SECTOR STUDY . NOVEMBER 2024

Together. Creating Value.

Industrial Gases

Research Team

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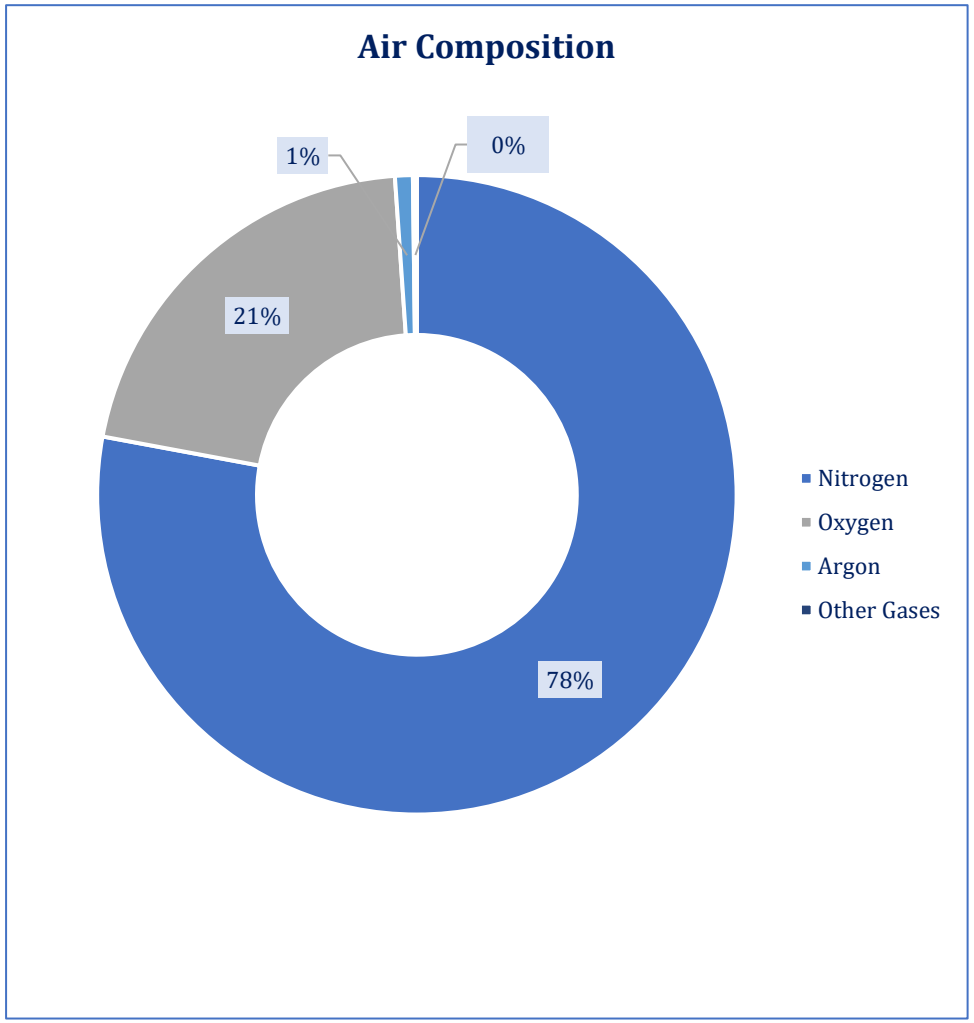
Contents

Industrial Gases

Introduction

- Industrial Gases are gaseous materials manufactured for use in various industries, such as cement, steel, the food industry, health care, and others. The main gases are nitrogen, oxygen, carbon dioxide, argon, hydrogen, helium, and acetylene, which are used in both liquid and gaseous forms.
- Industrial Gases are mostly part of the specialty chemicals industry and are used in a wide range of industrial applications, such as medical gases, cutting and welding, refrigeration, and food processing & packaging.
- Depending on their use in different sectors, these gases are also known as fuel gases, medical gases, refrigerant gases, and specialty gases. Steel, glass, oil, and fiber optic segments demand intensive usage of Industrial Gases.
- Different methods are used to obtain a wide variety of Industrial Gases. Nitrogen, oxygen, and argon are obtained from air by fractional distillation, hydrogen is made by the electrolysis of water, carbon dioxide is produced by the steam reforming of methane while Acetylene is made by the reaction of calcium carbide with water.
- The sector's growth is primarily attributed to the growing manufacturing industry across the globe. Ongoing investments in large-scale infrastructure projects and investments in core industrial segments of the economy are expected to drive demand for Industrial Gases in the medium term.



Source: Research and Markets, Fine Gases Ltd.

Industrial Gases

Introduction

Oxygen

- Medical & Chemical processing
- General engineering
- Fabrication
- Steel manufacturing,
- Welding industries
- Ship breaking industry
- Oxidation,
- Pulp and Paper industry

Nitrogen

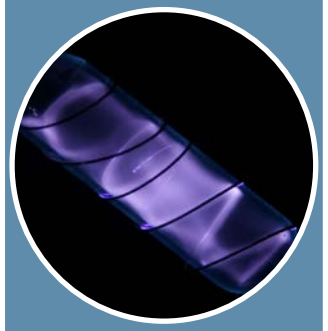
- Chemical processes
- Oil and Gas exploration
- Blanketing
- Healthcare application
- Food
- freezing/storage

Argon

- Healthcare applications
- Deep sea environments
- Welding
- Food and drink
- Cinematography
- Lighting

Carbon Dioxide

- Refrigerant
- Fire extinguishers
- Greenhouses
- Chemicals
- Pharmaceutical
- Metal industry



Hydrogen

- Commercial fixation of nitrogen from air
- Hydrocracking
- Rocket fuel
- Welding
- Production of hydrochloric acid
- Reduction of metallic ores
- Filling balloons

Helium

- Magnetic Resonance Imaging (MRI)
- Fiber Optics
- Balloon Filling
- Deep Sea Diving
- Space
- Exploration
- Leak Detection

Rare Gases (Neon/Krypton/ Xenon)

- Electronics,
- Media
- Healthcare

Source: Research and Markets

Industrial Gases

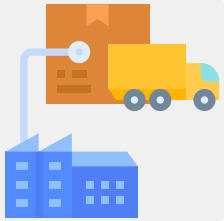
Supply Chain

Production

Extraction of gas from the raw materials – air, through electrolysis, reforming, and other techniques.

Storage

Storing the gas in gaseous, liquefied, slush/solid form to be delivered to the consumers.



Distribution

Transmitting the product to the industries and end consumers via methods including On-site/pipeline, Bulk/merchant, and Cylinder/packaged techniques.

Utilization

Industrial Gases are used in all the sectors and industries depending upon the nature of the gas.

Industries

Healthcare

Source: Research and Markets

Industrial Gases

Global | Overview

- **Market Size**: The global market size of Industrial Gases has grown from USD~99.4bln in CY22 to USD~146.1bln in CY23 and is expected to reach USD~166.0bln in CY24, at a growth rate of ~14.0% YoY. The predicted market size is expected to reach USD~272.6bln by CY28 at an annual CAGR of ~13.2%.

- **Regions**: The market's presence across different regions includes North America, Europe, Asia Pacific, Latin America, the Middle East, and Africa. The Asian Pacific market has led in CY23 owing to increasing urbanization and industrialization. China, India, Japan, and Indonesia, among others, are looking forward to investing in sustainable energy development.

- **Demand**: The rising application of Industrial Gases in various end-use industries such as chemicals, metallurgy, healthcare, food and beverage, oil & gas, and power contribute to the sector's overall demand.

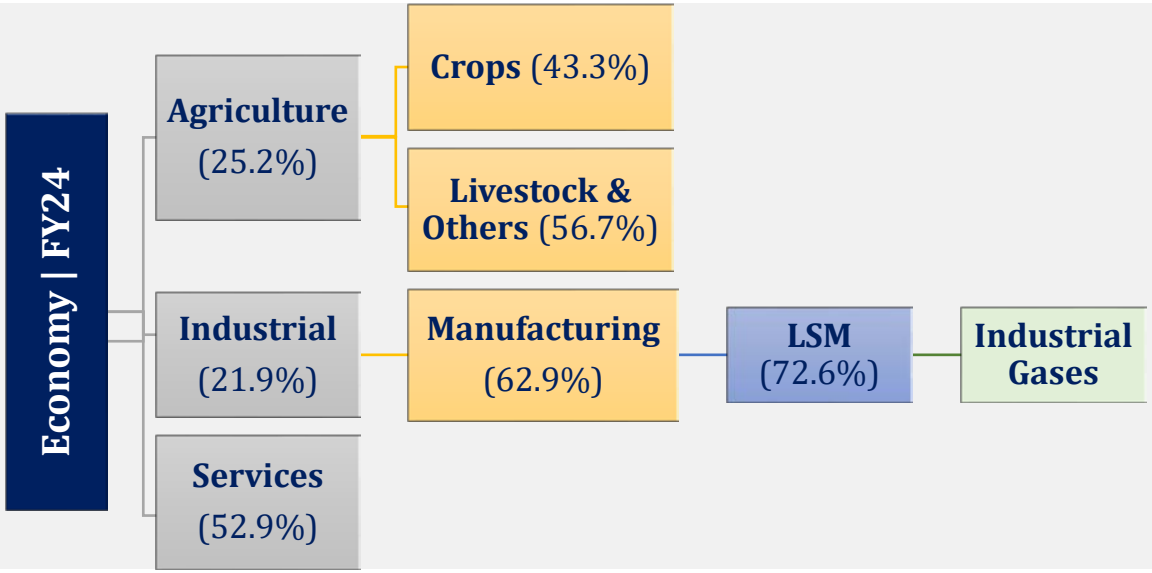
- **Supply:** The market is thriving with increased industrial gas usage in sectors spanning construction, metals, mining, and food services. Moreover, the surging global demand for electronic devices and renewable energy sources amplifies this growth trajectory.

- **Major Players**: The Industrial Gases sector is consolidated and globalized. It is dominated by a few major players including Air Liquide, Air Products, Linde PLC, Messer Group GmbH, and Matheson Tri-Gas among others.

Industrial Gases

Local | Overview

- In FY24, Pakistan's GDP (nominal) stood at PKR~106.0trn (FY23: PKR~83.9trn), increasing, in real terms, by ~2.4% YoY (FY23: ~-0.21% decline).
- Industrial activities in FY24 held ~21.9% share in the GDP while the manufacturing activities made up ~62.9% of the value addition.
- Large Scale Manufacturing (LSM) in Pakistan is essential for economic growth considering its linkages with other sectors, as it represents ~72.6% of the manufacturing activities in FY24.
- The LSM fell by negative ~10.3% YoY in FY23 (FY22: ~11.7%), however, it inched up to ~0.9% YoY in FY24.
- The sector can be classified under the Large-Scale Manufacturing (LSM) component within the country's industrial segment. During FY24, the sector's market capitalization stood at PKR~18.7bln.
- In 3MFY25, Large Scale Manufacturing (LSM) was recorded at negative 0.2% (SPLY: -2.5%).



Source: SBP, ESP, PSX

Industrial Gases

Local | Overview

- The sector's revenue was recorded at PKR~22.2bln in FY24 – a growth of ~27.4% YoY basis.
- The sector has a high dependency on the performance of LSM (positive growth of ~0.9% in FY24), and since there is an overall improvement in economic growth, the sector is also showing signs of improvement.
- The sector's growth remained impressive in FY21, as the economy had gradually, though not fully, recovered from the COVID-19 pandemic, and the economic activity revived to some extent. In FY22, the country was severely affected by the imposition of import restrictions (May'22-Jun'23), flash floods (Aug'22), and political turmoil (4QFY23), leading to high inflationary levels as well as the slowdown of numerous industries.
- In FY24, the economic outlook appears relatively stable, supported by improvements in the Large-Scale Manufacturing (LSM) sector and a reduction in the policy rate, which declined from a peak of ~22.0% to ~19.5%. Looking ahead, the policy rate is projected to drop further, potentially falling below 15.0% in FY25.
- Pakistan's overall production capacity for Industrial Gases stands at ~1,300TPD.
- The sector is organized and concentrated within two major players, i.e., Pakistan Oxygen Limited and Ghani Chemicals Limited**.**
- In FY24, these two entities are projected to hold ~74.0% of the market share in terms of production, with their dominance expected to grow further.
- This growth will primarily be driven by the upcoming operation of Ghani Chemical's 5th ASU plant, the largest in Pakistan, with a capacity of 275TPD, located in the Hattar Special Economic Zone.
- Other companies include Multan Gases, Sharif Gases, Agha Gas, Sultan Oxygen, and MediGas.

Industry Snapshot	FY21	FY22	FY23	FY24
Sector Revenue (*PKR mln*)	14,638	15,539	17,443	22,229
Revenue Growth	43.0%	6.2%	12.3%	27.4%
Players	2 players contribute ~74% to the market share.			
Structure	Duopoly			
Regulatory Body	Securities and Exchange Commission of Pakistan			

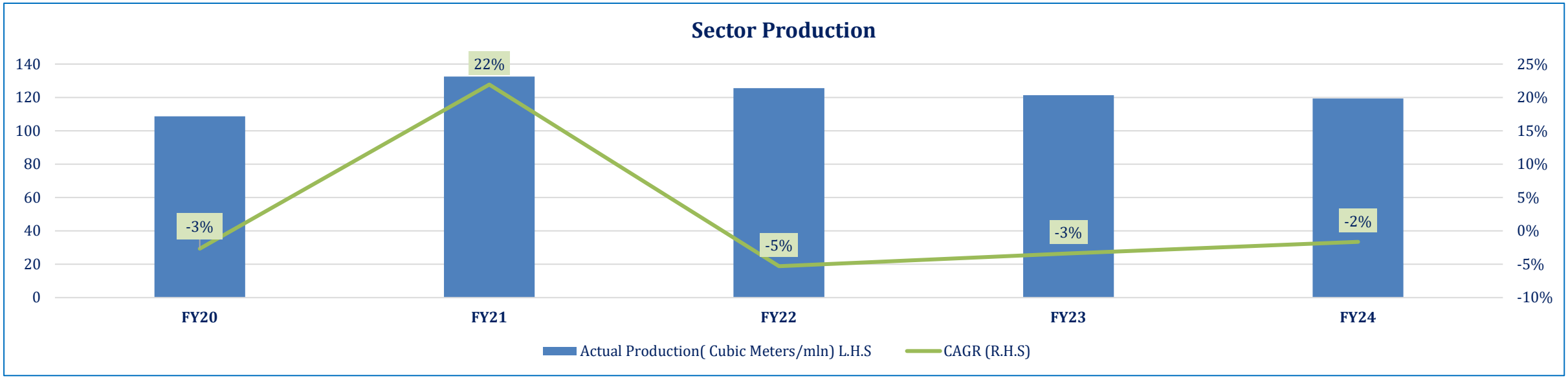
**Market shares are estimated based on PACRA-rated clients.*

Source: PSX, PACRA Database

Industrial Gases

Local | Demand

- Major demand of the sector emanates from the Large-Scale Manufacturing (LSM) as well as the healthcare segments of the economy. Thus, any fluctuations in LSM growth are likely to have a direct impact on the sector's revenue. However, demand from the healthcare segment can also determine the trend in the sector's performance.
- In FY24, the economic activity in the country improved with LSMI recovering from negative ~10.0% to ~0.9% in FY24. The sector's revenue was estimated at PKR~22.2bln in FY24 – a growth of ~27.4% YoY basis. This rise in revenue was primarily due to the rise in prices as the CPI remained at around ~15% in FY24.
- Marginal improvement in LSM activities increased the sector's Compound Annual Growth Rate (CAGR) by ~1.0%. However, actual production capacity is expected to rise significantly as major players undertake extensive upgrades and expansions of their plants, enhancing overall production capabilities.
- In short, the medium and long-term demand for the sector is likely to grow as these gases are used in several significant sectors of the economy like steel, cement, food industry, and other manufacturing sectors along with a visible improvement in the overall economic indicators.



Note: *FY24 numbers are prorated based on latest available quarterly accounts.*

Source: PSX, PACRA Database

Industrial Gases

Local | Supply

- For almost all Industrial Gases, production is derived from the underlying demand. It follows from this that variation in utilization levels across the years is attributable to demand.
- Underutilization of capacity is likely attributable to certain factors including non-availability of natural gas, lower demand, and load-shedding of electricity.
- Moreover, the sector players are expanding their capacities in different areas including Port Qasim, Karachi, and KPK. The added capacity is likely to ensure a consistent supply of gases for the industrial requirements of the health sector, CPEC projects, and growth in other sectors in the LSM.
- One of the major sector players Ghani Chemicals Industry is expected to set up its 5th 275TPD ASU plant in Hattar Special Economic Zone by Nov'24 while a calcium carbide manufacturing facility is also planned to be operational by Jan'25.
- This will result in not only an increase in Ghani Chemical's production capacity but will also likely increase its market share in the sector.

Year	Pakistan Oxygen Limited (CY)			Ghani Chemicals Industry Limited (FY)			Total		
	Production Capacity (mln cubic meter)	Actual Production (mln cubic meter)	Capacity Utilization	Production Capacity (mln cubic meter)	Actual Production (mln cubic meter)	Capacity Utilization	Production Capacity (mln cubic meter)	Actual Production (mln cubic meter)	Capacity Utilization
2020	101.2	64.6	64%	61.0	44.1	72%	162.2	108.7	67%
2021	101.2	70.8	70%	70.8	61.8	87%	172.1	132.6	77%
2022	103.8	66.2	68%	72.7	59.3	82%	176.5	125.5	71%
2023	128.6	62.8	49%	90.9	58.5	64%	219.5	121.3	55%
2024*	129.6	63.8	49%	91.9	55.5	60%	221.5	119.3	54%

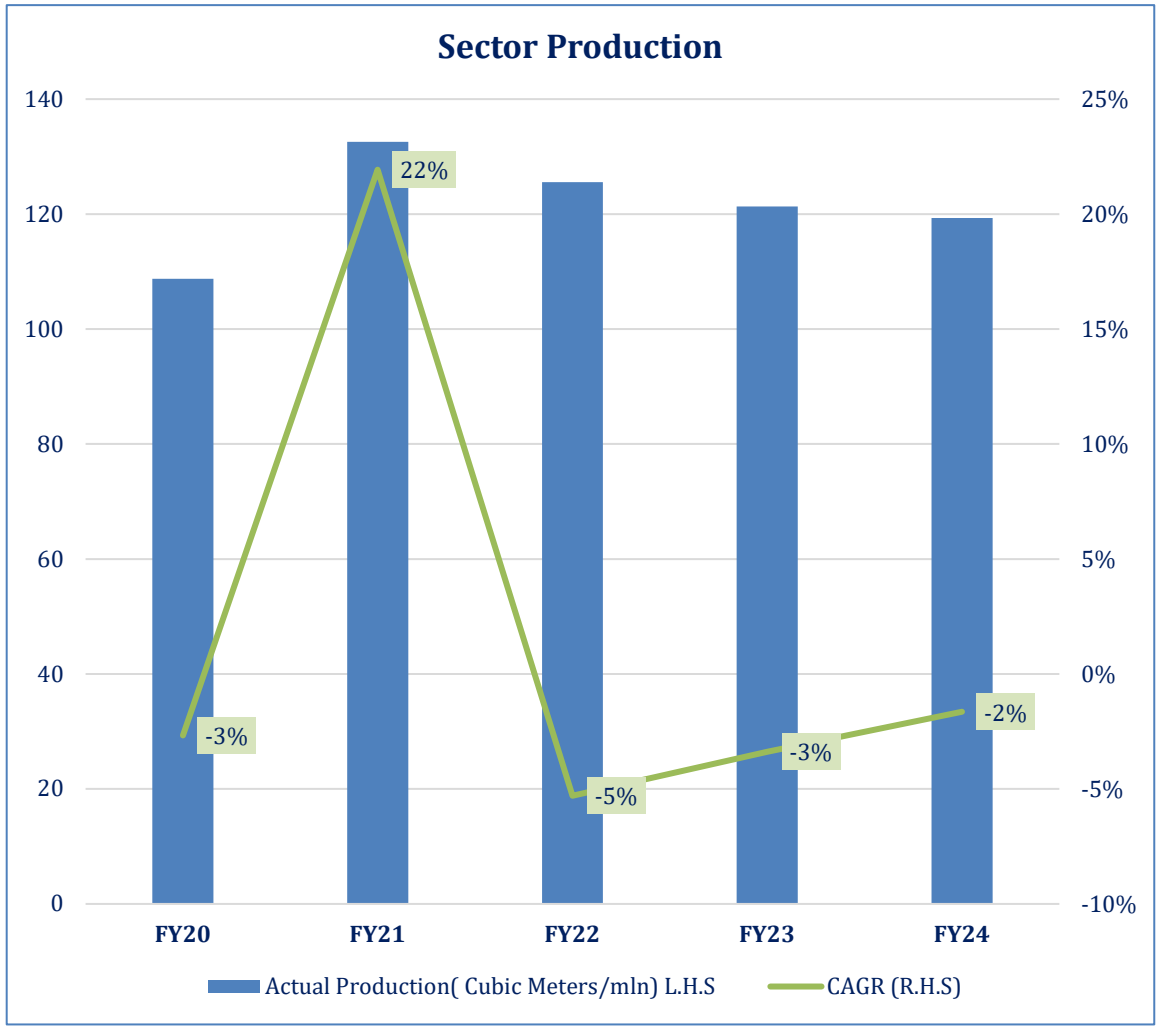
**Actual and estimated production of FY24 for Pakistan Oxygen Limited reflects CY24 data.*

Source: PSX, PACRA Database

Industrial Gases

Local | Supply

- In FY24, the actual production capacity of the sector was recorded at ~119.3mln, down by ~1.0% last year (FY23: ~121.3mln)
- The proportion of Pakistan Oxygen remained ~51.8% and Ghani Chemicals contributed ~48.2%.
- The production in FY24 witnessed a marginal decline of ~1.6% owing to slow demand and performance of the overall LSM sector.
- The expansion plans of the major players will increase the production capacity of the sector which can increase the availability of medical gases for hospitals and can also help in developmental projects of CPEC in the future as the economy starts recovering pushing demand up.
- The setup of the 5th ASU plant and an import substitute chemical project of one of the major sector players in the Hattar Special Economic Zone is in the final phase. These projects are expected to be in operation within 1HFY25.
- The import share of Industrial Gases has been insignificant as compared to the domestic production. Even though the amount has increased over the years, its share in total supply remains below ~1.0%.



Note: *Figures for FY24 are estimated based on PACRA-rated clients, representative of ~74% share in production capacity*

Source: PACRA Database

Industrial Gases

Business Risk | Price Determinants

- Prices of Industrial Gases are mainly dependent on the market forces. An increase in the amount of any price determinant can increase the overall cost and hence have an impact on the price. Some of the key contributors to the price are listed below:

- **Energy Cost**: Electricity is the main source of energy involved in the separation of air and thus drives the cost of production of Industrial Gases. Large-scale production has the advantage over smaller units as smaller units have higher electricity consumption.

- **Oil & Natural Gas Price Fluctuation**: For gases like hydrogen and helium, feedstock cost fluctuations have a larger impact on the production cost.

- **Quality/Special Gas**: If the composition of gas requirement is proprietary, the costs are generally very high. The requirement for high-quality gas also drives the cost and thus the price. Low-quality gas and general gases carry lesser costs due to the abundant availability of multiple sources of supply. Further, gases are often based and priced on their purity levels.

- **Customized Product:** Complex design, specific gas products are tailor-made, which involves high value of production. This increases the prices of such products as their availability is through selected channels.

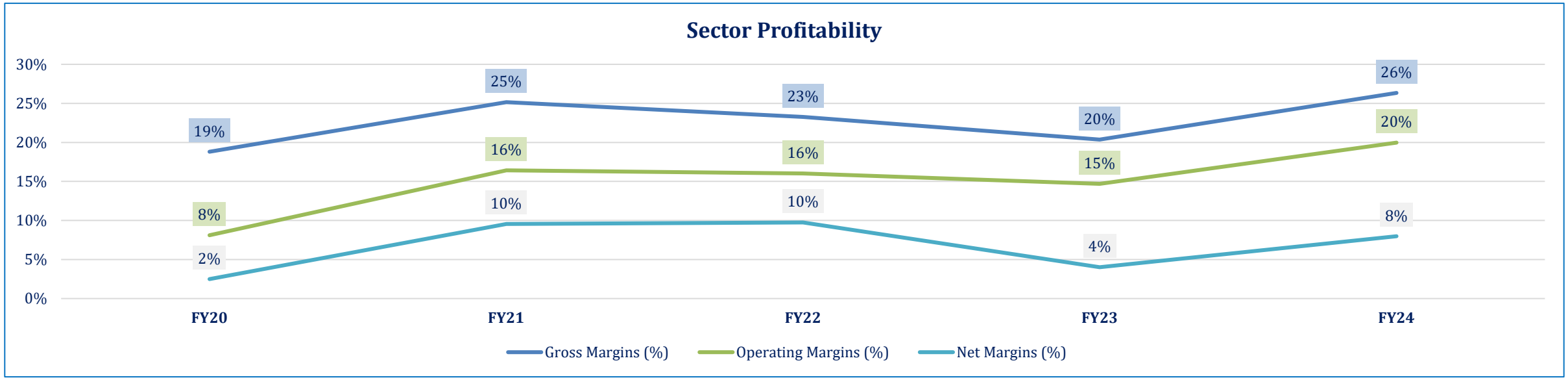
- **Other** price determinants include administrative costs and frequency/volume of purchase. The sector is largely able to pass on its cost of production to the end users.

Source: PACRA Database

Industrial Gases

Business Risk | Margins

- The sector's average gross margins for the period from FY20-FY24 hovered around ~23.0%. In FY24, the average gross margin was recorded at ~26.0%, exhibiting an increase from FY23 when it was recorded at ~20.0%.
- The sector's operating margins were also up by ~5.0% from the previous year and were recorded at ~20.0% in FY24 (FY23: ~15.0%) while the net margins also doubled to ~8.0% in FY24 (FY23: ~4.0%).
- The sector's improved margins can largely be attributed to a significant rise in net revenue, which grew by ~27.4% in FY24 compared to ~12.3% in FY23 due to price inflation.
- Additionally, enhanced cost-efficiency, driven by the adoption of new energy-efficient plants by leading market players, has further contributed to this improvement.



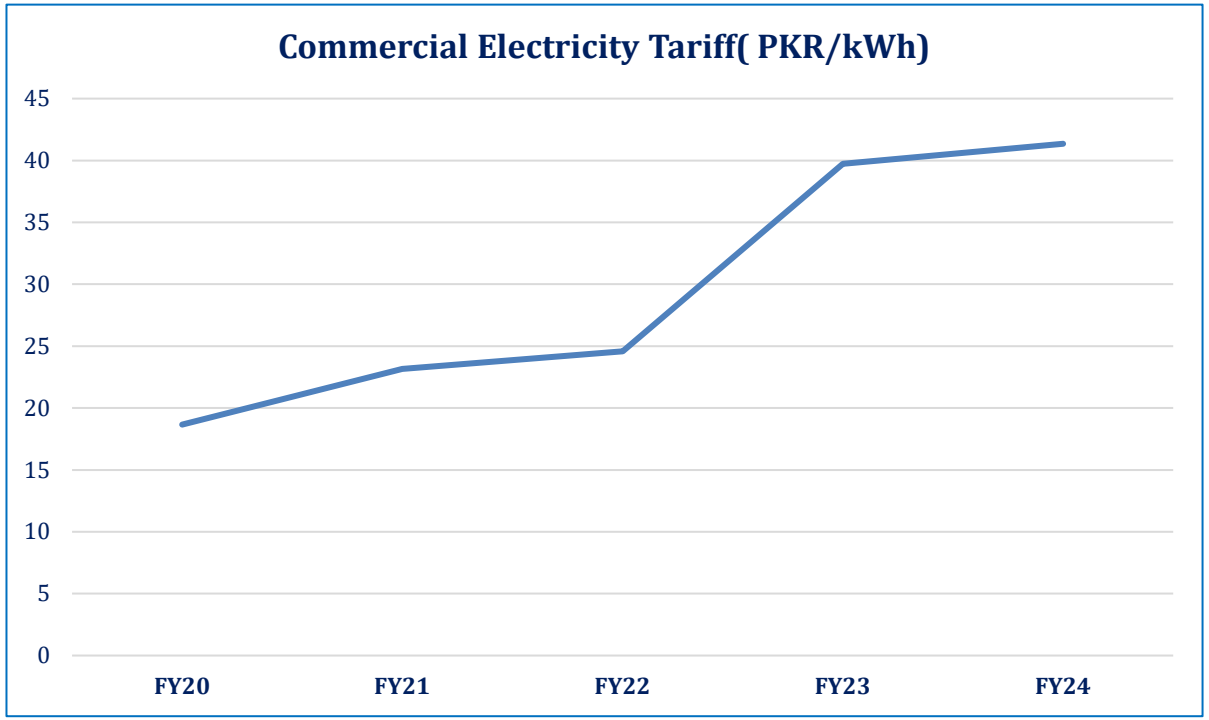
Note: *Figures for FY24 are estimated based on PACRA-rated clients, representative of ~74% of the sector's*

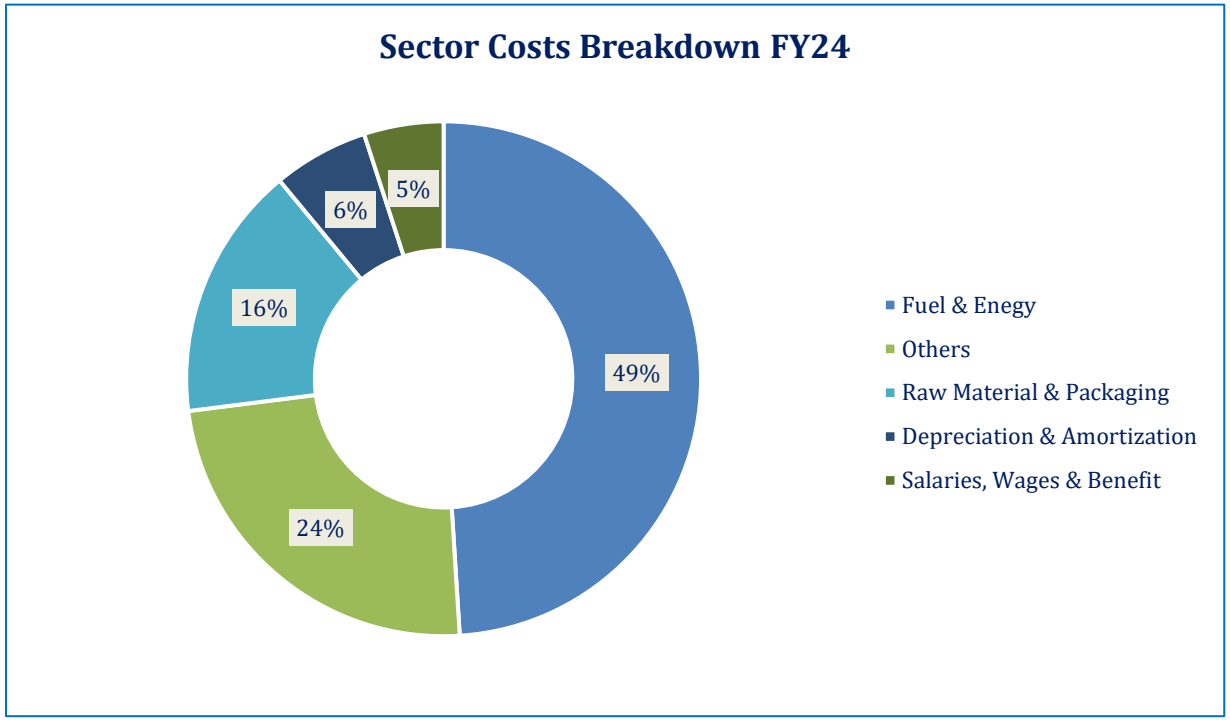
Source: PACRA Database

Industrial Gases

Business Risk | Cost Breakdown

- Major price drivers for the sector are energy cost, gas purity, customization of the product, volume purchased, and delivery location, while the production is entirely demand-driven.
- The cost structure of the Industrial Gases comprises ~75-80% variable cost, which is dominated by energy prices followed by other costs and raw materials.
- Electricity cost accounted for ~49.0% in FY24 (FY23: ~42.0%) due to a continuous rise in the commercial electricity tariffs.
- The commercial electricity tariffs sharply increased in FY23 to around PKR~40/kWh and averaged around PKR~41.3/kWh in FY24.
- Other costs include depreciation and consumable spares that constituted ~24.0% in FY24 compared to ~20.5% in FY23.





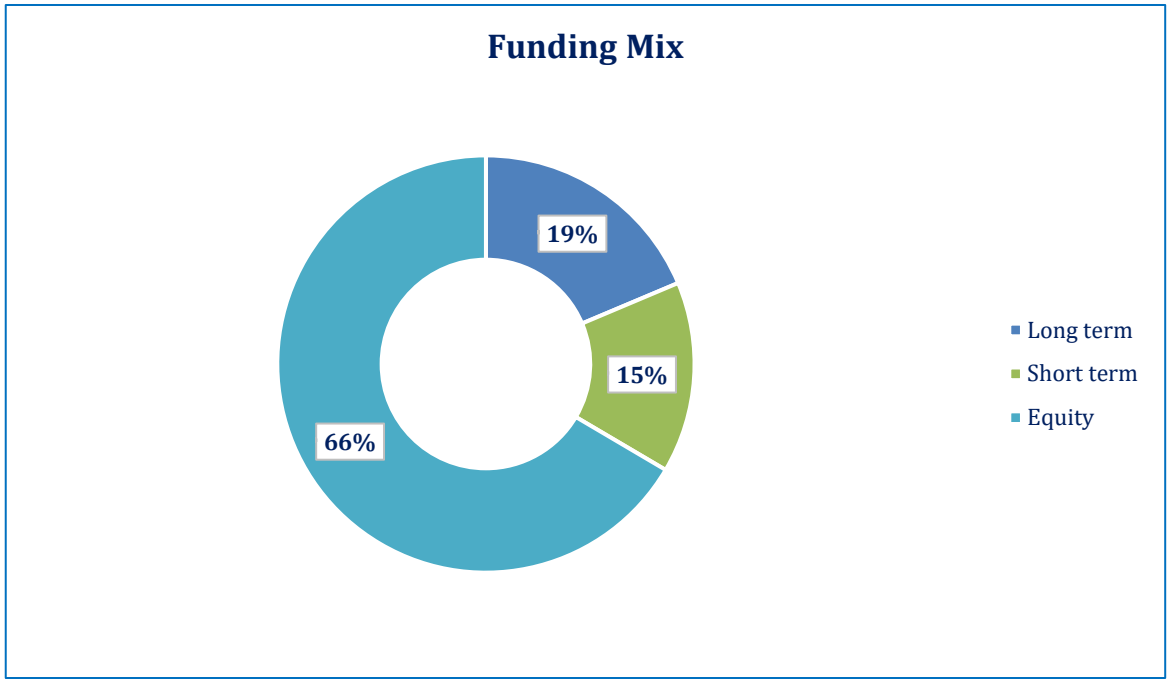
**Figures for FY24 are estimated based on PACRA-rated clients.*
***Note**: The electricity tariff does not include FCA or other charges.*

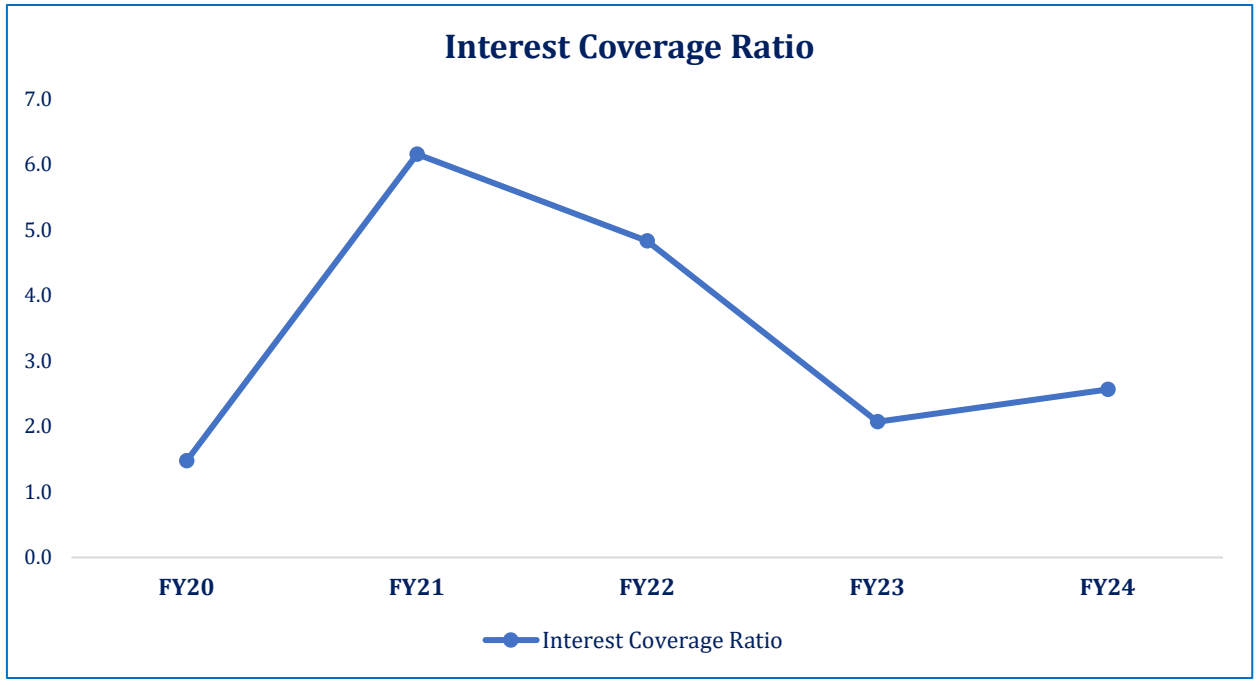
Source: PACRA Database, NEPRA

Industrial Gases

Financial Risk

- **Debt Leverage:** The sector is moderately leveraged with debt-to-equity ratio averaging around ~50.0% (from FY20-FY24), which reduced to ~50% in FY24 as compared to FY23 (~60.0%). The decline in leverage indicates an increase in the sector's equity in FY24 which rose by ~8.5% YoY.
- **Funding Mix:** The sector's total borrowings stood at PKR~10,407mln in FY24 (FY23: PKR~10,207mln), a marginal increase of ~1.9% YoY. This increase in borrowings reflects the pattern of expansion plans of the sector's leading players. The largest component in the borrowing mix is represented by long-term borrowings which made up ~54.7% of the total borrowings in FY24 (FY23: ~56.2%), while the short-term borrowings constituted ~45.3% (FY23: ~43.8%). Meanwhile, the sector's equity stood at PKR~18,950mln which was ~66.0% of the total funding mix with an increase of ~8.5% YoY growth.
- **Interest Coverage:** The average interest cover of the sector was recorded at ~3.4x (FY20-FY24) while in FY24 the interest coverage was recorded at ~2.6x which is higher than that of FY23, where it stood at ~2.1x.
- Overall, the increase in profitability of the sector and the interest coverage ratio indicates improved financial health of the sector.





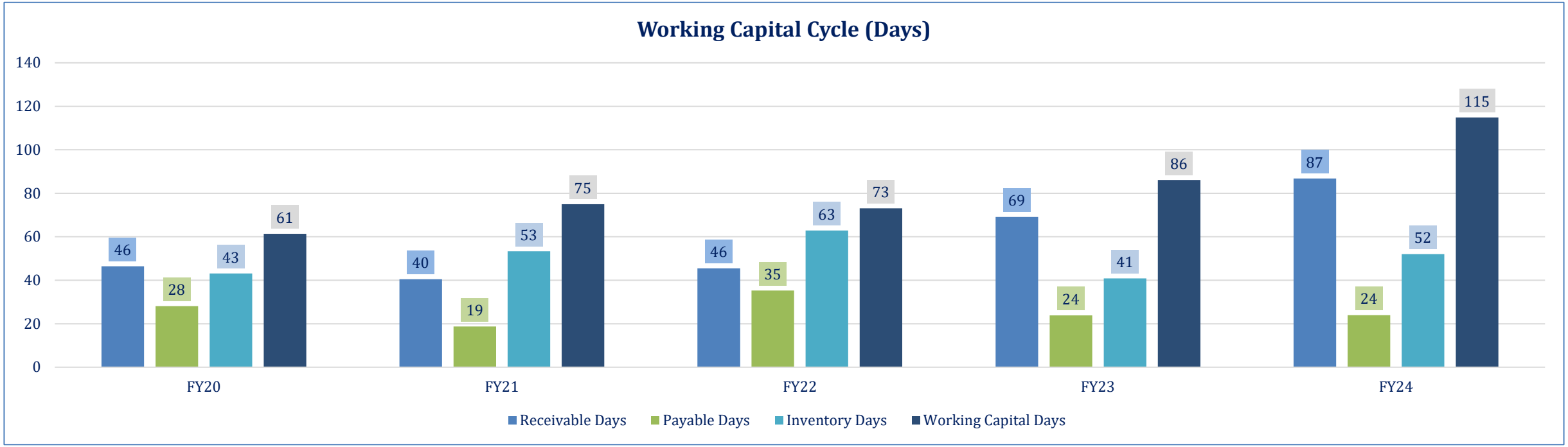
Note: *Figures for FY24 are estimated based on PACRA-rated clients.*

Source: PACRA Database

Industrial Gases

Financial Risk | Working Capital Management

- The sector's working capital requirement emanates from financing inventories and trade receivables for which the sector relies on both internal cash flows and short-term borrowings.
- The average net working capital cycle over the last five years (FY20-FY24) was ~82 days. In FY24, net working capital days were recorded at ~115 days which is ~29 days more than the previous year (FY23: ~86 days), reflecting an extended credit and payment cycle.
- The inventory days remained the same as of the previous year recorded at ~24 days while the receivable days increased by ~18 days to ~87 days in FY24.
- On the other hand, the sector's payable days also rose from ~41 days in FY23 to ~52 days in FY24.



Note: *Figures for FY24 are estimated based on PACRA-rated clients.*

Source: PACRA Database

Industrial Gases

Regulatory Framework

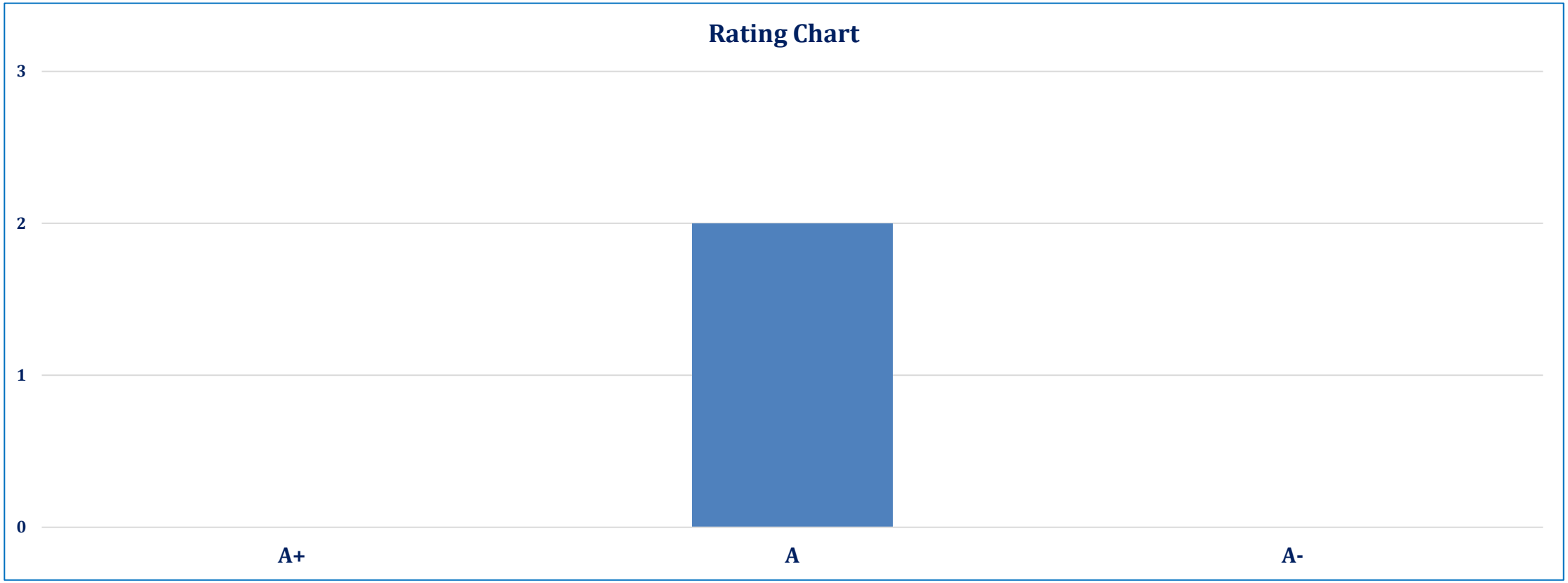
PCT Code	Description	Custom Duty		Additional Custom Duty		Regulatory Duty		Total	
		FY23	FY24	FY23	FY24	FY23	FY24	FY23	FY24
2804.1000	Hydrogen	3%	3%	2%	2%	0%	0%	5%	5%
2804.2100	Argon	3%	3%	2%	2%	10%	10%	15%	15%
2804.3000	Nitrogen	3%	3%	2%	2%	10%	10%	15%	15%
2804.4000	Oxygen	3%	3%	2%	2%	0%	0%	5%	5%
3824.9996	Neon	0%	0%	2%	2%	0%	0%	2%	2%
2811.2100	Carbon Dioxide	3%	3%	2%	2%	5%	5%	10%	10%
2814.1000	Anhydrous Ammonia	0%	0%	2%	2%	0%	0%	2%	2%
8405.1000	Acetylene	0%	0%	2%	2%	0%	0%	2%	2%
2804.2900	Other	3%	3%	2%	2%	0%	0%	5%	5%

Source: FBR

Industrial Gases

Rating Curve

- PACRA rates 2 entities in the Industrial Gases sector, with a long-term rating of A.



Industrial Gases

SWOT Analysis

- Ease of access to raw material.
- Mature and long-standing sector.
- Technologically advanced machinery with low power consumption.
- By-products of the gas production process can be sold separately.
- High barriers to entry.

- Low-value addition/commodity product.
- Highly volatile cost of production.
- Energy disruptions.
- Dependence on imports affected by exchange rate fluctuation.

- Duopoly structure – price influenced by two major players.
- Interdependency on demand from other Industrial Sectors.
- Large-scale manufacturing (LSM) slowdown.
- Non-availability of indigenous natural gas.

- Growing industrial and medical Sector.
- Rapid industrialization in emerging economies.
- An increased focus on ESG measures and environmental regulations.
- Opportunity to increase efficiency through technological upgrade.

Industrial Gases

Outlook: Stable

- In FY24, Pakistan's nominal GDP clocked in at PKR ~106.0trn (FY23: PKR ~83.9trn), growing by ~2.4% YoY in real terms (FY23: ~-0.21% decline).
- Industrial activities contributed ~21.9% to the GDP, with manufacturing accounting for ~62.9% of the total value added.
- During FY24, average CPI inflation level dropped to ~9.6% from ~27.4% in FY23. GDP growth was also recorded at ~2.4%, with SBP lowering the policy rate to ~19.5% at the end of FY24.
- The LSM continued to show a mixed trend with improvement in FY24, inching up by ~0.9%. However, in 1QFY25, the LSM was recorded at negative 0.2% whereas the policy rate lowered to ~17.5%.
- Although demand for industrial gases is closely linked to LSM however sector's financials remained strong on the back of strong revenue performance owing to higher prices and the duopoly of the market leaders.
- The sector's revenue surged by ~27.4%, reaching PKR~22.2bln in FY24, up from PKR~17.4bln in FY23.
- The sector's performance also reflected an improved outlook in FY24 with the gross margins rising to ~26.0% in FY24 (FY23:~20%), while net margins increasing to ~8.0% (FY23:~4.0%). However, escalating energy costs remain a concern for the sector.
- The new plant's operational impact on revenue and market share is yet to be realized. Additionally, new contracts and relocations in the pipeline will influence the sector's financial position. Furthermore, growing industries like research and technology are driving demand for specialty gases like argon and rare gases (neon, krypton, and xenon), while Nitrogen and carbon dioxide, used in packaged food to maintain freshness, are seeing rising demand due to increased consumption of packaged and canned products.
- The sector's improved margins and stronger interest coverage ratios reflect its sound financial health, although increased working capital days are a concern and optimal working capital management is essential to prevent any cash flow issues.
- Overall, the sector's performance indicators remained healthy during FY24, and the same is expected to strengthen in the coming days with economic stability and consolidation. However, factors such as slower-than-expected growth in LSM, higher energy costs, and rising working capital days may slow down the anticipated growth trajectory of the sector.

Industrial Gases

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