VIS

Credit Rating Company Limited

OIL AND GAS (REFINING)

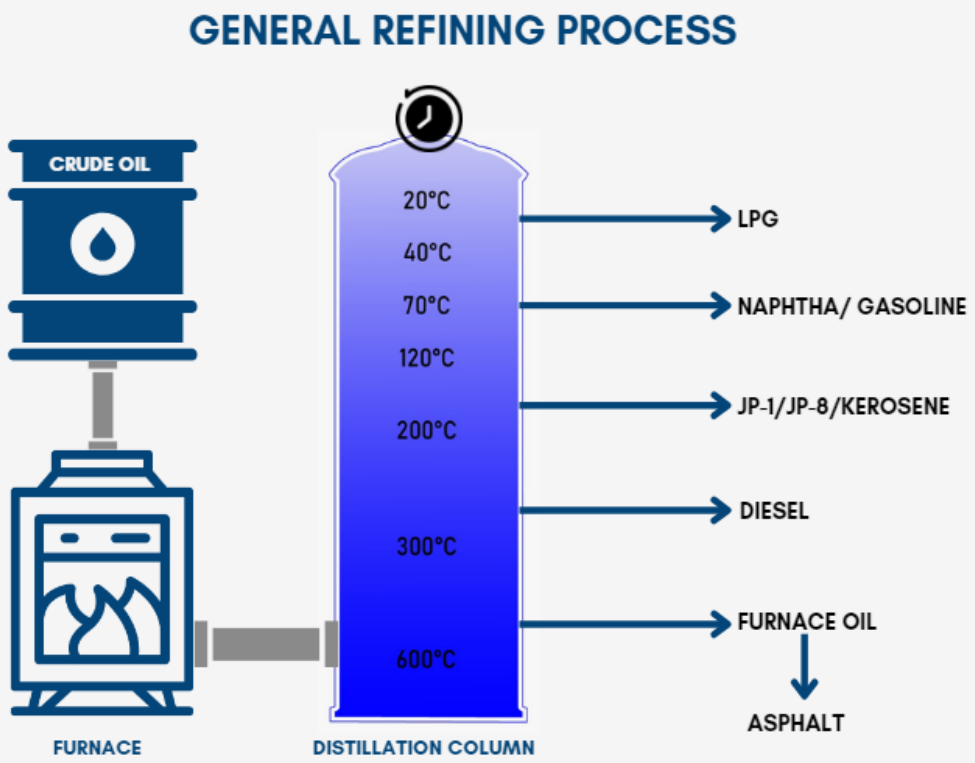
Table of Contents

INTRODUCTION

Oil and gas sector is vast and complex and it is broken down into three segments: Upstream, Midstream and Downstream. Upstream or Exploration & Production (E&P) companies, find reservoirs and drill oil and gas wells. Midstream companies deal with the transportation of oil from wells and storage of crude oil. Downstream segment involves refining the crude oil into various end products and sale of the finished products. Downstream business involves refineries and gas stations. Our report focuses on the refining side of this sector.

Refineries are critical components of the global energy infrastructure, transforming raw hydrocarbons into the fuels and materials that power virtually every aspect of modern life. The complexity of refineries can vary widely, from simple plants that only distill crude oil to highly complex integrated refineries that can produce a wide range of high-value products. Given the importance of oil and gas in the global energy supply, refineries are strategic assets that significantly influence national energy security and economic performance. Asia, specifically China and India, along with United States, are leading in terms of refining capacity; the same have developed substantial infrastructure to meet both their domestic energy demands and significant export capacities. Moreover, Middle East, particularly Saudi Arabia and other Gulf countries, also holds substantial refining capacities, driven by their large oil reserves and strategic focus on value-added exports in the oil sector.

The key activities pertaining to the oil and gas refining have been visualized below:



ECONOMIC OVERVIEW

GLOBAL

In 2023, the global economic landscape was shaped by enduring inflationary pressures, with many countries experiencing high inflation rates, leading central banks to pursue aggressive monetary tightening. The global growth forecast, according to the International Monetary Fund (IMF), was adjusted to around 3.1%, reflecting a subdued post-pandemic recovery influenced by factors such as supply chain issues and the ongoing Russia-Ukraine conflict, which exacerbated volatility in energy and food markets. China's economy, grappling with its challenges, received fiscal support, targeting growth above 5%. Emerging markets dealt with the impact of a strong US dollar, which contributed to capital outflows and currency pressures, with some currencies depreciating significantly against the dollar. The combined effect of these factors presented a significant challenge for global economic stability, with the risks of a slowdown and recession looming on the horizon.

PAKISTAN

In 2023, Pakistan's economic landscape was defined by its struggle with high inflation and efforts to narrow its trade deficit, achieving a significant reduction of 34.29% in the first half of the fiscal year, compared to the same period in the previous year. This was partly buoyed by a noteworthy 66.4% increase in exports to China during July-December 2023, showcasing a strengthening of trade ties between the two countries. This upward trend in exports, particularly to China, hints at potential continued economic engagement and benefits for Pakistan. The Asian Development Bank's forecasts encapsulate these dynamics, predicting a cautious GDP growth of 0.3% for 2023 and a slight improvement to 1.9% in 2024. The inflation rates are projected to remain high at 29.2% in 2023, with a slight improvement to 25.0% in 2024, indicating persistent cost-of-living pressures.

The future outlook of Pakistan’s economy in 2024 is cautiously optimistic yet hinges on several external and internal factors. Key among these are global energy prices influenced by geopolitical tensions, such as the ongoing Ukraine-Russia conflict and the situation in the Middle East, and climate change effects on agriculture. Additionally, Pakistan's economic trajectory is closely tied to its relationship with the International Monetary Fund (IMF), with recent engagements stabilizing some economic indicators. The country's ability to sustain and leverage these improvements depends on maintaining disciplined economic policies and enhancing its investment climate, as indicated by the establishment of the Special Investment Facilitation Council. However, challenges remain, including the need for a transition to a greener economy amidst global calls for climate justice and equitable responsibility sharing. These dynamics present a complex but navigable path for Pakistan’s economy, contingent on strategic policy decisions and international cooperation

OIL AND GAS (REFINING) INDUSTRY

GLOBAL

Global Oil Refining Market size was valued at USD 1,490.3b in 2021 and is poised to grow from USD 1,651.3b in 2022 to USD 3,751.5b by 2030, growing at a Computed annualized growth rate (CAGR) of 5% in the forecast period (2023-2030). The top-5 countries with highest refining capacities during FY22 have been listed below:

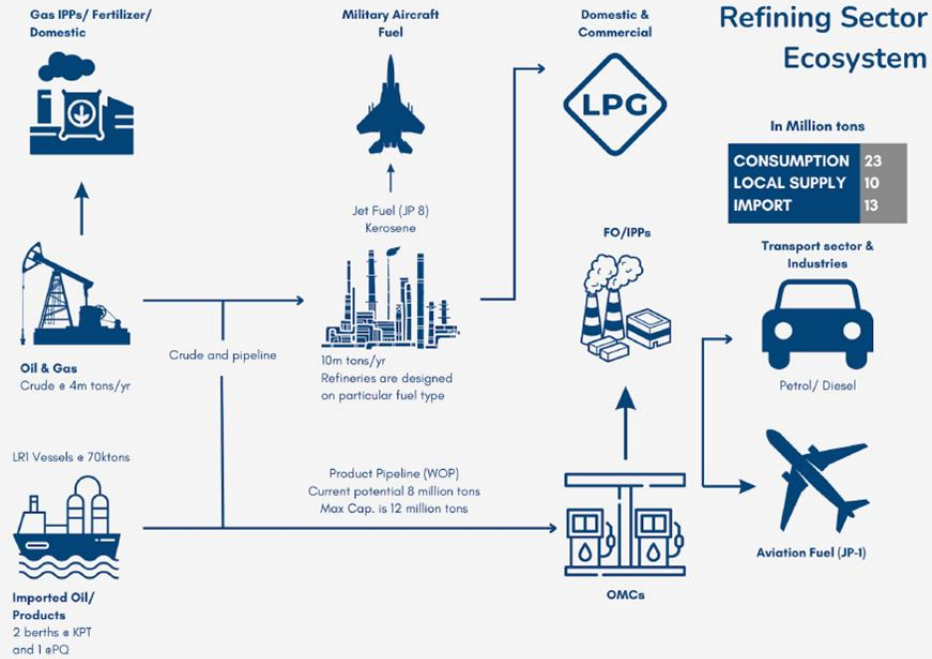
Country	Capacity in Million barrels/ per day
United States	17.94
China	16.99
Russia	6.86
India	5.01
South Korea	3.57

Global refining industry has undergone significant changes characterized by an increased focus on sustainability, technological advancements, and shifts in market dynamics. The sub-sector has been particularly responsive to the growing regulatory pressures aiming for lower carbon emissions, which has spurred investments in renewable energy sources, biofuels, and hydrogen production. This pivot towards greener alternatives is also driven by initiatives such as the European Green Deal, pushing refineries to adapt to stricter environmental standards and explore carbon capture and storage technologies to align with global climate goals. Additionally, the refining industry has embraced technological innovation to enhance efficiency and reduce operational costs. The adoption of digital tools like artificial intelligence and machine learning has improved predictive maintenance, energy management, and production optimization. Concurrently, refining capacity has adjusted to the changing demand;

PAKISTAN

Pakistan's local refineries are the backbone of industrial development and are intrinsically connected to Defense and energy security needs of the country. They have a pivotal role in the energy supply chain and economic development of Pakistan. A snapshot of refining sector ecosystem, visualizing the contribution of refining sector has been attached for reference:

While there are multitude of benefits of local refining, some of the strategic and economic benefits local refineries have provided specifically for Pakistan are:



- They supply 45% of the country's requirements of HSD, 30% of (Motor Gasoline) MS and more than 100% of Jet fuel for defense.
- They provide indigenous fuel supply for defense and essential transportation.
- As per recent calculations, they enable annual forex savings of more than USD 1 billion.
- They utilize about 70,000 barrels per day of local crude and condensate.
- They generate more than 100,000 direct and indirect employment.
- They represent a substantial contribution to national exchequer and GDP.
- They reduce the burden on Port Qasim and Kemari ports – instead of importing refined products, crude oil is processed to produce multiple energy and non-energy products (Petrol, Diesel, JP-1, JP-8, Kerosene, Furnace Oil, LPG, lubes, bitumen, wax, etc.).

In Pakistan, the input and output prices of refining products are regulated by the government, primarily through the Oil and Gas Regulatory Authority (OGRA), which oversees the pricing framework, ensuring that it aligns with both market conditions and national energy policies Input prices, such as the cost of crude oil, are generally determined by global oil markets. However, output prices for refined products like gasoline, diesel, and jet fuel are set by OGRA based on a pricing formula that considers international oil prices, exchange rate fluctuations, and government taxes and duties. This regulatory approach aims to stabilize the domestic market, protect consumers from volatile international markets, and ensure that refineries operate within a financially sustainable framework. The government periodically reviews these prices, presently on a fortnightly basis, and adjust them in response to changes in international oil prices and economic conditions, seeking to balance affordability for consumers with financial viability for refineries.

CAPACITY AND UTILIZATION

There are only 6 major oil refineries operational in Pakistan and despite being integral to the growth of the economy, no new refinery project has materialized in Pakistan since more than a decade and only two refineries have been added in the last 40 years. All of the refineries except PARCO are based on old, hydro skimming, technology. PARCO is a mild-conversion refinery and even that is now more than 20 years old. The product slate of all the existing local refineries typically comprises of Naphtha, Motor Gasoline (MS), High Speed Diesel (HSD), Furnace Oil (FO), Kerosene, Jet fuel (JP-1 & JP-8), High-Octane Blending Component (HOBC), Liquefied Petroleum Gas (LPG) and Light Diesel Oil (LDO). Pakistan's oil refining capacity is about 450,000 barrels per day (bpd), equivalent to 20MT per annum. The capacity of each refinery on a timeline has been tabulated below:

CAPACTIES OF LOCAL REFINERIES (*in Million Tons/Year*)			
Company	2021	2022	2023
PARCO	5.88	5.50	5.50
ARL	2.61	2.44	2.44
NRL	3.05	3.20	3.20
PRL	2.14	2.30	2.30
CPL	7.59	7.1	7.1
ENAR-II	0.37	0.30	0.30
Total	**21.64**	**20.80**	**20.80**

Annual yield by refineries aggregate to 9.95MT; the same is attributable to the decreasing FO demand in the country as a result of a change in the energy mix in the power sector. Moreover, the production slate for refineries is fixed. i.e.,

they cannot produce just MS or HSD, all products are produced simultaneously. Thus, as FO demand declines, refineries have to lower their overall production and struggle to maintain their throughput at optimal levels. The crude oil processed by these refineries has been tabulated below:

Crude Oil Processed by Refineries in Tonnes of oil Equivalent (TOE)			
	2021	2022	2023
ARL	1,858,164	1,897,413	1,867,751
CPL	1,793,205	1,146,918	832,081
ENAR	296,161	280,339	255,988
NRL	1,958,669	1,930,854	1,585,344
PARCO	4,636,853	5,405,047	4,532,624
PRL	1,300,781	1,337,139	1,340,998
Total	**11,843,833**	**11,997,710**	**10,414,786**

Additionally, in Pakistan, refineries process a combination of local and imported crude; the proportion of the latter remains very high in line with limited availability of crude in the country. A tabular presentation of local and imported crude processed by the local refineries has been given below:

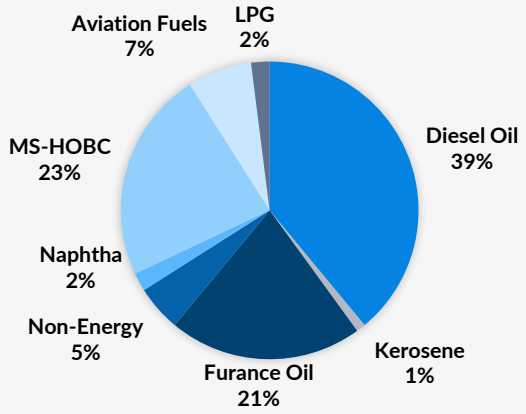
CRUDE PROCESSED (LOCAL & IMPORTED) in TOE			
Company	2021	2022	2023
Local	3,234,416	3,010,651	2,795,048
Imported	8,609,417	8,609,417	7,619,738
Total	**11,843,833**	**11,997,710**	**10,414,786**

PRODUCTION AND CONSUMPTION OF REFINERY PRODUCTS

During FY23, the production of energy products by refineries in Pakistan saw the highest output in jet fuel JP-1 and high-speed diesel, with annual production volumes of 531,600MT and 3,895,786MT, respectively. Jet fuel JP-8 also contributed significantly with 139,656T. Motor Spirit (MS) and Furnace Oil were other major products, with MS at about 2,197,019T and Furnace Oil at 2,055,489T. The production of Kerosene was considerably less, standing at 89,541T. Light Speed Diesel output was relatively minor at 13,426 tons. Overall, the total production for FY23 was nearly 8.97MT, reflecting a diversified output across the refinery spectrum. Additionally, the local refinery's production of non-energy products totaled to 1.2MT during FY23, with lubricant oil and naphtha being the primary outputs at roughly 147,000T and 218,000T, respectively. The production of other petroleum oil lubricants (POL products) varied,

with asphalt seeing a significant increase of about 267,000T. Liquefied petroleum gas (LPG) production decreased slightly to 441,000T. Notable products such as jute batching oil and sulfur showed stable production at approximately 2,349T and 39,397T, respectively. Other products, including waxes and solvents, witnessed a decrease in output compared to previous years, indicating shifts in refinery production priorities or market demands. The product mix of local refineries has been visualized:

PRODUCTION BY REFINERIES FY23



Furthermore, a notable decrease was observed in the overall import of petroleum products, which fell by a substantial 37.63% compared to the previous year. This decline is a significant trend with far-reaching implications for the energy sector. Moreover, the import of crude oil by refineries also registered a significant decrease of 29.4%. This reduction in imports had a positive effect on the oil import bill, which decreased from USD 19.4b to USD 13.6b is an encouraging sign, as it reflects potential cost savings and reduced reliance on foreign sources for oil.

The overall oil consumption in 2022-23 witnessed a significant drop of 26.5%, declining from 22.8MT to 16.79 MT. Among various petroleum products, diesel experienced the most substantial reduction, with a decline of 47.6%, followed by furnace oil, which fell by 45.9%. High Octane Blending Component (HOBC) and Motor Spirit also saw significant decreases of 42.7% and 16.9%, respectively. Kerosene consumption decreased by 14.9%. In contrast, the consumption of Aviation fuel showed an increase of 15.3% compared to the previous year.

BLENDED OIL SEGMENT

Blended oil production in Pakistan's refineries involves the formulation of base oils with various additives to meet specific performance requirements for motor oils. The blending process ensures that the motor oil can withstand high temperatures, reduce engine wear, and maintain efficiency under various operating conditions. In Pakistan, National Refinery Limited (NRL) is one of the key players in this segment in Pakistan; the same manages a comprehensive setup for refining crude oil and blending lubricants. The refinery's products include a range of motor oils and lubricants designed for various types of engines and industrial machinery.

The demand for blended oil in Pakistan is influenced by the automotive sector's growth, industrial expansion, and the general economic climate. As the number of vehicles on the road increases, so does the demand for motor oil, pushing refineries to enhance their blending capacities and technologies.

EX-REFINERY PRICE DETERMINATION

In Pakistan, the ex-refinery price of oil and gas-based products is determined through a structured process that involves various factors, including international market dynamics, refining costs, taxes, and regulatory considerations. The Platt's index serves as a benchmark for assessing the prices of crude oil and refined products in the global market.

Important determinants for ex-refinery prices of oil and gas based products are following:

Reference to Platt's Index: Oil marketing companies (OMCs) and refineries in Pakistan reference the Platt's index, which provides transparent and credible pricing data for crude oil and refined products.

Calculation of Refining Costs: Refineries in Pakistan calculate the costs associated with refining crude oil into gasoline. This includes expenses such as crude oil procurement, refining processes, transportation, storage, and distribution costs.

Taxes and Levies: Various taxes and levies imposed by the government are factored into the ex-refinery price. These may include sales tax, petroleum levy, and other regulatory charges.

Profit Margin: Refineries also factor in a profit margin to cover operational expenses and generate a reasonable return on investment.

Ex-Refinery Price= Platt's Index Price + Refining Cost + Taxes & Levies + Profit Margin

BUSINESS RISK

The oil and gas refining sector in Pakistan is characterized by **cyclicality risk**, primarily due to its heavy reliance on imported crude oil. This dependence makes the industry highly vulnerable to global market fluctuations and oil price volatility, directly affecting refining margins and operational costs. Such financial variability complicates planning and can destabilize both production and financial stability within the sector. Additionally, the Pakistani economy's significant reliance on oil and gas as primary energy sources means that any domestic economic fluctuations can directly affect the sector's demand. Regulatory changes and the need for environmental compliance further complicate the operational landscape, often necessitating costly updates to refining processes. Many of Pakistan's refineries also struggle with outdated infrastructure, limiting their ability to adjust to different crude types and amplifying the impact of supply and price changes.

Competition in Pakistan's oil and gas refining sector remains **low**, influenced by several factors that deter new entrants and maintain a small number of competitors. High barriers to entry, such as the substantial capital investment required to establish and operate refineries, and stringent regulatory approvals, discourage new companies. Moreover, the risk of substitutes within the domestic market is minimal, as there are limited alternative sources of refined petroleum products locally. The sector also suffers from a lack of rapid growth trends, which typically attract new competitors, thus keeping the industry competition subdued. Alongside this, the oil and gas sector faces **high capital intensity** risk, with significant investment needed not just for start-up but also for maintenance and routine operational upgrades every few years. The sector is heavily regulated by entities such as the Oil & Gas Regulatory Authority (OGRA) and the Ministry of Petroleum & Natural Resources (MP&R), with substantial government intervention adding another layer of complexity and risk. Lastly, the sector's **energy sensitivity is notably high** due to its reliance on imported crude and frequent domestic energy supply issues, such as electricity shortages and gas load shedding, which disrupt refinery operations. This situation is exacerbated by older, less efficient technologies that heighten the sector's vulnerability to energy cost fluctuations and supply instability.

RECENT DEVELOPMENTS AND THEIR IMPACT

Implementation of the Pakistan Oil Refining Policy 2023: This policy mandates the upgrade of existing refineries to produce Euro-V compliant fuels, aiming to reduce the production of environmentally harmful furnace oil; the same encourages modernization and compliance with international environmental standards, potentially increasing

operational efficiency and market competitiveness. Many refineries have also expressed concerns regarding the financial viability, technical feasibility, and regulatory conditions of the mandated upgrades, particularly around issues like tax exemptions and deemed duty benefits. These challenges may delay the upgrades, impacting the overall timeline for achieving the policy's objectives. Ongoing discussions and adjustments to the policy might be necessary to align the stakeholders' interests and capabilities.

Investments in Refinery Upgrades: Refineries like National Refinery Limited (NRL) and Attock Refinery Limited (ARL) are exploring or implementing new units like catalytic reformers and hydrocracking units to meet new fuel standards. These investments signify a move towards higher-value, cleaner products, improving the environmental footprint and potentially enhancing profitability.

Strategic Partnerships and Foreign Investments: Companies like Byco Petroleum (parent organization of Cnergyco) are planning significant shifts in production processes, and new entries like the Trans Asia refinery project show active foreign interest and investment. Such developments could lead to increased capacity and technological advancement in the sector, boosting domestic capabilities and reducing dependency on imports.

SECTOR DRIVERS

1. **Global Crude Oil Prices:** The cost of crude oil is a primary factor affecting refining operations. Since Pakistan imports a significant portion of its crude oil, global price fluctuations can have a profound impact on refining margins. High crude prices squeeze margins if refineries are unable to pass these costs onto consumers, whereas lower prices can improve margins but may also indicate weaker global economic conditions, potentially reducing demand.

2. **Domestic Demand for Petroleum Products:** Economic growth in Pakistan drives demand for petroleum products. As industries and the transportation sector expand, they fuel the demand for diesel, gasoline, and other oil products. A rising middle class also contributes to increased automotive sales, further boosting demand. This steady or growing domestic demand underpins the refining sector's output and profitability, ensuring that refineries operate at optimal capacities.

3. **Regulatory Environment and Government Policies:** Government regulations regarding fuel quality, environmental standards, and taxation significantly influence refining operations. However, supportive government policies, including subsidies or tax incentives for upgrading refinery operations or for importing crude oil, can mitigate these costs and foster sector growth.

4. **Technological Advancements:** The adoption of modern refining technologies is crucial for enhancing operational efficiency and product quality. Advanced technologies can help Pakistani refineries handle a broader range of crude oil types, reduce operational costs, and produce fuels that meet higher environmental standards. Investment in technology not only impacts the competitiveness of refineries but also their compliance with international environmental norms.

5. **Geopolitical Stability and Supply Chain Security:** Pakistan's geopolitical environment and its relationships with key oil-producing countries can impact crude supply security. Regional instability can disrupt supply chains or alter the terms of trade, affecting crude oil availability and prices. Ensuring a stable and secure supply chain is vital for continuous operations and for maintaining the cost-effectiveness of refining processes.

SECTOR RISKS

1. **Technological and Infrastructure Challenges:** Many of Pakistan's refineries are equipped with older technology and infrastructure, limiting their ability to process heavier and sourer grades of crude oil. This technological gap reduces operational efficiencies and increases production costs. Additionally, the lack of modernization leads to higher energy consumption and emissions, which not only affects profitability but also compliance with increasingly strict environmental regulations.

2. **Regulatory and Policy Risks:** Fluctuating government policies and regulatory frameworks pose a significant risk. Changes in fuel standards, environmental regulations, and taxation can abruptly alter the operating environment, forcing refineries to make costly adjustments.

3. **Economic and Market Fluctuations:** The refining sector is highly sensitive to global crude oil prices, exchange rate fluctuations, and changes in domestic demand. Volatile oil prices can affect the cost of crude oil imports and the price at which refined products are sold, impacting margins. Additionally, the Pakistani rupee's depreciation against the dollar increases the cost of imported crude oil, which is a major input for refineries.

4. **Supply Chain Disruptions:** The sector is vulnerable to supply chain disruptions that can arise from geopolitical tensions, trade disputes, or logistic challenges. Any interruption in the supply of crude oil due to regional instability or international conflicts could lead to operational shutdowns or reduced output.

INDUSTRY BUSINESS RISK:

The refining sub-sector of Pakistan is characterized by "medium to high risk"; the same is due to several interconnected challenges such as the sub-sector's vulnerability to global oil price fluctuations and reliance on imported crude oil heighten its cyclicality risk. Additionally, the need for substantial capital investments, strict regulatory requirements, and frequent technological upgrades contribute to the sector's overall risk profile. Challenges such as outdated infrastructure and energy supply issues exacerbate operational disruptions and financial instability. Given these factors, the medium to high-risk rating reflects the sector's need for strategic management and resilience to navigate both market dynamics and regulatory landscapes effectively.

SECTOR OUTLOOK

OVERALL ASSESSMENT/OUTLOOK: STABLE

In line with the aforesaid factors; this sector has been assigned a "Stable Outlook". However, the future is influenced by both domestic conditions and global energy trends. Currently, this sector is grappling with several challenges including aging infrastructure, the need for technological upgrades, and regulatory pressures to produce cleaner fuels. These refineries are often operating below capacity due to these technological constraints. On the economic front, fluctuations in global oil prices and the Pakistani rupee's volatility affect operational costs and margins. The government's policy decisions, including potential subsidies or tax adjustments, will play a critical role in shaping the sector's economic landscape. Additionally, domestic demand for petroleum products continues to grow, providing a steady market for refined products, yet the sector needs substantial investment to modernize facilities and comply with international environmental standards. Going forward, the success of refining companies in Pakistan will heavily depend

on their ability to innovate and adapt to evolving energy dynamics. The global shift towards renewable energy sources and the push for reduced carbon emissions represent both a challenge and an opportunity. Pakistani refineries will need to invest in upgrading their processing capabilities to handle a broader range of crude types and to produce more environmentally friendly fuels. Furthermore, partnerships with international energy companies could bring in needed capital as well as advanced technologies. The potential for policy support from the government, such as incentives for clean technology adoption and support for infrastructure development, will be crucial. Overall, the ability of Pakistan's refining sector to navigate these transitions will determine its resilience and future growth in an increasingly competitive and environmentally conscious global market.

INDUSTRIAL AVERAGES

In Pakistan, refining industry comprises 5 major companies. We have compiled important financials metrics for these companies and derived industrial mean and median of the aforesaid sector. Calculations are attached below:

REFINING INDUSTRY FINANCIALS & AVERAGES FOR 2023 (Rs. in millions)							
FOR FY23	PARCO	ARL	NRL	PRL	CNERGY	Industry Median	Industry Mean
Total Assets	381,433	176,760	111,780	105,472	346,267	176,760	224,343
Current Assets	230,775	97,837	78,788	76,646	36,574	78,788	104,124
Tier I Equity	-	54,612	34,599	5,031	20,193	27,396	28,609
Current Liabilities	127,612	66,777	76,445	77,345	78,178	77,345	85,271
Total Borrowings	48,655	-	37,674	31,976	39,014	37,674	31,464
Total Liabilities	159,495	66,988	77,181	80,115	167,925	80,115	110,341
Sales	956,040	369,222	298,805	261,860	193,912	298,805	415,968
Net Income /(loss)	66,596	29,225	(5,123)	1,825	(12,663)	1,825	15,972
Net Margin	6.97%	7.92%	-1.71%	0.70%	-6.53%	0.70%	1.47%
Current Ratio	1.81	1.47	1.03	0.99	0.47	1.03	1.15
ROAA	20.07%	18.88%	-4.78%	1.86%	-5.03%	1.86%	6.20%
ROAE		72.12%	-13.77%	43.97%	-46.18%	15.10%	14.03%
Gearing	-	-	1.09	6.36	1.93	1.51	2.34
Leverage	-	1.23	2.23	15.92	8.32	5.27	6.92

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ANNEXURE

(Units in M. Tons)	FY20	FY21	FY22	FY23
Refinery Production of Energy Products in Pakistan				
JET FUEL				
JP-1	405,083	316,591	489,203	531,601
JP-8	157,580	154,392	140,095	139,656
KEROSENE	84,984	92,732	94,792	89,541
MOTOR SPIRIT	-	-	-	-
HOBC (95/97 RON)	3,337	33,790	13,854	48,461
MS	1,973,444	2,486,476	2,482,466	2,197,019
HIGH SPEED DIESEL	3,790,431	4,697,017	4,698,855	3,895,786
LIGHT SPEED DIESEL	23,522	16,165	14,865	13,426
FURNACE OIL	2,223,303	2,549,069	2,408,345	2,055,489
TOTAL	8,661,684	10,346,232	10,342,475	8,970,979

Refinery Production of Non-Energy Products				
(Units in M. Tons)	FY20	FY21	FY22	FY23
Lubricant Oil	405,083	316,591	489,203	531,601
NAPHTHA	157,580	154,392	140,095	139,656
OTHER POL PRODUCTS:	84,984	92,732	94,792	89,541
Carbon Oil	-	-	-	-
Process Oil	3,337	33,790	13,854	48,461
Wax	1,973,444	2,486,476	2,482,466	2,197,019
BTX	3,790,431	4,697,017	4,698,855	3,895,786
Jute Batching Oil	23,522	16,165	14,865	13,426
Solvent	2,223,303	2,549,069	2,408,345	2,055,489
LPG	8,661,684	10,346,232	10,342,475	8,970,979
MTT	5,609	6,156	5,219	6,453
Asphalt	176,508	197,867	207,002	266,531
PMB				
BIT Cut Back	1,652	346	346	446
Extt Oil	4,933	2,784	14,296	44,182
Sulfur	40,718	47,471	49,303	39,397
Others				
TOTAL	1,197,877	1,286,832	1,323,583	1,210,576

RESEARCH & PUBLICATIONS

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Jahangir Kothari Parade (Lady LLoyd Pier) Inspired by Her Excellency, The Honorable Lady Lloyd, this promenade pier and pavillion was constructed at a cost of 3 Lakhs and donated to the public of Karachi by Jahangir Kothari to whose genrosity and public spirit the gift is due. Foundation stone laid on January 5, 1920. Opened by Her Excellency, The Honorable Lady Lloyd on March 21, 1921.

Dome: A roof or vault, usually hemispherical in form. Until the 19th century, domes were constructed of masonry, of wood, or of combinations of the two, frequently reinforced with iron chains around the base to counteract the outward thrust of the structure.

Origins: The dome seems to have developed as roofing for circular mud-brick huts in ancient Mesopotamia about 6000 years ago. In the 14th century B.C. the Mycenaean Greeks built tombs roofed with steep corbeled domes in the shape of pointed beehives (tholos tombs). Otherwise, the dome was not important in ancient Greek architecture. The Romans developed the masonry dome in its purest form, culminating in a temple built by the emperor Hadrian. Set on a massive circular drum the coffered dome forms a perfect hemisphere on the interior, with a large oculus (eye) in its center to admit light.

VIS Credit Rating Company Limited is committed to the protection of investors and offers a blend of local expertise and international experience to serve the domestic financial markets. With its international reach, VIS is positioned to aim for an international mark. In this regard, the global experience of our international affiliates and partners have been invaluable towards adding depth to our ongoing research endeavors, enriching us in ways, that enable us to deliver our responsibilities to the satisfaction of all investors. The edifice of the Jahangir Kothari Parade has stood proudly through the years and is a symbol of our heritage. Its 'Dome' as the most stable of building structures, exemplifies architectural perfection. Committed to excellence, VIS continues its endeavour to remain an emblem of trust.

INTERNATIONAL

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China Chengxin International Credit Rating Company Limited - China

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