Ltd. (OGDCL):

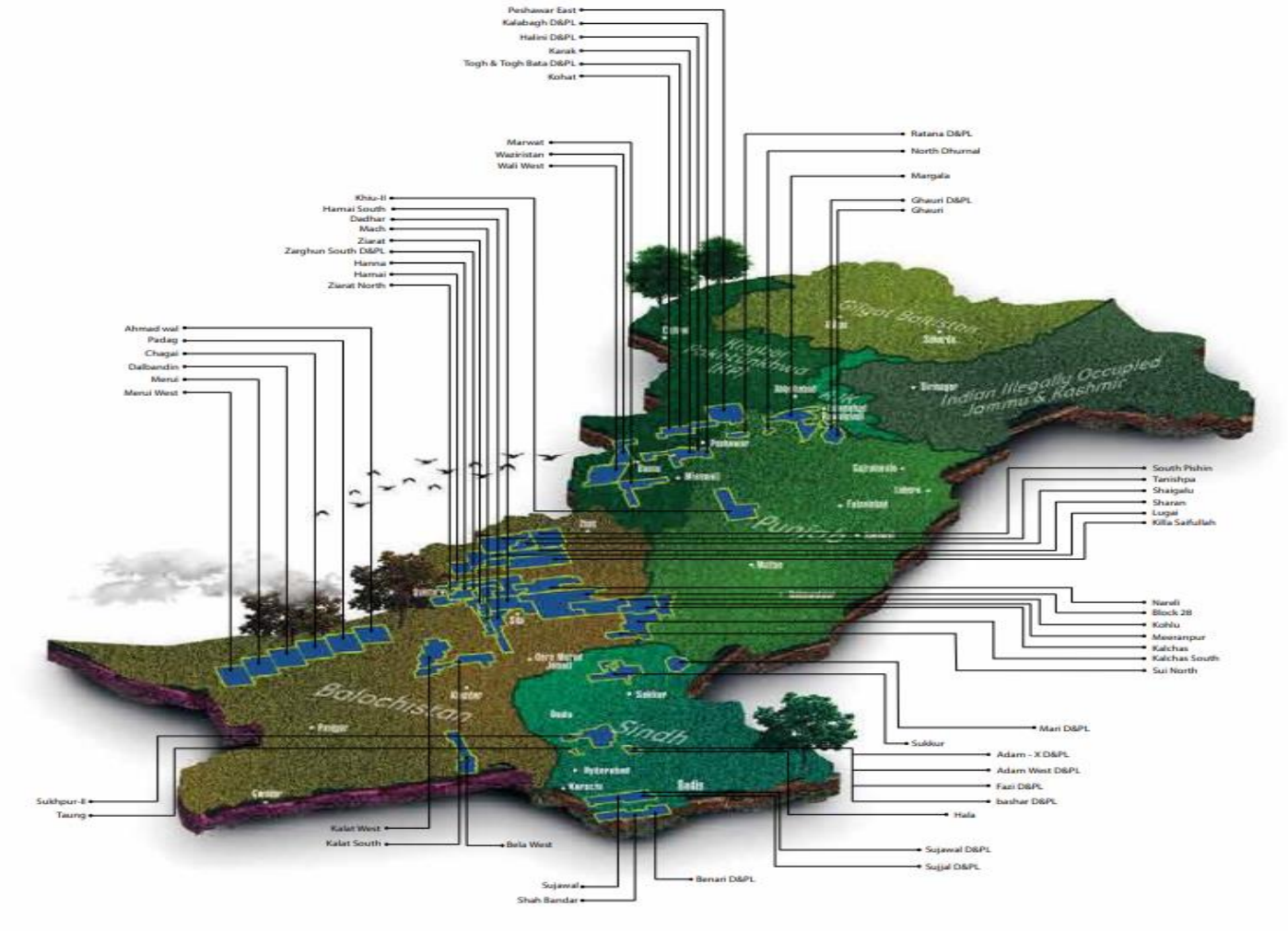
- During FY25, OGDCL Crude Oil Reserves stood at ~17.8Mn MT, which make up ~49.0% of Pakistan's total crude oil reserves (FY24: ~16.8Mn MT).
- During the same period, OGDCL had five new oil and gas discoveries and the number of wells drilled stood at ~15.
- The company produced ~30,919 bpd of oil, and conducted ~750 Km and ~1,051 Km of 2D and 3D Seismic Surveys.

Note: The map shows OGDCLs crude oil and gas activities as at June 30, 2025.
2D seismic is acquired using a single listening cable towed behind the seismic vessel, whereas 3D seismic is acquired using six parallel listening cables,

Source: OGDCL

Exploration & Production

Geographical Presence | MARI Energies



MARI Energies Ltd:

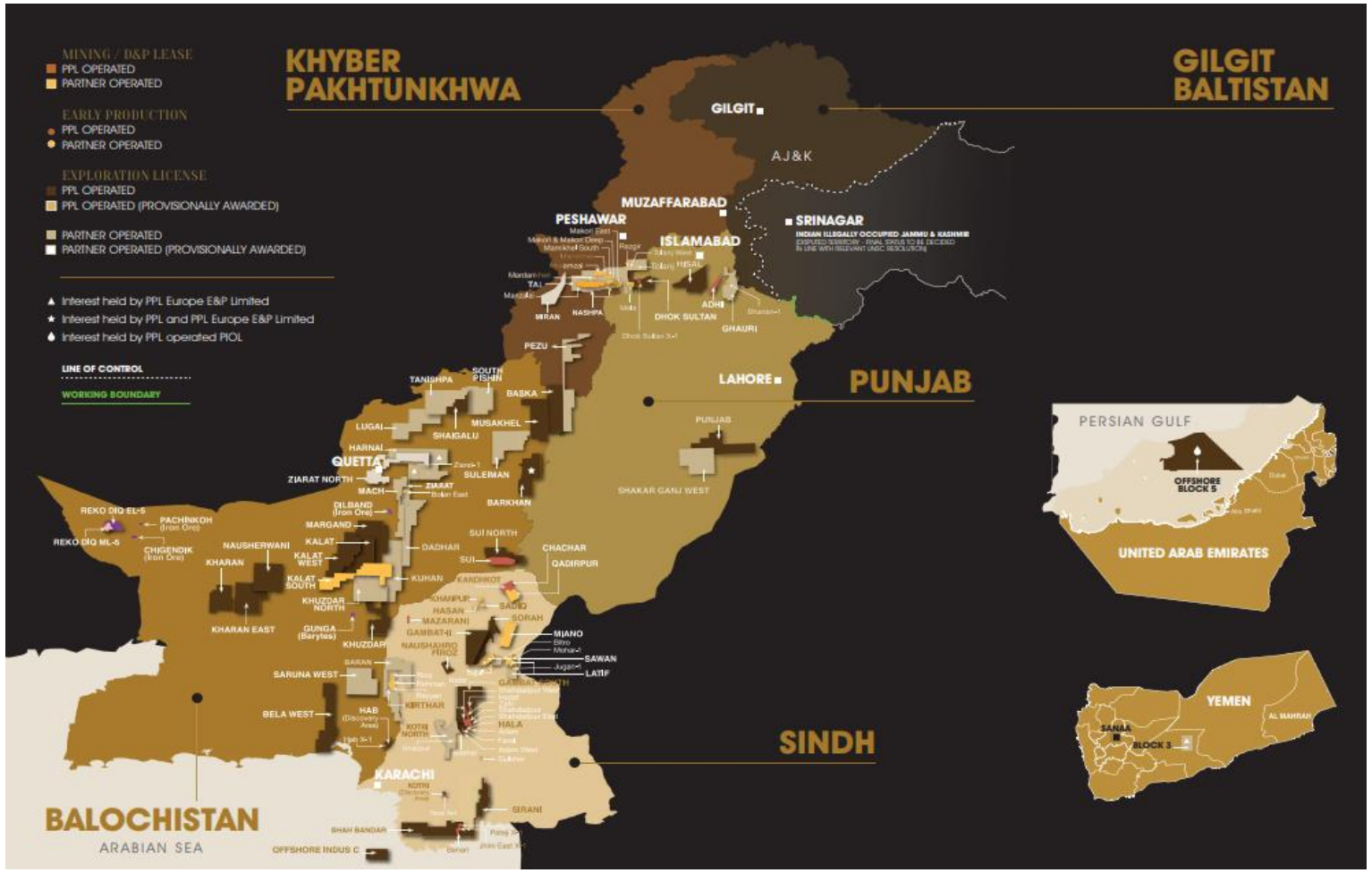
- As of FY25, MARI Energies held ~2.9% market share in oil and condensate and produced ~110,000 barrels of oil equivalent.
- The company's total estimated reserves* and resources (2P+2C) increased from ~816 MMBOE in FY24 to ~952 MMBOE in FY25.
- 2P reserves are the best estimate of commercially recoverable hydrocarbons under current conditions, while 2C resources are the best estimate of potentially recoverable volumes that are not yet commercially viable due to existing contingencies.
- MARI Energies conducted 26 exploratory wells, which led to 12 discoveries, and a total of 64 wells have been drilled. The company also carried out 1,610 line km of 2D seismic surveys and 326 sq.km of 3D seismic surveys.

Note: *Mari Energies Ltd. Reserves include both crude oil and gas reserves as at June 30, 2025. MMBOE = Million Barrels of Oil Equivalent

Source: MARI Energies Ltd.

Exploration & Production

Production Activities | PPL Ltd.



Pakistan Petroleum Ltd. (PPL):

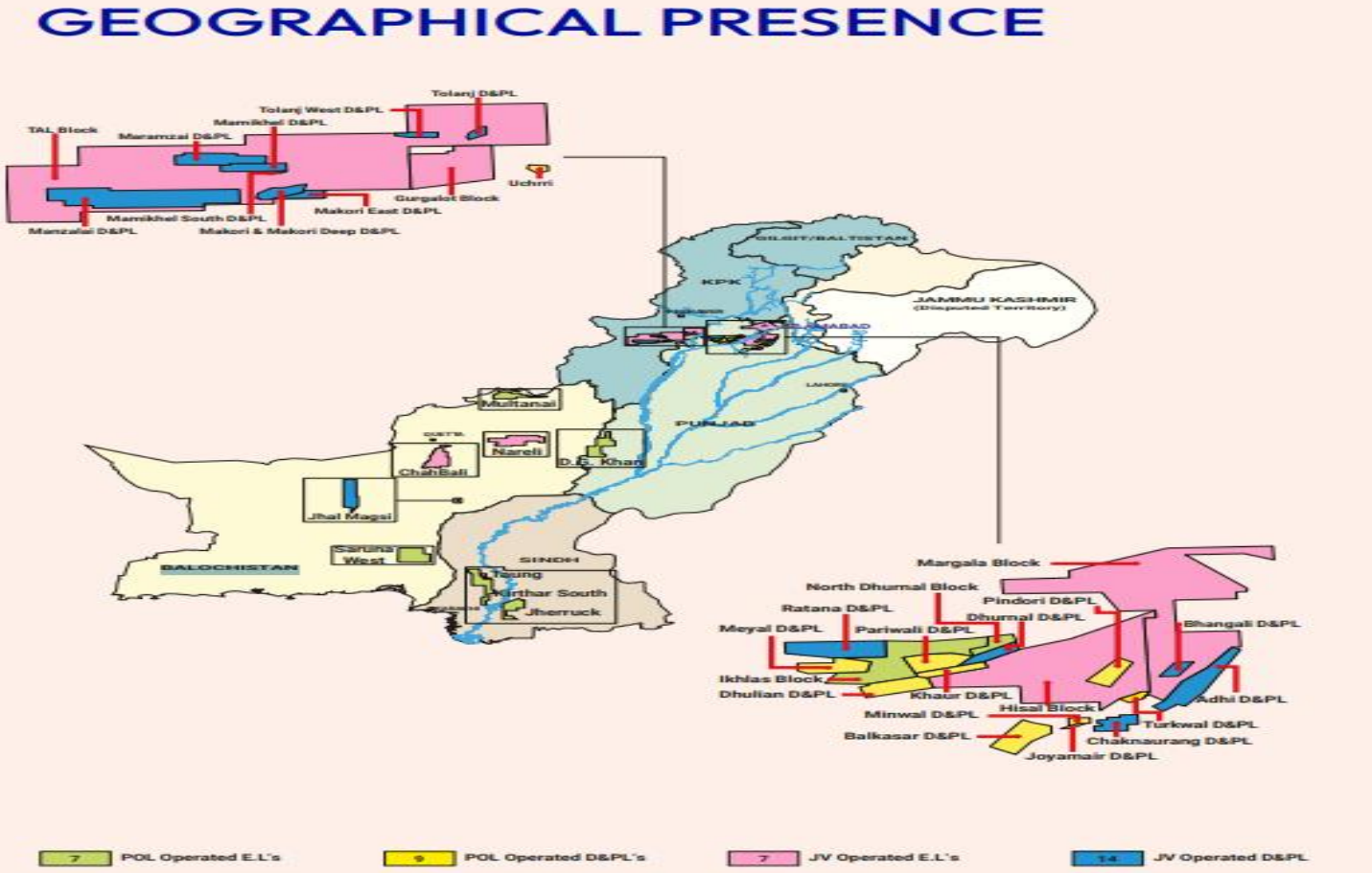
- For FY25, PPL had ~15.8 Mn MT (FY24: 13.6 Mn MT) of crude oil recoverable reserves and ~18,055,805 MMSCF* (FY24: 17,723,732 MMSCF) of Natural Gas recoverable reserves.
- During the period, PPL produced ~11,442 bpd of oil and NGL, while there were eight new discoveries.
- Eleven exploration and four development wells were drilled while the company conducted ~550 line km of 2D seismic acquisition.

Note: The map shows PPL crude Oil Reserves as of June 30, 2025. *MMSCF = Million Standard Cubic Feet.

Source: PPL Ltd.

Exploration & Production

Production Activities | POL Ltd.



Pakistan Oilfields Ltd. (POL):

- POL produced ~1,627,327 bbl of crude oil (FY24: ~1,730,118 bbl) for FY25.
- During the period, the company reported notable exploration successes, including the discovery of the Razgir-1 well in a joint venture and a confirmed success at Makori Deep, both of which are expected to contribute to production in the near term.
- These discoveries, along with ongoing exploration and development activities across various blocks, underscore the company's continued focus on reserve replacement and strengthening its production base.

Note: The map shows POL crude Oil Reserves as of June 30, 2025.

Source: POL Ltd.

Exploration & Production

Crude Oil Production | 5 Years at a Glance | Top 4 Entities

Production | 5 Years at a Glance | OGDCL						
Fuel/Product	**Unit**	**FY21**	**FY22**	**FY23**	**FY24**	**FY25**
Crude & Condensate	Mn bbl	13.5	12.9	11.9	12.1	11.3
Natural Gas	BMSCF	317.4	301.3	278.9	262.5	238.0
LPG	MT	293,153	294,747	262,852	262,436	234,336
Sulphur and Others	MT	18,827	14,160	10,635	8,677	9,121

Production | 5 Years at a Glance | MARI Energies						
Fuel/Product	**Unit**	**FY21**	**FY22**	**FY23**	**FY24**	**FY25**
Crude & Condensate	Mn bbl	0.5	0.5	0.4	0.4	0.5
Natural Gas	BMSCF	-	283.2	275.2	292.3	292.2
LPG	MT	54.3	32.2	17.6	-	-
Sulphur and Others	MT	-	-	-	-	-

Production | 5 Years at a Glance | PPL						
Fuel/Product	**Unit**	**FY21**	**FY22**	**FY23**	**FY24**	**FY25**
Crude & Condensate	Mn bbl	5.1	4.6	4.4	4.2	3.7
Natural Gas	BMSCF	276.3	263.5	266.6	231.6	204.9
LPG	MT	115,835	116,498	116,881	113,104	97,067
Sulphur and Others	MT	64,206	118,505	134,397	127,111	83,149

Production | 5 Years at a Glance | POL						
Fuel/Product	**Unit**	**FY21**	**FY22**	**FY23**	**FY24**	**FY25**
Crude & Condensate	Mn bbl	2.3	2.0	1.8	1.7	1.6
Natural Gas	BMSCF	28.6	25.8	23.7	22.5	19.4
LPG	MT	56,660	55,418	53,177	50,280	48,607
Sulphur and Others	MT	17,086	19,080	18,943	19,261	20,090

Source: PPL Ltd., Mari Energies Ltd. POL Ltd., OGDCL

Exploration & Production

Crude Oil Gross Sales | 5 Years at a Glance

Gross Sales	PKR Mn	5 Years at a Glance	OGDCL				
Fuel/Product	**FY21**	**FY22**	**FY23**	**FY24**	**FY25**
Crude & Condensate	97,257	182,411	203,568	229,844	187,035
Natural Gas	148,346	157,865	207,370	232,847	214,237
LPG	24,399	44,262	47,180	51,567	48,098
Sulphur and Others	501	863	381	281	752
Gas Processing	116	8	0	0	0
Total	270,620	385,409	458,499	514,539	450,123

Gross Sales	PKR Mn	5 Years at a Glance	PPL				
Fuel/Product	**FY21**	**FY22**	**FY23**	**FY24**	**FY25**
Crude & Condensate	41,395	74,049	86,594	91,925	71,341
Natural Gas	120,022	141,389	216,753	211,403	182,689
LPG	10,000	18,037	21,200	22,282	19,974
Sulphur and Others	737	1,281	1,784	1,894	2,669
Gas Processing	353	485	720	775	722
Total	172,507	235,240	327,050	328,278	277,395

Gross Sales	PKR Mn	5 Years at a Glance	MARI Energies, POL & Orient Petroleum				
Companies	**FY21**	**FY22**	**FY23**	**FY24**	**FY25**
MARI Energies Ltd.	82,693	108,970	163,156	204,605	200,214
POL Ltd.	39,482	58,394	65,984	72,606	64,070
Orient Petroleum Inc.*	3,396	5,703	7,274	7,262	-

***Note**: POL Ltd., MARI Energies Ltd. & Orient Petroleum Inc. do not show a breakdown of the Sales. * Orient Petroleum Inc. follows a CY reporting basis.*

Source: PPL , Mari Energies Ltd., OGDCL, POL

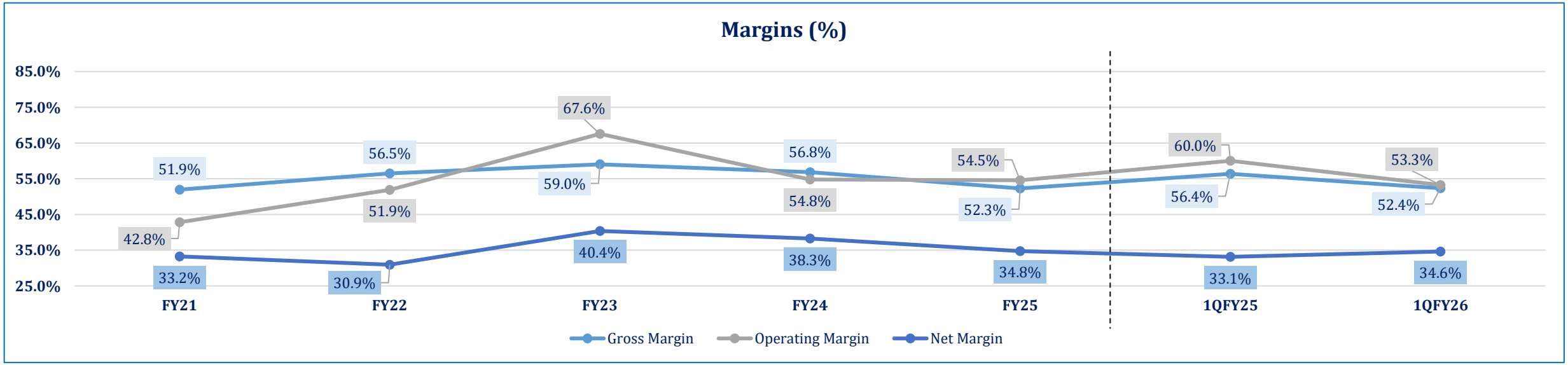
Exploration & Production

Business Risk | Margins

- Oil exploration and production is generally a high-margin business both in Pakistan and globally. In Pakistan, companies also benefit from strong 'other income', primarily driven by returns on circular-debt–related bonds and group investments. During FY25, the gross margin declined to ~52.3% (FY24: ~56.8%), as sales revenue for the period fell by 11.4% YoY, although the total cost for the segment also declined by ~2.0% YoY. Operating margins for the period also decreased to ~54.5% (FY24: ~54.8%).

- Higher operating margin (compared to gross margin) mainly came on the back of higher 'other income' for the period, specifically due to increased interest earnings from treasury bill investments. The net margins dropped to ~34.8% (FY24: ~38.3%), owing to a 10.3% YoY escalation in finance costs.

- For 1QFY26 (compared to 1QFY25), gross and operating margins fell to ~52.4% and ~53.3%, due to factors such as lower oil prices and lower "other income". Net margin clocked in at ~34.6%, an increase from ~33.1% previous quarter.



***Note**: Figures are based on financials of 5 Listed/PACRA-rated clients during FY21-FY24 and 4 Listed/PACRA-rated clients during FY25*

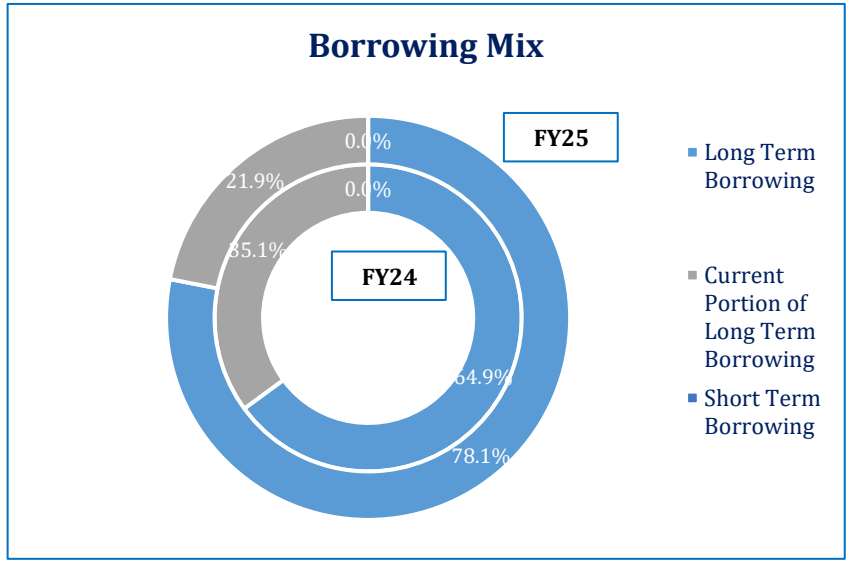
Source: PSX, PACRA Database

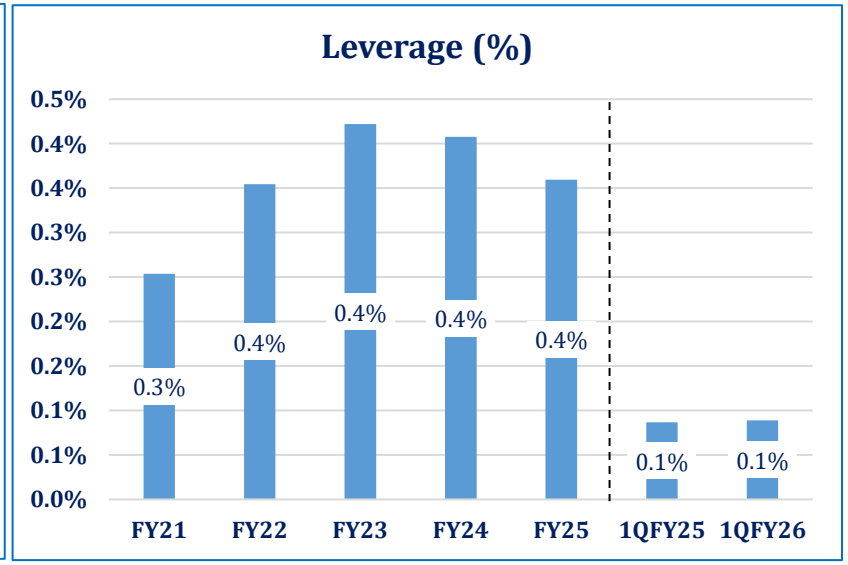
Exploration & Production

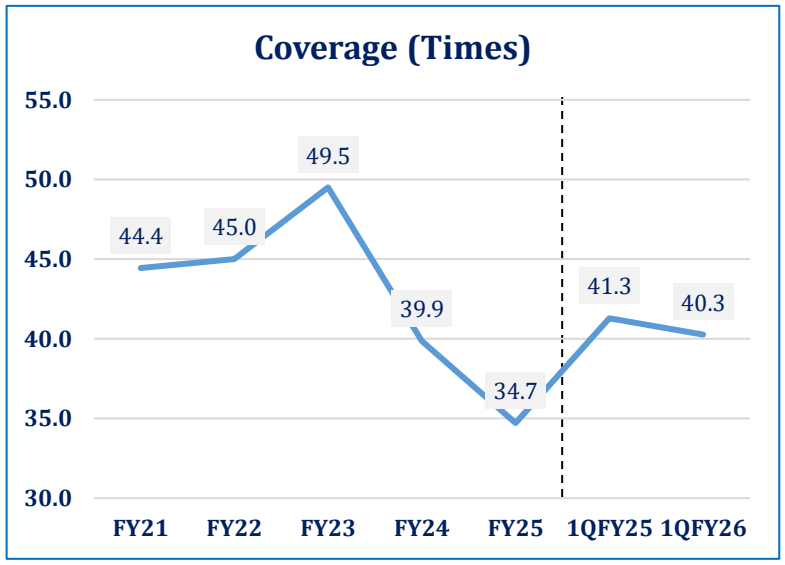
Financial Risk

- During FY25, the sector's total borrowing stood at PKR~8,734Mn compared to PKR~9,040Mn during FY24, down ~3.4% YoY. Long-term borrowing, comprising ~78.1% of total borrowing were recorded at PKR~6,819Mn (FY24: PKR~5,870Mn), increasing by ~16.2% YoY. Meanwhile, short-term borrowing remained at zero during FY25, consistent with the prior year In addition, the current maturity of long-term borrowing (CMLTB) comprising ~21.9% of total borrowing were recorded at PKR~1,915Mn (FY24: PKR~3.169Mn). Orient Petroleum accounts for ~74.0% of total borrowings, and the firm's recent financial behavior is driving a decline in overall borrowing.

- The sector's leverage remains low relative to equity, reflecting its strong reliance on internally generated funds. During FY25, the sector's leverage was recorded almost similar to previous year at ~0.4%, indicating a negligible level of financial risk. The sector's leverage remained low in 1QFY26 where it stood at ~0.1% (1QFY25: ~0.1%).
- During FY25, the average coverage ratio was recorded at ~34.7x (FY24: ~39.9x), on the back of an increase in finance cost (~10.3% YoY). The Sector's finance cost increased despite lower interest rates for the period. Coverage for 1QFY26 dropped to ~40.3x from ~41.3x in 1QFY25.







***Note**: Figures are based on financials of 5 Listed/PACRA-rated clients during FY21-FY24 and 4 Listed/PACRA-rated clients during FY25*

Source: PSX, PACRA Database

Exploration & Production

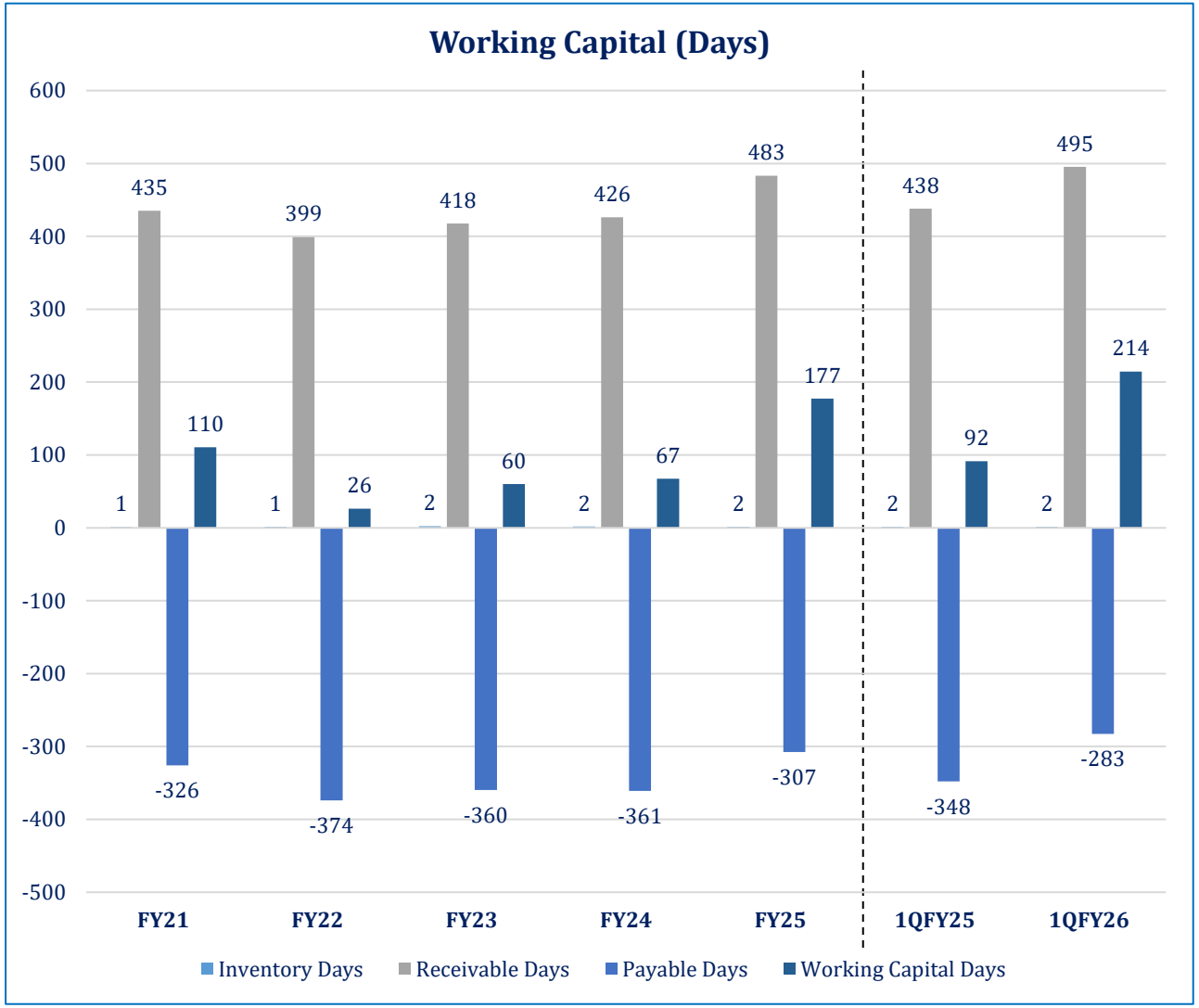
Financial Risk | Working Capital

- During FY25, the sector's working capital increased to ~177 days compared to ~67 days during FY24, on the back of an increase in receivable days which recorded at~483 days (FY24: ~426 days). The payable days also declined to ~307 days (FY24: ~361 days).

- Historically (FY21-25), the inventory days have been almost negligible, this trend continued during FY25 as well because crude oil and gas are delivered directly to pipelines or refineries with no stockpiling.

- A higher number of receivable days highlights circular-debt-related issues in the segment, as unpaid dues from state utilities and the power sector constitute the majority of receivables, resulting in extended collection cycles. At the same time, elevated payable days largely reflect delayed settlements to suppliers and joint-venture partners, as companies manage liquidity pressures arising from the same circular debt dynamics.

- In 1QFY26,recievable days increased further to ~495 days (1QFY25: ~438 days), while payable days clocked in at ~283 days (1QFY25: ~ 348). Working capital days stood at ~214 days (1QFY25: 92 days).



***Note**: Figures are based on financials of 5 Listed/PACRA-rated clients during FY21-FY24 and 4 Listed/PACRA-rated clients during FY25*

Source: PSX, PACRA Database

Exploration & Production

Regulatory Framework | Salient Features

Petroleum Policy 2012 (Updated Mar'24)

Petroleum Policy 2012 has superseded all previous policies (1993, 1994, 1997, 2001, 2007, and 2009).

Salient features:

- Licensing process.
- Licensing system with different fiscal terms for onshore Zones I(F), I, II, III and offshore shallow, deep, and ultra-deep areas.
- Onshore royalty fixed at ~12.5% with ~40% income tax offshore areas enjoy a 48-month royalty holiday.
- Windfall levies apply when market prices exceed base prices (e.g., USD~41/bbl for oil, annually escalated).
- Exploration Licenses run three years plus a two-year extension, with up to two one-year renewals; D&P leases last up to 25 years with a five-year renewal.
- Frontier Zone I(F) receives premium incentives, including offshore-equivalent wellhead pricing.
- Mandatory local participation of ~15–25% and ~10% royalty allocation for district-level development.
- Work obligations awarded through Work Units with a ~25% performance guarantee and penalties for non-fulfilment.
- Extended Well Testing allowed with ~5–10% discounted gas price; retention periods of 5–10 years for gas discoveries.
- Government may award blocks directly to foreign national oil companies designated as strategic partners.

Source: Ministry of Energy

Exploration & Production

Regulatory Framework | Salient Features

Pakistan Onshore Petroleum Exploration & Production Rules 2013 & Pakistan Offshore Petroleum Exploration & Production Rules 2023

Salient features:

- Permit for Reconnaissance surveys
- License for petroleum exploration
- Lease for petroleum development and production
- Accounts, records, inspection and reports
- Standards of Operation

Local Synopsis | Natural Gas

Exploration & Production

Local | Natural Gas | Snapshot

- Natural gas is a fossil fuel primarily composed of methane, along with small amounts of natural gas liquids and non-hydrocarbon gases. It is used across commercial, industrial, and power sectors, and also serves as fuel for pipelines, leases, and vehicles.
- In FY25, local gas consumption was recorded at ~24.0Mn MT (FY24: ~25.4 Mn MT), registering a decrease of ~5.5% YoY. Local production of natural gas during the year declined by ~10.1% YoY to settle at ~17.9Mn MT (FY24: ~19.9Mn MT).
- During the period, indigenous gas contributed ~29.3% (SPLY: ~28.9%) to the country's power generation mix.
- The country saw RLNG-related challenges in FY25 due to weak demand relative to contracted import volumes, elevated tariffs, and surplus gas creating financial and operational strain on the gas sector.
- During FY25, the two major gas utilities (SSGCL & SNGPL) enhanced network coverage by adding ~1,221km of mains and ~65km of service pipelines, enabling gas connectivity for 84 additional villages and towns.

Particulars	FY23	FY24	FY25*
Local Consumption (Mn MT)	**25.7**	**25.4**	**24.0**
Natural Gas	20.7	19.9	17.9
RLNG	5.0	5.5	6.1
Local Production | Natural Gas (Mn MT)	**25.0**	**24.0**	**22.5**
RLNG Imported (Mn MT)	**8.3**	**7.3**	**-****
Floating Storage and Re-gasification Unit (FSRU) (No.)		2	
Capacity FSRUs (Mn MT)		9.2	
Transmission Lines (Km)	13,775	13,989	14,276
Distribution Lines (Km)	41,352	41,463	41,577
Mains (Km)	157,395	161,806	162,031
Total Number of Connections (Mn No.)		10.8	
Structure		Oligopolistic	
Regulator		OGRA	

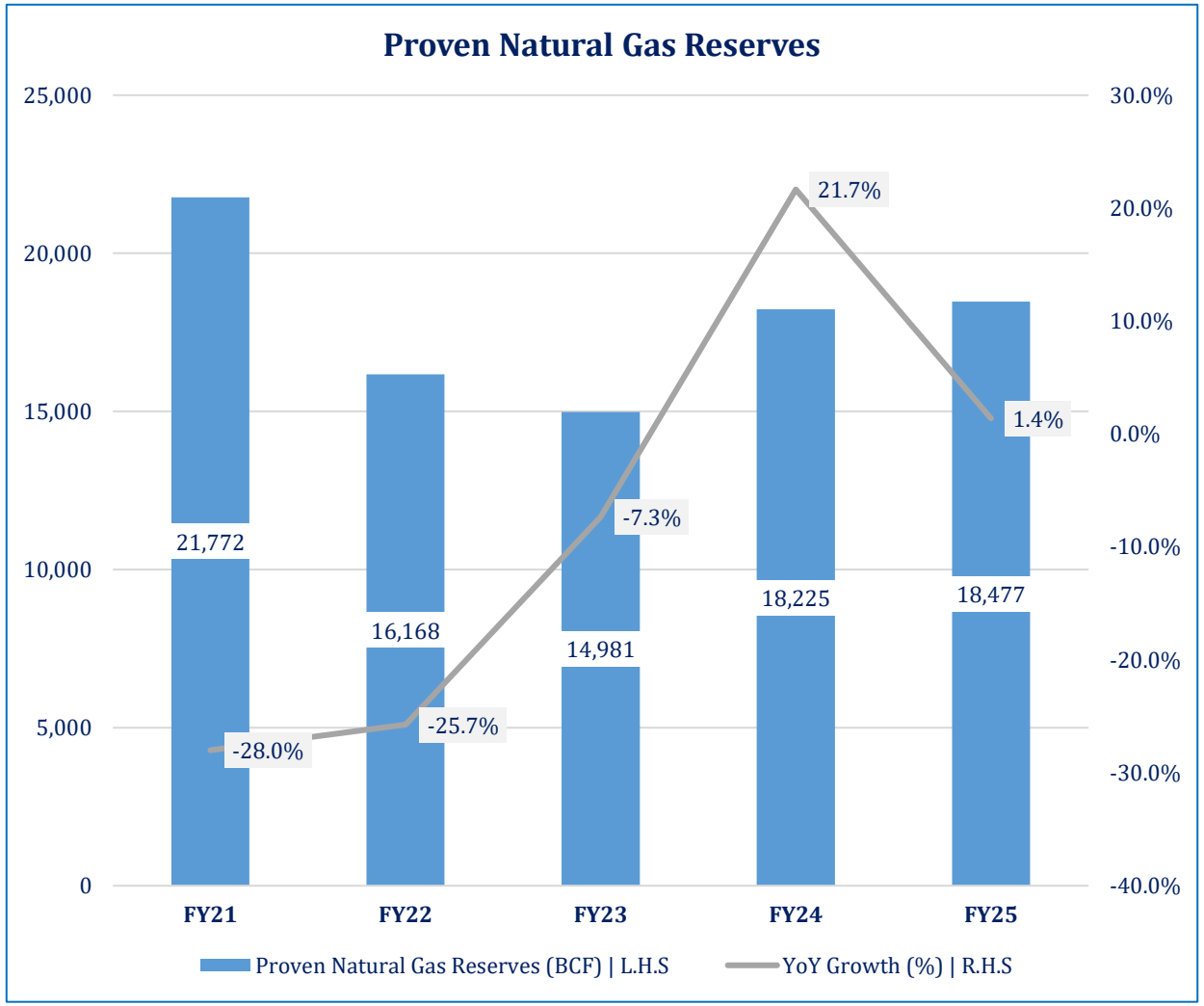
***Note**: Conversion Factor of ~1BCF (billion cubic feet) = 0.021Mn MTOE (Mn MT oil equivalent). * Prorated from 9MFY25.. ** Data not available for FY25 RLNG Imports.*

Source: PBS, PES, OGDCL

Exploration & Production

Local | Natural Gas Reserves

- During FY25, the country's proven natural gas reserves stood at ~18,477bcf (FY24: ~18,225bcf), up ~1.4% YoY.
- The local natural gas reserves after FY23 have shown a growing trend, mainly due to new discoveries by exploration companies, upward revisions of existing fields based on updated reservoir assessments, and increased drilling and development activity that enhanced recoverable volumes.
- Five new gas condensate discoveries were made by OGDCL during FY25 (Chak 202-1, Soghri North-1, Baloch-2, Faakir-1, and Bettani-2), with a combined estimated daily production potential of ~35MMCF of gas (SPLY: four discoveries). Additionally, a total of fifteen wells were spud during the year (SPLY: ~08 wells).



***Note**: Data estimated using OGDCL's share in recoverable natural gas reserves. BCF stands for billion cubic feet.*

Source: OGDCL

Exploration & Production

Local | Natural Gas Pricing

- OGRA calculates the average prescribed price, the average cost of providing gas for each licensee based on their annual operations and revenues.
- It then sends these prices to the Federal Government, which advises on the final consumer sale prices for each customer category.

Consumers	Jan'23	Nov'23	July'25
Domestic (Protected)			
Up to 0.25hm^3 /mo	121	200	200
Up to 0.5hm^3 /mo	150	250	250
Up to 0.6hm^3 /mo	200	300	300
Up to 0.9hm^3 /mo	250	350	350
Domestic (Non-Protected)			
Up to 0.25hm^3 /mo	300	500	500
Up to 0.6hm^3 /mo	600	850	850
Up to 1hm^3 /mo	1,000	1,250	1,250
Up to 1.5hm^3 /mo	1,200	1,450	1,450
Up to 2hm^3 per mo	1,600	1,900	1,900
Up to 3hm^3 /mo	3,000	3,300	3,300
Up to 4hm^3 /mo	3,500	3,800	3,800
Above 4hm^3 /mo	4,000	4,200	4,200

Consumers	Nov'23	Oct'23	Feb'24	Jul'24	Jul'25
Fertilizer Company (Feed Stock)	580	580	1,597	1,597	1,597
Fertilizer Company (Fuel Stock)	1,580	1,580	1,597	1,597	1,597
Export-Oriented (General Industry & Captive)	2,400	2,400	2,750	2,750	3,500
Power Stations and IPPs	1,050	1,050	1,050	1,050	1,225
General Industry	2,500	2,500	2,150	3,000	2,300
Cement Factories	4,400	4,400	4,400	4,400	4,400
Commercial & Ice Factories	3,900	3,900	3,900	3,900	3,900
CNG	3,600	3,600	3,750	3,750	3,750

Source: OGRA

Exploration & Production

Local | Tight Gas Policy 2024

- Tight Gas (Exploration & Production) Policy, 2011 was the first initiative to encourage upstream petroleum industry to invest in the exploration and production of tight gas. The document served as a comprehensive policy framework to promote and incentivize exploration and production of unconventional sources of hydrocarbons against the backdrop of growing population and economic expansion.
- **Definition**
  - Tight Gas is defined as a natural gas that cannot flow naturally at commercial rates with conventional methods despite having hydrocarbon reserves.
  - Extraction thus requires advanced technologies for its exploitation/production such as high-performance perforation, hydraulic fracturing, horizontal wells, slanted/deviated wells, multilateral wells &/or infill drilling or combination of these technologies or any new technology.
  - Moreover, it has an estimated value of effective permeability calculated using geometric mean of less than "~1.0 milli Darcy (mD)."
- The CY24 Policy has been designed to incentivize local and foreign E&P companies to invest in the unconventional hydrocarbons and is aimed at enabling the oil & gas industry to invest in unconventional ventures, mitigate demand-supply gap and provide a fair pricing regime compatible with market realities.
- **Objectives**
  - Incentivize Oil and Gas industry to invest in the exploration of unconventional/Tight gas resources that are not being produced due to non-commerciality.
  - Provide a Policy regime for transparent, effective, and efficient processing of regulatory approvals.
  - Address commercial viability issues of existing Tight Gas reservoirs.
  - To open new frontiers for exploration of Tight Gas which would help increase the exploration activities in the country.
  - Enhance indigenous production of hydrocarbons.
  - Minimize reliance on imported fuels and regenerate additional revenues for GoP.

Source: Petroleum Division

SEISMIC ACQUISITION SERVICES

Exploration & Production

Overview | Seismic Acquisition Services

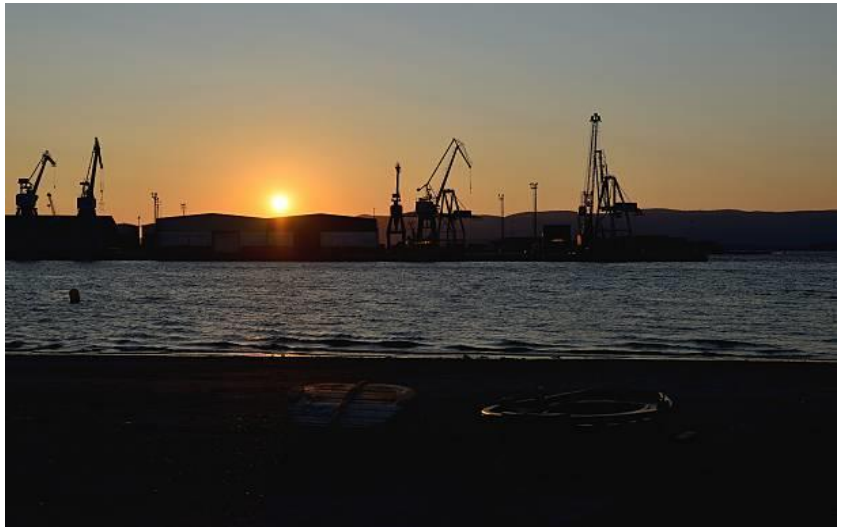
- Declining reserve life significantly increases the reliance on imported fuel to meet local demand. Exploration of new wells and major discoveries is imperative to improve local crude supply and reduce imports.
- Entities such as Polaris Geo offer seismic services that can facilitate exploration companies in the discovery of new oil and gas reserves and reduce reliance on imported crude. Such entities offer extensive project design and management services, cutting-edge technologies, and a highly skilled team of seismic experts to assist oil, gas, and mining companies in exploring challenging regions across the globe. These entities prioritize clients' needs and requirements to guarantee that the desired outcome is achieved.
- Some of the typical methods used by seismic acquisition services include vibroseis, dynamite, and 860 Accelerated Weight Drop System. Additionally, they offer GPS-guided mulchers to prevent cutting and narrow-width line construction. Moreover, these seismic acquisition entities conduct drilling using narrow-tracked, low-impact drilling equipment. Moreover, after completion, their projects undergo a comprehensive inspection to ensure that all environmental issues have been addressed.
- Currently, Pakistan's recoverable crude oil reserves are estimated at ~36.2Mn MT as of End-Jun'25 (SPLY: ~32.9Mn MT). The increase in oil reserves during FY24 is attributable to discoveries. Exploratory efforts of OGDCL led to five oil and gas discoveries, with an anticipated total daily production potential of ~30,919 bpd.
- New hydrocarbon discoveries continue across Pakistan's upstream sector, including OGDCL's oil discovery at Chakar-1 in Sindh, gas and condensate finds at the Spinwam-1 well in the Waziristan Block, additional discoveries such as Soghri North-1 and Faakir-1, and Mari Petroleum's oil and gas discovery at the Mari Ghazij CFB-1 in 2025.
- If the exploration companies take the services of the entities like Polaris Geo, the number of discoveries especially in challenging terrains and remote areas of Pakistan is most likely to increase. Hence, it will increase the recoverable reserves going forward.

Source: Polaris Geo

Exploration & Production

Business Risk | Seismic Acquisition Services

- Higher Costs and Fluctuating energy prices.
- Depleting reserves.
- Environmental concerns.
- Technological challenges.
- Geopolitical instability.



Source: Polaris Geo

Exploration & Production

SWOT Analysis

- Highly capital-intensive business.
- Government relations.
- Strategic importance.
- Robust local demand.
- Strong profitability

- Under-utilization of refining capacity.
- Exposure to exchange rate and international oil price movement.
- Technological lags.

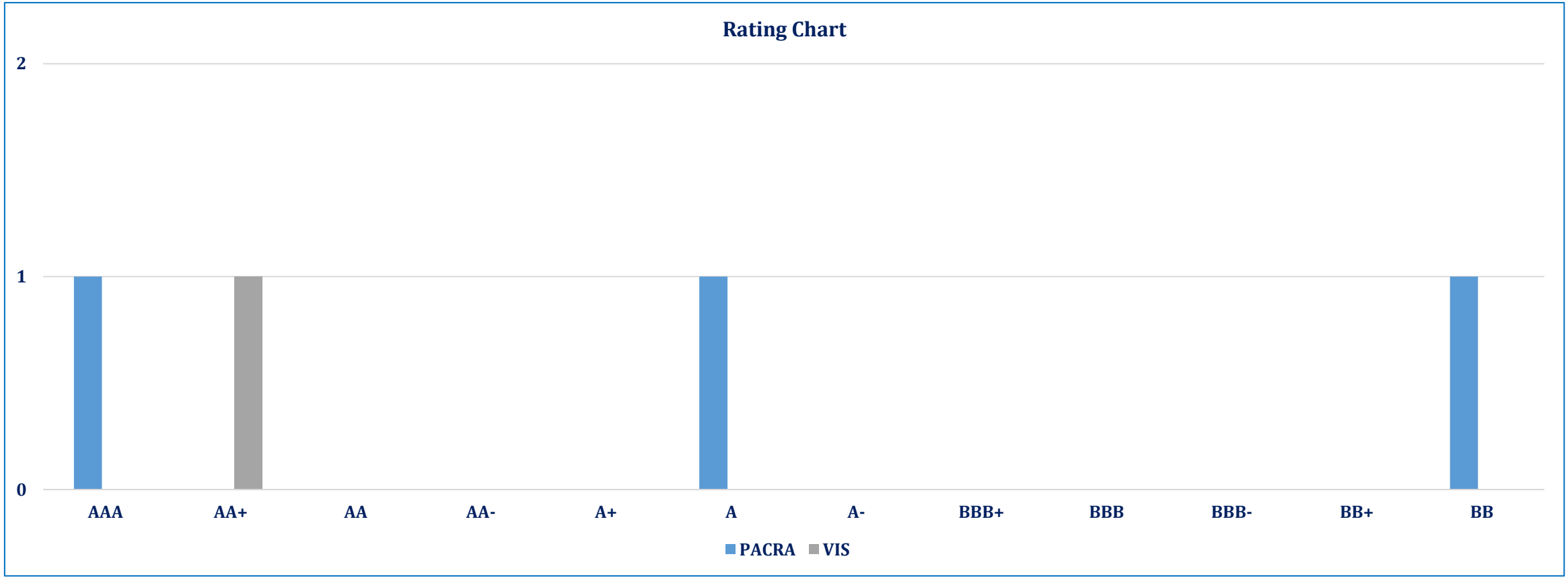
- Diversification – exploring further opportunities in the mining industry, renewables and energy value chain
- Attention/ focus of government towards solving issues of refineries.

- Reducing interest of international E&P companies in Pakistan
- Non-approval of refinery policy.
- Abrupt reduction in oil prices.
- Depleting local oil reserves.
- Environmental policies

Exploration & Production

Rating Curve

- PACRA rates 3 client in the exploration and production sector with a rating range of AAA to BB.



Exploration & Production

Outlook: Stable

- In FY25, Pakistan's GDP (nominal) stood at PKR~114.7trn (FY24: PKR~105.1trn), increasing, in real terms, by ~2.7% YoY (FY24: ~-2.5% growth) and is expected to grow by ~3.25% according to SBP in FY26.
- The sector has entered a "new chapter" following the historic signing of five major energy agreements on December 2, 2025. This partnership with Turkish Petroleum (TPOC) involves OGDCL, PPL, and Mari Energies in high-potential blocks including the Eastern Offshore Indus-C and Offshore Deep-C. This collaboration is expected to inject over USD 300 million in new investment and provide technical expertise for deep-sea drilling that was previously a major hurdle for local players.
- In 1QFY26 (compared to 1QFY25), the gross and operating margins declined to record at ~52.4% and ~53.3%, respectively. Net margins, however, followed a slightly improving trajectory to clock in at ~34.6%, up from ~33.1% in the previous period.
- The financial risk for E&P companies has significantly improved as the government successfully reduced the power sector's circular debt by PKR~0.8Tn over the past year. As of June 30, 2025, the total debt fell to PKR~1.6Tn, a sharp decline from previous years. This recovery, supported by a PKR~1.2Tn bank loan facility to settle IPP dues, has eased the cash flow bottlenecks that historically restricted the sector's ability to fund aggressive drilling and exploration programs.
- Under the Tight Gas Policy 2024, the sector is pivoting toward unconventional hydrocarbon resources to combat the depletion of mature fields. OGDCL has already launched a comprehensive study with Schlumberger to identify tight gas prospectivity in the Indus Basin, with plans to drill 25 wells over the next five years. These reforms offer better pricing and faster regulatory approvals, aiming to tap into an estimated ~25.2 TCF of prospective tight gas resources.
- Despite natural declines in older fields, Pakistan's recoverable crude oil reserves rose by ~10.0% YoY to estimated ~36.2Mn MT in FY25. This growth is driven by high-impact discoveries, such as OGDCL's find at the Braghzai X-1 well in the Nashpa Block, which is expected to produce ~2,280 bpd. The industry is increasingly utilizing advanced Seismic Acquisition Services (e.g., Polaris Geo) to improve discovery rates in challenging terrains, maintaining a Stable outlook for the sector.

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- Pakistan Stock Exchange (PSX)
- PACRA Database

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