



Oil Transportation & Storage

Research Team

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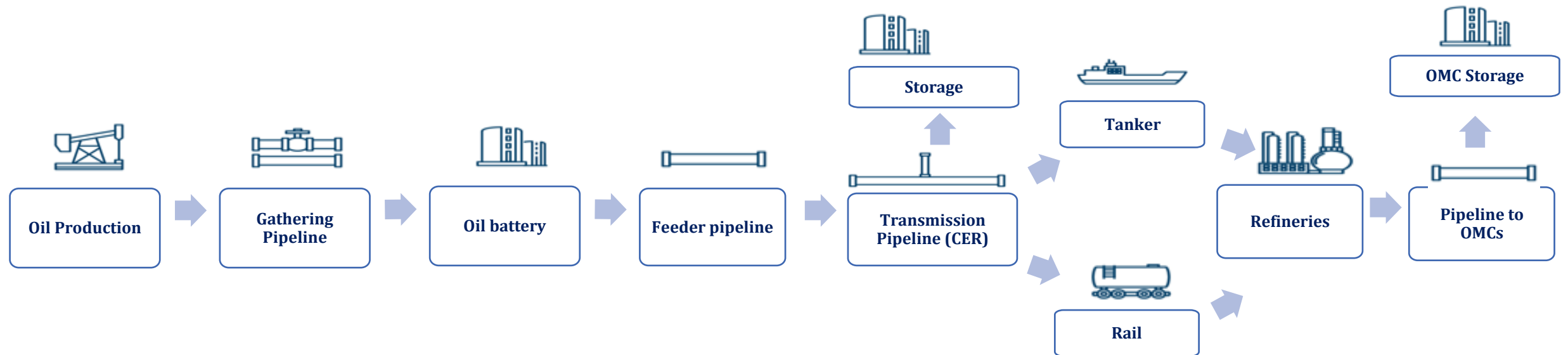
Oil Transportation & Storage

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Oil Transportation & Storage

Introduction

- There are two main types of oil pipelines: Crude Oil pipelines and Product Pipelines. Crude oil pipelines transport Crude Oil from oil wells to refineries. In contrast, Product pipelines carry refined products such as Gasoline, Kerosene, Jet Fuel, and Heating Oil from refineries or import terminals to the oil marketing companies' storage.
- After extraction, pipelines carry Crude Oil to processing or storage facilities, where it is stored before being transferred into feeder pipelines, which connect to nationwide pipeline networks in operation. Refineries receive the crude oil through nationwide pipelines, process it and subsequently pump the refined petroleum products back into the pipeline network. The supply chain for POL products, either refined or unrefined, is mainly comprised of oil tankers, trucks, railroads, and pipelines.



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Global | Crude Oil Pipelines

- The global pipeline network is broadly categorized into oil and gas pipelines. As of End-Mar'25, the total worldwide length of operating oil transmission pipelines stood at ~345,110Km (End-May'24: ~324,871Km), an increase of ~6.2%.
- The top 5 countries based on the operating crude oil pipeline are the USA, Russia, China, Canada and Iran. Among them, oil pipelines in China, Russia and Iran are entirely state-owned. Country-specific data reveals that the USA and Russia accounted for ~40.2% share (SPLY: ~41.0%) of operational oil pipelines as of Mar'25.
- A total of ~12,313Km of crude oil transmission pipelines are being constructed in the world, as of Mar'25. Iran and India together are constructing ~39.4% of this, followed by Russia with ~15.4% share.
- Iran is constructing pipelines to further expand its wide oil infrastructure, while India is building pipelines to expand its existing network for refineries and petrochemical complexes.

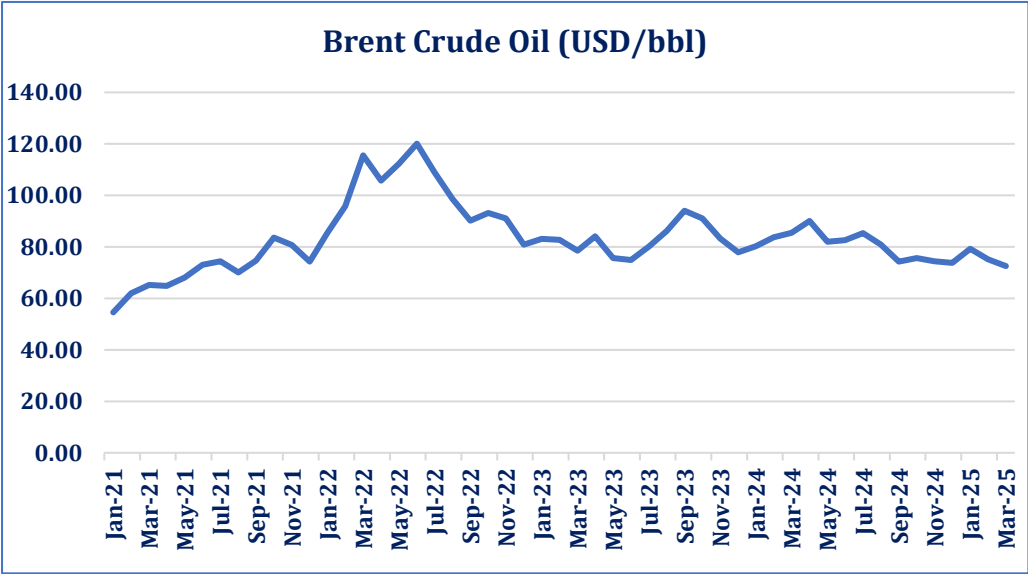
Crude Oil Pipelines by Country (End-Mar'25)	Operating (Km)	Operating Share (%)
United States	86,939	25.2%
Russia	51,707	15.0%
China	34,559	10.0%
Canada	15,828	7.8%
Iran	14,474	4.6%
India	9,254	2.7%
Pakistan	941	0.3%
Rest of the World	118,953	34.5%
World	345,119	100%

Crude Oil Pipelines by Country (End-Mar'25)	Under Construction (Km)	Construction Share (%)
India	2,824	22.9%
Iran	2,028	16.5%
Russia	1,894	15.4%
China	1,446	11.7%
Iraq	1,155	9.4%
Rest of the World	2,966	24.1%
World	12,313	100%

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Global | Oil Dynamics

- Global crude oil production was up ~0.6%, YoY, in CY24 , and stood at 4,557.2mln MT, while the USA and Saudi Arabia cumulatively accounted for ~22.0% of global production. Overall, the Middle East and North America comprised over ~58.1% of the global crude oil production in CY23, while the ‘Other CIS’ region contributed ~15.0%, with Russia’s share in global output recording at ~12.0%. Global crude oil production as a share of total available reserves stood at ~2.1% (SPLY: ~2.0%).
- Global crude oil consumption was up ~0.9%, YoY in CY24, recording at 4,554.7mln MT. Average Brent crude oil prices stood at USD~80.7/bbl in CY24; however, these have declined since then. Average prices in 3MCY25 stood at USD~75.7/bbl, down ~14.4% from the same period last year. Going forward, global crude oil prices are expected to stay below USD~70.0/bbl by End-CY25 owing to geopolitical tensions and trade tariffs.



Crude Oil Production (mln MT)						Crude Oil Consumption (mln MT)					
Period	CY19	CY20	CY21	CY22	CY23	Period	CY19	CY20	CY21	CY22	CY23
Crude Extraction	4,487.4	4,188.2	4,237.9	4,424.1	4,514.1	Crude Consumption	4,451.5	4,051.2	4,277.6	4,422.1	4,530.5
Middle East	1,411.4	1,300.3	1,314.7	1,442.1	1,413.9	Asia Pacific	1,661.7	1,574.2	1,613.0	1,656.6	1,744.3
N. America	1,109.4	1,060.4	1,079.0	1,133.6	1,207.5	N. America	1,031.5	900.8	983.4	1,000.3	1,005.1
CIS	718.5	659.1	673.2	679.2	675.2	Europe	700.3	609.3	639.1	660.5	653.6
Asia Pacific	361.5	353.1	348.2	344.5	345.7	Middle East	390.9	362.5	382.9	411.6	421.4
S. & Cent. America	329.5	313.0	313.5	339.7	378.1	S. & Cent. America	279.2	242.8	271.1	291.1	301.2
Africa	397.2	333.9	348.4	333.6	341.5	CIS	198.3	191.9	202.8	207.0	210.1
Europe	160.0	168.4	160.9	151.4	152.1	Africa	189.6	169.7	185.1	195.0	194.8

Note: Data is recorded as of May'24; bpd – barrels per day 2024 Data is recorded as of Aug'24*

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Global | Trade

- Crude Exports:** In CY23, major crude oil exporters included Saudi Arabia, Russia, and Canada, with these forming ~37.4% of the total ~2.1bln MT crude oil exported. For Saudi Arabia, the largest export destinations were other Asia Pacific countries (~26.7%, SPLY: ~25.2%), China (~24.6%, SPLY: ~24.0%) and Japan (~14.7%, SPLY: ~14.4%). With respect to Russia's total crude exports, ~13.5% went to Europe (SPLY: ~44.2%), while ~44.4% was imported by China (SPLY: ~32.5%). Meanwhile, the USA exported ~43.5% of the total crude produced to Europe (SPLY: ~44.9%).
- Crude Imports:** The top three global importers of crude oil, as depicted, formed ~62.2% of the total crude oil imported globally during the year (~75.5%). China remained the largest crude oil importer, with ~11.0% YoY higher imports signaling economic recovery. Meanwhile, Europe imported ~10.7% YoY lower crude oil (SPLY: ~11.3% YoY growth), with Russia forming ~4.3% of its total crude oil imports (SPLY: ~10.0%) and the USA accounting for ~15.2% (SPLY: ~20.3%), reflecting the region's lower dependency on Russia's Crude Oil.

Country	Exports mln MT (CY23)	Share, Global Exports (%)	YoY Δ	Country	Imports mln MT (CY23)	Share, Global Imports (%)	YoY Δ
Saudi Arabia	349.1	16.4%	-5.1%	China	563.9	26.5%	+11.0%
Russia	240.8	11.3%	-8.3%	Europe	436.6	20.5%	-10.7%
Canada	207.2	9.7%	+4.2%	USA	323.8	15.2%	+3.5%
USA	185.0	8.7%	+14.7%	Other Asia Pacific	288.5	13.6%	-3.1%
Iraq	184.2	8.7%	-3.6%	India	231.0	10.9%	-0.1%
UAE	170.7	8.0%	-4.3%	Japan	125.5	5.9%	-5.3%
ROW	790.0	37.1%	+1.9%	ROW	157.7	7.4%	-3.9%
World	2,127.1	100%	-0.4%	World	2,127.1	100%	-0.4%

Note: Data is recorded as of May'24; bpd – barrels per day. bcm = billion cubic meters

Source: Global Energy Monitor, IEA, S&P Global

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Local | Snapshot

- Pakistan’s oil movement (crude oil and petroleum products) is majorly carried through road transport which comprised ~69.0% share in FY24 (SPLY: ~63.0%).
- Transport through pipelines stood as the second-largest mode of oil movement with a share of ~29.0% in FY24 (SPLY: ~35.0%), whereas ~2.0% (SPLY: ~2.0%) was conducted through railways.
- In FY24, gross revenue for the sector increased by ~5.3% YoY to PKR~11,126mln (SPLY: PKR~10,569mln), despite a decline in oil throughput by ~8.1% YoY to ~3.8mln MT. In 1H FY25, oil throughput also increased to ~2.5mln MT, an increase of ~31.6% (SPLY: ~1.9mln MT).
- Pipelines are the cheapest and the safest mode of transportation for petroleum products. The total length of the oil pipeline network operational in the country is over ~2,000Km, transporting High-Speed Diesel (HSD), motor gasoline (MOGAS) as well as crude Oil.
- The upgrade of the White Oil Pipeline (WOP) in CY21 by the Pak Arab Pipeline Company (PAPCO) allows the transport of both MOGAS and HSD through its ~786Km route from Karachi to Mahmoodkot.
- Currently, PARCO and PAPCO control all four of Pakistan’s major oil pipelines, two of which run through the country’s industrial hub, connecting Karachi to Mahmoodkot. Other players in the sector, along with refineries, operate their pipelines exclusively for internal transportation, not for commercial use.

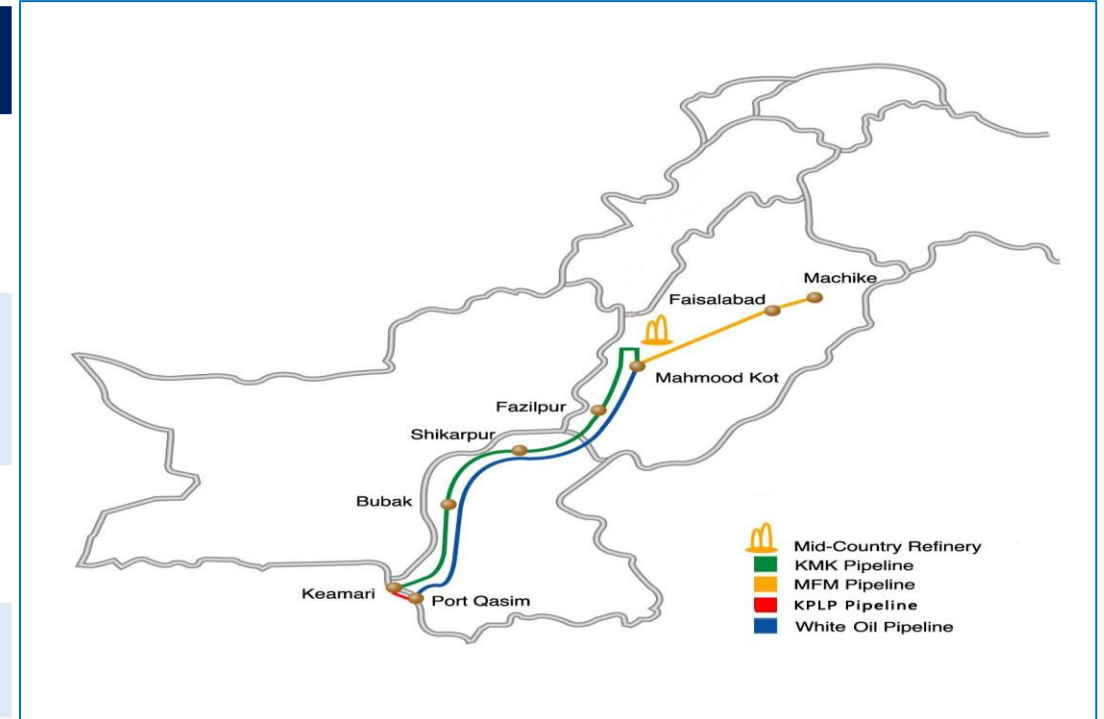
Particulars	Units	FY21	FY22	FY23	FY24	1H FY25
Gross Revenue	PKR mln	6,104	8,879	10,569	11,126	7,145
Major Oil Pipelines	No.	4	4	4	4	4
Structure	Regulated					
Oil Throughput	000 MT	3,851	4,880	4,166	3,829	2,476
Regulator	Oil & Gas Regulatory Authority (OGRA)					
Association	Oil Companies Advisory Council (OCAC)					
Key Players	Pak Arab Refinery Company (PARCO) & Pak Arab Pipeline Company (PAPCO)					
Products Transported	Crude Oil, High Speed Diesel (HSD) and Motor Gasoline (MOGAS)					

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Local | Pipeline Network

- The entire up-country demand for HSD and MOGAS is efficiently met through an integrated pipeline system. PAPCO's White Oil Pipeline (WOP) transports these fuels from Karachi to Mehmoodkot, while PARCO's Mehmoodkot-Faisalabad-Machike (MFM) pipeline extends the supply further to Sheikhupura.
- PARCO and PAPCO (a subsidiary of PARCO and operator of the WOP) in FY21 have converted the two pipelines from the present single product (HSD) to multiproduct (HSD and MOGAS) with an investment of USD~194.0mln.

Pipeline	Year Commissioned	Operated by	Length (Km)	Route	Product
Karachi-Mahmoodkot (KMK)	1981	PARCO	870	Keamari, Bubak, Shikarpur, Fazilpur, Mahmoodkot	Crude Oil
Mahmoodkot-Faisalabad-Machhike (MFM)	1997	PARCO	362	Mahmoodkot, Faisalabad, Machhike	HSD
White Oil Pipeline (WOP)	2005	PAPCO	786	Port Qasim, Shikarpur, Mahmoodkot	HSD, MOGAS
Korangi-Port Qasim link	2006	PARCO	22	Port Qasim, Keamari	Multi-Purpose



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Upgradation & Expansion | White Oil Pipeline

- **Upgradation of MFM Pipeline:** In FY22, the Pakistan Light Oil Pipeline MFM MOGAS (MFM MP) Phase-II Reconstruction and Expansion project was completed. The terminal station-3 and terminal Station-4 are located in Faisalabad and Sheikhupura, respectively.
- **Construction of WOP finalized with SIFC backing:**
 - WOP is a flagship initiative led by the Frontier Works Organization and Pakistan State Oil (PSO) to complete the oil pipeline, signed in Sep'24.
 - The project, spanning ~477.0Km, will link key locations in Pakistan, including Machike (Sheikhupura), Thalian (Rawalpindi), and Taru Jabba (Peshawar), and aims to enhance the country's Oil distribution system.
 - Running parallel to the motorway, this two-part pipeline will connect the Attock Refinery with key sites like Chak Pirana (Gujrat) and Faqirabad (Attock), ensuring smoother and more efficient Oil transportation across the country.
 - The pipeline's construction is expected to significantly reduce transportation costs and smoothen the supply chain from the current capacity of ~7.0mln MT to ~10.0mln MT annually, reducing the risk of fuel adulteration and increasing safety.

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Pricing and Taxes

- PAPCO generates its revenue by way of throughput agreements with the OMCs and refineries. The company has been awarded a 25-year tariff plan by OGRA after a competitive bidding process. The HSD tariff was finalized with the GoP at the pipeline's inception in FY00, accompanied by a minimum throughput guarantee of ~8 years to support its initial operations.
- The transportation of MOGAS through the White Oil Pipeline (WOP) has been assigned a tariff regulated by OGRA, fixed for a period of ~20 years, aligning with the project's lifespan. The amount is payable in PKR to be converted at the USD to PKR prevailing rate on the date of the payment.
- Sales tax applicable on the sector is ~18.0%. This was increased in FY24 from the previously ~17.0% applicable, through the Finance Supplementary Act 2023. The import of Crude Oil is subject to a customs duty of ~3.0%, an additional customs duty of ~2.0% , federal excise duty (FED) of ~5.0%, and income tax of ~12.0%.
- Among Petroleum Products, MOGAS is taxed with an additional customs duty of ~2.0%, a regulatory duty of ~10.0% and an income tax of ~12.0%. For High-Speed Diesel (HSD), an additional customs duty of ~2.0%, a regulatory duty of ~10.0%, and an income tax of ~12.0% is

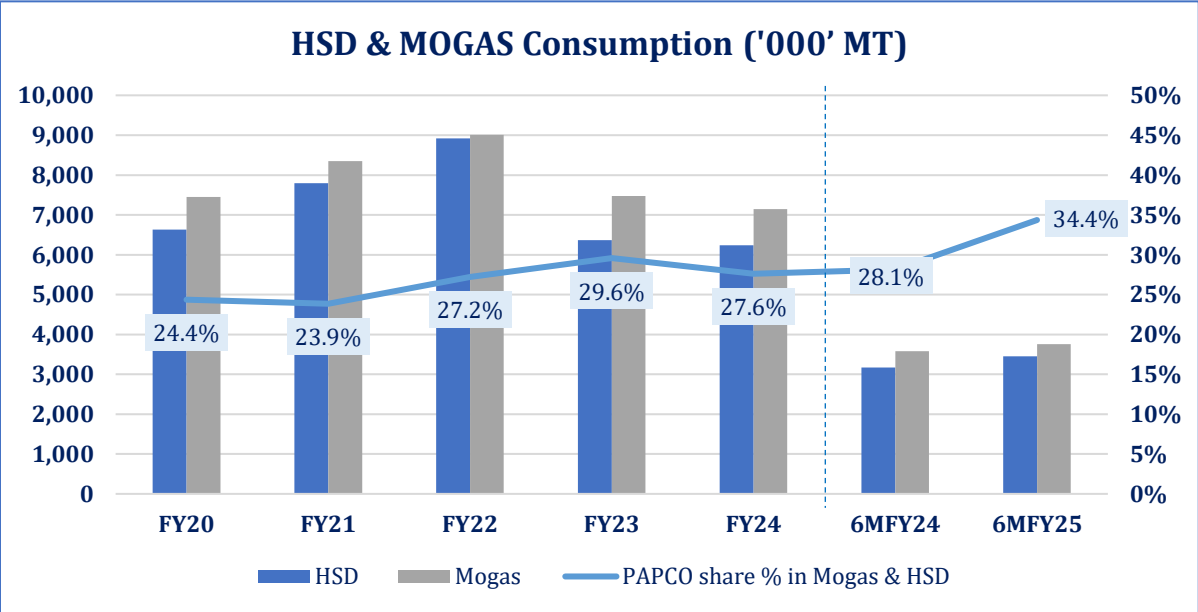
White Oil Pipeline Tariff Structure			White Oil Pipeline Tariff Structure	
High Speed Diesel	Karachi-Mahmoodkot	Karachi-Shikarpur	Motor Gasoline	USD/MT
	USD/MT			
1st five years	15.889	10.068	Karachi-Mahmoodkot	11.27
2nd five years	15.342	9.770	Karachi-Shikarpur	6.43
3rd five years	13.252	8.476		
4th five years	10.416	6.884		
5th five years	9.670	6.387		

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Local | Demand

- In FY24, the overall consumption of petroleum products (as depicted below) was recorded at ~16.6mln MT, down ~25.5% YoY, whilst comprising ~86.8% White Oils and ~13.2% Black Oils. The three major products, i.e., HSD, MOGAS and RFO, cumulatively accounted for ~92.8% of the total petroleum products consumed in the country (SPLY: ~94.4%), with RFO consumption down ~11.4% YoY (RFO consumption, during FY20-24, declined at a CAGR of ~1.0% owing to phasing out of RFO consumption in the power sector). Meanwhile, MOGAS and HSD consumption was down ~0.9% and up ~1.4%, respectively, during the year (SPLY: down ~74.6% and ~78.1% YoY, respectively).
- During 9MFY25, consumption of POL products stood at ~13.2mln MT, up 7.3% YoY where MOGAS and HSD formed ~79.5% of the total POL consumption. A sectoral-level analysis reveals that the transport sector accounted for ~86.0% of the total petroleum consumed in the country in FY24, while in 8MFY25, this stood at ~79.5%. PAPCO’s share in HSD and Mogas has averaged at ~26.3% in FY20-23. It stood at ~27.6% in FY24, however, rose to ~34.4% in 6MFY25 (SPLY: ~28.1%), as reliance on pipelines for transportation of oil and pol products

POL Consumption (mln MT)							
Period	FY20	FY21	FY22	FY23	FY24	9MFY24	9MFY25
White Oils	14.9	16.9	18.8	14.9	14.5	10.7	11.5
MOGAS	7.5	8.4	9.0	7.5	7.1	5.3	5.5
HSD	6.6	7.8	8.9	6.4	6.2	4.6	5.0
JP-1/ JP-8	0.6	0.4	0.5	0.6	0.8	0.6	0.6
Others*	0.2	0.3	0.4	0.3	0.2	0.2	0.4
Black Oils	2.4	3.2	4.3	2.6	2.2	1.6	1.7
RFO	2.4	3.2	4.3	2.6	2.2	1.6	1.7
Total	17.3	20.1	23.1	17.4	16.6	12.3	13.2

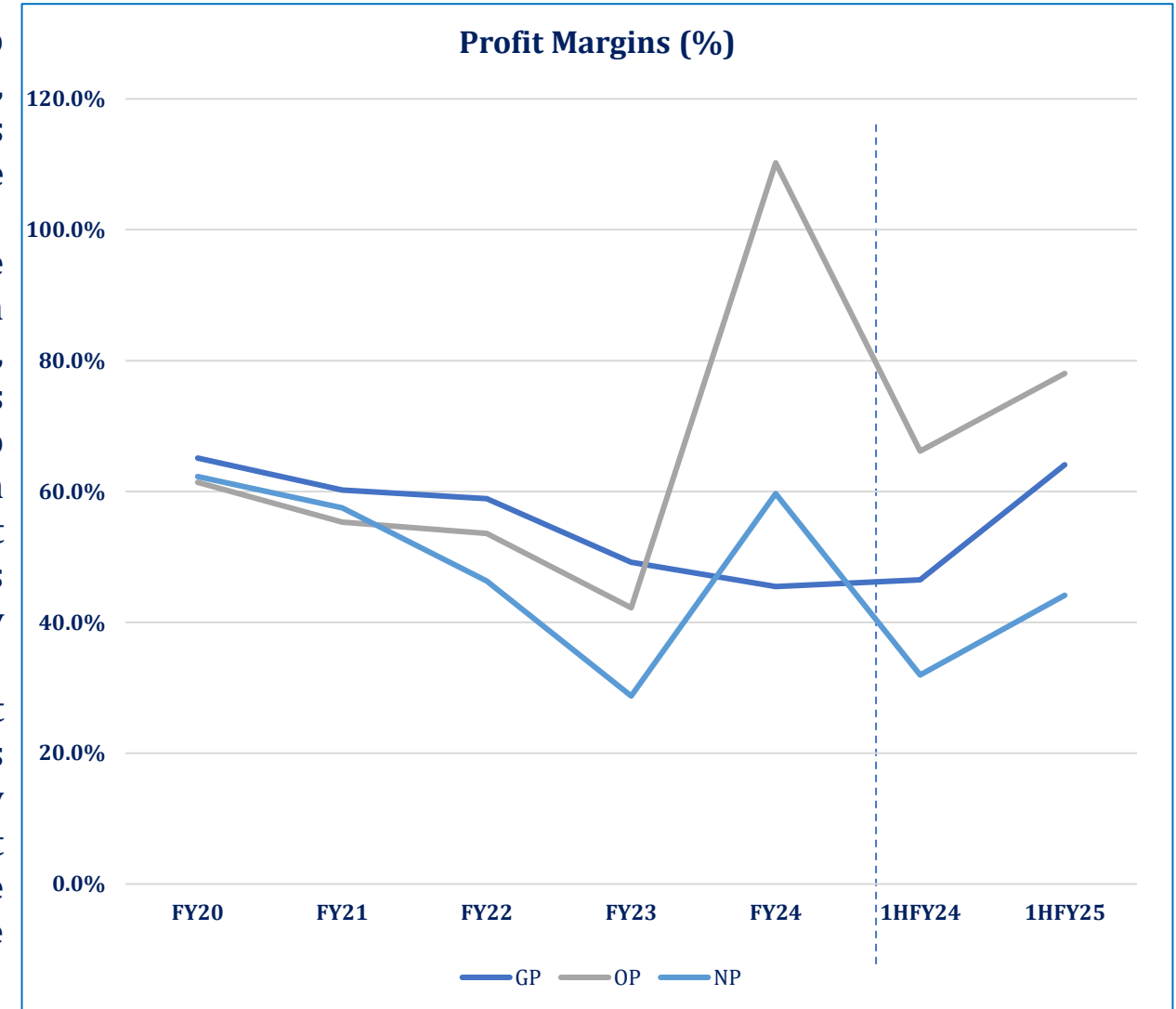


Note: Petroleum imports include HSD, Crude Oil, JP-1 & MOGAS. * Includes Kerosene, LDO, 100 LL, NAPTHA and HOBC.

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Local | Business Risk

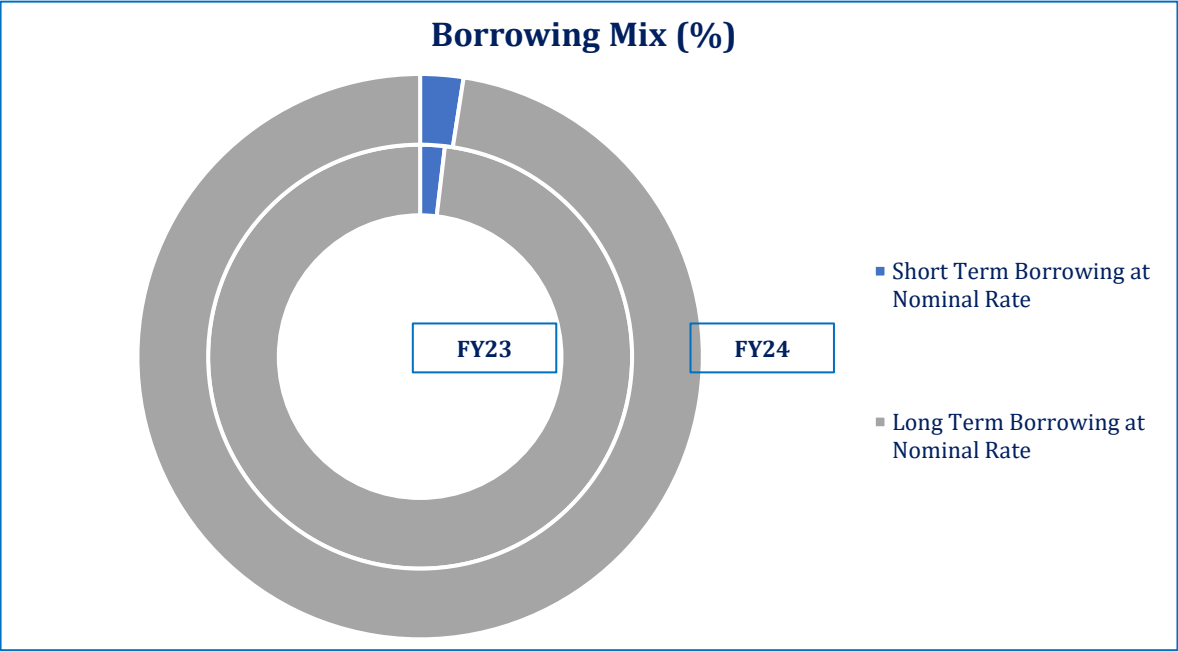
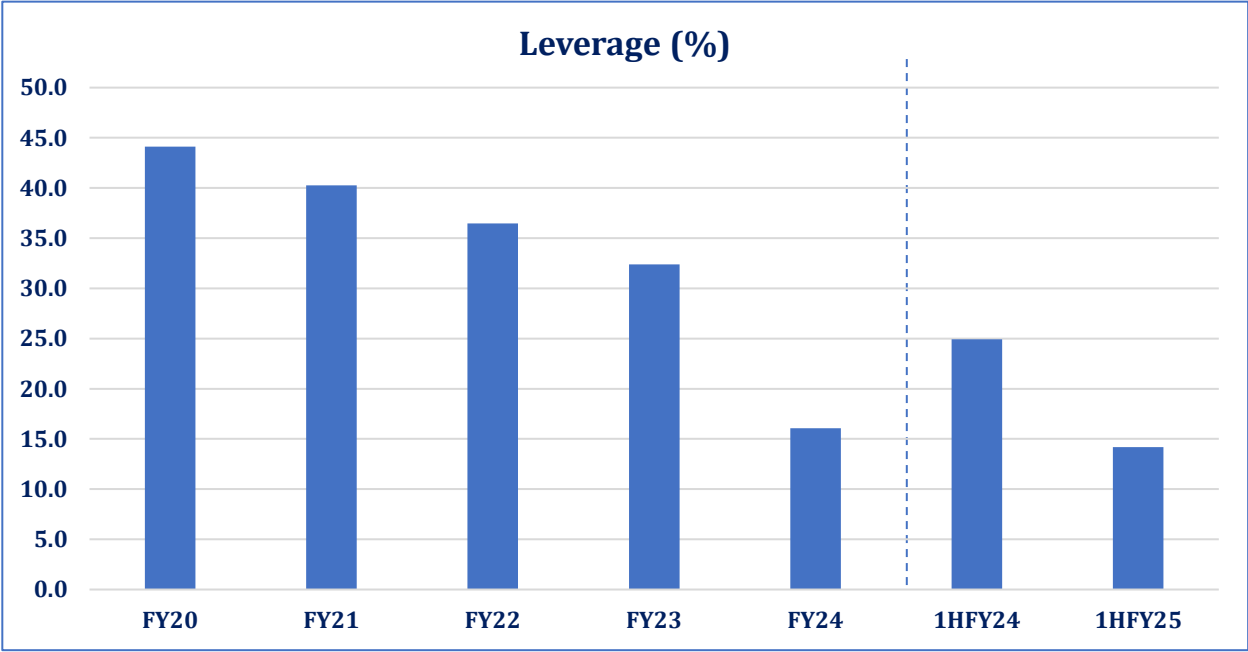
- OGRA regulates pipeline delivery tariffs, which are based on two factors: (i) fixed tariff and (ii) the quantity of oil transported, determined by pumping and storage capacity. The sector's sales revenue is USD-linked, offering a natural hedge against exchange rate fluctuations or reduced deliveries.
- Therefore, despite lower throughput levels during FY24, the sector registered ~5.0% growth in sales revenue that clocked in at PKR~11,126mln, reflecting the hedging impact. However, gross margins fell to ~45.5% (SPLY: ~49.2%), as cost of sales increased by ~12.6%, while operating margins rose sharply to ~110.2% (SPLY: ~42.2%), driven by income from foreign deposits and currency depreciation. Net margins stood at ~59.7% (SPLY: ~28.7%) as income from non-financial assets increased by ~191.6% YoY while finance cost decreased by ~95.4% YoY.
- For 1HFY25, the sector's average gross margins were recorded at ~64.1% (SPLY: ~46.5%) whereas average operating margins stood at ~78.0% (SPLY: ~66.1%) as revenue increased by ~27.5%, however, cost of sales declined by ~14.5%. Average net margins for 1HFY25 stood at ~42.8% (SPLY: ~31.9%) on the back of increased income from non-financial assets, which rose by ~90%.



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Financial Risk | Borrowings

- The sector’s borrowing mix, which comprises short-term and long-term borrowings at nominal interest rates, remained consistent between FY23 and FY24, in that, long-term borrowings constituted the largest share of ~97.5% indicating stable and long-term debt financing (FY23: ~98.1%) whereas short-term borrowings recorded a nominal share of ~2.5% (FY23: ~1.9%).
- The sector’s declining leverage ratio from ~32.4% in FY23 to ~16.1% in FY24 reflected an improvement in the sector’s capital structure and increased reliance on internal capital. The sector’s long-term borrowings reduced by ~48.0% in FY24 compared to FY23.
- In 1HFY25, the trend of declining leverage ratio continued as it was recorded at ~14.2%, down from ~24.9% in the same period last year. Overall borrowing recorded ~48.0% YoY decline.

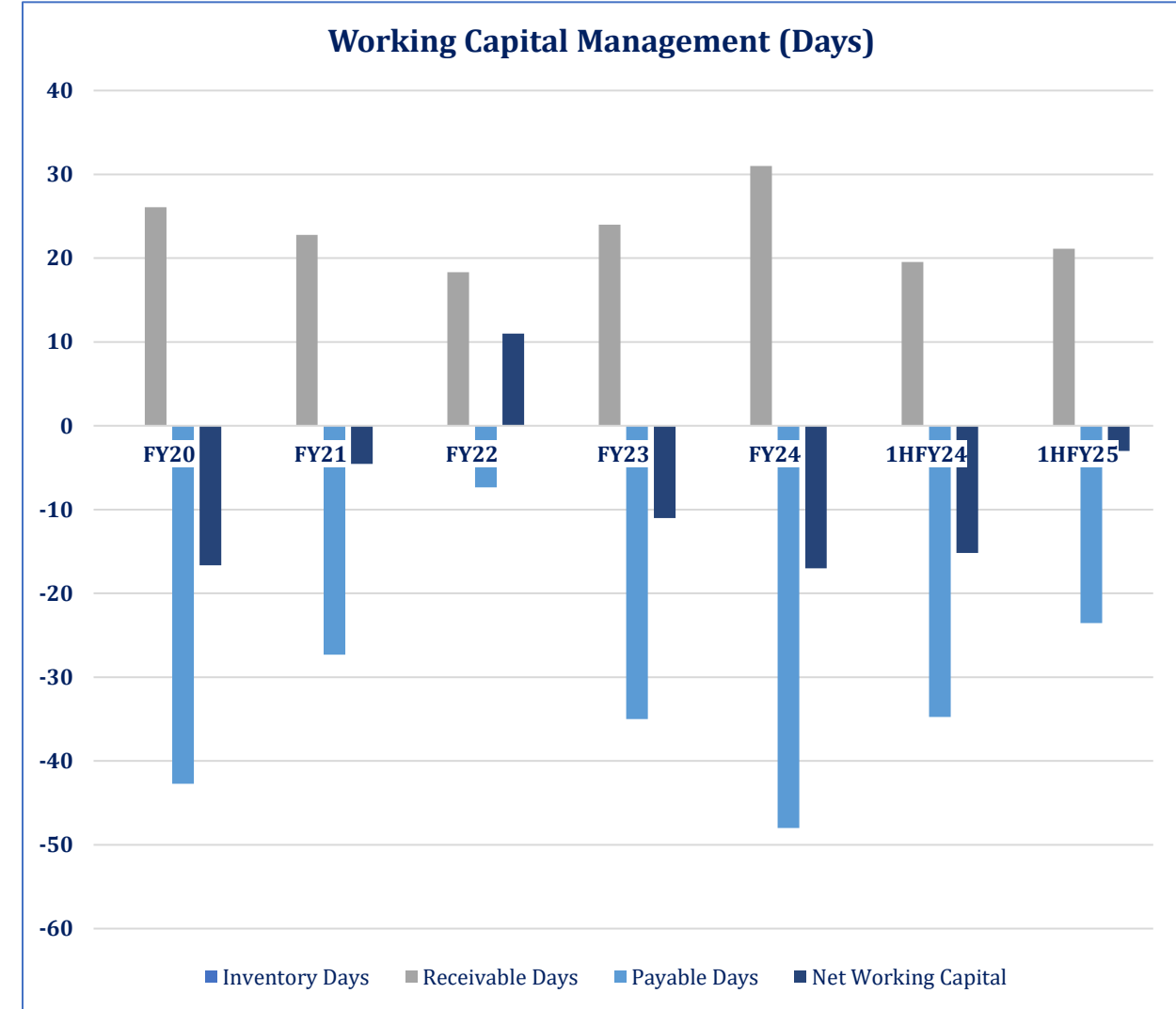


Note: Calculation are based on Sector player having market share of more than~50% based on Revenue.

Oil Transportation & Storage

Financial Risk | Working Capital

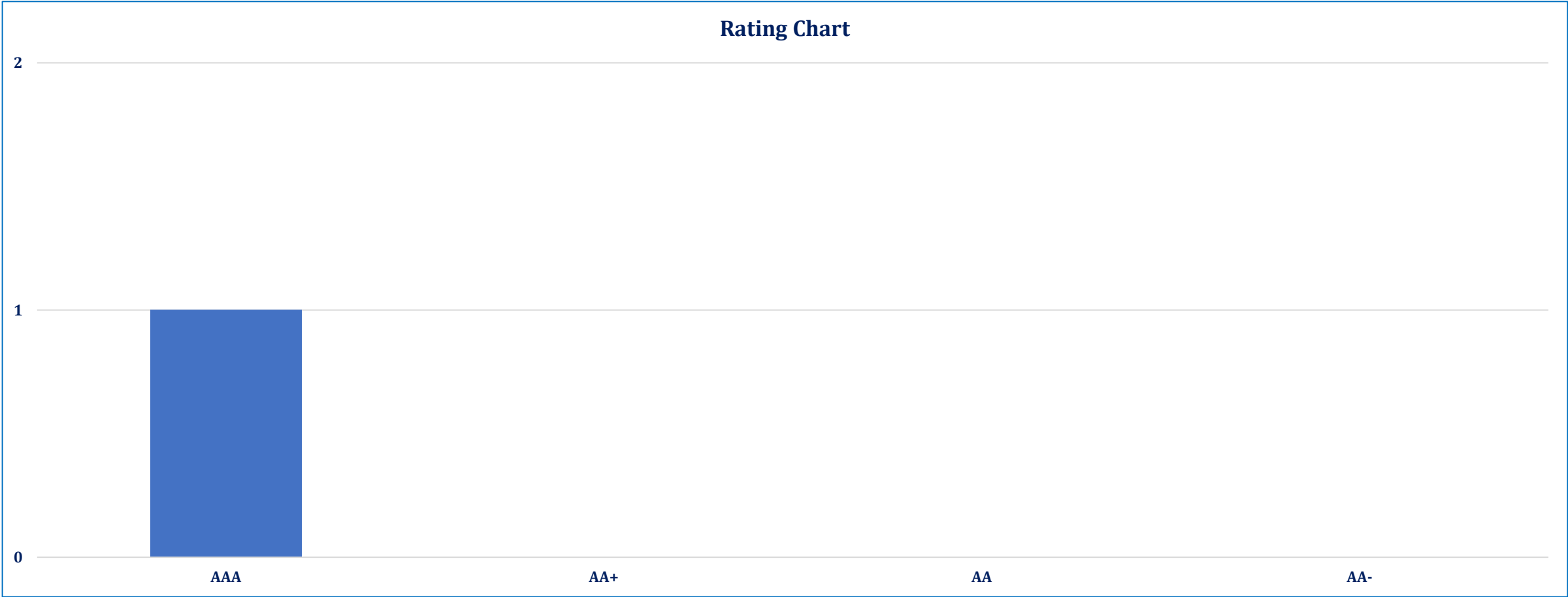
- The sector's working capital cycle is a function of its trade receivables and payables, as it records minimal or no inventory. The sector player utilizes its storage facilities at pumping locations to ensure smooth crude oil flow through pipelines.
- During FY24, the sector's trade receivable days increased by ~7 days, rising to ~31 days from ~24 days in FY23. Meanwhile, payable days increased by ~13 days, reaching ~48 days in FY24, as receivables increased by ~24.6%, YoY, while sales increased by ~5.3%.
- During 1HFY25, the sector's net working capital cycle was negative at ~ -3 days as payable days were recorded at ~24 days while receivable days stood at ~21 days.
- The sector's operating cycle is derived from the throughput agreements with Oil Marketing Companies and Refineries, under which sector player is entitled to settle payments and receive funds within 45 days of invoicing.
- This arrangement, under long-term agreements, ensures smooth cash flows. Resultantly, the sector maintains a strong working capital cycle, with excess liquidity to meet its operational and financial needs.
- The sector does not maintain any inventories; therefore, inventory days are not recorded.



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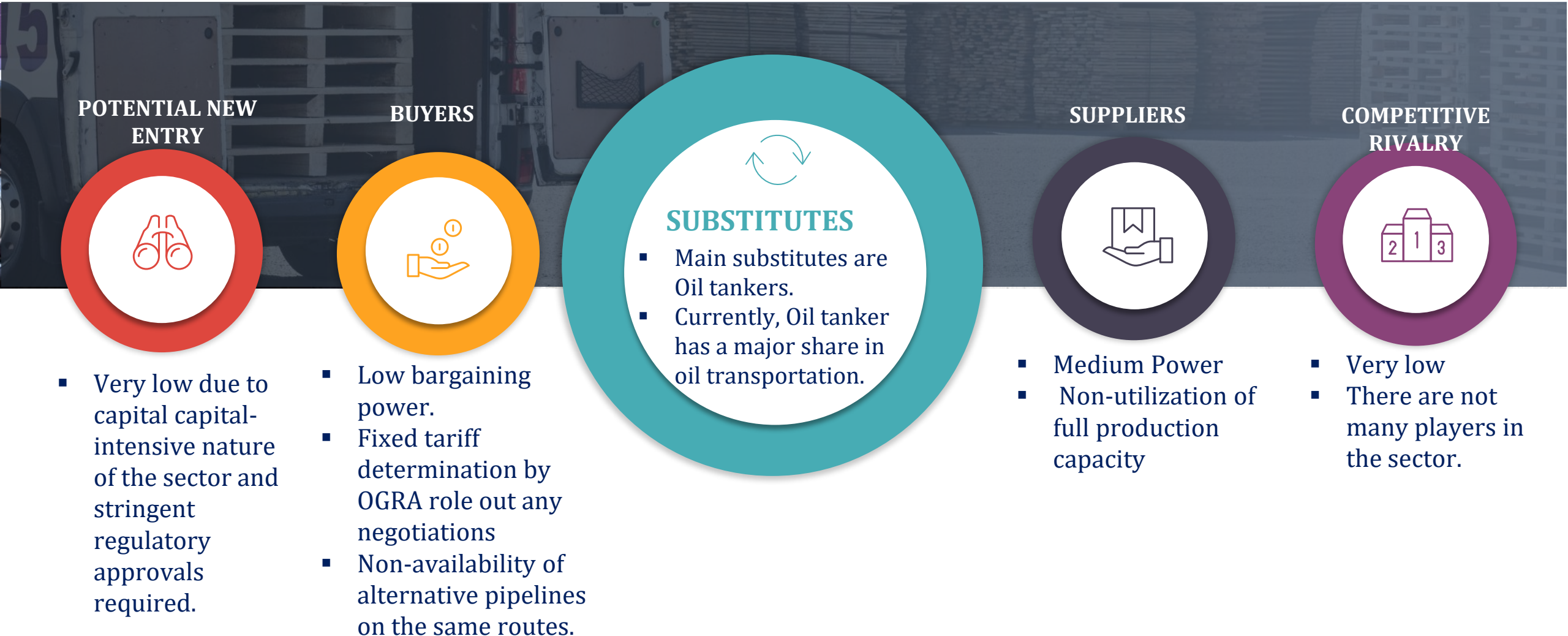
Rating Curve

PACRA rates one player in the sector with a long-term rating of AAA.



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Porter's 5 Forces Model



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SWOT Analysis

- Single player in the Sector
- Growing demand for pipelines due to cost-effectiveness
- Low inventory management
- No environmental impact or road accidents
- USD-indexed tariffs



- Capital-intensive
- Tariffs regulated by OGRA
- High maintenance and depreciation
- Longer regulatory approval process

- Natural disasters
- Pipeline leakages or damage inflicted
- Abolishment of fixed tariff regime or conversion to PKR-based return
- Security threats

- Pipeline network is extendable
- Growing opportunity for MOGAS transportation
- Pipelines can be upgraded for dual purposes (MOGAS and HSD)
- Increasing demand for petroleum products in the country

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Outlook: Stable

- Pipelines are considered a cost-effective and environmentally-friendly mode of transporting crude oil and petroleum products. They not only ensure efficient domestic transportation but also facilitate cross-border movement of Oil and Gas, making them a strategically significant part of the country's energy infrastructure.
- As of End-Oct'24, road transport handled ~69.0% of the total movement of crude oil and petroleum products, followed by pipelines at ~29.0%, and railways at ~2.0%. Pakistan's operational oil pipeline network (crude oil + petroleum products) spans over ~2,000Km, primarily transporting High-Speed Diesel (HSD), Motor Gasoline (MOGAS) and crude oil.
- PAPCO, the sole commercial operator of the White Oil Pipeline (WOP), completed an upgrade in CY21, enabling the transport of both MOGAS and HSD through the pipeline. An expansion project spanning ~477.0Km is expected to start soon, aiming to connect strategic hubs such as Machike (Sheikhupura), Thalian (Rawalpindi), and Taru Jabba (Peshawar), further enhancing the country's Oil Pipeline network.
- The sector benefits from fixed tariffs and USD indexation, which limit its revenue volatility, providing a natural hedge against exchange rate fluctuations. This mitigates price sensitivity and keeps margins highly attractive, with volumes serving as the primary driver of growth. Despite lower throughput in FY24, the sector achieved ~5.0% revenue growth, reflecting the positive impact of currency hedging. Gross margins stood at ~45.5% while operating margins surged to ~110.2% due to foreign inflows and the PKR depreciation of ~14%. Net margins reached ~59.7%, aided by reduced finance costs. Additionally, the leverage ratio improved to ~16.1%, reflecting a ~48.0% reduction in the long-term borrowings. However, borrowing is expected to rise as the WOP expansion project commences soon.
- In 1HFY25, the sector's gross margins were recorded at ~78.0% (SPLY: ~66.1%) and operating margins at ~64.1%(SPLY: ~46.5%), while, net margins during the 1HFY25 stood at ~42.8% (SPLY: ~31.9%).
- Going forward, the sector is likely to experience higher throughput volumes in FY25, driven by anticipated economic recovery and declining inflation, as it averaged at ~4.6% in 11MFY25 (SPLY: ~24.5%). This is expected to boost demand for crude oil and petroleum products in the country. The 1HFY25 period already recorded oil throughput of the sector player being recorded at ~2.5mln MT, resulting in an increase of ~31.6%.

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- Mordor Intelligence
- Cabinet Committee on Energy
- U.S. Energy Information Administration (EIA)
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