Industrial Gases

Sector Study

October 2021

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Industrial Gases

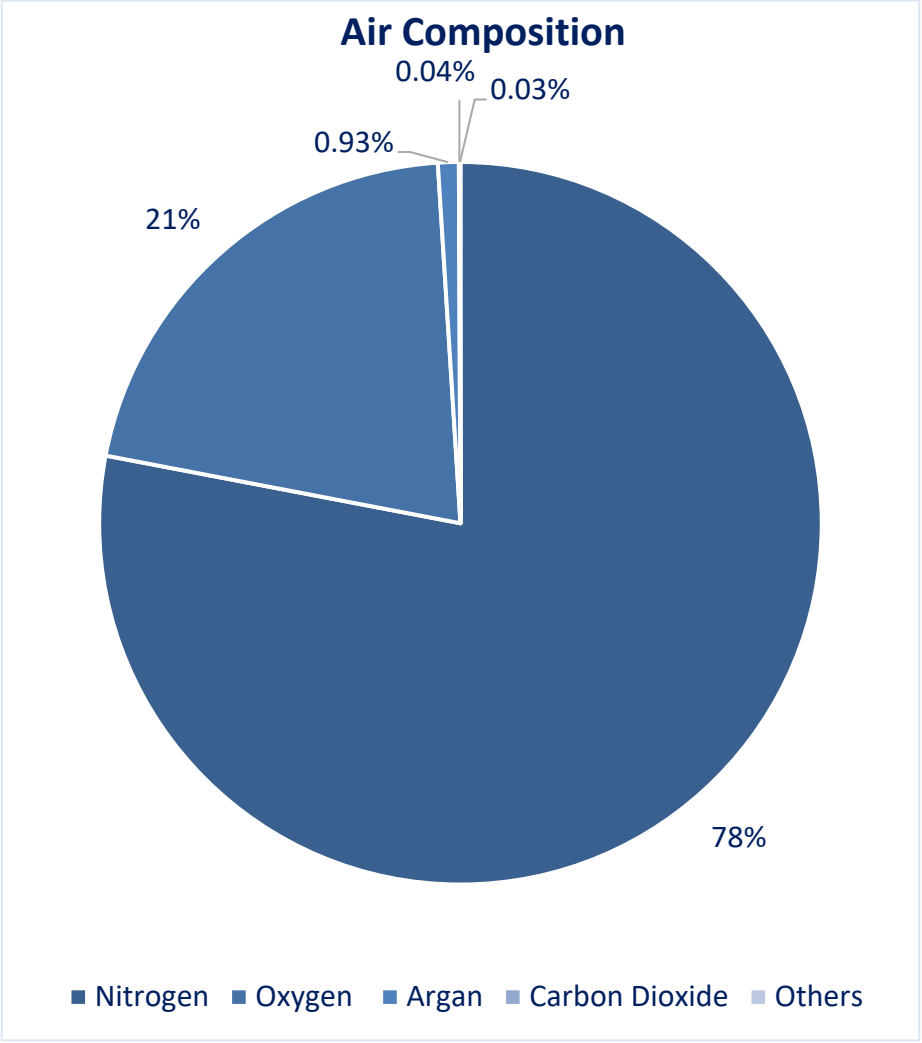
Global Overview

- "Industrial Gases" refers to gases which are produced in relatively large quantities for use in a variety of industrial manufacturing processes and medical purposes. They are produced and supplied in both gas and liquid form. They are transported to customers in cylinders, as bulk liquid, or through pipelines in gaseous form. The principal gases are nitrogen, oxygen and carbon dioxide.

- **Global Market size**: In CY21, global industrial gas market is estimated to grow to USD~101.1bln (CY20: USD~96.8bln) at a YoY growth rate of ~4.4%. The growth is mainly due to the companies rearranging their operations and recovering from the COVID-19 impact, which had earlier led to restrictive containment measures involving social distancing, remote working, and the closure of commercial activities that resulted in operational challenges.

- Asia Pacific is the largest region in the global industrial gas market, accounting for ~42% of the market. North America is the second largest region accounting for ~24% of the global industrial gas market. Africa is the smallest region in the global industrial gas market.

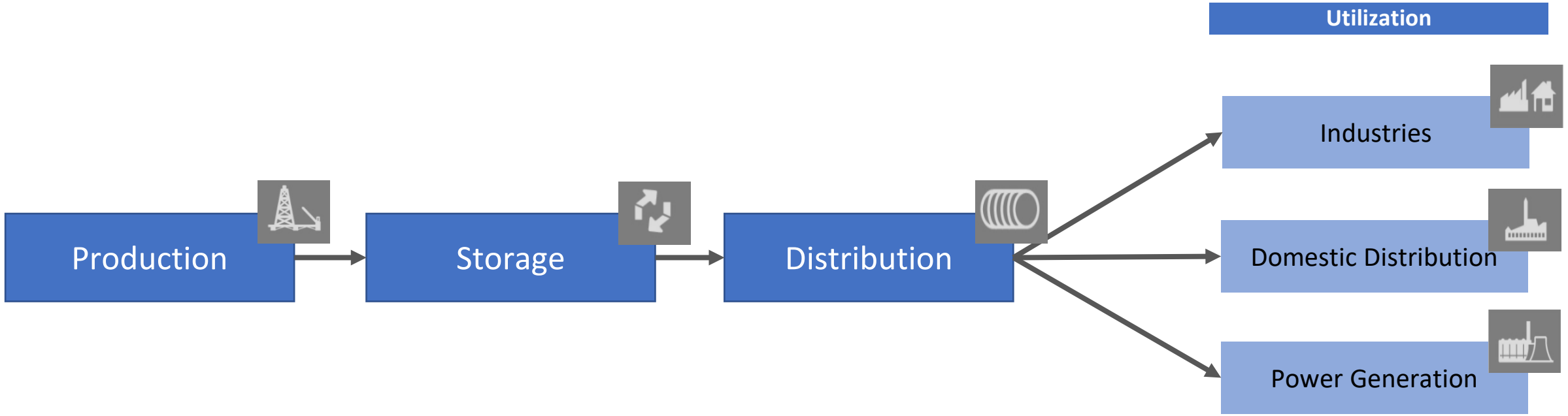
- Major companies in the industrial gas market include: Air Liquide, The Linde Group, Praxair, Inc, Air Products and Chemicals Inc and Mitsubishi Chemical Holdings Corp.



Source: Research and Markets

Industrial Gases

Supply Chain



Industrial gases value chain involves four main steps:

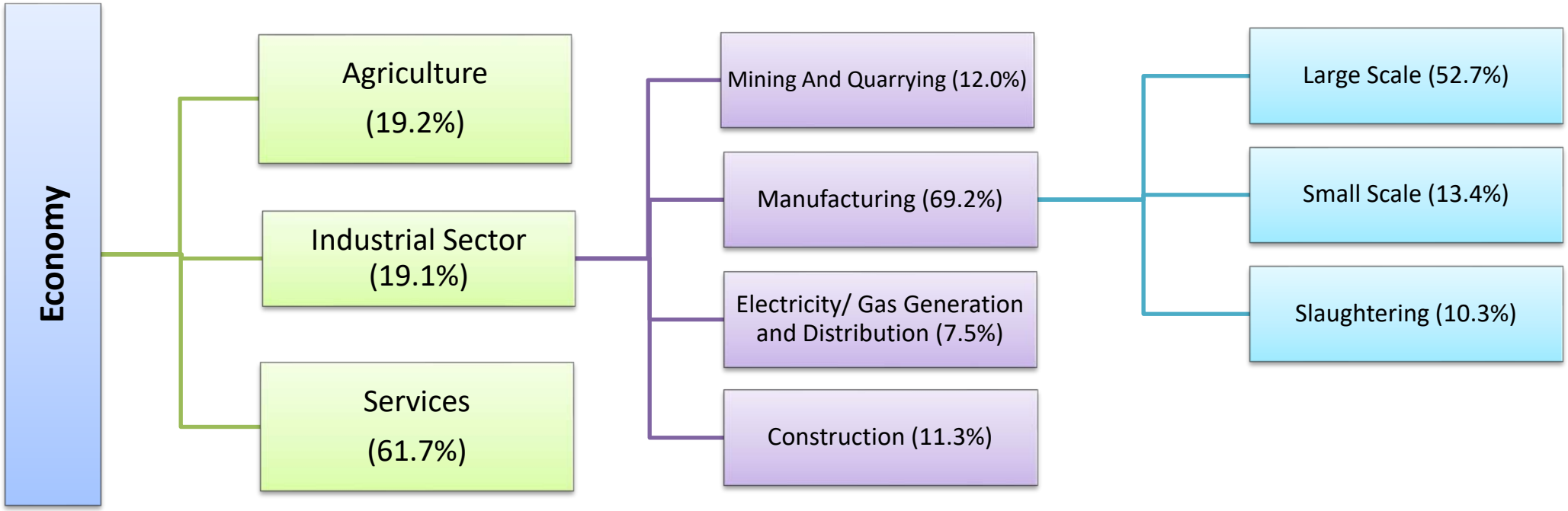
1. **Production**: Extraction of the gas from the raw materials – air, through electrolysis, reforming, and other techniques.
2. **Storage**: Storing the gas in gaseous, liquefied, slush/solid form to be delivered to the consumer.
3. **Distribution**: Transmitting the product to the industries and end consumers via methods including On-site/pipeline, Bulk/merchant, Cylinder/packaged techniques.
4. **Utilization**: Industrial gases are used in all the sectors and industries depending upon the nature of the gas.

Industrial Gases

Large Scale Manufacturing | Overview

- Pakistan's economy is classified into three main sectors. Industrial sector represents ~19.2% to the country's GDP and manufacturing segment contributes ~69.2% to the industrial sector. Meanwhile, Large Scale Manufacturing (LSM) contributes ~52.7% to the manufacturing segment.

- Within the Industrial sector, the manufacturing segment has been the primary contributor to GDP growth in FY21. In particular, the LSM rebounded sharply and surpassed its average levels. Output of the LSM grew by ~14.9% in FY21, in contrast to a contraction of ~10.2% in FY20. A conducive policy environment with targeted fiscal support played a key role in the economic rebound.



Source: SBP

Industrial Gases

Local | Overview

- The Revenue of the Sector was recorded around PKR~11bln in FY21 – a momentous growth of ~40% YoY basis. The Sector has a high dependency on the performance of LSM. However, during the third wave of COVID-19, the demand for medical gases reached its peak and the sector shifted its capacity towards the medical sector.

- The Sector's impressive growth of ~40% in FY21 majorly stemmed from the health sector as well as eased lockdown restrictions, leading to a rebound in Industrial activity.

- The structure of the sector is organized yet concentrated with two major players, i.e., Pakistan Oxygen and Ghani Chemicals estimated to have ~82% share of the market. Other companies include Sharif Gases, Agha Gas, Sultan Oxygen and MediGas.

- One of the prominent players of the industry, Pakistan Oxygen and Ghani Chemicals are moving towards expansion plans to meet the growing demand of oxygen and nitrogen.

Industry Snapshot	FY20	FY21
Sector Revenue (*in PKR mln*)	7,594	10,643
Sector Growth	9%	40%
Players	2 players contributing ~82% to the market demand.	
Structure	Duopoly	
Regulatory Body	National Disaster Management Authority NDMA	

**Figures are estimated based on PACRA rated clients.*
** FY21 numbers are prorated based on latest available quarterly accounts.*

Source: PSX, PACRA Database

Industrial Gases

Local | Demand

- Major demand of the sector emanates from large scale manufacturing companies and health care sector. Thus, any fluctuation in LSM activity holds a direct implication for the sector's revenue.

- Recently, the COVID-19 has raised serious concerns over the existing healthcare infrastructure. During these challenging times, oxygen demand touched its peak and the country's capacity reached its exhaustion level. Further, when the need of medical gases surged drastically due to COVID-19, the two major companies had to rescue the situation. Pakistan Oxygen decided to serve the community and diverted its entire capacity of gas production towards healthcare medical gases.

- Going forward, the increased demand from healthcare segment is expected to get a downward adjustment as COVID-19 situation significantly improves in the country. The demand will, however, remain above pre COVID-19 level.

Local Demand	
Products	**Industrial Use**
Liquid Oxygen	Medical, Chemical processing, General engineering, Fabrication, Steel manufacturing, Welding industries, and Ship breaking industry
Liquid Nitrogen	Chemical processes and oil and gas exploration
Liquid Argon	Medical, Chemical processing, General engineering, Fabrication, Steel manufacturing, Welding industries, and Ship breaking industry
Nitrous Oxide	Medical
Compressed Oxygen Aviation Oxygen Compressed Nitrogen Compressed Argon Compressed Air Compressed Hydrogen Compressed Carbon dioxide Dissolved Acetylene	Manufacturing and Engineering

Source: PSX, PACRA Database

Industrial Gases

Local | Supply

- For almost all of the gases, the production is derived from the underlying demand and, hence, the variance and utilization is attributable to demand.
- Underutilization of capacity is attributable to certain factors including non- availability of natural gas, plant shutdowns and energy disruptions.
- Moreover, the sector players are expanding the capacity/plants to meet up the increasing demand from medical sector. The added capacity shall ensure consistent supply of Oxygen to the hospitals in KP and Northern regions of the country with the spirit of combating COVID-19 emergencies besides meeting the industrial requirements of CPEC projects.

Industrial Gases	Total Capacity		Total Production		Capacity Utilization	
	CY19	CY20	CY19	CY20	CY19	CY20
Oxygen/ Nitrogen (Cubic meters)	82,233,900	82,233,900	66,408,391	62,969,250	81%	77%
Hydrogen (Cubic meters)	3,400,056	3,400,056	2,050,835	1,540,565	60%	45%
Dissolved Acetylene (Cubic meters)	268,152	268,152	72,663	65,079	27%	24%
Nitrous oxide (Gallons)	39,422,000	39,422,000	19,823,009	17,496,967	50%	44%

** Table pertains to Pakistan Oxygen Limited.*

Source: PSX, PACRA Database

Industrial Gases

Local | Price Determinants

- Prices of Industrial gases are majorly dependent on the market forces.

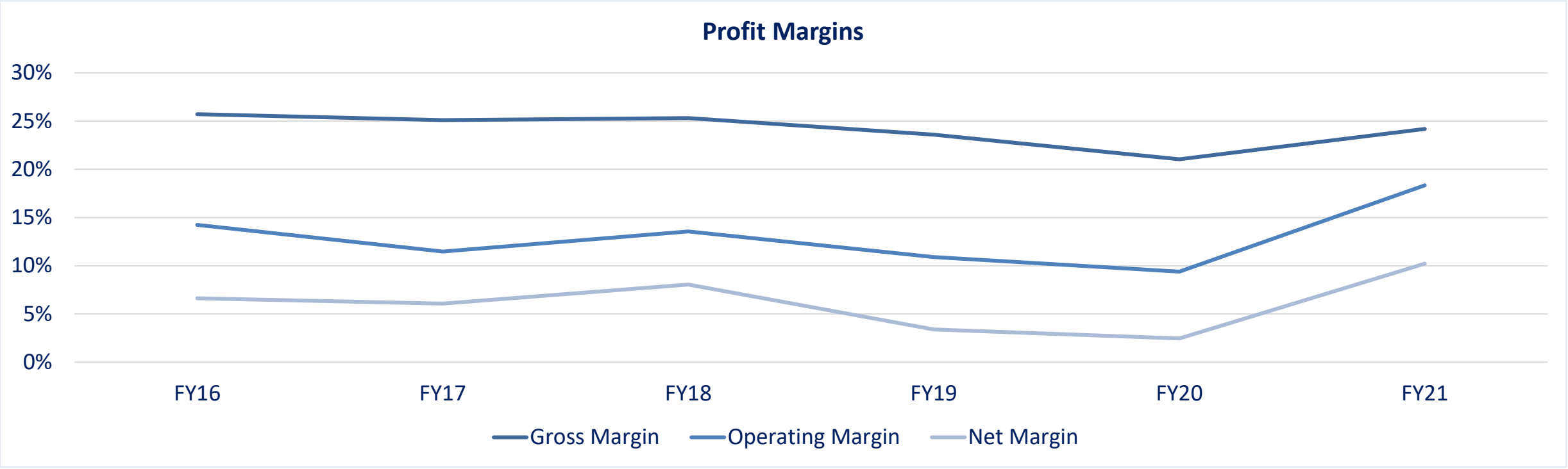
Following are the other key contributors to the price:

- **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 advantage over smaller units as smaller units have higher specific electricity consumption.
- **Oil & Natural Gas Price Fluctuation**: For gases like hydrogen and helium, feedstock cost fluctuations have a large impact on production cost.
- **Quality/Special Gas**: If the composition of gas requirement is proprietary, the costs are generally very high. The requirement of high-quality gas also drives the cost and thus the price. Low quality gas and general gases carry lesser cost due to abundant availability of multiple sources of supply.
- **Gas Purity :** 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.

Industrial Gases

Business Risk | Margins

- **Margins:** The average gross margins of the sector (from FY16-FY20) stood at ~24%. The gross profit margin is expected to record around ~24% during FY21 (FY20: ~21%), owing to improved prices amid high demand from health care sector**.**
- The average operating margins of the sector (from FY16-FY20) were recorded at ~12%. With the increase in gross profit margin, the operating margin is expected to increase to ~18% during FY21 (FY20:~9%).
- The average net margins (from FY16-FY20) hovered around ~5%. During FY21, The net margins are estimated to increase to ~10% (FY20:~2%). Historically low interest rates and improved operating margins have contributed positively to net margin growth.

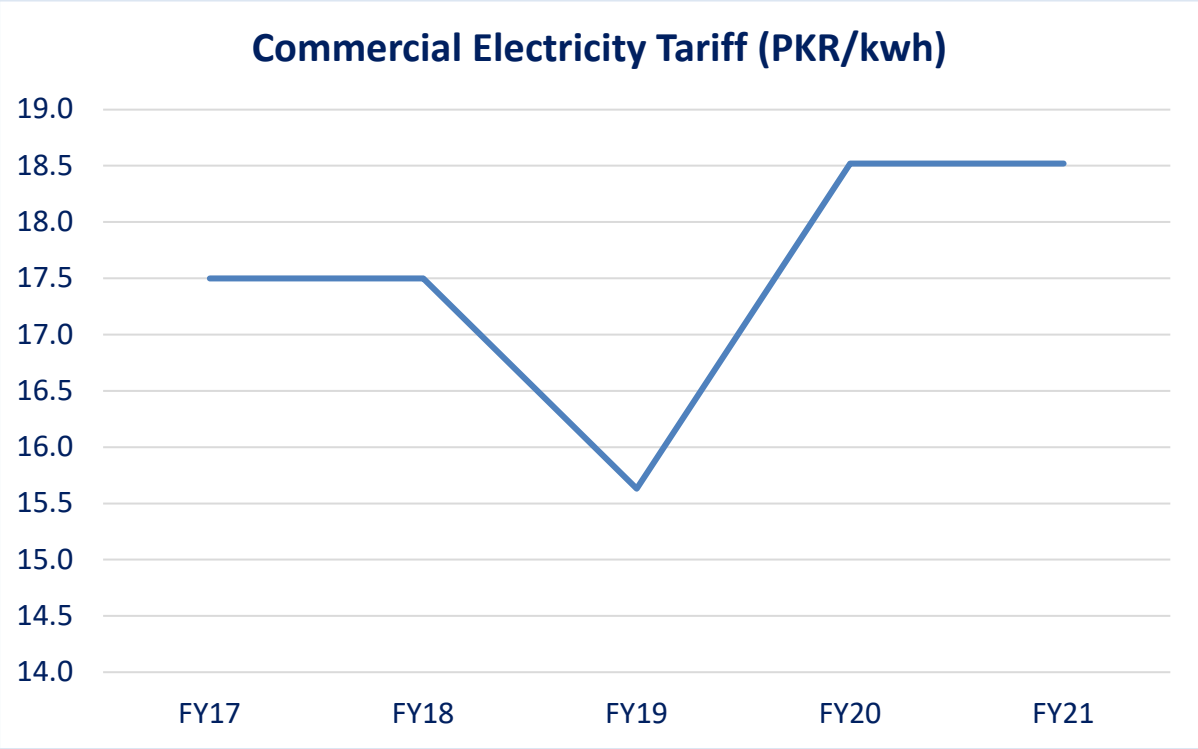


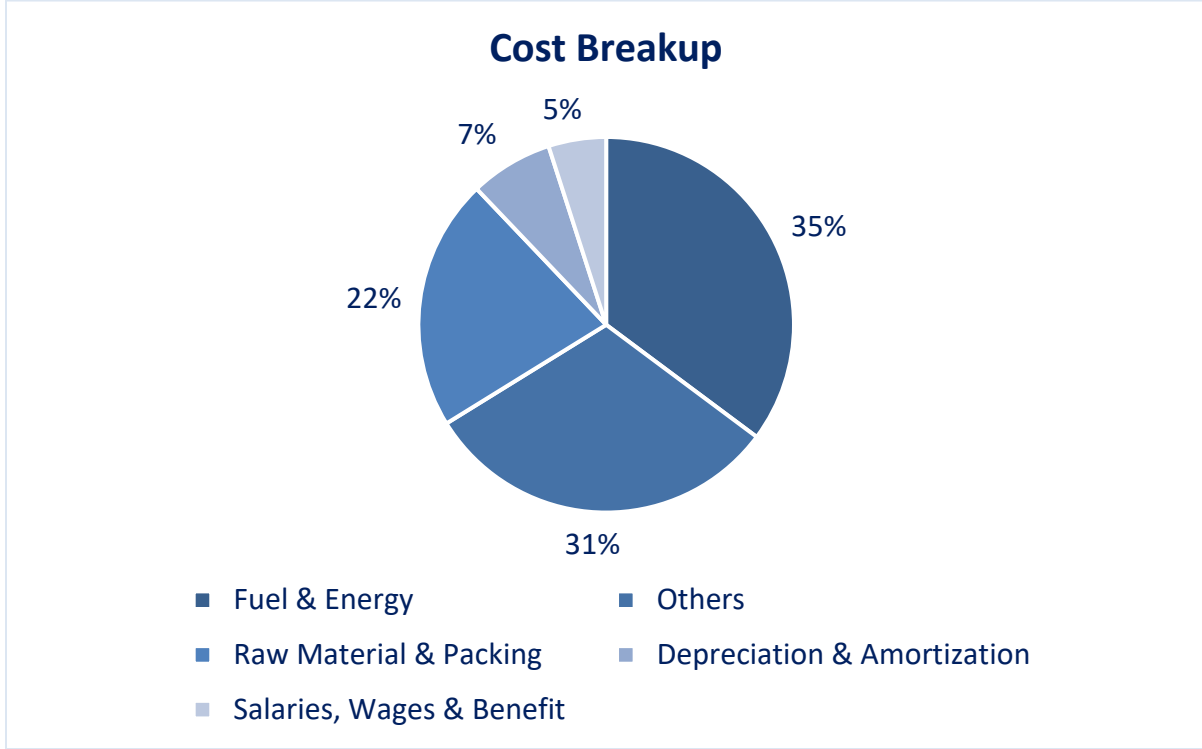
**Figures are based on financials of PACRA rated clients.*

Industrial Gases

Business Risk | Operating Risk

- The key price drivers for industrial gas sector are gas purity, customization of the product, the volume of purchase, and delivery location.
- Production is entirely demand driven.
- The cost structure of the Industrial gases is mostly variable; ~65-75% variable cost, consequently affecting the business of the sector.
- Electricity cost accounts for nearly ~35% of the total cost, hence the cost of production varies with electricity prices, and the business remains vulnerable to the changes in electricity tariffs.





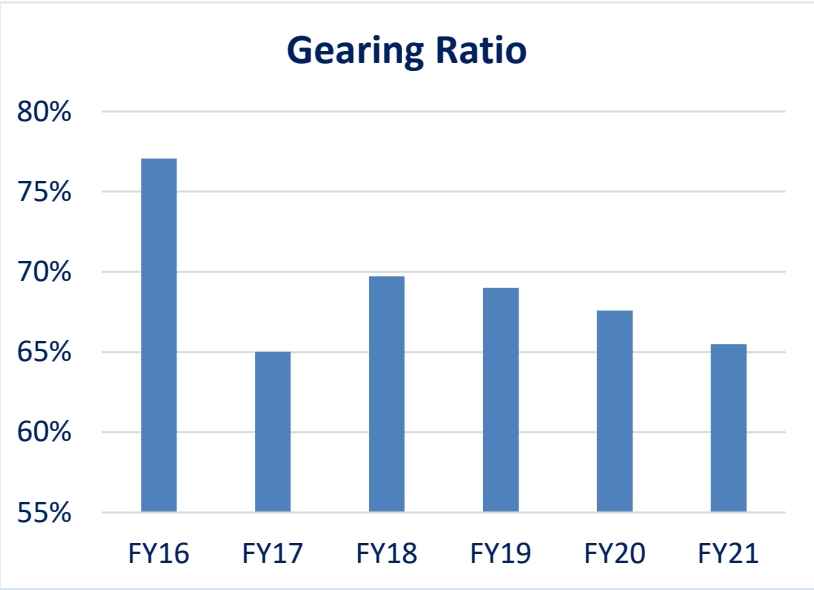
**Figures are based on financials of PACRA rated clients.*

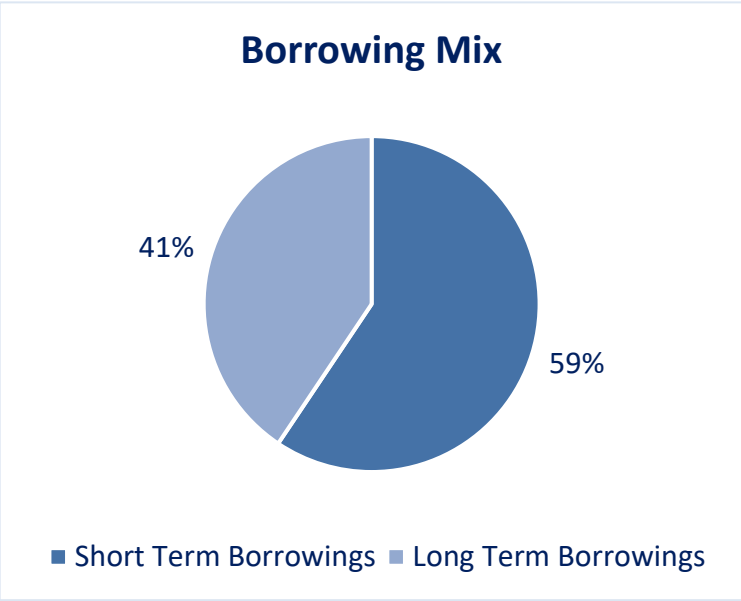
Source: PACRA Database, PES

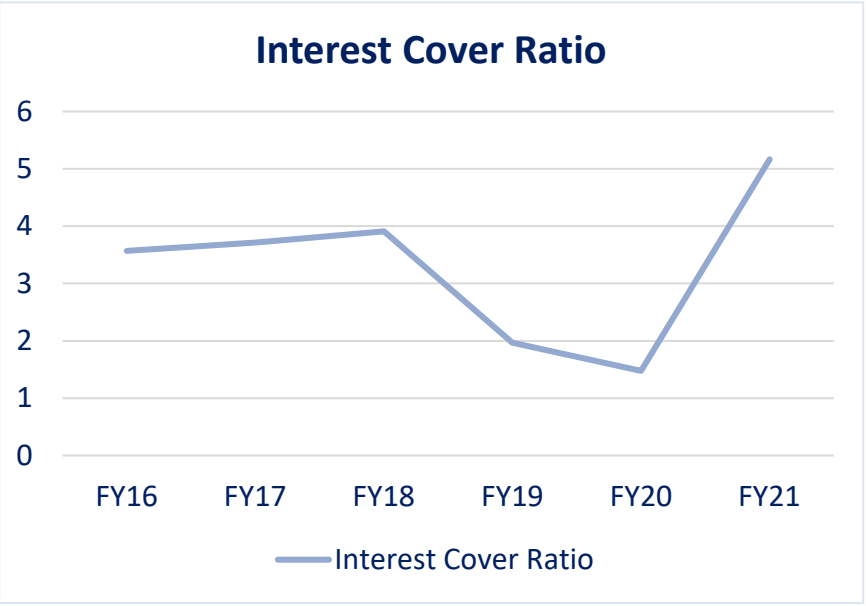
Industrial Gases

Financial Risk

- **Leverage:** Industrial gases sector is highly leveraged with debt to equity ratio averaging around ~70% (from FY16-FY20), which slightly decreased in FY21: ~65% (FY20:~68%), mainly due to improved equity base amid good profitability. Going forward, leverage ratio of the sector is expected to increase as Ghani Chemicals is planning to increase its production capacity.
- **Borrowing Mix:** The sector's total borrowing is estimated to be around PKR~3,864mln (FY20: PKR~3,040mln) a spike of ~27% YoY basis. The increase in borrowings reflects the pattern of expansion plans of one of the leading players of the sector. The largest component in borrowing mix is represented by long term borrowings: ~59% (FY20: ~77%) while the short term borrowings constitute ~41% of the total borrowings (FY20: ~23%).
- **Interest Cover:** The average interest cover of the sector was recorded around ~3x (from FY16-FY20), which improved to ~5x in FY21 (FY20:~1x). Improved profitability and lower Interest costs improved the interest coverage ratio of the sector.







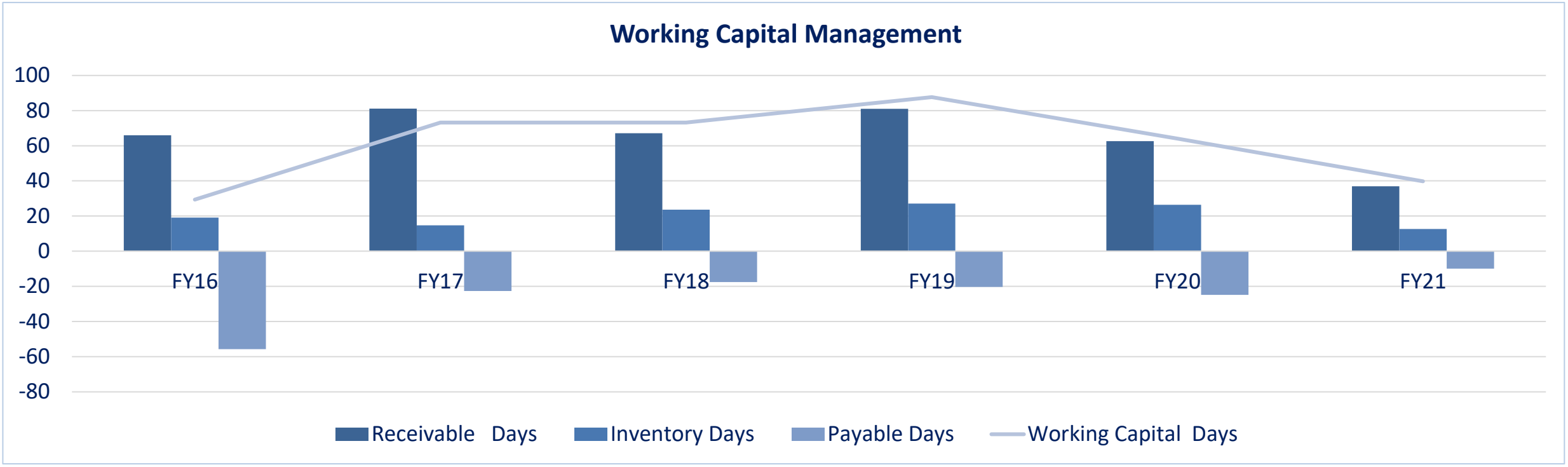
**Figures are based on financials of PACRA rated clients.*

Industrial Gases

Financial Risk | Working Capital Management

- The sector's Working Capital (WC) requirement emanates from financing inventories and trade receivables for which the sector relies on both internal cash flows and short-term borrowings.

- During FY21, higher demand stemming from the medical sector energized the Sector's topline as well as led to efficiency in its WC cycle. WC days decreased from ~64 days in FY20 to ~40 days during FY21. A major downside shift was witnessed in all components of WC cycle leading to efficiency in the overall cash conversion cycle.



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Industrial Gases

Regulatory Framework

- The custom duty remained stable at ~3% for most of the gases. For Hydrogen, it decreased from ~11% to ~3%, for Neon, Anhydrous Ammonia and Acetylene it was reduced from ~3% to ~0%.
- No change in the Additional Customs Duty was witnessed.
- In terms of Regulatory Duty, the government imposed a regulatory duty of ~10% on import of Argon and Nitrogen.
- The imposed Sales Tax is of ~17% and income tax is charged at ~11% on import stage.

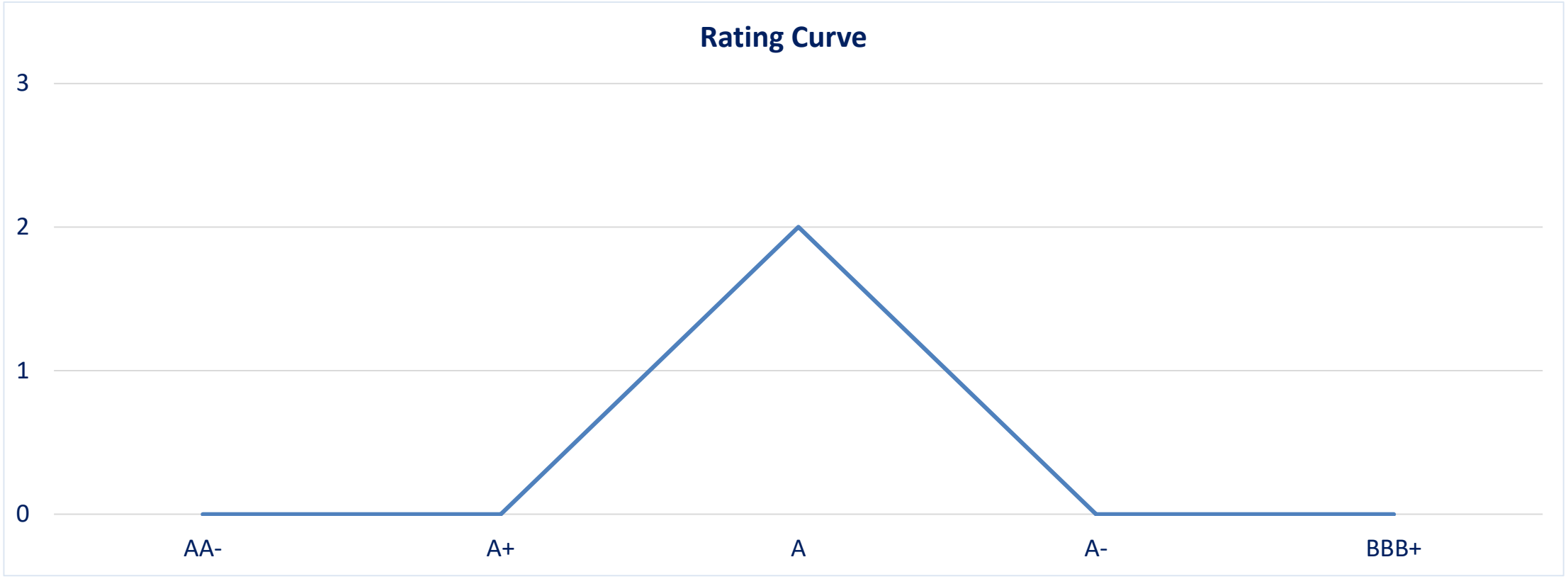
		Customs Duty		Additional Customs Duty		Regulatory Duty	
PCT Code	**Description**	**2019-2020**	**2020-2021**	**2019-2020**	**2020-2021**	**2019-2020**	**2020-2021**
2804.1000	Hydrogen	11%	3%	2%	2%	-	
2804.2100	Argon	3%	3%	2%	2%	-	10%
2804.3000	Nitrogen	3%	3%	2%	2%	-	10%
2804.4000	Oxygen	3%	3%	2%	2%	-	-
3824.9996	Neon	3%	0%	2%	2%	-	-
2811.2100	Carbon Dioxide	3%	3%	2%	2%	5%	5%
2814.1000	Anhydrous Ammonia	3%	0%	2%	2%	-	-
8405.1000	Acetylene	3%	0%	2%	2%	-	-
2804.2900	Other	3%	3%	2%	2%		

Source: FBR

Industrial Gases

Rating Curve

- PACRA rates 2 clients in the industrial gases sector.
- Both of the clients have a long term rating of A.



Industrial Gases

SWOT

- 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

- Imported machinery
- Low value addition/commodity product
- Highly volatile cost of production
- Energy disruptions

- Duopoly structure – price influenced by two major players
- Interdependency on demand from other Industrial Sectors.
- Non-availability of natural gas

- Growing industrial and medical sector.
- Rapid industrialization in emerging economies.
- Increased ESG measures and Environment regulations after Paris agreement.
- Opportunity to increase efficiency through technological upgrade.

Industrial Gases

Outlook: Stable

- Industrial gases are highly significant in a wide range of industries, which includes oil and gas, petrochemicals, chemicals, power, mining, steelmaking, metals, environmental protection, medicine, pharmaceuticals, biotechnology, food, water, fertilizers, nuclear power and electronics.

- Major demand of the sector emanates from large scale manufacturing industries. But during the third wave of COVID-19 oxygen demand touched its peak and total country's capacity reached to its threshold, raising serious concerns over the existing health infrastructure. Thus, the sector diverted its entire capacity of gas production towards healthcare medical gases.

- Amid low competition among existing players and robust demand of the industrial gases, the overall profitability of the sector is expected to remain strong in the coming periods. Going forward, the rising demand from health sector and LSM would enhance the sector's performance.

- The Sector is characterized with moderate working capital needs. Improvement in working capital cycle during FY21 demonstrates soundness of the Sector's operational efficiency.

- While debt levels have historically remained on a high side for the Sector, the latest FY21 numbers reflect reduction in debt portion in the overall capital structure of the Sector. This, coupled with improved free cash flows are expected to keep the sector's financial risk profile stable.

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