BUY

CMP: **INR 1,205** Target Price: **INR 1,400** ▲ 16%

ICICI Securities Limited is the author and distributor of this report

28 March 2024

India | Equity Research | Initiating Coverage

INOX India

Capital Goods

Tanked up and ready to roll

INOX India (INOX) is India's dominant player in the manufacture of cryogenic tanks. Cryogenic usage is set to grow in India and globally given its rising use cases and promise of clean fuel. With a strong domestic foothold, INOX is making significant strides in capturing a larger portion of the exports pie. While it is building new products such as marine fuel tanks and LNG fuel tanks, INOX has also entered new segments/geographies; it enjoys a first-mover advantage in India, especially in LNG markets. The industry, flanked by high entry barriers, is well insulated from competition. INOX has exhibited notable financials – 16% revenue/14% PAT CAGR over FY18–FY23. Fuelled by wider cryogenics application, new products and industrial growth, we see FY23–FY26E PAT CAGR of 26%. Initiate with BUY; INR 1,400 TP at 42x FY26E earnings.

Leading by a wide margin; strong track record

INOX is the largest supplier of cryogenic tanks with revenue of INR9.7bn with a CAGR of 16% over FY18-FY23. The revenue of the second-largest supplier is 25% that of INOX's total revenues. INOX's EBITDA margin is 21%; competitors' margins are <16%. It commands 60% market share in LNG tanks in India and has many firsts in the cryogenic world.

Multiple legs to the story

Gas consumption is set to increase – 1) Industrial gases: Rise of consumption in existing user industries (medical, refinery and steel) and new industries (semiconductors, and increased usage of gases for new use cases). 2) LNG: Fuel tanks, LNG fuelling stations and marine fuel tanks. 3) Producing cryogenic tanks for government and new developments (ex-cryostat for MRI). Also, armed with its competitive edge, INOX is looking to increase supplies to global markets and gain market share. Besides, it has started producing stainless steel kegs for export.

A credible moat; thin competition

Cryogenic tanks need approvals from gas suppliers, users and from the respective regulators of the various countries of import. Establishing trust is vital when it comes to the discerning clients of an inherently hazardous industry. Naturally, entry barriers are steep and India has only two suppliers of note apart from INOX. Further, INOX has many firsts to its name in India – LNG and marine fuel tanks, fuel stations, MRI cryostat etc. and hydrogen tanks.

Financial Summary

Y/E Mach (INR mn)	FY23A	FY24E	FY25E	FY26E
Net Revenue	9,659	11,946	14,854	17,851
EBITDA	2,044	2,681	3,336	4,055
EBITDA Margin (%)	21.2%	22.4%	22.5%	22.7%
Net Profit	1,527	2,006	2,476	3,030
EPS (INR)	16.8	22.1	28.3	33.4
EPS % Chg YoY	17.0%	31.4%	23.4%	22.4%
P/E (x)	71.6	54.5	44.2	36.1
EV/EBITDA (x)	52.2	39.8	31.6	25.8
RoCE (%)	34.8%	33.0%	36.9%	35.4%
RoE (%)	29.0%	32.0%	32.0%	31.0%

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Market Data

Market Cap (INR)	111bn
Market Cap (USD)	1,334mn
Bloomberg Code	INOXINDI IN
Reuters Code	INOI.BO
52-week Range (INR)	1,323 /802
Free Float (%)	17.0
ADTV-3M (mn) (USD)	11.6

Price Performance (%)	3m	6m	12m
Absolute	36.7	-	-
Relative to Sensex	35.3	-	-

Outlook and valuation

INOX has witnessed stable growth over FY18-FY23 with revenue/EBITDA/PAT CAGR of 16%/14%/14% to INR 9.7bn/2bn/1.5bn. It is a debt-free company with cash and equivalents of INR 3.2bn as of FY23.

The company has built a strong product suite across cryogenic storage tanks ranging from ship fuel storage tanks and mini terminals at ports to fuel dispensation solutions, refrigerant cylinders, non-refillable disposable cylinders, cryogenic solutions for space and medical research, and the recently introduced stainless steel kegs.

INOX along with the existing growth drivers is well poised to capitalise on new growth drivers such as the shift to a cleaner LNG fuel for transportation (ships and heavy duty CVs) from diesel, increased use of cryogenic gases in the general industrial purposes, entry into stainless steel kegs market, refrigerant cylinders, etc.

We estimate INOX's revenue to grow at a 23% CAGR over FY23-FY26E to INR 17.8bn, EBITDA expanding at a 26% CAGR to INR 4.05bn, as EBITDA margins inch up to 22.7% in FY26E (vs. 21% in FY23). Consequently, we envisage PAT growing at a 26% CAGR to INR 3.0bn in FY26E. We also see RoE improving to 31% in FY26E (vs. 29% in FY23).

Given the strong moat and healthy profitability metrics, we believe a P/E multiple of **42x** is fair as compared to the **average P/E of 38x** for FY26E of our coverage universe

We initiate coverage on INOX with a BUY and a target price of INR 1,400, valuing the stock at 42x FY26E EPS of INR 33.4/share.

Exhibit 1: Inox India PE(x)-based target price of INR 1,400/share

	FY26E PAT (INR m)	PE (x)	FY26E equity value (INR m)	Target price (INR/share)
Valuation	3,030	42	127,096	1,400
No. of shares				91
Target price (INR/share)				**1,400**

Source: I-Sec research

Exhibit 2: Valuation table

S.No.	Companies	Price (INR)	Mcap (INR mn)	EPS (INR) FY26E	P/E (x) FY26E	P/BV (x) FY26E	EV/EBITDA (x) FY26E	PEG ratio (%)
1	**Inox India**	**1205**	**109.370**	**33.4**	**35.5**	**9.6**	**25.4**	1.3
2	Siemens	4804	1,710,224	72.6	66.1	-	51.8	2.2
3	ABB	5730	1,214,760	82.5	69.5	13.3	61.3	6.2
4	Cummins	2800	776,160	63.3	44.2	9.6	43.0	3.4
5	Bhel	220	766,062	8.6	25.6	2.6	16.6	0.3
6	Suzlon	36	490,032	1.4	26.1	9.9	18.5	0.2
7	Thermax	3690	439,664	70.4	52.4	7.9	37.8	2.3
8	AIA	3654	344,647	133.4	27.4	4.5	20.6	4.6
9	Honeywell	37550	331,942	859.2	43.7	6.9	32.9	2.2
10	Hitachi	6670	282,808	119.8	55.7	11.8	37.3	NA
11	Apar Industries	6150	251,152	220.5	27.9	4.0	15.1	NA
12	GE T&D	850	217,643	11.5	73.7	14.1	46.8	0.3
13	Carborundum	1120	212,688	38.2	29.3	4.8	20.7	1.4
14	Grindwell	1910	211,475	48.1	39.7	7.0	28.4	2.6
15	Inox Wind	450	152,100	20.2	22.3	5.6	21.6	NA
16	Engineers India	175	110,585	9.7	18.1	3.8	14.9	0.9
17	Voltamp	8350	84,478	318.6	26.2	4.7	24.7	1.5
18	Techno Electric	635	68,338	34.9	18.2	2.6	10.5	0.3
19	ISGEC	833	61,226	45.9	18.2	2.2	12.1	0.8
	Average (ex-Inox India)				**38.0**	**6.4**	**28.6**	**18.4%**

Source: I-Sec research, PEG calculated based on FY23-FY26E PAT CAGR

Exhibit 3: Global peer valuation table

Companies	Share price	M. Cap	EPS	PE (x)	P/BV (x)	EV/EBITDA (x)	RoE (%)
Linde India (INR)	6549	562,219	112.0	58.5	11.8	52.0	22.0%
Linde Inc* (USD)	466	224,459	17.0	27.4	5.3	17.5	19.1%
Air products* (USD)	235	52,349	13.3	17.7	3.0	11.7	17.8%
Air Liquide** (EUR)	212	110,108	8.4	25.0	3.5	13.0	14.5%
Air Water* (JPY)	41	3,589	1.6	10.0	1.0	6.8	10.5%

Source: I-Sec research, Bloomberg; *CY25E, **Sept-25E

Exhibit 4: Industrial gases BAU and future growth drivers

BAU growth driver

Large use cases

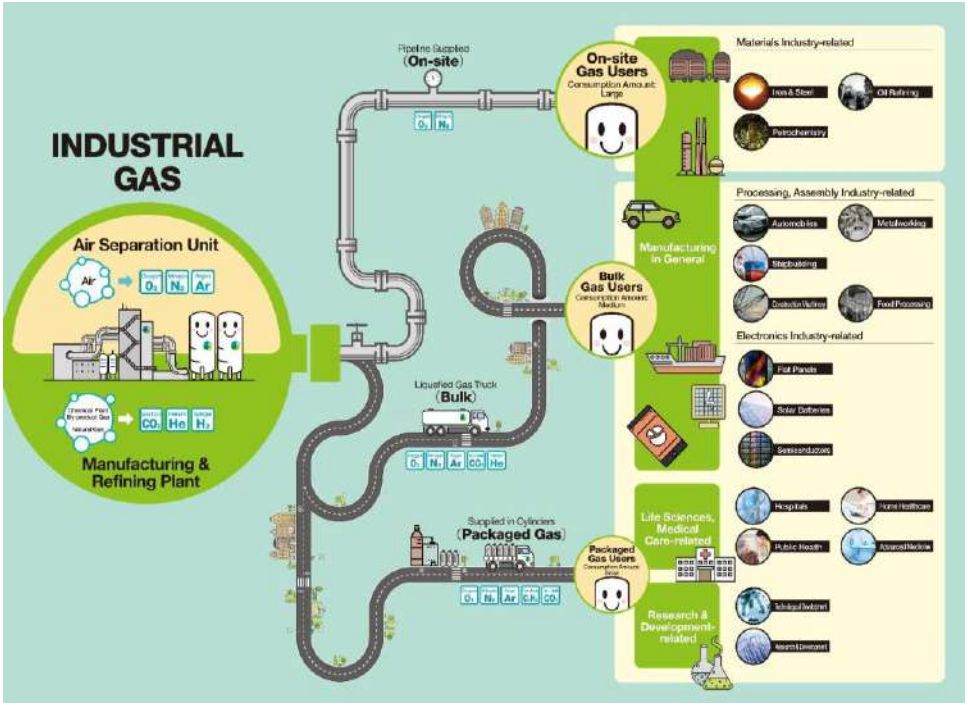
- Investment in steel
- Investment in refinery
- Investment in chemicals

Bulk gas users

- Capex in Auto Industries
- Capex in metal working – Steel
- Food processing

Other use cases

- Medical
- R&D
- Technological Development
- **It's a big driver for INOX**



Optionality

- Development of domestic semiconductor
- Liquid hydrogen use cases

Source: Company data, I-Sec research

Exhibit 5: LNG BAU and future growth drivers

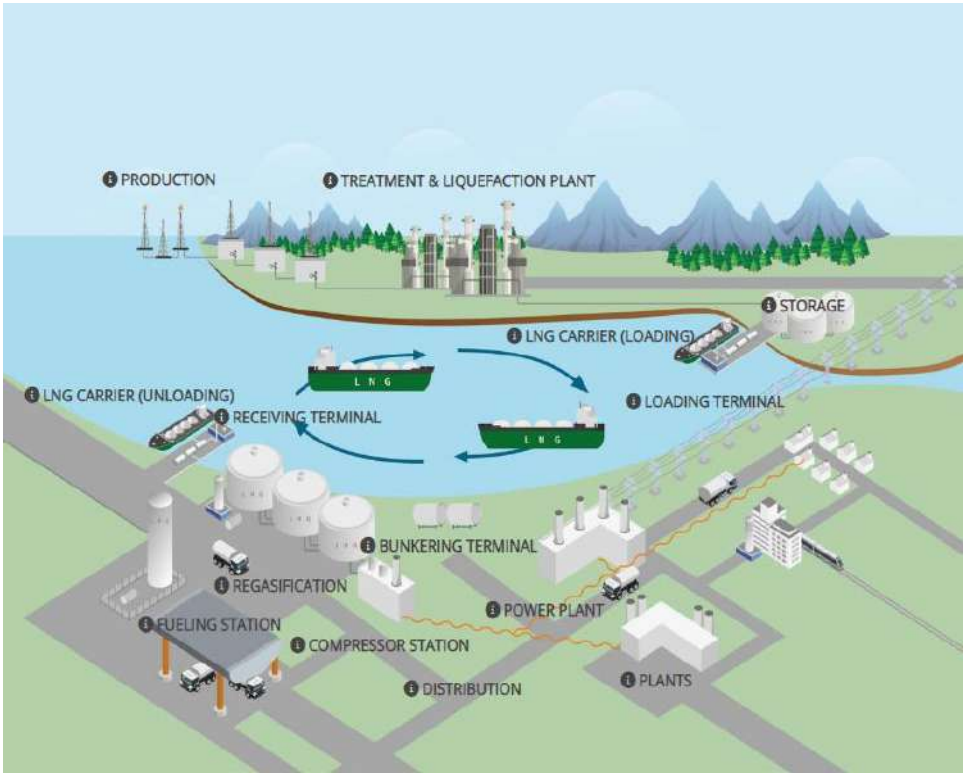
BAU growth driver

LNG as a transition fuel

- India government mandate of 15% by 2030

LNG terminals

- Govt. target to set up 70mt LNG handling capacity at ports by 2030
- Declining LNG cost



Optionality

EU rules to switch 30,000 ships from diesel to LNG

- Strong rise in LNG as fuel for large vessels
- Inox supplied 50 LNG fuel tanks for large vessels

LNG stations for Heavy duty CV

- Strong case for heavy duty CVs to shift to LNG
- LNG Fuel station target of 1000 by 2030

LNG Fuel tank for heavy duty CV

- Auto OEMs rolling out LNG versions in CVs
- Retrofitting demand also expected to pick up

Source: Company data, I-Sec research

Exhibit 6: Other segment BAU and future growth drivers

BAU growth drivers

Refrigerant cylinders
- Strong demand for refrigerant cylinders in the export market

Stainless steel kegs
- Selling stainless steel kegs in a small scale

Cryo-scientific
- Have supplied to ISRO and global research projects like ITER

Optionality

- Inox India is likely to come clean in anti-dumping duty case
- Expect bounce back in refrigerant business from FY25E

Stainless steel
- New keg manufacturing facility with capacity of 1mpa

Cryo-scientific
- Developing cryostat with Govt.
- New opportunity at FAIR project
- Possible third satellite launch pad

Source: Company data, I-Sec research

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Investment Argument

- INOX is the market leader in the manufacture of cryogenic tank in India with 60% domestic market share in terms of revenues; it is also gaining share in international markets. Note – the second largest player in the domestic market is 25% of revenues of INOX.
- The company has also built an export engine to sell cryogenic tanks across countries. It has sold to over 100 countries since inception. 50% of revenues for H1 came from exports to various countries.
- INOX has 30 years of experience in supplying cryogenic tanks. Supply of such tanks require certifications from the various respective countries' regulators; thus, creating an entry barrier.
- Use cases for cryogenic gases are increasing. Existing driver for cryogenic tanks are driven primarily by oxygen, nitrogen, argon and LNG. Oxygen and nitrogen use cases are driven by steel and refinery while LNG usage is driven by a promise of lower carbon emissions.
- Driven by competitive advantages and low cost, INOX has not only maintained its edge over nearest rivals, but has done so with a consistent track record of profitability and return metrics. It earns an EBITDA margin of 22% (vs. that of nearest competitor's 16%).
- Oxygen consumption will be driven by steel, nitrogen consumption will be driven by refineries, and argon and neon consumption will be driven by semiconductor production.
- INOX has three products to cater to LNG: 1) Transport trailer. 2) Storage tanks. 3) LNG fuel station. 4) LNG fuel tanks. LNG remains the preferred transition fuel and is also one of the preferred choice for reducing carbon emissions in heavy commercial vehicle markets.
- LNG markets are likely to see speedy growth on the back of: 1) competitive pricing vs. alternate fuels; and 2) the promise of clean fuel. INOX has the first-mover edge in new products in India – marine tanks, LNG fuel tanks and LNG fuelling stations. LNG, as a fuel, is 20% cheaper than current prices of diesel.
- The company forayed into the stainless steel keg market with a tie up with Super Monte – an Italian stainless steel keg manufacturing company. The tie-up has given the company access to European stainless steel keg markets. We estimate 10% of revenues originating from the beer stainless steel markets in FY26E.
- We estimate business to grow at 23% CAGR over FY23-FY26E driven by: 1) stable domestic business growth at 15% CAGR; 2) higher growth in export markets of ~20% CAGR; and 3) supported by new markets – stainless steel kegs.
- **Valuation:** INOX is trading at 32x FY26E EPS. Stock is up 75% since its listing in Dec-23. We believe that a strong end-market outlook and the company's return metrics warrant further re-rating. We value the stock at 42x FY26E EPS of INR 33.4/share.
- **Key risks:** Part of domestic industrial gas consumption is linked to steel and refinery capex cycle; loss of competitiveness in global markets; delay in market share gains of LNG in domestic and global markets; imposition of duties in export markets; and delay in market share gain in stainless steel kegs' markets.

INOX – the making of a cryogenic leader

- **India's initiation into cryogenic tanks was by virtue of INOX's tie up in 1992 with Nippon Sano – a Japanese player.**
- **Thus, INOX gained foothold in an industry with high entry barriers. However, INOX decided to pursue the business independently after 1995 owing to differing expectations.**
- **It continued to consolidate the business and built upon its initial success between FY00-FY09. It received approval to supply to USA, and supplied cryogenic equipment to Indian Space research Organisation (ISRO).**
- **It acquired 70% stake in CVA in 2009 in order to boost its presence in North American market. But the declining investments in shale exploration took a toll on the CVA, leading to the sale of the business in 2018.**
- **It had to raise money from private equity in 2012 and also took debt to navigate the turbulent times.**
- **It paid off the debt and private equity investors through proceeds of sale and internal accruals and is debt free as on date Dec-23**
- **Post-sale of CVA, INOX focused on manufacturing in India and exporting to global markets. The efforts paid off handsomely between FY17-FY23.**
- **The company reported a revenue CAGR of 16% over FY18-FY23, whereas post-covid CAGR stood at 28% over FY21-FY23. Operating margins improved to 20%. RoE was >25% in the last six years.**
- **INOX has also entered into producing cryogenic tanks for LNG. It has assiduously built a market for its products in new countries. Below is its journey timeline:**

Pre-FY07 – baby steps

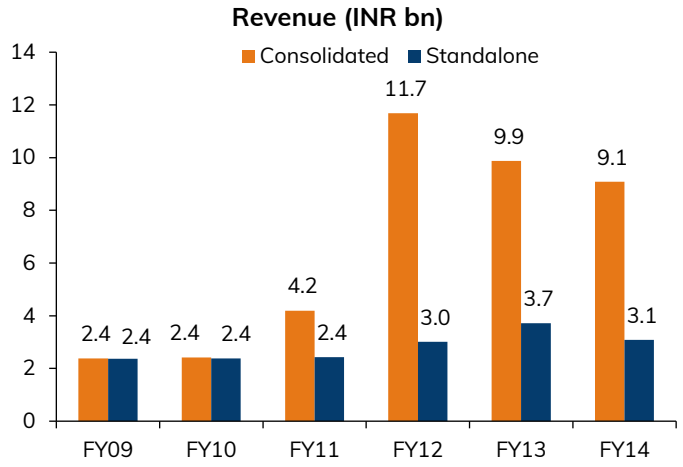
- INOX, founded by Mr. P.K. Jain, entered into the cryogenic tanks market. The company tied up with Nippon Sanso for the manufacture of cryogenic tanks.
- It soon started manufacturing liquid nitrogen cylinders with super insulation technology under the brand 'CRYOSEAL'.
- 2001: Started manufacturing portable liquid gases storage tanks. In 2002, it received certification for export of its products to USA.
- 2006: It developed critical cryogenic equipment, trailer-mounted hydrogen transport tank and cryogenic equipment for ISRO's second launch pad.

FY09-FY13 – acquisition, new capabilities and new geography foray

- 2007: INOX acquired Refron Cylinders (disposable gas cylinder manufacturers), Silvasa and later merged the company. It also set up a new cryogenic storage tank manufacturing facility at Kandla SEZ.
- Domestic business grew at a CAGR of 12% over FY09-FY13 to INR 3.7bn owing to strong accretion in LNG storage and handling services, tanks and regasification systems, cryogenic systems for space technology, and other types of cryogenic storage systems.
- However, operating margins for its domestic business (standalone) were >20%, but declined sharply in FY14 on account of lower revenues and negative operating

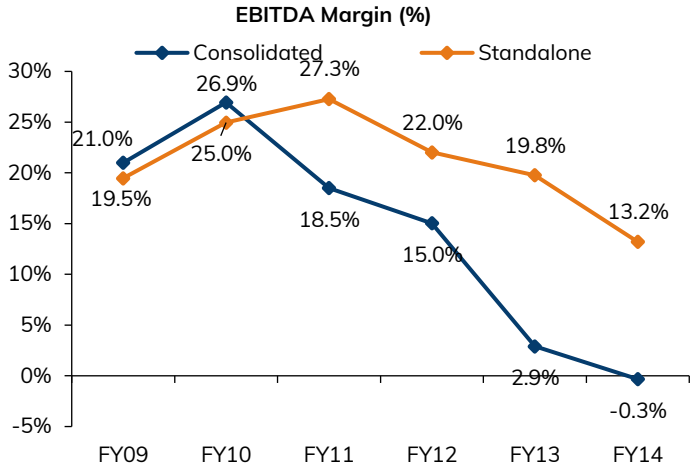
leverage. Stress due to acquisition had started impacting the domestic business (details below).

Exhibit 7: Stable revenue growth in domestic and international subsidiaries



Source: I-Sec research, company

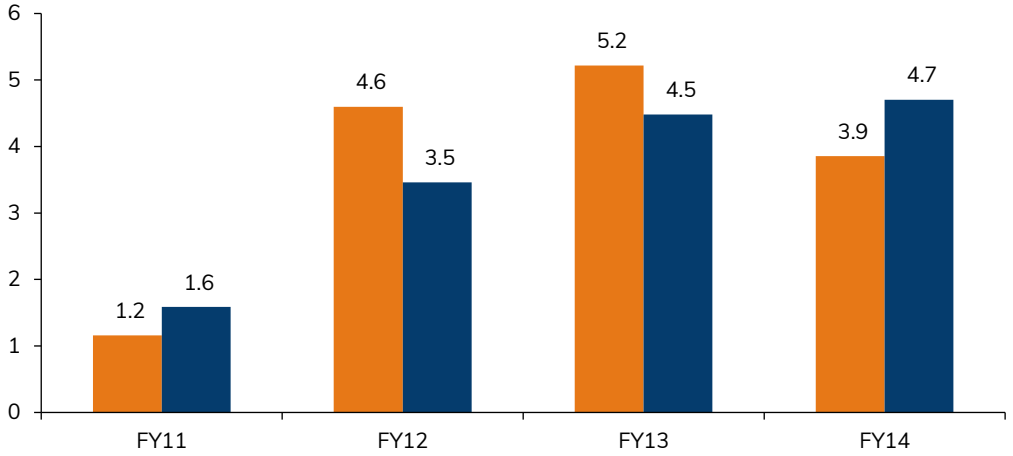
Exhibit 8: EBTDA margins reduce gradually from the highs of 27% in FY11



Source I-Sec research, company:

- 2009: It acquired Cryogenic Vessel Alternatives, Inc. (CVA) in USA to enter the North American market and acquire capabilities to manufacture transport trailers. Hitherto, it was only producing stationary tanks.
- While INOX acquired CVA in 2009, it had a tough time with the declining investment in shale oil business.
    - CVA, one of the top global players in large cryogenic transport tanks and oil & gas field pumping units. Its exposure to shale business in USA was very high.
    - INOX acquired 70% stake in US based CVA Inc. for a total consideration of USD 24.5mn (valuing the company at USD 35mn).
    - The remaining 30% stake remained with existing promoters of the company. CVA was based out of Texas and had one subsidiary in Canada and a JV with a partner in China.
    - CVA's revenues were USD 34.8m in CY09 and EBITDA stood at USD 1.7m with EBITDA margin at 5.5%. Total debt and equity, as of CY09, stood at USD 10.4m and USD 13.8m.
- Consolidated revenue grew at 31% CAGR largely led by acquisition. INOX reported its highest revenue in FY12 of INR 11.7bn. But revenues declined sharply to INR 9.1bn in FY14 led by slowing investment in shale gas business.

Exhibit 9: Working capital requirement increased from INR 1.2bn to INR 3.9bn, as of FY14; total debt increased to INR 4.7bn, as of FY14 (INR bn)



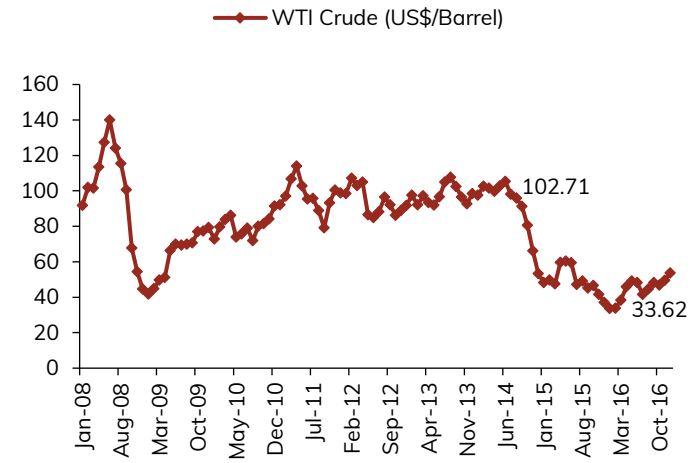
Source: I-Sec research, company

- Also, working capital deteriorated from INR 1.1bn, as of FY11, to INR 3.9bn as of FY14.
- Thus, total debt (short and long term) increased to INR 4.7bn, as of FY14, from INR 1.2bn in FY11. This led to a sharp increase in interest burden to INR 280mn in FY14, from INR 80mn in FY10, thus, impacting profitability further.

FY14-FY17 – stress on balance sheet

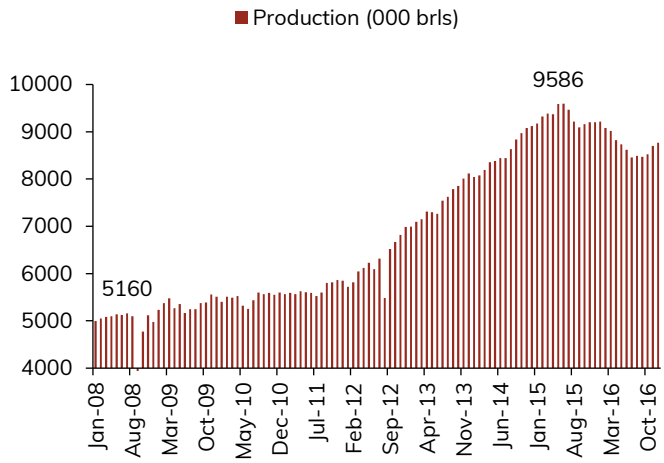
- Given the large capex in the O&G sector in the US between FY08 to FY14 towards increasing shale gas production capacity, investments had peaked and the inventory of raw materials and equipment across the sector had reached saturation.
- CVA was largely suppling transportation and storage vessels to the shale industry and demand remained supressed for a very long time.

Exhibit 10: WTI Crude price (USD/bbl)



Source: I-Sec research, company

Exhibit 11: US crude oil production (000s bbl)

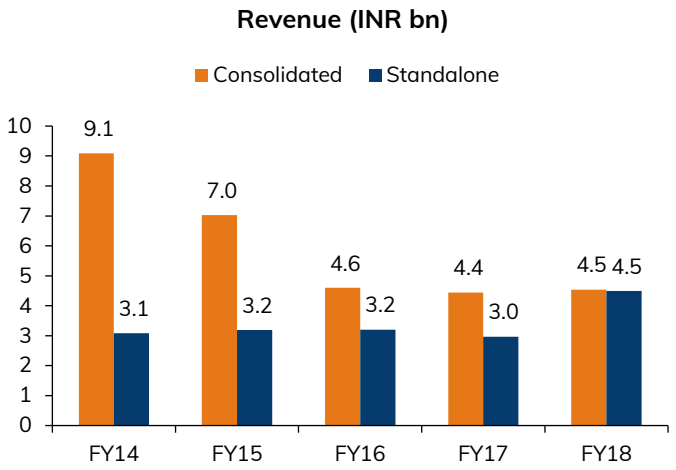


Source: I-Sec research, company

- US shale industry boomed from FY09-FY10 when the crude oil prices were low and US crude production was very low. This was accompanied by strong capital investment in the shale gas value chain.

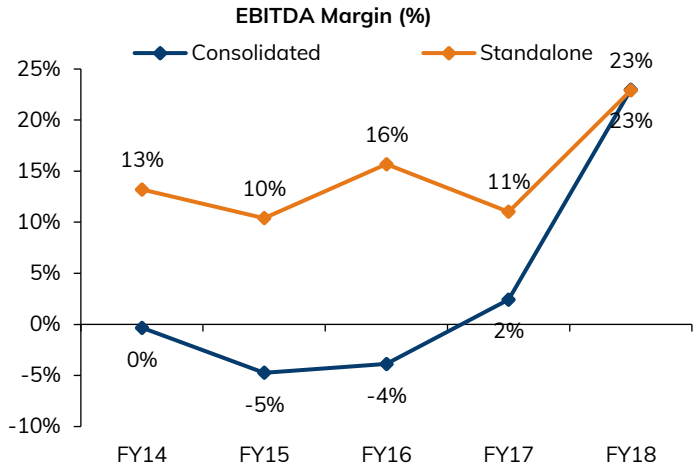
- However, as the crude prices started correcting in FY14-FY15, additional capital expenditure dried up and the sector was already flush with unused equipment. This led to weakness in demand for CVA in the US market and also delayed project commissioning and ramp up.

Exhibit 12: Consolidated revenue slumped owing to industry headwinds



Source: I-Sec research, company

Exhibit 13: Operating margins were impacted owing to lower execution and cost escalations



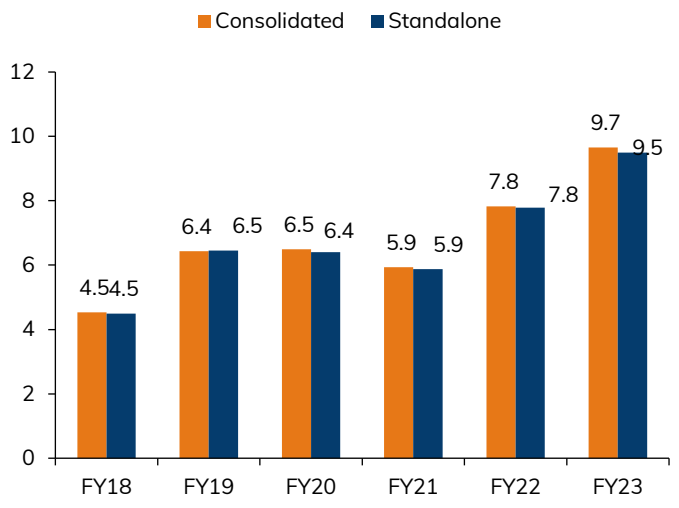
Source: I-Sec research, company

- Consolidated revenue fell from INR 9.1bn in FY14 to INR 4.5bn in FY18. Also, the operating profits took a large hit as EBITDA margin slumped to negative from FY14 to FY17.
- Also, standalone business (domestic manufacturing and export) saw muted growth in revenues of 10% CAGR, from INR 3bn in FY14 to INR 4.5bn in FY17.
- Operating margins for the standalone business continued to be sub-par. It was 13% in FY14 to 11% in FY17.

FY18-FY24 – shedding excesses; reaping the fruits

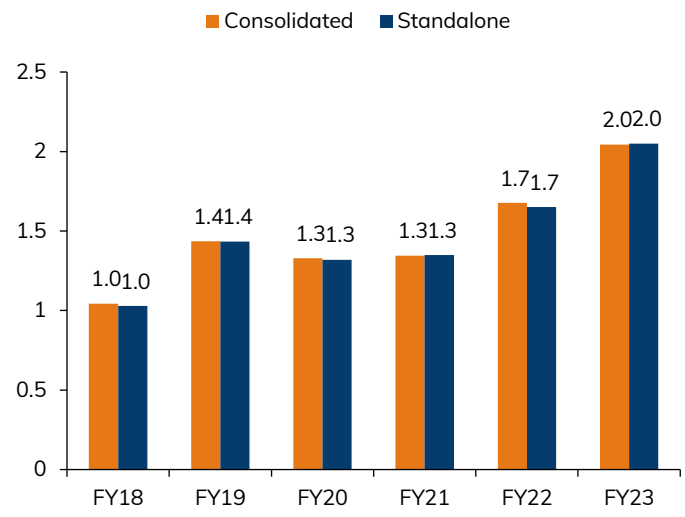
- INOX discontinued its operations in USA owing to slow moving projects, and inventory being stuck; thus, preventing value from being realised.
- US subsidiary was struggling and there were no signs of revival in the business; management sold off the assets at a loss.
- INOX took a hit in profitability in FY19. Note that total investment in CVA was INR 2.8bn.
- **Post liquidation of US subsidiary, management revived the business by reviving its strategy.**
- **INOX started looking at ways to increase customised orders and tap into export markets.**

Exhibit 14: Revenue grew at a CAGR of 16% to INR 9.7bn in FY23 (INR bn)



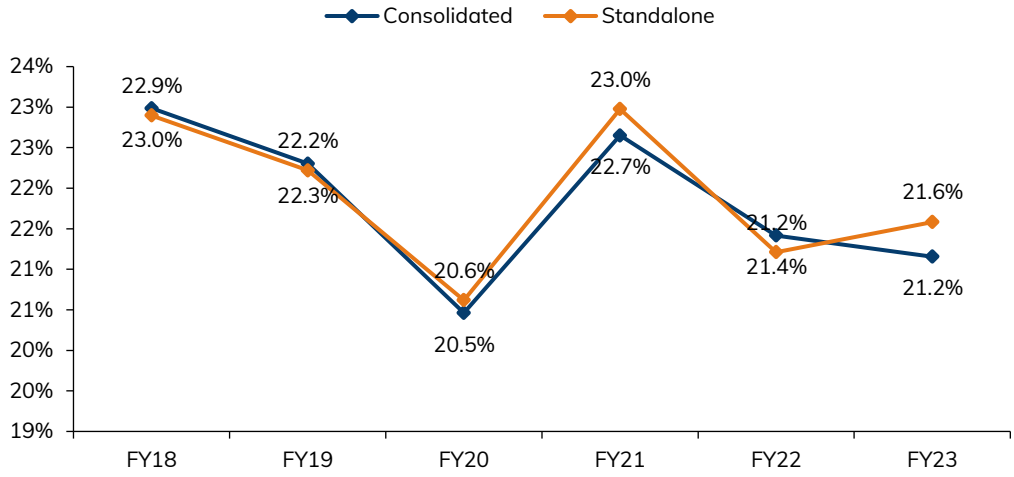
Source: I-Sec research, company

Exhibit 15: EBITDA grew at a CAGR of 14% to INR 2bn in FY23 (INR bn)



Source: I-Sec research, company

Exhibit 16: EBITDA margins remained stable (%)



Source: I-Sec research, company

- Further, sharp rise in demand for cryogenic equipment both domestically and internationally post FY18 aided in recovery.
- Barring a couple of years (FY20-FY21) impacted by Covid-19, INOX witnessed consistent growth in revenues.
- Even during the pandemic, as demand from industrial sector slumped, the company witnessed a sharp increase in demand from healthcare and medical segment for liquid oxygen storage solutions.
- INOX witnessed sharp growth as demand improved post-FY17 and revenue witnessed CAGR of 16% from FY18-FY23 to INR 9.7bn in FY23 and EBITDA grew at 14% CAGR over the same period to INR 2bn.
- Post-covid, recovery was very strong, as FY21-FY23 revenue CAGR stood at 28% and EBITDA CAGR stood at 23% over the same period.

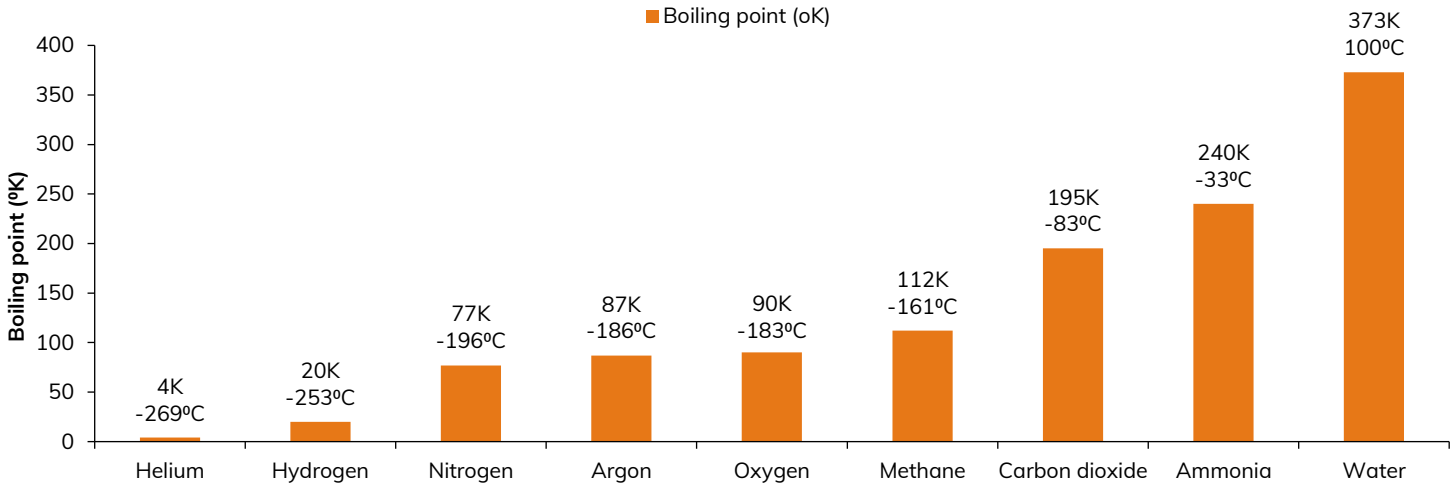
A primer on cryogenic gases and equipment

- **Industrial gases are used in a wide range of industries, including O&G, petrochemicals, chemicals, power, mining, metals, pharmaceuticals, electronics, glass and aerospace.**
- **Gases are produced by an Air Separation Unit (ASU), which filters and cools the atmospheric air to very low temperatures.**
- **As gases are cooled, they turn into liquid. However, each gas liquefies at a different temperature.**
- **This property enables the separation of gases by distillation with very high purity levels. The output of this process is available as a liquid at a very low temperature (below -150°C) and is called cryogenic gas.**
- **Cryogenic gases are stored in a double vessel tank with inner vessel made of austenitic stainless steel. The two vessels are separated by insulation material and vacuum.**
- **Various equipment is required in the cryogenic value chain – tanks, valves, pumps, vaporisers and others.**

Broadly, cryogenic gases are the gases that liquefy at a very low temperature (below -130°F).

Cryogenic gases are industrial gases are used in industrial processes for manufacturing products in a wide range of industries, including O&G, petrochemicals, chemicals, power, mining, metals, pharmaceuticals, electronics, glass and aerospace. Nitrogen, oxygen and natural gas are the major gases that would account for almost 80% of the cryogenic equipment demand.

Exhibit 17: Boiling temperatures for major industrial gases



Source: I-Sec research, company

Cryogenic gases have a very low density at room temperature; thus, require a high-pressure vessel to store gasses in large quantity. However, in liquid form (at very low temperatures), the density for these gases is increased and can be stored in large quantity.

Exhibit 18: Comparison densities for cryogenic gases in liquid and gas form

	Liquid density (g/L)	Gas density (g/L)	Multiple (x)	Type of gas
Argon	1402	1.63	**860**	Inert
Helium	125	0.16	**781**	Inert
Hydrogen	71	0.082	**866**	Flammable
Nitrogen	808	2.25	**359**	Inert
Oxygen	1410	1.4	**1007**	Oxidizer
Methane	425	0.72	**590**	Flammable

Source: I-Sec research, company

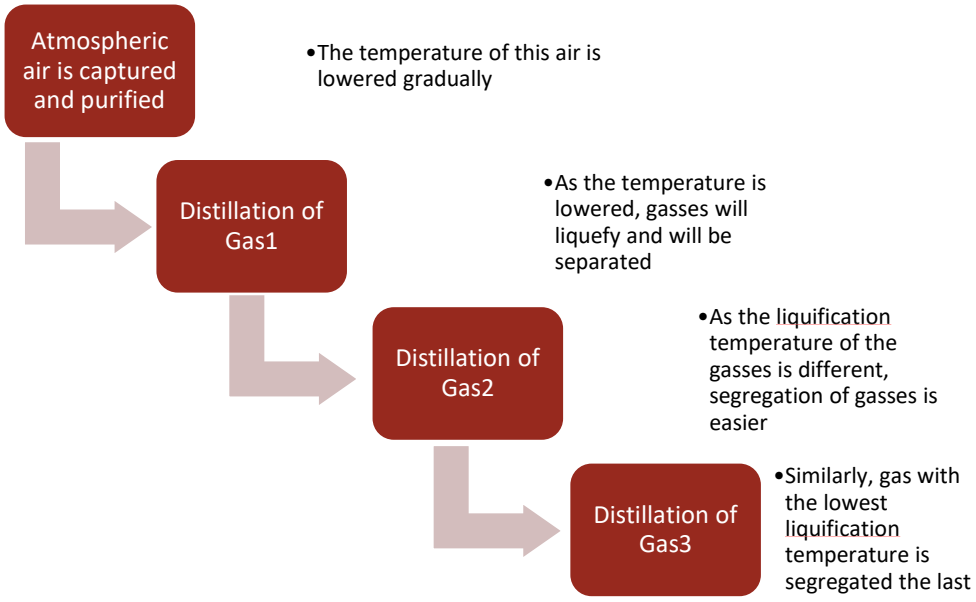
As can be seen in Exhibit 11, the liquid density for most of the cryogenic gases increased over hundreds of times (359x–1,007x), as compared to its gaseous form; thus, enabling bulk storage of gases in a smaller space. However, the gases need to be stored at low temperatures to maintain the liquid form.

How are cryogenic gases manufactured?

Cryogenic gases are produced by a gas production plant called an ASU, which filters and cools the atmospheric air to very low temperatures. As gases are cooled, they turn into liquid.

However, each gas liquefies at a different temperature. This property enables the separation of gases by distillation with very high purity levels. The output of this process is available as a liquid at a very low temperature (below -150°C) and is called cryogenic gas.

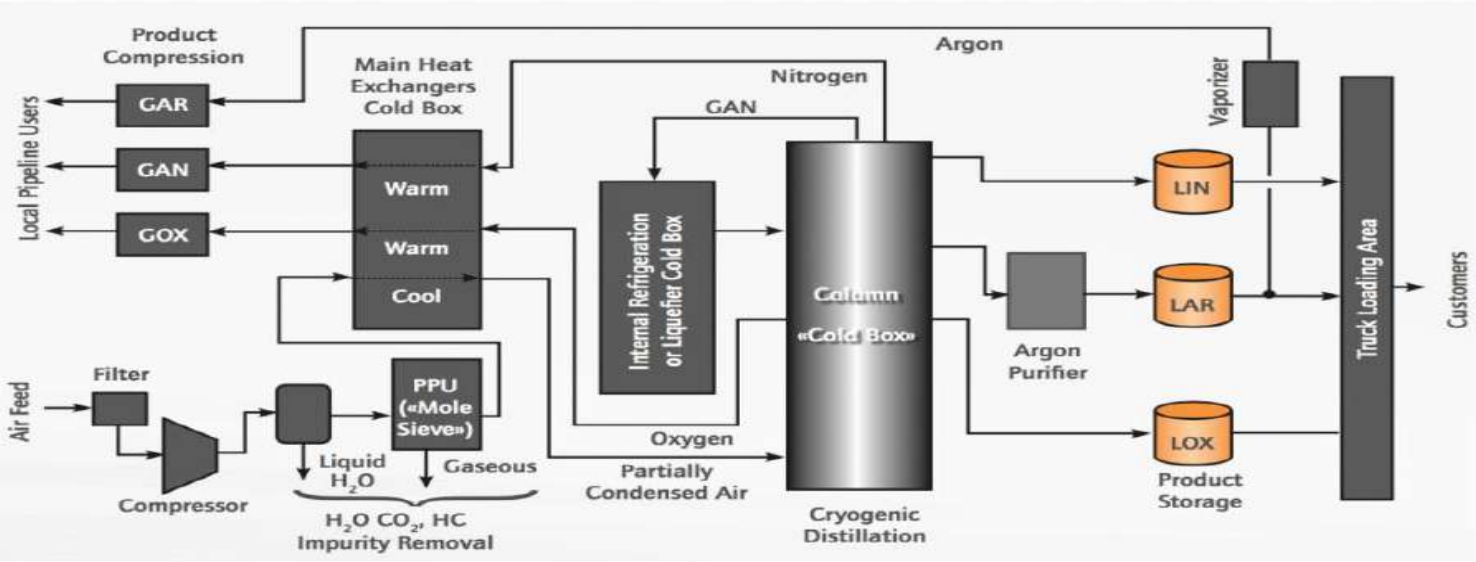
Exhibit 19: Schematic flow of cryogenic gas manufacturing



Source: I-Sec research

As long as cryogenic gases are kept cool, they stay in liquid form and can be held at a lower pressure. Very large quantities can be contained in a smaller tank compared to their gaseous form, which require high-pressure tanks that hold a lower amount of gases by weight. If the temperature of a cryogenic liquid increases, by absorbing heat from its surroundings, it turns into gas, increasing the pressure inside the equipment.

Exhibit 20: Schematic air separation unit diagram



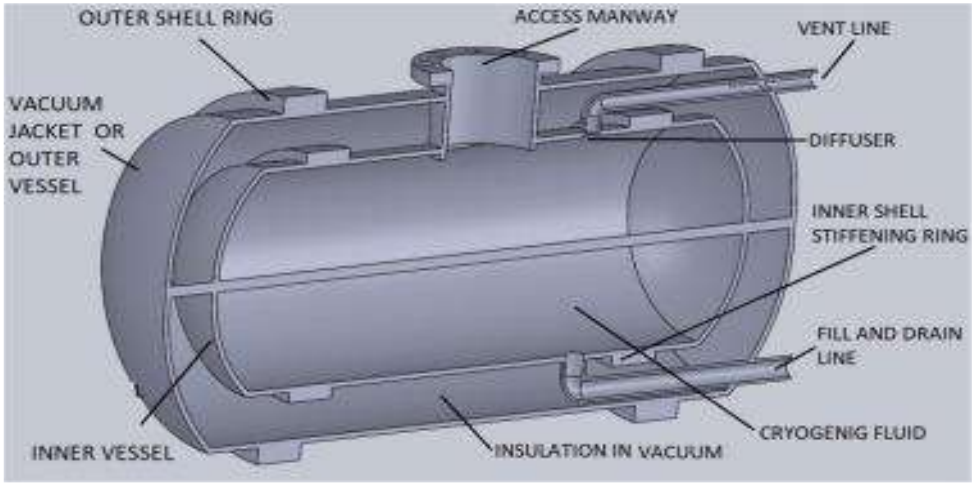
Source: I-Sec research, Company

How are these gases stored?

Cryogenic gases are stored in a cryogenic storage tanks with double-walled cylinders, an outer jacket of stainless steel and an inner vessel of **austenitic stainless steel.**

These two cylinders are separated by vacuum to prevent heat transfer and an insulation material like glass fibre to further prevent heat transfer from the atmosphere to the inner vessel containing cryogenic liquid.

Exhibit 21: Schematic diagram of a cryogenic storage tank



Source: I-Sec research, Company

Austenitic stainless is essential for cryogenic tanks as it is capable of handling extreme low temperature without any physical cracks or damage.

Austenitic stainless steel sheets are of the required thickness are bent to form a cylindrical shape of required radius. Multiple such parts of the cylinders are welded together to reach the necessary height of the inner vessel. The outer vessel is usually made of mild steel in a similar process.

The inner vessel is suspended on the outer vessel with minimum contact to reduce the heat transfer. Air is sucked out of the space between inner and outer vessel to create vacuum and necessary insulation material are used as well.

Exhibit 22: What are the different gases produced, where is it used and the large players in the segment

Industrial gases		Process gases	
• Nitrogen • Oxygen • Argon	Rare gases – • Krypton • Neon • Xenon	• Hydrogen • Carbon di-oxide • Carbon monoxide	• Helium • Acetelyne • Propane
Its produced as air is purified, compressed, cooled, distilled and condensed		Its is produced from natural gas or as by-products of chemical production	
Where are the gases used?		**Leading players in the Gas Industry?**	
• Health care (Liquid oxygen) • Foods and beverages (Nitrogen and Carbon di-oxide) • Chemicals and energy	(H2, Nitrogen, LNG) • Manufacturing • Metals and Mining (Hydrogen, oxygen, etc)	• Linde Plc • Air Products • Air Liquide	• Messer • Air Water

Source: I-Sec research, Company

Exhibit 23: Industrial gases, their sources and distribution mode

Products	Primary Source		Feed stock	Distribution Mode		
				Packaged	Merchant	On-site
Oxygen	Air Separation		Air + Power			
Nitrogen						
Argon						
Hydrogen	SMR, ATR, POX, Electrolysis, etc.	By-product	Hydrocarbons, Power, etc.			
Carbon Di-oxide	By-product		Crude Carbon di-oxide			
Helium	Helium reserve	NG				
Rare Gases	Air Seperation		Air + Power			

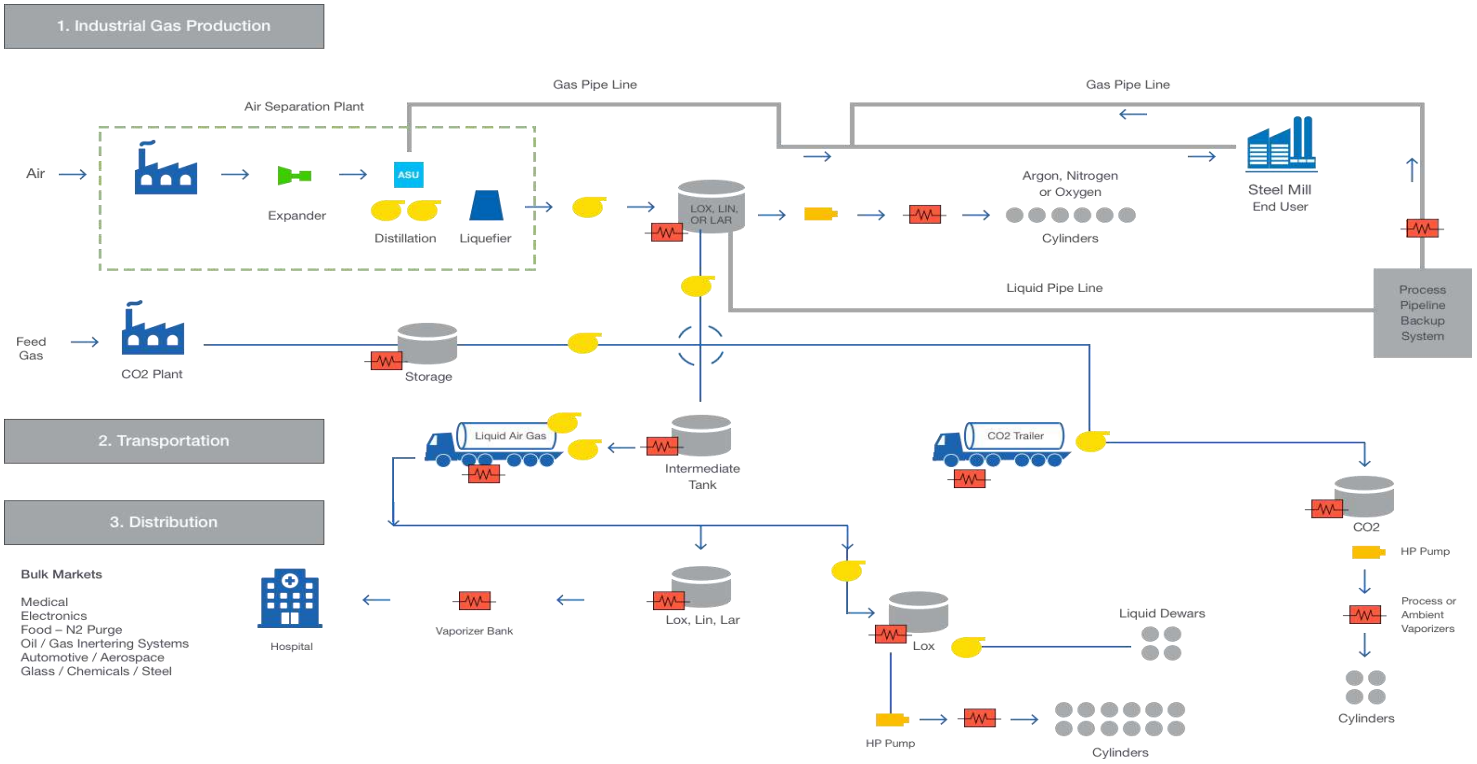
Source: I-Sec research, Company

What are the key cryogenic equipment?

Cryogenic gases are manufactured at air separation units and require large quantity of storage and evacuation capacities for timely production and supply to customers. These gases are then transported either through pipes or road or rail. This requires storage system during the transit and the subsequent storage at the destination.

Moreover, pumps to load and unload the gases, before and after transportation requires vaporisers at the destination to safely turn these cryogenic liquids into gaseous form to be used. It also requires a lot of piping and insulation material to minimise losses.

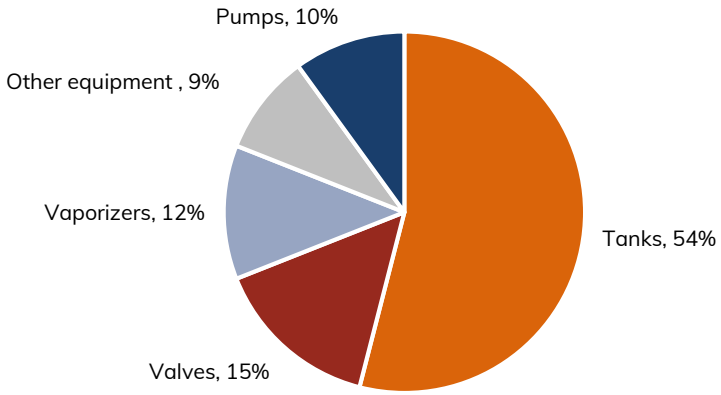
Exhibit 24: Cryogenic gas value chain



Source: I-sec, Company

Of the types of equipment used, tanks used for storage and transportation form a major share – over half of the total cryogenic equipment demand.

Exhibit 25: Share by type of cryogenic equipment



Source: I-Sec research, Company

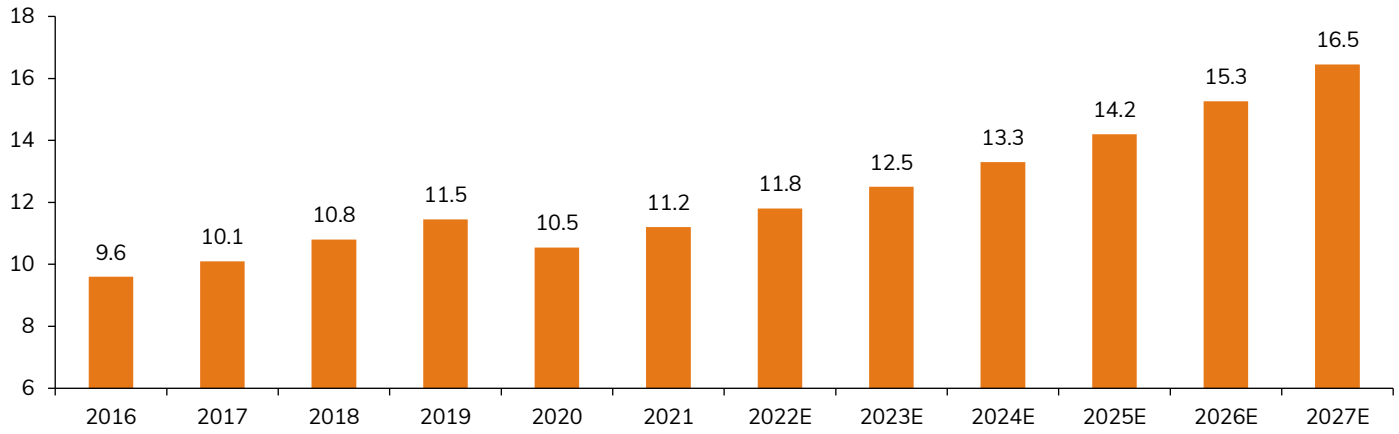
Multiple diversified use cases for cryogenic tanks

- **Uses of industrial gases is critical in various industries. Steel and refinery needs oxygen and nitrogen while the argon is important for metal cutting industries.**
- **Globally, total industry value is pegged at USD 12bn – comprising of tanks, etc. The industry is expected to grow at CAGR of 7% over next few years. (CRISIL industry report)**
- **Indian domestic cryogenic gas industry is pegged at INR 21bn. And tanks are pegged at INR 10bn (CRISIL industry report). We believe, usage of semi-conductors in India, increase usage of LNG and indigenous cryostat is likely to increase the size of domestic market.**
- **We envisage the Indian cryogenic tank market growing at 15% over the next few years.**
- **Gas supply market is dominated by four major suppliers and INOX is qualified to supply cryogenic tanks to all the four suppliers.**
- **INOX operates in a three-player market for cryogenic tanks. As a result, competition is low.**
- **INOX has many firsts to its credit. The supply of hydrogen tanks, supply of marine fuel tanks and setting up of LNG fueling stations.**

Global cryogenic industry to grow at CAGR of 6.8% over CY22-CY27E

Global cryogenic equipment market is pegged at USD 11.8bn, as of CY21. The market witnessed a CAGR of 6.1% from CY19-CY19 to USD 11.5bn before remaining flat during the covid-affected period. The market is expected to grow at a CAGR of 6.8% over CY22-CY27E to USD 16.5bn by CY27E (CRISIL industry report).

Exhibit 26: Global cryogenic equipment industry by size (USD bn)



Source: I-Sec research, Company

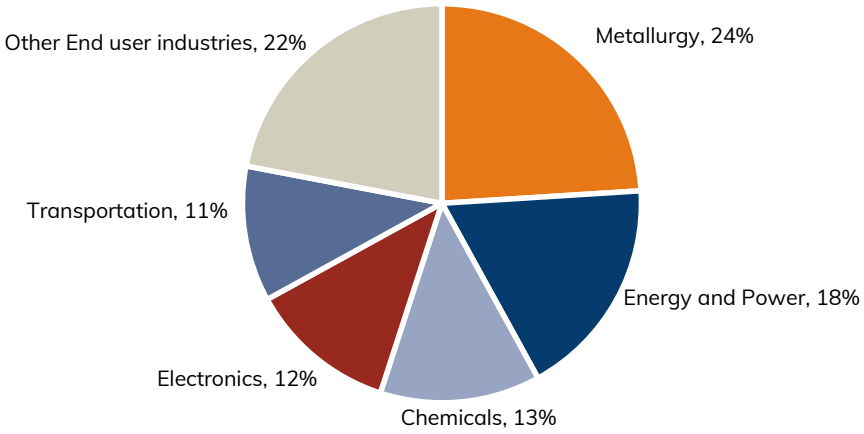
Equipment used to store, transport and handle cryogenic gases are collectively referred to as cryogenic equipment. As of CY21, the breakdown of cryogenic equipment market stands as follows –

- Storage tanks 53%,
- Valves 16%,
- Vaporisers 12%,
- Pumps 10%, and
- Other equipment at 9%.

Cryogenic equipment industry by end-user industry

Major sectors that utilize cryogenic equipment are metallurgy, energy and power, chemical, electronics, transportation, and others.

Exhibit 27: Sector wise demand for cryogenic equipment



Source: I-Sec research, CRISIL report

Metallurgy (24% share)

Within the metallurgical sector, industrial gases such as oxygen, nitrogen, argon, hydrogen, etc. are used in various processes like steel production, metal forming, welding, combustion, etc. There is a growing demand for green hydrogen, which is produced by purging hydrogen through molten iron.

Energy and power (18% share)

Cryogenic tanks demand in energy and power segment largely stems from production and exploration activities, refining activities and the subsequent transportation and distribution. LNG fired power plant require large scale LNG storage capacities.

Chemicals (13% share)

In the chemicals segment, industrial gases are used for polymerisation, synthesis of intermediates, synthetic gases, specialty chemicals etc.

Electronics industry (12% share)

Cryogenic gases cater to an array of applications in the electronics industry, such as fibre optics, flat panel displays, integrated circuit manufacturing, packaging, assembly and testing, LED technologies, photovoltaics, printed circuit board (PCB) assembly and testing, and semiconductors.

A modern semiconductor fabrication plant can expect to use as much as 50,000 cubic meters of nitrogen per hour.

A modern semiconductor fabrication plant can expect to use as much as 50,000 cubic meters of nitrogen per hour. In semiconductor manufacturing, nitrogen plays the role of a general-purpose inerting and purging gas, protecting sensitive silicon wafers from reactive oxygen and moisture in the air.

Transportation (11% share)

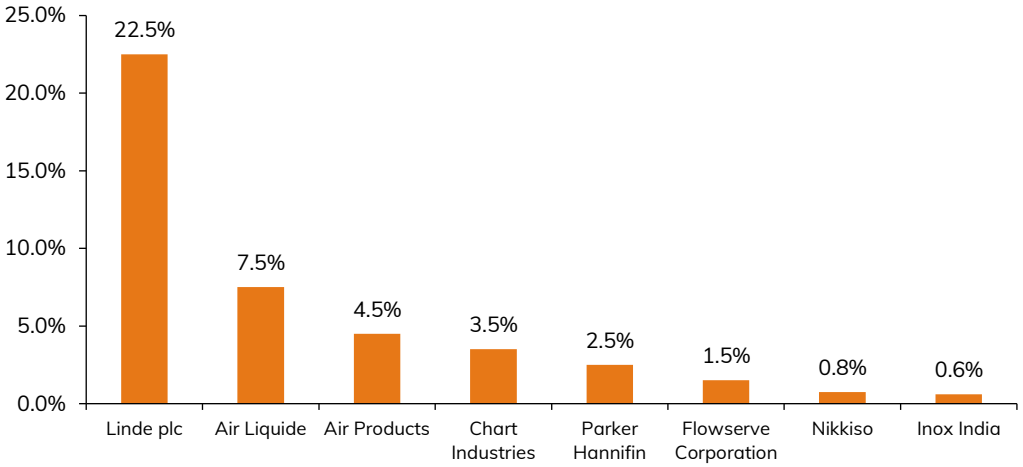
Owing to initiatives taken to reduce carbon emission in the transportation industry, Heavy duty vehicles are being converted to CNG or LNG powered trucks. CNG has low density and thus less fuel can be stored; however, LNG has very high density and can increase the span of distance between refueling to over 700-800kms.

Moreover, shipping companies are increasingly shifting to LNG power vessels in order to cut down carbon emission. The EU has mandated over 30,000 diesel power ships to be converted to LNG power by 2030. INOX has already supplied marine LNG fuel tanks to over 50 ships till date.

Market share of key cryogenic equipment suppliers globally (CY21)

Since many cryogenic equipment suppliers have multiple business segments and can also offer a wide range of industrial solutions, such as production of cryogenic gases, transport and distribution businesses, the market share of players in the global cryogenic equipment industry is calculated based on estimates of the revenue related to their cryogenic equipment business.

Exhibit 28: Global cryogenic equipment market share (CY21)



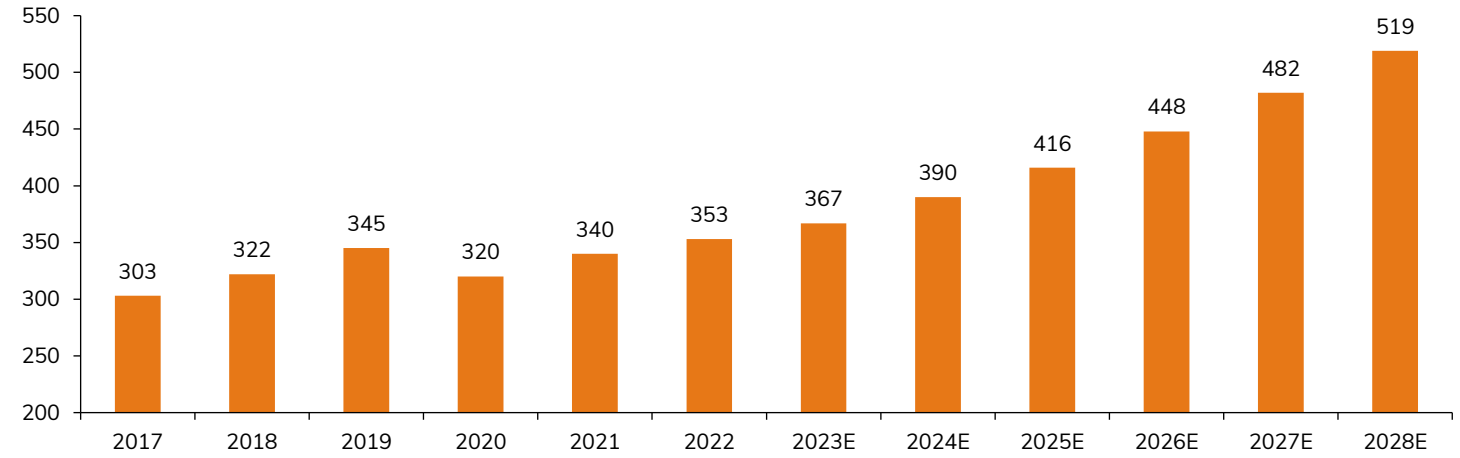
Source: I-Sec research, CRISIL report

According to CRISIL report, Linde plc is the largest global player with a market share of 22.5%, followed by Air Liquid and Air Products with market share of 7.5% and 4.5%, respectively. INOX has a very low market share in global market of around 0.6%.

Domestic cryogenic equipment industry est. at USD 353mn in CY22

The domestic cryogenic equipment market size was estimated at USD 353mn in CY22. Demand for cryogenic equipment was steadily growing at a rate of 6.8% CAGR between CY17-CY19 before being impacted by the COVID-19 pandemic. The ensuing lockdown and travel restrictions saw demand growth for cryogenic equipment stall for two years between CY19-CY21. Going forward, demand for cryogenic equipment is expected to grow at a CAGR of 7.2% between CY23-CY28E (Source: CRISIL report).

Exhibit 29: Domestic cryogenic equipment industry (USD mn)



Source: I-Sec research, CRISIL report

Cryogenic equipment-wise share in the domestic market is largely in line with the global trend (Exhibit 19).

Factors driving demand for cryogenic equipment in domestic market

Shift to LNG (the transition fuel) 207

As India adopted a new policy to increase the share of LNG in India's energy basket, India expects to install 70mt LNG terminals at ports by 2030 and further increase it to 100mt by 2040.

India currently has 42mt of installed LNG terminal capacity and 34mt capacity of LNG terminals are under-construction which will become operational by 2030.

We estimate the cost of a 1,000m^3 mini-LNG terminal storage (0.4mt) to cost INR 80mn each. Thus, the total estimated opportunity to add another 34mt over the next six years stands at **INR 7bn-INR 7.5bn**.

Similarly, we estimate the total transportation equipment capacity required to transport LNG from port terminal to the distribution centers is 5x. This translates to 5,000m^3 of transportation equipment requirement i.e. 500x100m^3 transport tanks. We estimate, a single transport tank to cost INR 5mn; thus, the total annual opportunity size is estimated at INR 2.5bn and an opportunity of INR 15bn over the next six years.

India has plans to set up 1,000 LNG fueling station by 2030. We estimate a single fueling station to cost INR 40-50mn. Thus, total opportunity size of INR 50bn till 2030.

Moreover, LNG as an alternative fuel to CNG and diesel is gaining a lot of traction owing to its lower total cost of ownership. Total annual CV sales in India stands at 400,000 in a year, given the cost benefits of LNG even if we assume penetration increasing from 1% in FY25 to 5% in FY30 – provides an opportunity of INR 300bn over the next five-six years.

As a result, LNG provides a total opportunity of INR 350-375bn for cryogenic storage tanks and services over the next 5-6 years in the domestic market.

Semiconductors industry

Ultra-high purity gases are essential throughout the semiconductor supply chain. In fact, for a typical fab, high purity gases represent the biggest material expenditure after silicon itself. In the wake of a global chip shortage, the industry is expanding faster than ever – and demand for high purity gases is increasing too.

The semiconductor industry is a major consumer of nitrogen. A modern semiconductor fabrication plant can expect to use as much as 50,000 cubic meters of nitrogen per hour. In semiconductor manufacturing, nitrogen plays the role of a general-purpose inerting and purging gas, protecting sensitive silicon wafers from reactive oxygen and moisture in the air.

Micron has already started work on its semiconductor manufacturing plant in FY23 and has recently announced three more chip manufacturing plants – 1) Tata-PSMC plant in Dholera, Gujarat. 2) CG Power – Renesans-Star are setting up a plant in Sanand, Gujarat. 3) Tata semiconductor assembly plant in Assam. Total investment outlay for the project is at INR 1.5trn.

Given the criticality of nitrogen in the chip manufacturing process to remove every spec of dirt particle, we estimate this opportunity worth **INR 5-10bn** over the coming years.

Indigenous cryostat

INOX, along with the Government of India, is developing a cryostat for MRI machines. These cryostats are magnets which when cooled to a low temperature turn in super-magnets. These super-magnets are required in MRI scanning machines and INOX is already working with the government to develop one cryostat worth INR 60-80mn.

A three player industry – cryogenic tanks

Domestic cryogenic equipment manufacturing market is estimated at INR 14bn as on CY21 (source: CRISIL Industry report). And given the high technical expertise required in manufacturing the cryogenic tanks, the entry barrier remains relatively high; thus, not many players are participating in the market.

INOX is the largest domestic cryogenic tank manufacturer with a revenue of INR 6bn in FY21, which is almost than 4x of the immediate competitor.

Exhibit 30: Financial comparisons of domestic competition (INR mn)

VRV	FY17	FY18	FY19	FY20	FY21	FY22	FY23
Revenue	1,020	1,088	1,121	966	1,318	2,672	2,713
EBITDA	(105)	120	68	60	194	515	323
EBITDA Margin (%)	**-10.3%**	**11.0%**	**6.1%**	**6.2%**	**14.7%**	**19%**	**12%**
PAT	25	10	55	(141)	158	305	147
Debt	1,487	1,412	1,569	1,577	1,584	1,591	1,679
Equity	101	138	194	53	721	1,026	1,174
ROE (%)	25%	7%	29%	-265%	22%	35%	13%
Debt/Equity	14.7	10.2	8.1	29.8	2.2	1.6	1.4
Cryolor	**FY17**	**FY18**	**FY19**	**FY20**	**FY21**	**FY22**	**FY23**
Revenue	372	403	634	541	608	931	1,184
EBITDA	(24)	31	50	63	99	104	195
EBITDA Margin (%)	**-6.4%**	**7.7%**	**8.0%**	**11.7%**	**16.2%**	**11%**	**16%**
PAT	(54)	3	18	30	70	81	167
Debt	68	68	83	78	58	-	470
Equity	168	171	189	220	290	542	797
ROE (%)	-32%	2%	10%	14%	24%	19%	25%
Debt/Equity	0.4	0.4	0.4	0.4	0.2	-	0.6
INOX	**FY17**	**FY18**	**FY19**	**FY20**	**FY21**	**FY22**	**FY23**
Revenue	4,439	4,537	6,435	6,491	5,938	7,827	9,659
EBITDA	108	1,043	1,435	1,328	1,345	1,676	2,044
EBITDA Margin (%)	2.4%	23.0%	22.3%	20.5%	22.7%	21%	21%
PAT	(375)	778	1,766	920	961	1,305	1,527
Debt	5,159	3,390	2,560	917	604	434	-
Equity	192	194	2,096	2,794	3,715	5,023	5,495
ROE (%)	-195%	401%	84%	33%	26%	0.1	-
Debt/Equity	26.9	17.5	1.2	0.3	0.2	30%	29%

Source: I-Sec research

Apart from INOX, there are two significantly large competitors in the domestic market – VRV Color and Cryolor.

VRV: The company offers a complete range of products for the storage, distribution and vaporisation of liquid gases including nitrogen (LIN), oxygen (LOX), argon (LAR), carbon dioxide (LCO2), nitrous oxide (LN2O), hydrogen (LH2) and natural gas (LNG) complements. It has presence in India and Italy. The company was acquired by Chart Industries (US listed).

Cryolor: It has presence in designing and manufacturing cryogenic equipment for transport and storage of liquefied gases for the industry markets, and notably electronics, health and energy transition (hydrogen, nitrogen, argon, oxygen, carbon dioxide, or even natural gas-LNG).

All the companies faced industry related headwinds in FY17, reporting losses and lower operating margins, owing to lowered demand outlook from the O&G segment. However, this improved post FY17 with renewed demand growth in the industry.

INOX has over 4x revenue of INR 6bn in FY21, as compared to the nearest competitor VRV Color, which has revenue of INR 1.3bn in FY21. Also, INOX's EBITDA margins are far superior, at 22.7% in FY21, versus 14.7% for VRV and 16% for Cryolor in FY21.

This reflects the moat INOX commands, in terms of customer penetration and technical expertise, to generate significantly higher operating margins versus peers.

LNG as a transportation fuel – chicken and egg need to come together

- **De-carbonisation for heavy CVs and marine ships needs LNG as a fuel.**
- **INOX has first-mover advantage in fuelling stations and LNG fuel tank; it will be the automatic beneficiary.**
- **India had pencilled a target of 1,000 LNG fuel stations. However, take off has been slow.**
- **But, decline of LNG is improving the economics of heavy transportation. In recent past, there has been a sharp rise in tenders and volumes for LNG fuel station.**
- **Meanwhile, transportation companies and heavy commercial vehicle OEMs are looking to convert their vehicles to LNG.**

De-carbonisation of heavy CVs

One of the largest contributor to air pollutions globally are emissions by CVs in the transportation sector. To contain the level of emissions, LNG provides a better alternative to usual diesel power trucks.

LNG is considered as the cleanest burning fuel and offers a compelling solution by burning significantly cleaner than diesel, presenting a remarkable reduction in emissions from heavy trucking. Trucks powered by LNG emit up to 28% less carbon dioxide, 70% less carbon monoxide, and 59% less nitrogen oxide than their diesel counterparts.

While LNG is not the cleanest solution available as on date, it is certainly one of the most viable transition fuel for the next 15-20 years till the time green solutions like green hydrogen and electric HDVs become commercial and technically viable.

Exhibit 31: Comparison of various fuel alternatives for the M & HCV segment

Fuel	Diesel	CNG	LNG	Green Hydrogen	Electric HDVs
Technology Maturity	High	Moderate	Moderate	Low	Low
Fuelling Infrastructure	Widely available	Limited availability for interstate travel	Limited availability	Zero availability	Limited Availability
Level of self-dependence	Low	Moderate	Low	High	Moderate (due to Batteries)
Level of Diversification	Low	Moderate	Low	N/A	Low
TCO	Moderate	Moderate	Moderate	High	High
Emissions Savings	Low	Moderate	Moderate	High	High

Source: I-Sec research, NITI Aayog

Comparison of Total Cost of Ownership (TCO) of CV, based on fuel

TCO of a CV is calculated based on the following parameters –

- Capital cost
- Fuel cost
- Tolling
- Salary of drivers
- Maintenance cost

Tolling and driver salary will remain the same for both. Thus, let us look at the TCO based on the other factors.

We assume that capital cost of a diesel CV of INR 5mn and that of a LNG CV of INR 6mn – both the fuels will provide same fuel efficiency and mileage of 5km/kg (ltr), total distance travelled in a year of 60,000kms, cost of diesel of INR 95/ltr and cost of LNG of INR 72/ltr (20% discount to diesel) and maintenance cost diesel CV at INR 0.7mn/year and that of LNG CV at INR 0.5mn/year.

Considering LNG cost of USD 16/mmbtu (vs. USD 10/mmbtu as on date), the TCO of an LNG CV is lower than that of a diesel power CV.

Exhibit 32: Total cost of ownership of a LNG CV as compared to a diesel CV

INR mn	Diesel	LNG
Cost of Vehicle (INR)	5,000,000	6,000,000
Life (years)	10	10
Cost of capital (%)	10%	10%
Km travelled (in a year)	60,000	60,000
Equivalent annual cost (INR)	813,727	976,472
Capital cost (per km)	13.6	16.3
Fuel cost (per km)	19.0	15.3
Maintenance cost (per km)	1.2	0.8
Total cost of ownership (per km)	**33.7**	**32.4**

Source: I-Sec research

Thus, the TCO throughout the life of an LNG CV is 5% cheaper at INR 32.4/km to that of diesel CV of INR 33.7/km. TCO of an LNG CV is estimated at INR 27/km at the current price of LNG of USD 10/mmbtu.

Considering Diesel price of INR 95/litre, the distance covered by a heavy duty vehicle in a year is 60,000km and cost of an LNG vehicle higher by INR 1m over a diesel vehicle, let us try to understand the payback period based in the range of LNG retail prices –

Thus, at current price of USD 10/mmbtu the fuel cost saving per km is INR 9.1/km. Thus, considering travel of 60,000km/year, the payback period to recoup the incremental capex of INR 1mn for a LNG heavy duty vehicle works out to 1.8 years.

Exhibit 33: Payback period sensitivity with respect to incremental capex of a LNG heavy duty vehicle

LNG price (USD/ kg)	Fuel cost saving (INR/km)	Distance to recover incremental capex (km)	Payback period (years)
10.0	9.1	109,476	1.8
12.5	6.9	145,524	2.4
15.0	4.6	216,967	3.6
17.5	2.3	426,212	7.1

Source: I-Sec research

As explained above, the payback period increases to 2.4 years for LNG price of USD 12.5/mmbtu, 3.6 years for USD 15/mmbtu and 7.1 years for USD 17.5/mmbtu.

However, given the limited penetration of LNG fueling stations across India, the lower cost of ownership is not reflecting in the sales of LNG CVs across India.

India's plans for LNG fueling stations taking shape

India, in 2017, came out with a policy initiative to enhance the use of LNG in India's energy basket. India wants contribution of gas in India's energy basket to reach around 15% by 2030.

This led to several initiatives from the GoI, both upstream and downstream, such as –

- Setting up of 100MT of LNG handling terminals at Indian ports
- Allowing LNG as an automobile fuel
- Enhance the penetration of LNG infrastructure across India with an initial target to set up 1,000 LNG fueling station.

While this initiative did not bear fruit in the initial years, the government kick started its effort in FY21 to set up 50 LNG fueling on the golden quadrilateral circuit.

LNG fueling station plans

PSUs have led the charge in setting up LNG fueling stations for heavy duty vehicles' use along the golden quadrilateral. While IOCL has announced plans to set up 20 LNG fueling stations, it has already started work at 16 station that are under construction.

Further, HPCL and BPCL have announced 11 stations each; GAIL has announced four stations. Petronet LNG has plans to add 14 stations, out of which work is underway at four stations.

Exhibit 34: LNG fuel station addition plans

Company	Stations announced (nos.)
IOCL	20
BPCL	11
HPCL	11
GAIL	4
Petronet LNG	14
Adani Total Gas	50
Total	110

Source: I-Sec research

Meanwhile, recently, Adani Total Gas announced plans to add 50 LNG fuel stations across India.

What is the capital cost of an LNG station?

A LNG fueling station will require a capex of INR 100mn with a debt to equity ratio of 4:1. Daily LNG sales is estimated at 25,000kg with a gross margin of INR 15/kg. Annual operating expenditure is estimated at 10% of the total capex.

Exhibit 35: Illustrative financial model for a LNG fueling station

Project capital structure and profit and loss	INRm	Particulats	INRm
Capital expenditure (INR mn)	100	Gross profit (INR mn)	137
Debt (INR mn)	800	Opex	10
Equity (INR mn)	200	EBITDA	127
		Interest	87
		Dep	4
Yearly operating parameters		PBT	36
Daily LNG sales (kg)	25,000		
Yearly sales (mn kg)	9.1	RoE (Pre-tax-%)	18%
Gross margin per Kg	15	Free cash flow	31
Yearly Opex (of capex)	10%	Payback period (years)	3

Source: I-Sec research

Thus, based on the above assumptions, the fueling station is expected to generate an RoE of 18% with a payback period of three years.

LNG, as an alternate fuel for CVs, is becoming economical

As the total cost of operations over the lifetime of a heavy duty vehicle is cheaper versus CVs that are diesel-powered, CV OEMs have introduced LNG-powered truck variants in their product portfolios.

India sells around 400,000 CVs a year and has an estimated operational fleet of 5mn as on date. Cryogenic LNG storage tanks for a single truck costs ~INR 0.5mn/truck. Even if 5% of this market shifts to LNG fuel, annual potential market will grow to INR 10bn/year. And if we assume 5% of the existing fleet retrofits to LNG, it will generate a total demand worth INR 100bn.

The current news flow indicates a renewed momentum

Maharashtra state to convert 5,000 diesel-powered buses to LNG

Maharashtra State Road and Transport Corporation (MSRTC) has recently announced its plans to convert 5,000 diesel-powered buses into LNG power buses over the next two-three years. It has signed an MoU with Kings Gas for the retrofitting of LNG tanks to the existing fleet.

Moreover, it will set up LNG fueling stations at its depot for refueling of these LNG-powered buses.

INOX has supplied 5 LNG fuel tanks for their pilot projects is most likely to be the beneficiary going ahead as well. Given the need to reduce pollution in cities, more such initiatives from state governments across India are likely in the future.

Adani Total Gas partners with INOX to boost India's LNG ecosystem

Adani Total Gas Ltd (ATGL), and INOX India Ltd (INOXCVA), a global leader in cryogenic liquid storage and distribution, have signed a mutual support agreement aimed at strengthening the country's LNG ecosystem,

Adani is looking to set up 50 fueling station and has already given the orders for setting up of five such stations.

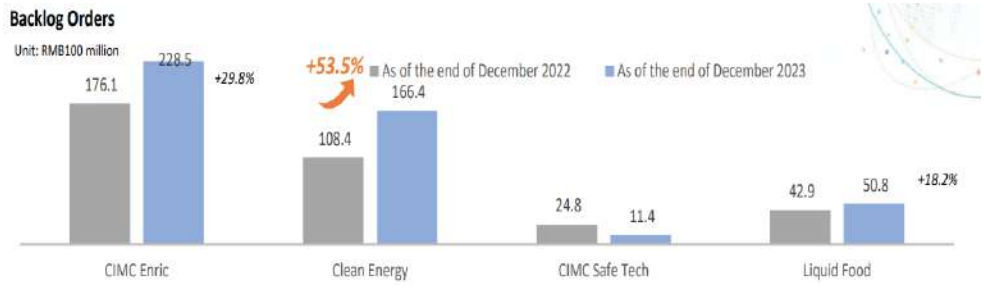
China: A sharp ramp up in LNG heavy vehicle

CIMIC ENRIC is the largest producer of LNG storage tanks and LNG trucks. It is reporting a surge in orders from clean energy orders.

Surge in backlog

As of end-Dec'23, backlog orders amounted to RMB 22.85bn, representing a YoY increase of 29.8%, and backlog orders for the clean energy business increased by 53.5%. Economic recovery, the rebound of the Chinese natural gas market, and favourable government policies have driven the sales of LNG on-vehicle cylinders, LPG trailers and other storage and transportation equipment to improve.

Exhibit 36: LNG fuel tank orders inflow for large players in china



Source: I-Sec research

Demand of LNG fuel tanks

CIMC Enric Holdings Limited and its subsidiaries have announced that in Jan'24, the company's orders for LNG on-vehicle cylinders skyrocketed to RMB 165mn, representing YoY growth of 27 times. The LNG heavy-duty truck market remained hot at the beginning of the new year. To meet the strong market demand, the company is actively accelerating the debugging progress of the new intelligent production line for LNG on-vehicle cylinders. The new production line is expected to be fully operational around Mar'24. Under a double-shift working system, the maximum production capacity of LNG on-vehicle cylinders can reach 200,000 units per year, providing strong assurance for continuous market supply.

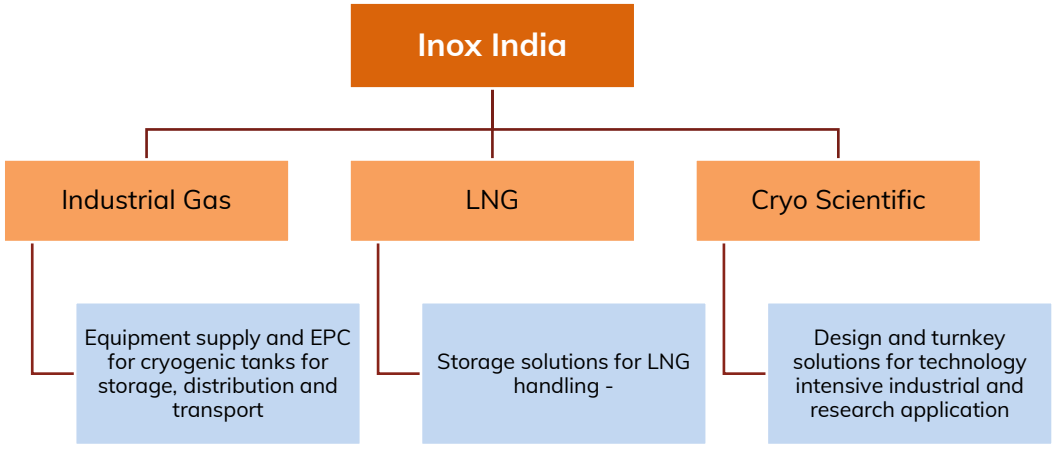
INOX – a key beneficiary

- **INOX primarily consists of three segments – 1) Industrial Gas division; 2) LNG division; and 3) Cryo Scientific division.**
- **Industrial gas division caters to storage, transportation and distribution storage solution for industrial gases like oxygen, nitrogen, argon, carbon di-oxide, hydrogen, etc.**
- **LNG division provides end-to-end solutions for the LNG value chain starting from LNG fuel tanks for shipping vessels, mini LNG terminals for storage, LNG storage for various transport modes, vaporisers, and distribution equipment like fuel dispensers, micro storage, etc.**
- **Under the LNG division, it also caters to automobile LNG tank solutions for CVs. It supplies standalone storage tanks as well as storage tanks with vaporisers to feed LNG to engines.**
- **Under the Cryo Scientific division, INOX works with the government and science projects.**
- **Moreover, it has set up a 1mn p.a. stainless steel keg manufacturing facility at Savali. These kegs will primarily cater to the demands of beer retail industry and also can be used for various food and beverage industry demand.**

INOX's three business divisions

- **Industrial Gas:** Manufactures, supplies and installs cryogenic tanks and systems for storage, transportation and distribution of industrial gases such as green hydrogen, oxygen, nitrogen, argon, carbon dioxide (CO2), hydrogen and provides after-sales services.
- **LNG:** Manufactures, supplies and installs standard and engineered equipment for LNG storage, distribution and transportation as well as small-scale LNG infrastructure solutions suitable for industrial, marine and automotive applications.
- **Cryo Scientific:** Provides equipment for technology intensive applications and turnkey solutions for scientific and industrial research involving cryogenic distribution.

Exhibit 37: INOX business segments



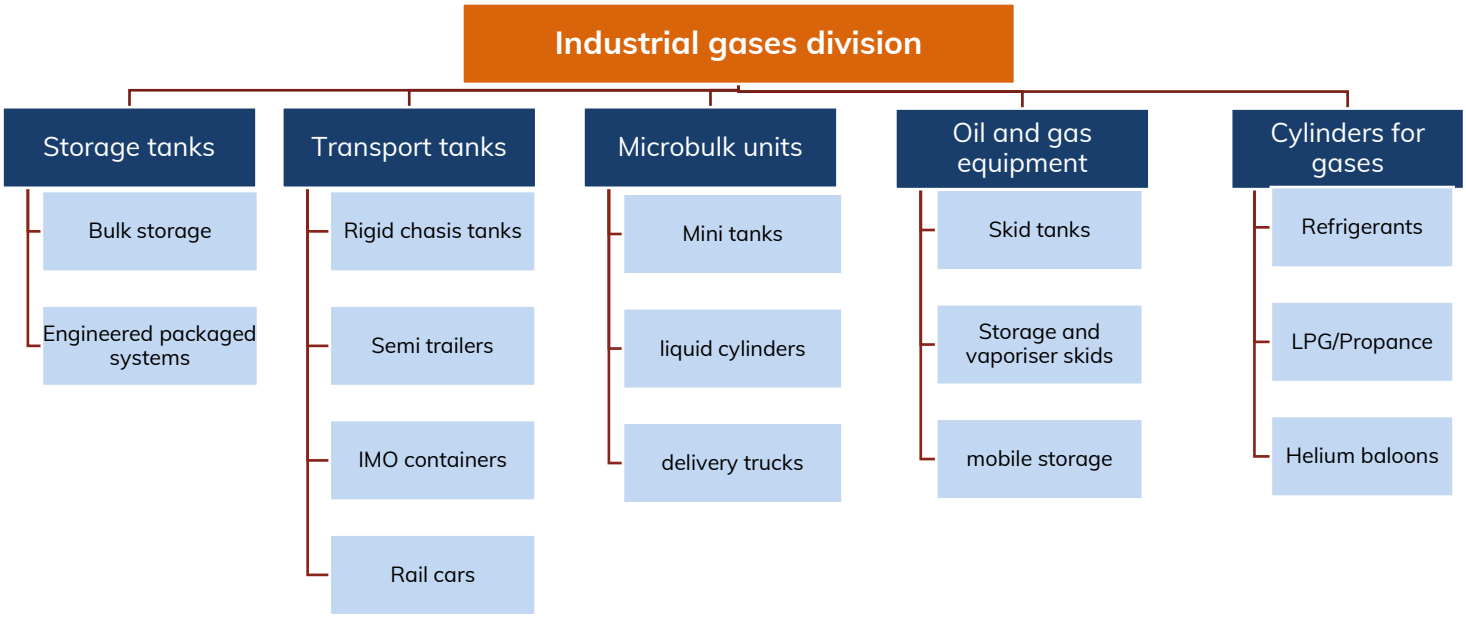
Source: I-Sec research

Industrial gases

The industrial gas division designs, manufactures, supplies and installs vacuum insulated cryogenic storage tanks and systems for the storage, distribution and transportation of industrial gases. It also designs and manufactures customised cryogenic storage tanks and systems as per the customer's requirements as well as standard storage tank. Its storage tank offering includes stationery storage tanks from 1,000litres to 1mn litres capacity, portable storage tanks from 1litre to 1,000litres capacity and transport tanks and tankers/trailers up to 60,000litres capacity.

Its product line also includes vaporisers of various types and skid mounted piping skids for pumping and regasification. Inox also provides engineering, procurement and construction services for cryogenic solutions including bulk storage and regasification equipment, typically associated with petrochemical or steel projects.

Exhibit 38: Industrial gases product portfolio



Source: I-Sec research

INOX produces standard bulk storage tanks of 4KL to 1,000KL for liquid industrial gasses and also provides turnkey solutions for cryogenic gas storage from ASUs, including pumps, valve and PLC instruments. It also produces transportation tanks based on the requirements like trailer and chassis-mounted tanks, container tanks and also rail bogey mounted tanks.

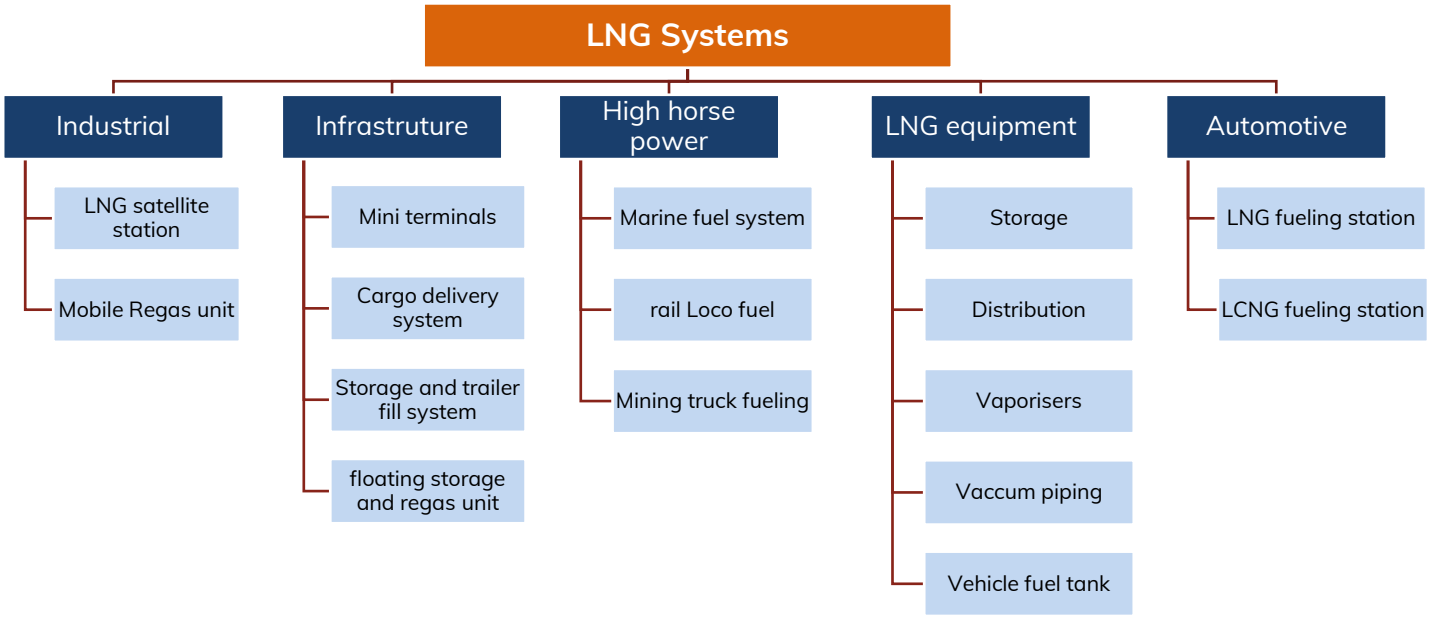
The company also produces micro and mini industrial gas tanks for storage, dispensing and delivery, and also provides skid mounted tanks systems that consists of vaporisers enabling these liquids at low temperatures to turn into gases in a systematic manner at ambient temperatures.

Key clients – Air Liquide Global E&C Solutions India Private Limited, All Safe Global, Baif Development Research Foundation, CRYONiQ s.r.o., Gulf Cryo LLC, Hyundai Engineering and Construction Co Ltd, INOX Air Product Pvt Ltd, Carbacid (CO2) Limited, Navin Flourine International Ltd, National Refrigerants Inc, Pentrade Global LLC, Prodair Air Products India Pvt Ltd, SK ecoengineering Co. Ltd, StemCyte India Therapeutics Pvt Ltd, Synergy Gases (K) Ltd.

LNG System

The LNG division designs, manufactures and installs standard and engineered solutions for LNG and LCNG including static storage tanks up to 1mn litres capacity, transport trailers, LNG satellite stations for industrial users, marine fuel tanks, LNG and LCNG fuel stations and LNG vehicle fuel tanks.

Exhibit 39: LNG system product portfolio



Source: I-Sec research

INOX has a full suite of LNG solutions ranging from LNG storage at production sites, transportation, vaporisers, piping systems and distribution solution both for industrial and retail customers.

Under the infrastructure division it provides LNG storage at ports, both floating and onshore, LNG receiving units which will shift LNG from the inbound vessel to the storage unit, LNG cargo delivery system, trailer fill solutions and also vaporisers, which will help the stored gas in liquid form to be converted back to gas at room temperatures.

Key clients – Caribbean LNG Inc, 2G Energy Inc, AGP City Gas Pvt Ltd, H-Energy Gateway Pvt. Ltd., Hoglund Gas Solutions AS, IRM Energy Limited, Saint Gobain India Private Limited, Shell Energy India Private Limited; Think Gas Distribution Private Limited, Ultra Gas & Energy Limited.

Cryo Scientific division

The Cryo Scientific division designs, manufactures and installs equipment for technology intensive industrial applications and turnkey solutions for scientific and industrial research involving cryogenic distribution. Its activities are focused on customised cryogenic storage and distribution systems for space research, cryogenic fuel filling systems for launch pads, space simulation chambers, vacuum jacketed piping and cryostat for MRI magnets.

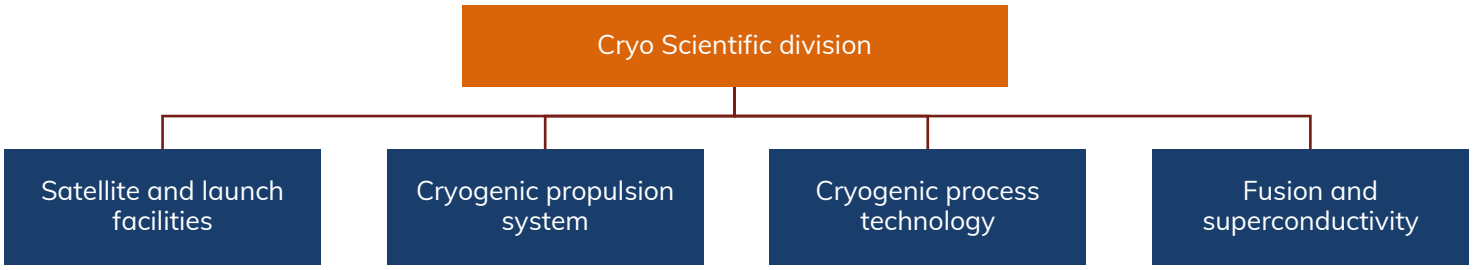
INOX has developed technologies for ISRO for cryogenic propellant fuelling and servicing systems at the launch pad. The cryogenic fuel is filled in the rocket tanks at the last minute, just prior to the launch time and thus is a very crucial equipment.

It has also developed cryogenic fuel handling systems, thermo vacuum space simulation chambers and liquid H2, helium and oxygen storage systems. It has also

developed cryogenic coolers, inert gas supply systems, cold boxes for cryo processes, etc.

Additionally, it has developed capabilities to produce cryo magnets which transform to super conductors at very low temperature. Its applications are in MRI scanning machines.

Exhibit 40: Cryo Scientific division portfolio



Source: I-Sec research

The company has also supplier cryo-lines for cryogenic fluid handling systems has supplied the same at ITER Having gained experience in these scientific experiments – INOX is well placed to capitalise on future large scale scientific experiments like the FAIR project.

FAIR project

FAIR will be one of the largest and most complex accelerator facilities in the world. The FAIR accelerator facility will have the unique ability to provide particle beams of all the chemical elements (or their ions), as well as antiprotons. The particles will be accelerated to almost the speed of light in the FAIR accelerator facility and made available for scientific experiments. FAIR will generate particle beams of an outstanding intensity and quality. The FAIR facility consists of a superconducting ring accelerator with a circumference of 1,100 meters, storage rings and experiment sites with several km of beam line in total.

This project is likely to have applications of superconducting magnets which will require liquid helium (-269^{O}K liquefaction temperature). Thus, given INOX's experience in ITER projects, it can contribute to FAIR project too.

Strong experience working with the giants

- **Industrial gas market is highly concentrated, both globally and domestically, with major players being – Linde Plc, Air Products, Air Liquide, Messers and Air water.**
- **Industry is characterised by 3 distribution methods for industrial gases: (i) on-site or tonnage; (ii) merchant or bulk liquid; and (iii) packaged or cylinder gases.**
- **Domestically and Internationally, INOX has supplied its products across the value chain to these Big-5 players. As a result, it becomes easier for INOX to supply its cryogenic tanks especially in International markets**
- **INOX has negligible global market share (0.6%) as of CY22, thus owing to its track record with the large IG companies it can tap into exports markets too.**

Industrial gases market is highly concentrated. Major global players like Linde plc, Air products, Air liquid and Air water have cornered a significant chunk of the global as well as the domestic market.

Industrial gas manufacturing companies provide variety of the solution like –

- On-site solutions ASUs are set up at the customer's facility,
- Merchant sales gases are provided in bulk quantities through transport storage tanks and
- For retail requirement small cylinders are used for supply

Thus, these companies require a host of cryogenic products – from setting up of ASUs, storage of liquids after production, to distribution solutions like transport trailer tanks, and then the subsequent storage and dispensing solutions at the end-user level.

INOX has over the years supplied its products directly to all the big-4 companies as well as their customers.

Exhibit 41: Financial highlight of the leading Industrial gas manufacturers

LINDE INDIA (INR mn)	CY19	CY20	CY21	15MFY23
Revenue	17618	14711	21120	31,355
EBITDA	4357	4075	2313	8,655
PAT	7255	1538	5129	5,387
EBITDA Margin (%)	*25%*	*28%*	*11%*	*28%*
PAT Margin (%)	*41%*	*10%*	*24%*	*17%*
Net Worth	21,368	22,037	26,910	31,139
Debt	85	10	230	207
AIR LIQUIDE (EUR mn)	**CY20**	**CY21**	**CY22**	**CY23**
Revenue	20,485	23,335	29,934	27,608
EBITDA	5,928	6,333	7,328	7,550
PAT	2,528	2,691	2,904	3,188
EBITDA Margin (%)	*29%*	*27%*	*24%*	*27%*
PAT Margin (%)	*12%*	*12%*	*10%*	*12%*
Net Worth	19,005	21,999	24,572	25,043
Debt	11,190	11,539	11,221	9,607
AIR PRODUCTS (USD mn)	**CY20**	**CY21**	**CY22**	**CY23**
Revenue	8,856	10,323	12,699	12,600
EBITDA	2,238	2,281	2,339	2,495
PAT	1,887	2,099	2,256	2,300
EBITDA Margin (%)	*25%*	*22%*	*18%*	*20%*
PAT Margin (%)	*21%*	*20%*	*18%*	*18%*
Net Worth	12,443	14,088	15,660	13,702
Debt	7,430	7,150	7,086	9,431

Source: I-Sec research

Since INOX has technical approvals from these companies in India and globally, it is easier for them to gain a larger wallet share in the export market, either through the industrial gas producers or selling it directly to end-customers. Please refer Annexure-1 for financial performance of domestic companies.

Multiple stringent approvals – a strong entry barrier

- **Supply of cryogenic tanks require stringent approvals from various regulators in domestic and global markets**
- **INOX has supplied its tanks to various countries and has dealt with regulators over the years.**

Cryogenic storage tanks are a very critical part and can attract significant risks in times of malfunctioning. Thus, stringent regulations are required for the design, manufacture and operation of these equipment. The regulations differ based on the applications of these tanks and area of usage.

The major global organizations that specify and maintain standards related to cryogenic equipment across geographies are:

- **United States:** ASME provides the public and private sectors with a wide range of safety codes and standards. These are managed by the Board on Safety Codes and Standards (BSCS). In fact, the BSCS is responsible for the management of all ASME activities related to codes, standards, and accreditation and certification programmes directly applicable to safety codes, safety standards, and related accreditation and certification.
- **European Union:** There are over 20 publishers of standards relevant to cryogenic equipment in the European Union, including ISO and the British Standards Institution. These standards specify requirements for cryogenic equipment for use in the EU.
- **Global:** ISO also maintains globally accepted standards. For example, ISO 21011:2008 is required for cryogenic valves, while ISO 3834 specifies requirements for fusion welding of metallic materials that are part of a process in the manufacture of cryogenic equipment, such as tanks. For devices with risk of explosion possibility, additional certifications may be required (such as ATEX/IECEx/PESO).

Domestic regulatory environment

The Petroleum and Explosives Safety Organization (PESO), formerly known as Department of Explosives, is the nodal agency for regulating safety of hazardous substances such as explosives, compressed gases and petroleum.

Equipment manufactured will require testing every year for safety relief values, every two years for pressure vessels containing toxic and corrosive gases and every five years for other vessels. Getting PESO approvals can be difficult and the approval process can be very stringent, information-intensive and time-consuming. Since cryogenic systems have stringent certification requirements and products are required to undergo rigorous testing and quality checks, customer royalty.

PESO has appointed certification agents across India and every cryogenic tank manufactured needs to be certified or approved at the manufacturing facility by one of these certification agents.

INOXCVA acquired standard global approvals and certification such as ISO 9001:2015 ISO 45001:2018, ASME (U Stamp), ADM, HPO, PED, TPED, CE and DOT 39.

List of certifications INOX has obtained

- ASME Sec. VIII Div1 with (App 44) & without Cold Stretch
- EN 13458 with & without Cold Stretch – for Static tanks

- EN 13530 with & without Cold Stretch – for Transport tanks
- AS 1210 with & without Cold Stretch – for Static tanks
- EN 1251 - for Cryogenic containers less than 1,000liters
- API 620 – Field erected flat bottom tanks
- ISO 3834-2 Comprehensive Welder Quality Management System
- DNV certified IMO tanks
- LNG Marine Shop Approvals from DNV, Llyod's Register, Bureau Veritas, Rina.
- R Stamp Certificates for repairs
- PQN/ATEX for dispenser not seen
- NSF certification for Beverage kegs
- BIS certification for cryoseal containers

Stainless steel keg – entering a promising market

- **INOX has set up a facility to produce 1mn stainless steel kegs and is looking to get gain market share.**
- **Stainless steel keg is a sustainable way of packaging beers. A keg has 9x lower emission.**
- **INOX has received the know-how from an Italian player and is looking to export the product to Europe.**
- **Global market is pegged at 10mn kegs; value estimated at INR 40bn p.a.**
- **We estimate INOX-CVA to acquire 10% of market share in the next two-three years backed by its competitive advantages.**

A keg is a better packaging solution for craft beer. It is sustainable, efficient and brings freshness benefits to the liquid. As a result, steel keg penetration is increasing in Europe and America. INOX is looking to tap into this market. It has set up a new factory to produce beverage keg.

Advantage of stainless steel keg

Stainless steel allows transport and conservation of the beer under perfect conditions until consumption. Stainless steel is replacing plastic; thus providing sustainable solutions. Stainless steel is food-safe, resists corrosion, is durable, and is easy to clean and sanitize. Stainless steel is also a low-cost element, especially when it comes to longevity.

Tie-up with Italian player

Thielmann, Belfa, and Schaefer Container Systems are some of the major stainless steel keg manufacturers in Europe. INOX has tied-up with Supermonte. INOX has signed a technology license agreement with Supermonte SRL of Italy, for the manufacture of stainless steel beverage kegs using the Supermonte brand and technology.

A sharp duty on Chinese import

Europe has imposed definitive anti-dumping duties on imports of stainless steel refillable kegs originating in China for a period of five years. The duties are in the range from 62.6% to 69.6%. As a result, INOX is likely to be in an advantageous position compared to Chinese competition (Link).

Exhibit 42: Anti-dumping duty on Chinese players

Country	Company	Definitive injury margin
People's Republic of China	Penglai Jinfu Stainless Steel Products Co., Ltd	69.60%
	Ningbo Major Draft Beer Equipment Co., Ltd	63%
	Other cooperating companies	66.70%
	All other companies	69.60%

Source: I-Sec research

Market size and expected market for INOX

We estimate market size of 10mn kegs in a year or INR 40bn p.a. On account of dumping duty and competitiveness of INOX, we expect it to gain 10% market share in next three years.

Headwinds in refrigerant cylinders is almost behind

- **INOX is producing disposable cylinder for storing of refrigerant. Unlike India, disposable cylinders are compulsory for storing refrigerants in USA.**
- **It sold cylinders worth 15% of revenues in FY23. However, the refrigerant business saw a slowdown in 9MFY24, owing to an anti-dumping investigation in USA.**
- **Preliminary investigation suggests imposition of nil anti-dumping duty on INOX.**
- **We note that final investigation is expected to be published in next couple of months. Post which, we believe volumes will return to normal FY25 onwards.**
- **INOX is selling disposable cylinders in the US market. Decline in disposable cylinders has impacted revenues in FY24E. The clarity on duties likely by Q1FY25E is likely to bring back the lost revenues from FY25E.**

INOX is selling disposable cylinder in USA market. Decline in disposable cylinders has impacted revenues in FY24E. The clarity on duties likely by Q1FY25E is likely to bring the lost revenues from FY25E.

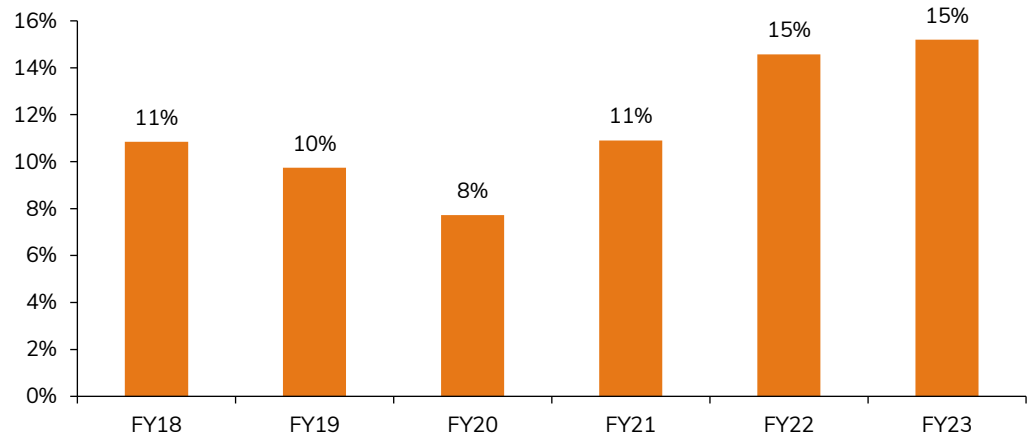
Non-refillable steel cylinders (or disposable cylinders)

NRSC are portable, non-reusable steel containers specifically designed to store, transport, and dispense compressed or liquefied gases, or other materials for a wide variety of end-use applications. Some common contents and end-uses include: (1) refrigerant gases for refrigeration and air-conditioning applications; (2) helium for inflating retail and commercial balloons; (3) gases for industrial applications; and (4) various liquid chemical mixtures such as foam insulations, sealants, and adhesives for residential and commercial construction applications.

Significant contribution to disposable cylinders to revenues

Refrigerant business has contributed up to 15% in last few years to INOX revenues. INOX sells the disposable cylinders directly in US markets or sells to domestic players selling the refrigerants in United States. However, owing to uncertainty related to import duty, the business has been subdued in FY24E.

Exhibit 43: Share of disposable cylinders in INOX's revenue



Source: I-Sec research

Anti-dumping duty on Chinese disposable cylinders

US has already imposed anti-dumping duty on disposable cylinders from Chinese players. As a result, Chinese disposable cylinders are likely to continue to face

headwind. As a result, we expect INOX to be in advantageous position compared to competitors.

Preliminary investigation imposes NIL duty; expect normal service to resume in FY25E

Worthington Industries – the only US manufacturer of disposable cylinders has filed a petition for imposing anti-dumping duties on Indian players. Department of commerce has suggested NIL duty on the INOX disposable cylinders in FY25E. The final results on duties are likely to be notified by end of Q1FY25E. As a result, we believe a NIL duty will give a leg up to the volumes of INOX in FY25E.

Exhibit 44: Anti-dumping duty petition preliminary result

Exporter/producer	Estimated weighted-average dumping margin (percent)	Cash deposit rate (adjusted for subsidy offset(s)) (percent)
Bhiwadi Cylinders Private Limited; Sapphire (India) Private Limited [7]	61.00	59.36
Inox India Limited	0.00	0.00
All Others	[8] 33.62	31.93

Source: I-Sec research, USA regulators

As per the preliminary results, the US regulators have identified Bhiwandi Cylinders and some other manufacturers to have sell refrigerated cylinders below fair value. Thus it is likely to impose import duty on these manufacturers. Whereas the regulators have not found any need to impose anti-dumping duty on INOX.

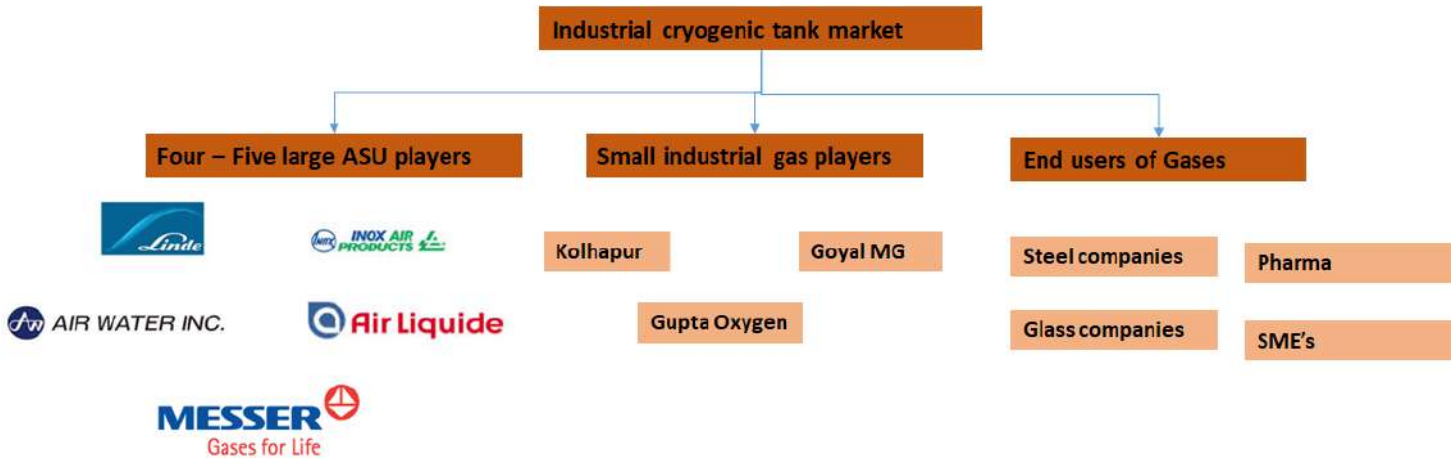
INOX's revenue from disposable cylinders is impacted in FY24E as its production for the same is likely to be in the range of 1.2mn cylinders in FY23 (vs. over 2mn cylinders in FY23) on account of uncertainty due to anti-dumping duty case. However, going forward as the restrictions are potentially lifted, we believe INOX will be in a better place to more than recover the lost revenues from FY25E and FY26E.

Selling to a well-diversified customer base; insulated from volatility

- **Industrial Cryogenic tanks (51% contribution to sales) are being sold to air separation units and end users of gas. Gas supply markets are well diversified with large 4 suppliers and numerous industrial gas players.**
- **Disposable cylinders (15% contribution to sales) for storing refrigerants are being sold to refrigerant companies for selling to US market.**
- **LNG (24% contribution to sales) tanks are being sold to City Gas Distribution (CGD) companies, LNG users. The LNG fuel tanks are being sold to OEMs or individual users.**
- **Further, it sells its products to a number of countries across world to a varied set of customers.**

Developer of air separation units are significant buyers of the storage tanks. But, storage tanks are being used also by the users – customers and transporters. The setting up of air separation unit is dominated by four large manufacturers – Air products, Air Liquide, Air Water and Linde. All the manufacturers have a presence in India through their Indian subsidiaries. INOX India supplies cryogenic tanks to all the four manufacturers in India. Note that these four customers are present across different geographies, enabling INOX to sell its products globally.

Exhibit 45: Industrial cryogenic tank market by player size



Source: I-Sec research

Industrial gas markets comprise of gas supplier of four – five large players and numerous Industrial players. Tanks are being sold to the players in the entire value chain – end users, transporters and customers

Large gas players

Linde and Linde India

Linde is the largest gas player in world with a revenue of USD 27bn. Linde India has been in India and has emerged as the largest player with a revenue of INR 33bn. Linde has recently won two large contracts from SAIIL and IOCL to set up ASU's. (Source: website and annual report).

Air Products and INOX Air products

Air Products has been in India since 1999 through a tie up with INOX. It is the second largest player in India with a revenue of INR 22bn. INOX air products is in the process

of expanding its gas supply business. It is setting up eight air separation units of ~8,000 tpd (Source: website and annual report)..

Air Water and Air Water India

Air Water made an entry into India by acquiring a facility from Linde India. Note that Linde India was forced to sell facilities in south India post-merger with Praxair on account of concerns of lower competition due to merger (due to order from competition commission of India). Air Water is bullish on India and has a plan to increase its revenues by 5x to 100bn Yen or INR 55bn by 2030.

Air Liquide and Air Liquide India holdings limited

Air Liquide is the second-largest player globally and it made an entry into the Indian markets in 2018. It is looking to expand its capacity in India.

Messers

Messers is a German company and has no presence in India. It made an entry into North America by acquiring assets post-merger of Linde and Praxair.

Small Industrial players

Host of small industrial companies, the likes of Goyal Glasses, HS Kanthi Industrial Gears, Shivam Industrial Gases are present in the sector.

Customers storage tanks

Major industrial companies have storage tanks on their premises to store the gases in liquid forms.

Refrigerants (15% of the market)

It's dealing with National Refrigerant INC, Navin Fluorine, SRF and Gujarat Fluorochemicals. All these players are serving the US market where disposable cylinders are allowed to store refrigerants.

LNG markets (25% of the revenues)

LNG end-use markets comprises of different set of players from CGDs to oil companies. INOX is selling tanks to CGDs, oil companies and fuel tanks to existing state and private transport companies and vehicle OEMs.

Export basket is fairly diversified

INOX has a fairly diversified export market base with top 10 countries accounting for over 50% of the revenue in 6MFY24. The largest being Korea at 15%, followed by USA at 12.2%.

Exhibit 46: Consolidated - top 10 Export Countries & Year wise Growth of Exports

Sr. No	Revenue	FY24-6M		Fiscal 2023		Fiscal 2022		Fiscal 2021	
		INR mn	%	INR mn	%	INR mn	%	INR mn	%
1	United States of America	690.92	12.24%	1534.75	15.89%	901.73	11.52%	487.09	8.20%
2	Antigua And Barbuda	591.92	10.48%	396.97	4.11%	0.00	0.00%	0.00	0.00%
3	Norway	2.05	0.04%	333.74	3.46%	0.00	0.00%	8.26	0.14%
4	Saudi Arabia	288.26	5.11%	275.34	2.85%	170.18	2.17%	122.05	2.06%
5	Japan	96.17	1.70%	244.14	2.53%	83.81	1.07%	0.00	0.00%
6	Korea	841.41	14.90%	24.59	0.25%	1.52	0.02%	6.58	0.11%
7	France	167.58	2.97%	187.94	1.95%	31.92	0.41%	12.80	0.22%
8	Puerto Rico	43.65	0.77%	166.83	1.73%	0.44	0.01%	2.96	0.05%
9	Canada	17.07	0.30%	108.41	1.12%	26.49	0.34%	2.86	0.05%
10	United Arab Emirates	138.68	2.46%	72.56	0.75%	102.71	1.31%	96.15	1.62%
	Export to Others country	**633.03**	**11.21%**	**1,081.22**	**11.19%**	**1,365.13**	**17.44%**	**1,318.69**	**22.21%**
	Total Exports	**3,510.73**	**62.18%**	**4,426.49**	**45.83%**	**2683.93**	**34.29%**	**2,057.44**	**34.65%**
	Total Revenue	**5,646.12**		**9,659.00**		**7827.11**		**5,937.97**	

Source: I-Sec research, Company

Manufacturing capabilities

INOX has three manufacturing facilities: 1) Kalol; 2) Kandla Special Economic Zone (SEZ); and 3) Silvassa.

Its Kalol facility manufactures Perlite and super-insulated cryogenic containers and tanks, standard customer station tanks, large bulk storage tanks, LN2 dewars, transport tanks, micro bulk storage units, vaporisers, pressure regulating and control skids, CO2-based dry cleaning machines, disposable cylinders, and customised equipment.

Kandla SEZ facility manufactures customer station tanks, large bulk storage tanks, flat bottom tanks, water bath Vaporisers, pressure regulating & control skids, and specially engineered equipment. Silvassa facility manufactures disposable refrigerant cylinders.

Exhibit 47: Manufacturing facility details

Manufacturing plant location	Details of production
Kalol	Perlite and super-insulated cryogenic containers and tanks, standard customer station tanks, large bulk storage tanks, LN2 dewars, transport tanks, micro bulk storage units, vaporisers, pressure regulating and control skids, , disposable cylinders, and customised equipment.
Kandla SEZ	Station tanks, large bulk storage tanks, water bath vaporisers, pressure regulating and control skids, and specially engineered equipment
Silvasa	Disposable refrigerant cylinders

Source: I-Sec research, Company

How is the manufacturing capacity calculated?

INOX manufactures engineered products (non-standard) of different sizes and complexities. Thus, the annual capacity calculation is not straight forward. Its manufacturing capacity is a function of man-hours required and surface area required at the facility.

Since its products are non-standard, the capacity of the facility is calculated in 'Equivalent tank units' (ETUs), where in 10,000litre capacity tank (10m^3) is considered as 1ETU.

So, based on that if a 10,000 litres tank requires 1,200 man hours to manufacture, then a 20,000litre tank with 1,620 man-hour requirement for production will be considered 1.35 ETU.

Thus, based on the above formula, INOX has an installed capacity of producing 3,100ETUs p.a. and disposable cylinder capacity of 2.4mn p.a.

Exhibit 48: Manufacturing capacity

	FY23		FY22		FY21	
	Capacity	Actual	Capacity	Actual	Capacity	Actual
Cryogenic tank (ETU)	3,100	2,172	3100	2,544	3100	2,200
Disposable cylinders (m)	2.4	2.0	2.4	1.9	2.4	1.4

Source: I-Sec research, Company

Moreover, INOX has been manufacturing beverage kegs required mostly in food and beverage segment with a capacity of 50k units p.a. However, given the strong demand for the product, it is investing INR 1bn in setting up a beverage keg manufacturing facility in Savali.

The capacity of the new Savali plant will be 1mn kegs. However, in the initial phase capacity will be 300k kegs p.a. and will reach 1mn kegs as the demands rises.

Management details and promoter group

Management details

Exhibit 49: Key management personal details

Name	Designation	Details
Mr. Parag Kulkarni	Executive Director	Holds a bachelor's degree in mechanical engineering from the College of Engineering, Goa and a masters' degree in management studies from Jamnalal Bajaj Institute of Management Studies, Mumbai. He has been associated with the Company since 16 July, 1992. He is an executive member of Indian Cryogenics Council. He has ~30 years of experience in the cryogenic engineering and high vacuum technology industry. He oversees the strategic growth opportunities, engineering developments, business expansion and new energy strategies and related functions and together with senior management is responsible for implementation of strategy in respect of such functions.
Mr. Deepak Acharya	Chief operating officer	Mr. Acharya joined Inox on 29 November, 1992. He holds a bachelor's degree in engineering from Nagpur University and a masters' degree in mechanical engineering from University of Roorkee. He is also a registered welding inspector and completed a diploma in marketing and sales management from Bhartiya Vidya Bhavan, Baroda. He holds an executive diploma in finance from Nirma University of Science and Technology, Ahmedabad. He holds a diploma in motorcycle manufacturing welding and international welding engineer from The ILO Association of Japan, Inc., and International Institute of Welding, respectively. Further, he also holds a fellowship from the Indian Institute of Welding. He holds a lifetime membership from Indian Society for Non-destructive Testing. He has over 30 years of experience in welding.
Mr. Pavan Logar	Chief Financial Officer	Mr. Logar joined INOX on 10 September, 1993. He holds a bachelor's degree in commerce from Rajasthan University. He is a certified Chartered Accountant and Company Secretary. He has over 35 years of experience in accounts and taxation. He has worked with Mangalam Cement Limited as deputy manager of accounts and taxation department.

Source: I-Sec research

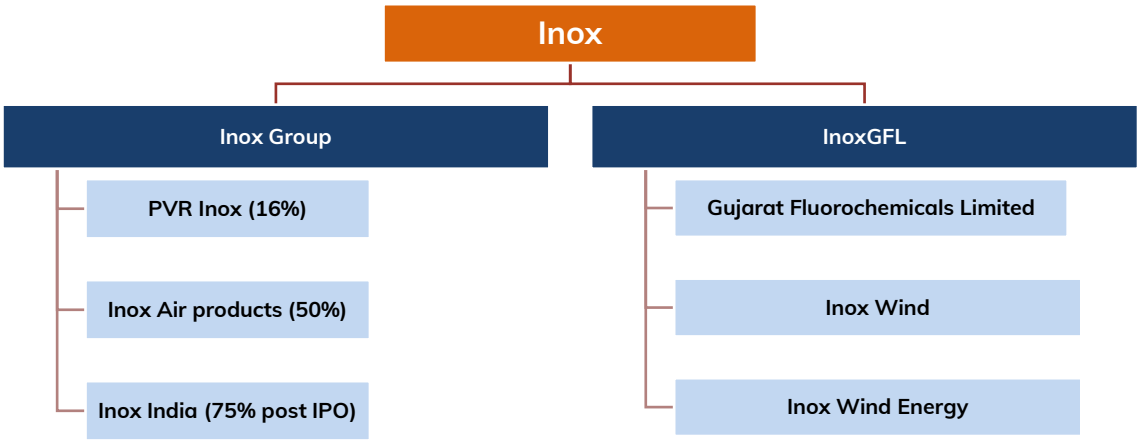
Promoter details

After a corporate rejig in 2021, the businesses were primarily separated into two groups –

- Inox Group
- InoxGFL

The Inox Group consists of Inox Air Products, Inox India and Inox Leisure. InoxGFL consists of Gujarat Fluorochemicals Limited, Inox Wind, Inox Wind Energy and Inox Green Energy Solutions.

Exhibit 50: Inox Group details



Source: I-Sec research

Inox India is part of the Inox Group and does not have any relation with InoxGFL after the 2021 rejig.

Exhibit 51: Key promoter group personnel

Name	Designation	Details
Mr. Pavan Kumar Jain	Chairman and Non-Executive Director	He holds a bachelor's degree in chemical engineering from the Indian Institute of Technology, Delhi. He has been associated with the company since April 16, 1979. He has approximately 30 years of experience in the cryogenic engineering and high vacuum technology industry and has helped the company to become one of the leading cryogenic tank manufacturers in the world by revenues in 2021.
Ms. Nayantara Jain	NA	She holds a bachelor's degree of arts from the University of Calcutta. In the past, she was associated with Ladies Wing of the IMC Chamber of Commerce and Industry as the president. She was also associated with the Ekal Sansthan as its member on the board of trustees.
Mr. Siddharth Jain	Non-Executive Director	He holds a bachelor's degree of science in engineering from the University of Michigan and has obtained certification in master of business administration from the faculty of INSEAD. He has been associated with the Company since March 17, 2004. He has approximately 18 years of experience in the cryogenic engineering and high vacuum technology industry. He oversees the groups' strategic planning, business development and together with responsible for the industrial gases, entertainment and cryogenics equipment manufacturing businesses.
Ms. Ishita Jain	Non-Executive Director	She holds a bachelor's degree in arts from the Fergusson College, Pune, and diploma in pre-primary teaching training from Bharatiya Vidya Bhavan, Pune. She has been associated with the Company since August 12, 2021. She oversees the CSR activities and implementing CSR projects for the social and local community welfare for and on behalf of the company.

Source: I-Sec research

Post-IPO, promoter group holds 75% stake in the company.

Financials

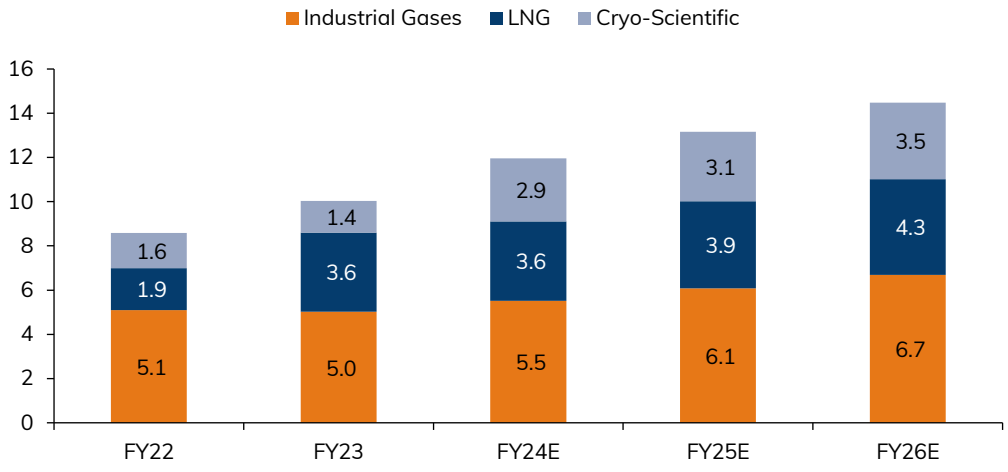
- **INOX witnessed healthy order inflows over the last three years, as its order book swelled from INR 6bn in FY20 to INR 10.5bn, as of Dec'23. We envisage, given growth drivers, an order book of INR 14.5bn by FY26E.**
- **Revenue is likely to grow at a CAGR of 23% over FY23-FY26E to INR 17.8bn led by strong demand from LNG, industrial gases and incremental contribution from stainless steel kegs and disposable cylinders.**
- **EBITDA margins are likely to inch up to 24% in FY26E owing to operating leverage; thus, EBITDA is likely to grow at 27% CAGR over FY23-FY26E to INR 4.2bn.**
- **INOX has brought its debt down to nil in the last 3-4 years; thus, PAT is likely to grow at 27% CAGR over FY23-FY26E to INR 3.1bn with an EPS of INR 35/share in FY26E.**
- **Given the strong moat and payment terms with customers, we expect working capital cycle to remain stable at 90-100 days going forward.**

Order book analysis

INOX is witnessing strong order inflows in the recent. Order backlog grew 17% YoY in FY23 to INR 10.03bn on the back of strong inflow from the LNG segment, as its order backlog doubled to INR 3.6bn (vs. INR 1.9bn YoY). However, order backlog for industrial gas and cryogenic segment remained flat YoY in FY23 at INR 5bn and INR 1.4bn, respectively.

Exhibit 52: Order backlog expected to rise to INR 14.5bn in FY26E (INR bn)

Note: *This order backlog does not include short duration orders like disposable cylinders and stainless steel kegs.*



Source: Company data, I-Sec research

In YTD-FY24, order backlog for Cryo Scientific division has doubled to INR 2.9bn, as of Dec'23 (vs. INR 1.4bn in Mar'23). We expect the order book to grow at a 13% CAGR over FY23-FY26E to INR 14.5bn in FY26E, of which industrial gases will likely contribute 46%, LNG 30% and the rest will likely come from Cryo Scientific.

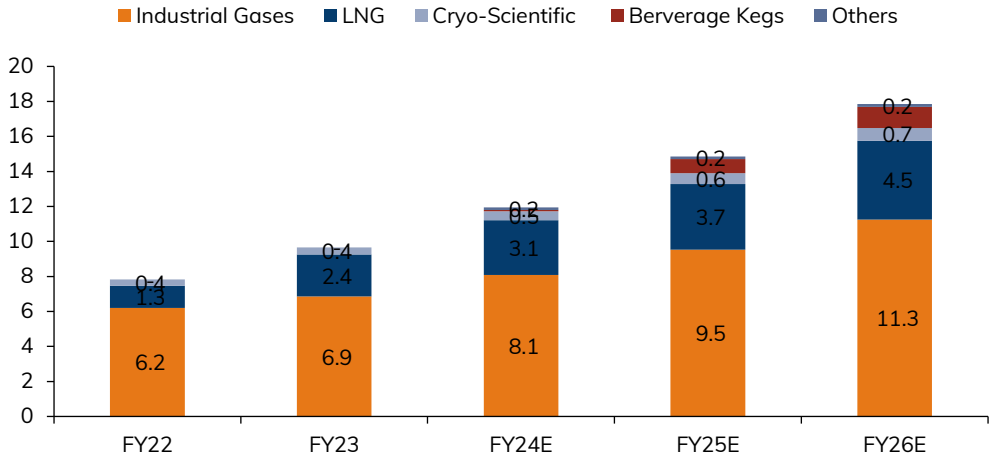
The company produces standard as well as non-standard products. From an execution perspective, while the standard tanks and other products can take 3-4 months; non-standard products and tanks can take 8-9 months.

Note that the order backlog mentioned above does not take into consideration the short duration orders for disposable cylinders and stainless steel kegs which are turned around in less than 2-3 months.

Revenue analysis – 23% CAGR likely over FY23-FY26E to INR 17.8bn

INOX is likely to witness healthy revenue growth of 23% CAGR over FY23-FY26E on the back of strong traction in LNG, Industrial Gas and incrementally also from stainless steel keg revenues.

Exhibit 53: Incremental revenue to come from LNG, IG and beverage kegs (INR bn)



Source: Source: I-Sec research, company

Given the strong traction across business division, INOX is expected to witness an all-round growth. We expect Industrial Gas' revenue to grow at a CAGR of 15% over FY23-FY26 to INR 10.5bn, LNG and Cryo Scientific divisions' to grow at a CAGR of 23% each to INR 4.5bn and INR 770m, respectively.

Incrementally, its 1mn p.a. (current capacity at 300k kegs p.a.) beverage keg plant is expected to start generating revenue from FY25E. We estimate INOX to sell 200k kegs in FY25E, which is expected to generate a revenue of INR 900mn (average realisation at USD 50/keg).

Also, note that its disposable cylinders' business is running at 50% capacity (producing 1.2mn cylinders per year vs. capacity of 2.5mn p.a.) in FY24E owing to on-going anti-dumping duty petition filed by a US based manufacturer

Also, note that its disposable cylinders' business is running at 50% capacity (producing 1.2mn cylinders per year vs. capacity of 2.5mn p.a.) in FY24E owing to on-going anti-dumping duty petition filed by a US based manufacturer. This petition is expected to get resolved in FY25E (refer exhibit 36) in FY25E and thus will further boost revenues in FY25E. We estimate disposable cylinders' revenue at INR 800-900mn in FY24E, which can be doubled to INR 1.6-1.7bn in FY25E.

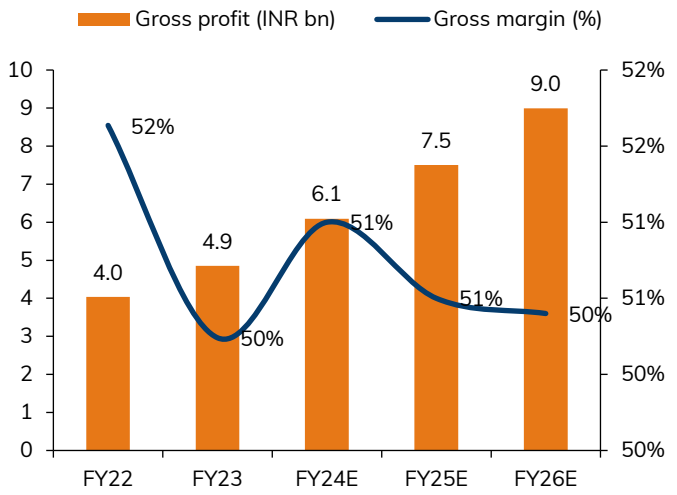
Thus, we estimate consolidated revenues to grow at a 23% CAGR over FY23-FY26E to INR 17.8bn in FY26E.

Operating margins profile

Input cost environment of industrial raw materials has been benign in the recent past, as the prices of major raw materials like steel, aluminium, etc. have been stable after spark spike witnessed in FY21-FY22.

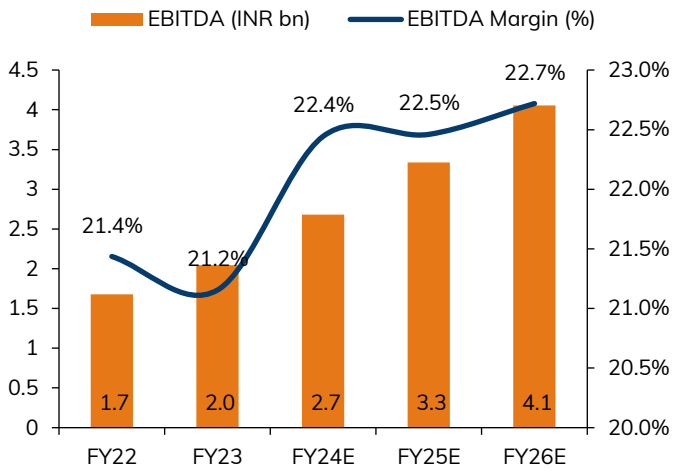
Moreover, given the strong moat that INOX commands, owing to the criticality of the work and solutions it provides, the company can pass on any significant price hikes in raw materials, freight or cost escalations to the customer.

Exhibit 54: Gross margins to remain stable, around 50%



Source: I-Sec research, company

Exhibit 55: EBITDA margins to inch up to 22.7% in FY26E, on higher utilisation (INR bn)



Source: Source: I-Sec research, company

Commodity prices were very volatile at the start of FY23 owing to Russia-Ukraine war. Despite the disruption in supply chain, increased freight cost and key raw material cost; gross margins for INOX remained stable around 50%. This exemplifies the moat the business commands. Thus, we believe the gross margins to remain stable at 51% from FY23-FY26E.

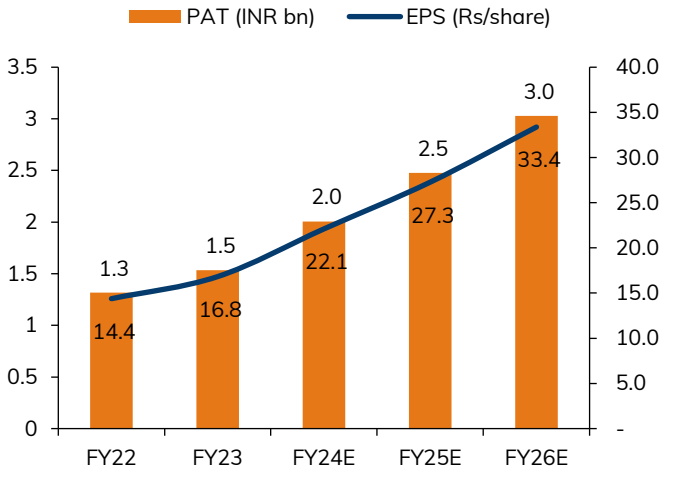
As a result, we expect the EBITDA margin to inch up from FY23 to FY26E from 21% in FY23 to 22.7% in FY26E on the back of higher capacity utilization.

PAT expected to grow at 26% CAGR over FY23-FY26E

On the back of improving operating leverage and improving operating margins, net profit is estimated to grow at a CAGR of 26% over FY23-FY26E to INR 3.05bn in FY26E as compared to INR 1.5bn in FY23.

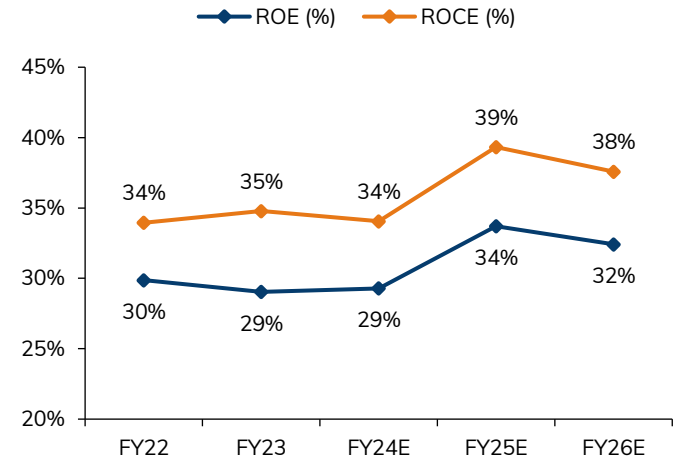
Moreover, return on equity is also expected to inch up from 29% in FY23 to 32% in FY26E and RoCE is likely to improve to 38% in FY26E as compared to 35% in FY23.

Exhibit 56: EPS to grow at 26% CAGR to INR 33.4/share in FY26E



Source: I-Sec research, company

Exhibit 57: Profitability ratios to remain healthy with RoE at 32% and RoCE at 38% in FY26E



Source: I-Sec research, company

Working capital to remain stable around 90 days

INOX operates in a niche segment with limited competitive intensity and high technical expertise. This enables INOX to command better payment terms with its customers as well as its vendors.

Inventory level is very high, as compared to any other product company. Execution cycle for standard products ranges from 3-4 months while that for non-standard products (customised products) is around 9-10 months. Cryogenic cylinders are made of austenitic stainless steel, and the vendors and the supply for the same is fairly limited. Thus, the company has to maintain sufficient supply of austenitic stainless steel to overcome any supply chain issues.

However, the payment terms from customers for INOX are very favourable. It receives advance payments up to 25% from its customers and almost 90% of the total payment is done before dispatch of products.

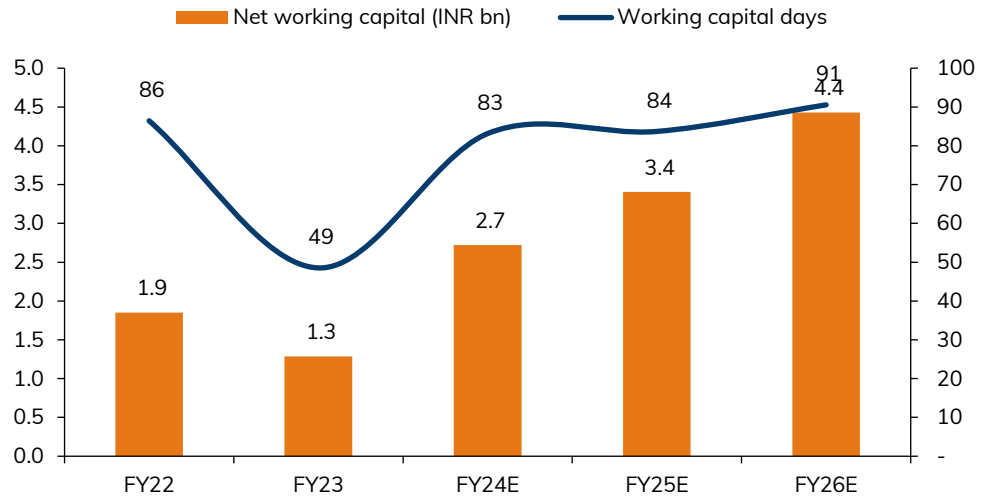
Exhibit 58: Working capital days to remain stable at 91 days in FY26E (vs. 86 days in FY22)

Working capital days	FY22	FY23	FY24E	FY25E	FY26E
Inventory days	151	156	145	135	135
Receivable days	36	54	54	54	54
Payables days	(19)	(24)	(24)	(24)	(24)
Advance from customers days	(82)	(137)	(91)	(81)	(74)
Total	86	49	83	84	91

Source: I-Sec research, company

As a result, INOX's net working capital cycle stands at ~90 days; we estimate it to remain ~90-100 days going forward as well.

Exhibit 59: Net working capital at 91 days in FY26E

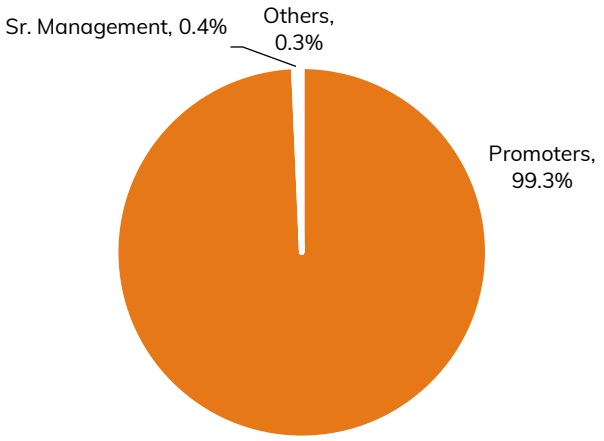


Source: I-Sec research, company

Shareholding

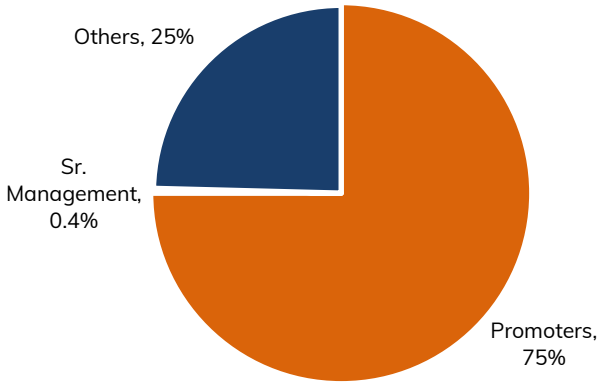
Promoter shareholding in INOX pre-IPO stood at 99.31%, key managerial personals held 0.4% and others held ~0.3% stake. The IPO was an offer for sale, wherein mostly the promoter group sold ~24% of its stake.

Exhibit 60: Pre-IPO shareholding



Source: I-Sec research, company

Exhibit 61: Post IPO shareholding



Source: I-Sec research, company

Thus, post-IPO promoter shareholding stands at 75%; key managerial persons hold 0.4% and new public investors hold around 24.6% stake.

Exhibit 62: Shareholding pattern pre and post IPO

Shareholder	No. of Shares	%	Post OFS	%
Siddharth Jain	41,416,060	45.63%	30,978,705	34.13%
Pavan Kumar Jain	19,903,090	21.93%	14,903,090	16.42%
Nayantara Jain	19,267,250	21.23%	14,267,250	15.72%
Devendra Kumar Jain	5,391,300	5.94%	5,391,300	5.94%
Ishita Jain	2,471,600	2.72%	1,271,600	1.40%
Manju Jain	919,840	1.01%	689,840	0.76%
Lata Rungta	760,840	0.84%	570,840	0.63%
Bharti Shah	53,320	0.06%	39,920	0.04%
Kumud Gangwal	53,340	0.06%	39,940	0.04%
Suman Ajmera	53,340	0.06%	39,940	0.04%
Rajni Mohatta	53,320	0.06%	39,920	0.04%
Sub-total	**90,343,300**	**99.5%**	**68,232,345**	**75.18%**
Parag Kulkarni	301,000	0.33%	301,000	0.33%
Pavan Logar	46,000	0.05%	46,000	0.05%
Deepak Acharya	20,000	0.02%	20,000	0.02%
Sub-total	**90,710,300**	**99.9%**	**68,599,345**	**75.58%**
Others	50,384	0.1%	50,384	0.1%
Public	-	0.0%	22,110,955	24.4%
TOTAL	**90,760,684**	**100.0%**	**90,760,684**	**100.0%**

Source: I-Sec research, company

Key risks

High customer concentration

INOX derives a significant share of its revenue from top 10 customers in FY23 and this has risen from 39% in FY21. This poses a significant risk for the company as if any of these companies face any headwinds, it will in turn impact INOX as well.

Exhibit 63: Customer concentration in revenue terms

(INR mn)	FY23		FY22		FY21	
	Revenue	% of total	Revenue	% of total	Revenue	% of total
Top 10 customers	4,493	46.5%	2,827	36.1%	2,329	39.2%
Largest customer	1,117	11.6%	715	9.1%	705	11.9%

Source: I-Sec research, company

High dependence on capex cycle

Majority of INOX products have a very high operational life also the requirement for its product arises largely owing to capacity augmentation plans. Thus, it is likely to face headwinds as and when the capital expenditure cycle sees a downturn.

High export dependence

Exports form almost 50% of the annual revenue for INOX. Although its market share in the global market is still negligible. Protectionism from any of the export markets is likely to impact INOX's competitiveness. Similarly, increased competitive intensity from global players is likely to impacts its growth as well as profitability.

Delays in LNG infra theme picking up

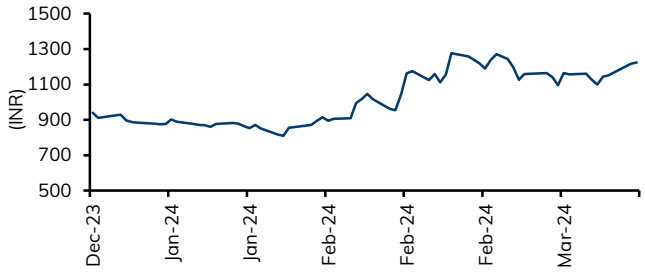
INOX has seen substantial demand pick up from LNG value chain. Its LNG order book has increased more than 2x in FY23. Any delay in execution of LNG projects is likely to impact future order inflows and revenue growth going forward. Also, some of its LNG products such as truck fuel tank and marine fuel tanks might also witness substantial slowdown.

Exhibit 64: Shareholding pattern

%	Dec'23
Promoters	75.00
Institutional investors	10.8
MFs and others	5.5
FIs/Banks	0.0
Insurance	0.6
FIIs	4.7
Others	14.2

Source: Bloomberg

Exhibit 65: Price chart



Source: Bloomberg

Financial Summary

Exhibit 66: Profit & Loss

(INR mn, year ending Mach)

	FY23A	FY24E	FY25E	FY26E
Revenue from operations	9,659	11,946	14,854	17,851
Operating Expenses	**2,810**	**3,411**	**4,165**	**4,941**
EBITDA	2,044	2,681	3,336	4,055
EBITDA Margin (%)	**21.2**	**22.4**	**22.5**	**22.7**
Depreciation & Amortization	139	184	238	244
EBIT	1,904	2,497	3,099	3,812
Interest expenditure	37	60	71	78
Other Non-operating Income	183	238	274	306
Recurring PBT	2,050	2,675	3,301	4,040
Profit / (Loss) from Associates	**-**	**-**	**-**	**-**
Less: Taxes	**523**	**669**	**825**	**1,010**
PAT	1,527	2,006	2,476	3,030
Less: Minority Interest	-	-	-	-
Extraordinaries (Net)	-	-	-	-
Net Income (Reported)	1,527	2,006	2,476	3,030
Net Income (Adjusted)	**1,527**	**2,006**	**2,476**	**3,030**

Source Company data, I-Sec research

Exhibit 67: Balance sheet

(INR mn, year ending Mach)

	FY23A	FY24E	FY25E	FY26E
Total Current Assets	7,247	8,605	11,351	15,069
of which cash & cash eqv.	137	284	1,528	2,361
Total Current Liabilities & Provisions	5,770	6,692	7,507	9,022
Net Current Assets	**1,477**	**1,913**	**3,844**	**6,047**
Investments	2,489	2,489	2,489	2,489
Net Fixed Assets	1,608	3,070	3,332	3,688
ROU Assets	-	-	-	-
Capital Work-in-Progress	2	2	2	2
Total Intangible Assets	-	-	-	-
Other assets	100	100	100	100
Deferred Tax Assets	-	-	-	-
Total Assets	**5,714**	**7,575**	**9,768**	**12,326**
Liabilities				
Borrowings	**-**	**-**	**-**	**-**
Deferred Tax Liability	**83**	**83**	**83**	**83**
provisions	-	-	-	-
other Liabilities	136	444	797	1,143
Equity Share Capital	182	182	182	182
Reserves & Surplus	5,313	6,866	8,706	10,919
Total Net Worth	**5,495**	**7,047**	**8,888**	**11,100**
Minority Interest	-	-	-	-
Total Liabilities	**5,714**	**7,575**	**9,768**	**12,326**

Source Company data, I-Sec research

Exhibit 68: Cashflow statement

(INR mn, year ending Mach)

	FY23A	FY24E	FY25E	FY26E
Operating Cashflow	**1,784**	**1,962**	**2,098**	**2,982**
Working Capital Changes	270	(288)	(687)	(370)
Capital Commitments	(489)	(1,425)	(262)	(356)
Free Cashflow	**1,294**	**537**	**1,836**	**2,626**
Other investing cashflow	**376**	**238**	**274**	**(694)**
Cashflow from Investing Activities	(113)	(1,187)	11	(1,050)
Issue of Share Capital	-	-	-	-
Interest Cost	(37)	(60)	(71)	(78)
Inc (Dec) in Borrowings	(456)	-	-	-
Dividend paid	(1,044)	(567)	(794)	(1,021)
Others	-	-	-	-
Cash flow from Financing Activities	(1,536)	(627)	(865)	(1,099)
Chg. in Cash & Bank balance	**134**	**147**	**1,244**	**833**
Closing cash & balance	146	284	1,528	2,361

Source Company data, I-Sec research

Exhibit 69: Key ratios

(Year ending Mach)

	FY23A	FY24E	FY25E	FY26E
Per Share Data (INR)				
Reported EPS	16.8	22.1	27.3	33.4
Adjusted EPS (Diluted)	16.8	22.1	27.3	33.4
Cash EPS	18.4	24.1	29.9	36.1
Dividend per share (DPS)	-	-	-	-
Book Value per share (BV)	60.5	77.6	97.9	122.3
Dividend Payout (%)	-	-	-	-
Growth (%)				
Net Sales	23.4	23.7	24.4	20.2
EBITDA	21.9	31.2	24.4	21.6
EPS (INR)	17.0	31.4	23.4	22.4
Valuation Ratios (x)				
P/E	72.8	55.4	44.9	36.7
P/CEPS	66.7	50.8	41.0	34.0
P/BV	20.2	15.8	12.5	10.0
EV / EBITDA	52.2	39.8	31.6	25.8
P / Sales	11.3	9.2	7.4	6.1
Dividend Yield (%)	-	-	-	-
Operating Ratios				
Gross Profit Margins (%)	50.2	51.0	50.5	50.4
EBITDA Margins (%)	21.2	22.4	22.5	22.7
Effective Tax Rate (%)	25.5	25.0	25.0	25.0
Net Profit Margins (%)	15.8	16.8	16.7	17.0
NWC / Total Assets (%)	23.6	21.5	23.7	29.9
Net Debt / Equity (x)	(0.5)	(0.4)	(0.5)	(0.4)
Net Debt / EBITDA (x)	(1.3)	(1.0)	(1.2)	(1.2)
Profitability Ratios				
RoCE (%)	28.4	32.7	31.7	30.9
RoE (%)	29.0%	32.0%	32.0%	31.0%
RoIC (%)	28.4	32.7	31.7	30.9
Fixed Asset Turnover (x)	6.6	5.1	4.6	5.1
Inventory Turnover Days	172	160	150	147
Receivables Days	60	60	60	59
Payables Days	27	27	27	27

Source Company data, I-Sec research

Annexure

Exhibit 70: Annexure – 1: Indian gas companies financials

LINDE INDIA		
Particulars (INRm)	**CY21**	**15MFY23**
Revenue	21120	31,355
EBITDA	2313	8,655
PAT	5129	5,387
EBITDA Margin (%)	11%	28%
PAT Margin (%)	24%	17%
Net Worth	26,910	31,139
Debt	230	207
AIR WATER INDIA PRIVATE LIMITED		
Particulars (INRm)	**FY22**	**FY23**
Revenue	9,344	10,359
EBITDA	2,061	2,287
PAT	1,408	1,316
EBITDA Margin (%)	22%	22%
PAT Margin (%)	15%	13%
Net Worth	27,040	28,360
Debt	-	-
INOX AIR PRODUCTS		
Particulars (INRm)	**FY22**	**FY23**
Revenue	20,904	21,918
EBITDA	11,356	11,214
PAT	7,077	6,654
EBITDA Margin (%)	54%	51%
PAT Margin (%)	34%	30%
Net Worth	40,559	47,177
Debt	-	-

Source: I-Sec research, ROC

Exhibit 71: Annexure – 2: Tata Motors new LNG truck

TATA MOTORS
Connecting Aspirations

TATA

for immediate use **PRODUCT NOTE**

TATA LPO 1613 LNG

Tata Motors is a leader in heavy duty and light duty natural gas vehicles in Indian market and a leading vehicle manufacturer globally. Tata Motors has always been at the forefront of innovation providing products and mobility solutions catering to discerning needs of the society. Taking a leap Tata Motors displayed LNG technology on TATA PRIMA Truck at Auto Expo 2014 followed by the country's first LNG Powered bus in November 2016 at Kerala. LNG is the cleanest form of alternate fuel, which is much safer than conventional fuel and CNG.

TATA LPO 1613 LNG – Tata Motors is the first OEM to Offer a Passenger Vehicle with Integrated LNG system for Indian market. This is a Standard floor height Bus (1100 mm), built on LPO 1613 platform for City application with improved TCO, increased utility space, best in class NVH and Safety. It is environmental friendly with 30% lesser Greenhouse gases emission. It offers best in class fuel economy as LNG is the cheapest fuel available and has high density. It contains enhanced safety features such Fuel and vapour shut off valve, Excess flow valve, Primary and secondary relief valve. A single LNG tank used in the vehicle results in increased range, lesser complexity of operation and lower maintenance. The LNG tank and LNG system has been approved by PESO.

USP:

- Offer Higher Range - LNG has 2 times range of the fuel density of CNG.
- LNG operates at lower pressure - as operating pressure for LNG is 15 bar against CNG of 200 bar.
- LNG is more safe - evaporates quickly and being lighter than air it does not stick around it to catch fire.
- Faster fill times - 50% faster for LNG than for CNG.
- Best in class TCO

Applications:

- City Application

Technical Specifications:

Parameter	Description
Engine	TATA 5.7 SGI Bharat Stage IV- IOBD-II
Max Power	96 kw(130PS) @ 2500 RPM
Max Torque	405Nm (41.3mkg) at 1250-1500 RPM
Clutch Type	330 Dia
Gear Box	GBS 40- 5speed synchromesh+1 reverse
Front Axle	Rigid front axle
Rear Axle	RA 109RR heavy duty, hypoid gears, fully floating axle shafts
Suspension	Front & Rear Parabolic Suspension
Frame	Ladder type heavy duty frame

Source: I-Sec research

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