Gujarat Fluorochemicals Ltd

LiPF6 -Too aggressive capex plan

- As per our estimate, the best-case Li-ion battery demand in India is likely to be 60GW. For stationary storage, VFB scores higher & is already present in India.
- In India, VFB batteries are being used by NTPC and for grid applications, flow batteries are best suited as they have much lower levelized costs.
- In this scenario, the best-case LiPF6 demand, assuming no LiFSi cannibalization, is ~12kt in India while the planned domestic capacity is 50kt.

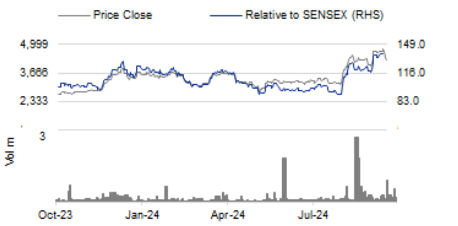
India

REDUCE *(no change)*

Consensus ratings*:	Buy 10	Hold 0	Sell 5

Current price:	Rs4,275
Target price:	Rs1,946
Previous target:	Rs1,946
Up/downside:	-54.5%
InCred Research / Consensus:	-47.4%
Reuters:	GFLL.NS
Bloomberg:	FLUOROCH IN
Market cap:	US$5,585m
	Rs469,598m
Average daily turnover:	US$10.1m
	Rs846.8m
Current shares o/s:	109.9m
Free float:	36.2%

**Source: Bloomberg*



Source: Bloomberg

Price performance	1M	3M	12M
Absolute (%)	(0.7)	34.7	58.9
Relative (%)	5.6	34.7	27.1

Major shareholders	% held
Promoter & Promoter Group	63.8
HDFC Asset Management Co Ltd	2.1
DSF MF	1.9

Li-ion batteries are unlikely to be used in energy storage system

Li-ion batteries have limitations that make them less ideal for energy storage system (ESS) services, especially for stationary and grid-level applications. The low cycle life (<1,000 cycles) when the depth of discharge is higher than 80%, high levelized cost of storage (a typical Li-ion battery will have a levelized cost of around Rs6/unit in India), and high levels of degradation with increased usage are some of the reasons that will prohibit their use in ESS. The best-suited battery for ESS is the vanadium flow battery (VFB). These batteries are reliable, their levelized cost of storage is much lower than that of Li-ion batteries, and they don't degrade over time (Li-ion batteries degrade even if they remain unused). In fact, major Indian users like NTPC are already installing VFB batteries. An Indian government website, India Brand Equity Foundation (IBEF,www.ibef.org), has promoted the idea of Li-ion-based ESS capacity of 43GW in India by 2030F (currently, it is at zero, while VFB is being installed); however, as argued earlier, this target is misplaced.

The bull-case Indian demand for $LiPF_6$ by 2030F is likely to be ~12kt

As argued earlier, it is logical that no one would use Li-ion batteries for ESS. We also believe that hybrid vehicles have better potential in the Indian market than pure electric vehicles or EVs. In this scenario, IBEF's forecast of 60GW Li-ion battery requirement for EVs, and consumer electronics appears to be a highly optimistic demand projection. As far as electrolyte demand goes, 1kWh of battery capacity requires around 150–225gm of $LiPF_6$, which means, at best, $LiPF_6$ demand in India could be around 12kt. Gujarat Fluorochemicals or GFL and Neogene alone are bringing 50kt of $LiPF_6$ capacity online. Please note that $LiPF_6$ has inferior properties compared to LiFSi, which Tesla is using in their newer vehicles. Hence, even assuming no cannibalization of $LiPF_6$ demand by LiFSI and a minimal impact on battery demand from hybrid vehicles, the best-case $LiPF_6$ demand in India could be around 12kt by 2030F.

Consensus earnings at risk; incremental capex to be RoCE negative

Please note that the huge Chinese $LiPF_6$ capacity is leading to a 92% decline in $LiPF_6$ prices, resulting in negative EBITDA for $LiPF_6$ manufacturing. That said, the near-term earnings will be impacted by falling HFC demand and a deceleration in PFAS demand. The stock's valuation is too high, earnings are at risk, and incremental capex will generate negative RoCE. We retain our REDUCE rating on GFL with a target price of Rs1,946. Upside risks**:** A rally in risk assets and narrative-based bullishness.

Financial Summary	Mar-23A	Mar-24A	Mar-25F	Mar-26F	Mar-27F
Revenue (Rsm)	56,847	42,808	40,668	44,735	46,971
Operating EBITDA (Rsm)	20,472	9,548	9,389	11,711	13,084
Net Profit (Rsm)	13,231	4,350	5,310	7,085	8,289
Core EPS (Rs)	120.4	39.6	48.3	64.5	75.5
Core EPS Growth	70.8%	(67.1%)	22.1%	33.4%	17.0%
FD Core P/E (x)	35.49	107.97	88.43	66.28	56.65
DPS (Rs)	0.0	0.0	0.0	0.0	0.0
Dividend Yield	0.00%	0.00%	0.00%	0.00%	0.00%
EV/EBITDA (x)	23.58	51.06	50.81	39.95	34.93
P/FCFE (x)	355.70	276.23	67.90	99.22	76.96
Net Gearing	23.9%	30.3%	11.7%	(2.3%)	(15.6%)
P/BV (x)	8.51	7.91	7.26	6.54	5.87
ROE	27.1%	7.6%	8.6%	10.4%	10.9%
% Change In Core EPS Estimates					
InCred Research/Consensus EPS (x)					

SOURCE: INCRED RESEARCH, COMPANY REPORTS

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LiPF6 -Too aggressive capex plan

Gujarat Fluorochemicals (GFL) has announced a Rs60bn capex plan. The company has already raised Rs10bn from promoters, family offices, and other investors. GFL plans to produce 200kt of $LiPF_6$ and binders like PTFE and PVDF to cater to both domestic and global demand for Li-ion batteries. However, we have serious concerns about the viability of this capex for two reasons: 1) $LiPF_6$ is increasingly being replaced by LiFSi in the global market, and 2) Indian Li-ion demand is unlikely to exceed 60GW, as Li-ion is a poor choice for stationary grid storage applications.

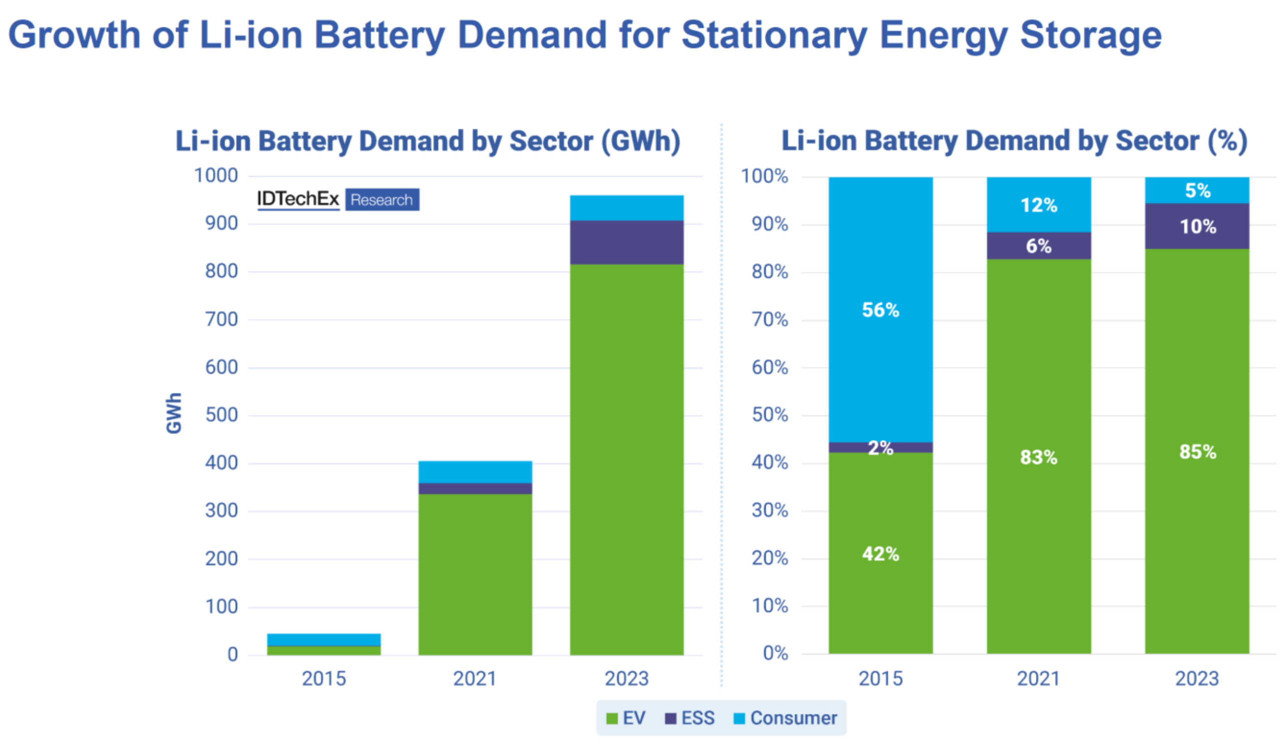
Global Li-ion battery demand has primarily been led by EVs

Global Li-ion battery demand has primarily been led by electric vehicles or EVs. The stationary grid and energy storage applications are a minuscule part of the overall demand. Given the high life cycle cost of Li-ion batteries, redox and flow batteries are better suited for stationary applications.

Historically, most of the Li-ion battery demand has been led by EVs ➤

The Li-ion battery demand for ESS (energy storage solutions) stood at 10% in 2023.

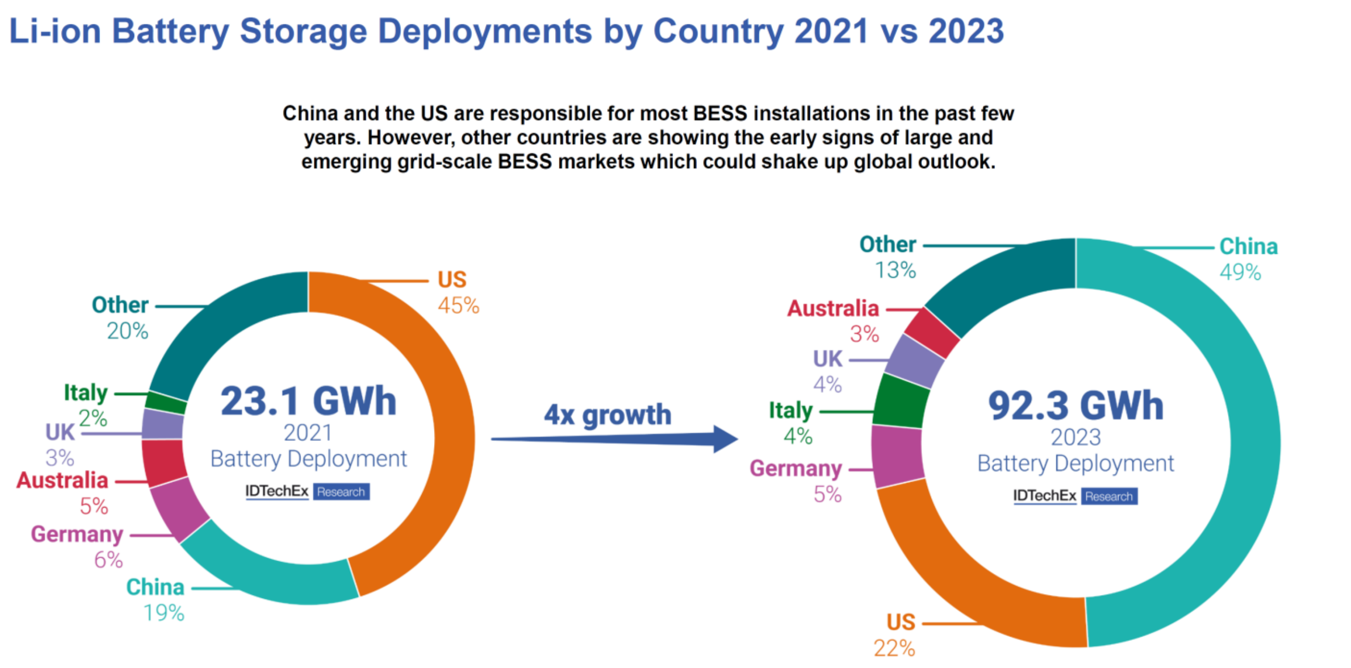
Figure 1: Globally, 90% of Li-ion battery demand has come from EVs and consumer appliance applications



SOURCE: INCRED RESEARCH, HTTPS://WWW.IDTECHEX.COM

ESS usage has primarily been led by wealthy countries like the US, but China has recently installed a huge Li-ion battery capacity for ESS ➤

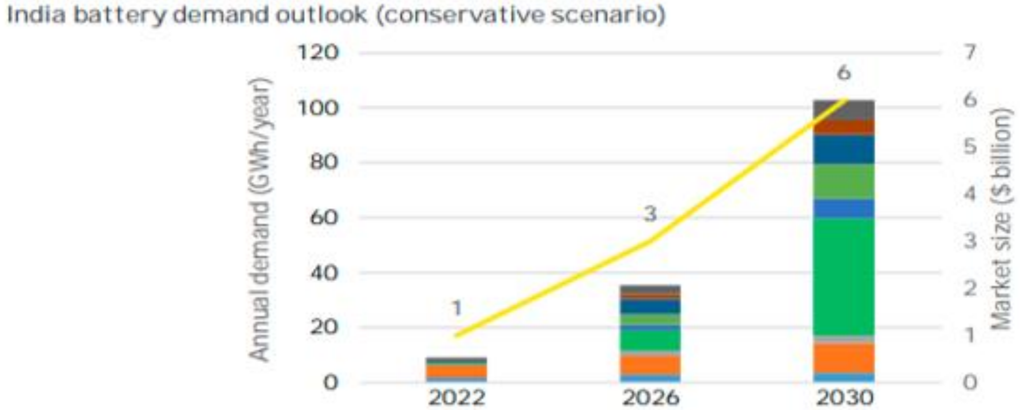
Figure 2: In the recent past, China has installed a huge Li-ion battery capacity for ESS



SOURCE: INCRED RESEARCH, HTTPS://WWW.IDTECHEX.COM

Indian government sounds quite bullish on the usage of Li-ion batteries for ESS ➤

Figure 3: IBEF predicts that India needs around 43GW of Li-ion battery capacity for stationary storage solutions



	2022	2026	2030
Passenger EVs	1	3	7
Commercial EVs	0	2	5
E 2-wheeler/3-wheeler	0	6	11
E-buses	1	4	12
Freight	0	2	7
Stationary storage (grid scale)	0	8	43
Behind the meter (Residential + Commercial)	0	2	3
Consumer electronics	4	7	11
Rail + Defense	2	3	4
Market size	1	3	6

SOURCE: INCRED RESEARCH, COMPANY REPORTS

Li-ion batteries cannot be used for grid-scale energy storage solution

Li-ion batteries are not ideal for grid-scale energy storage due to several limitations:

1. **High costs**: Li-ion batteries are relatively expensive, primarily due to raw materials like lithium, cobalt, and nickel. Although costs have decreased, they still remain high compared to other energy storage technologies such as pumped hydro storage and sodium-based batteries.
2. **Limited lifespan and degradation**: Li-ion batteries face degradation issues with repeated charge-discharge cycles. Their lifespan decreases with deep cycling, and the efficiency reduces over time, increasing maintenance and replacement costs.
3. **Safety concerns**: Li-ion batteries are prone to thermal runaway, which can lead to fires or explosions. For large-scale installations, this poses significant risks and requires extensive safety protocols, which add to costs.
4. **Resource constraints**: Scaling Li-ion battery production for grid applications may strain the supply of critical materials like lithium, cobalt, and nickel, leading to supply chain vulnerabilities and increasing geopolitical risks.
5. **Energy density vs. power requirements**: While Li-ion batteries have high energy density, grid-scale storage often requires high power for quick responses, which can cause thermal stress in Li-ion cells. This makes them less efficient for certain grid services like frequency regulation and peak shaving.
6. **Alternatives** like flow batteries (e.g., vanadium redox), sodium-sulphur batteries, or even non-battery technologies like pumped hydro and compressed air energy storage are better suited for grid-scale applications due to their longer lifespan, better scalability, and lower costs per kWh stored. These alternatives are more reliable for applications requiring long-duration storage and deep discharge cycles, such as renewable energy storage and grid stabilization.

Li-ion battery life degrades fast if it is fully discharged- something which is a prime requirement for grid-scale solution ›

The lifespan of Li-ion batteries and their performance are significantly influenced by the depth of discharge (DoD). DoD refers to the percentage of a battery's capacity that has been discharged relative to its total capacity. For example, if a battery has a capacity of 100kWh and 30kWh has been used, the DoD is 30%. A cycle is defined as a complete discharge and recharge of the battery. However, partial discharges can also contribute to cycles.

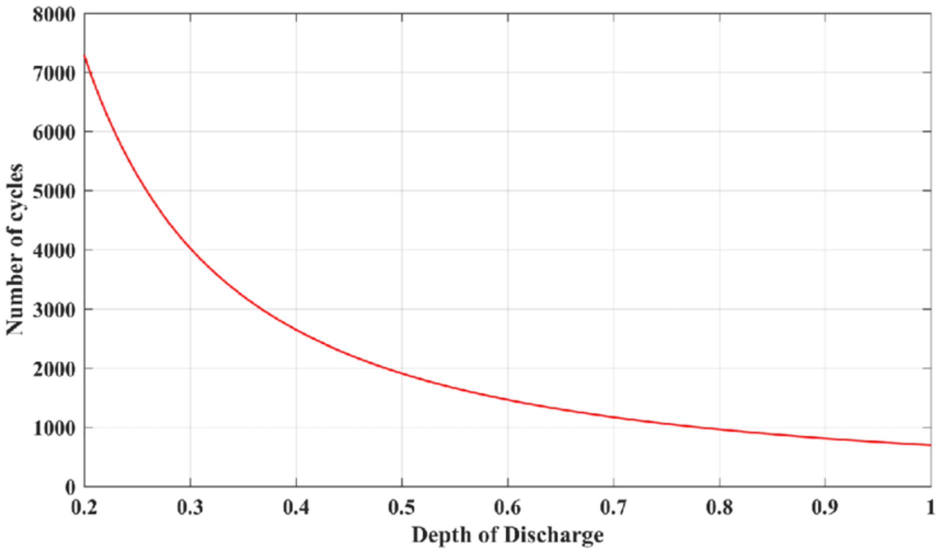
Higher DoD: Frequently discharging to a high DoD (e.g., above 80%) can lead to faster degradation of battery cells, reducing the overall cycle life. This is due to increased stress on battery materials and more pronounced chemical reactions that degrade the electrodes.

Lower DoD: Limiting the DoD to lower percentages (e.g., 20-50%) can significantly extend the cycle life of a battery. For instance, discharging only to 50% might allow for several thousand cycles, whereas discharging to 80% might reduce that number significantly.

1. Li-ion batteries tend to lose capacity over time and with use. A higher DoD can accelerate this process. For example, a battery regularly cycled to 80% DoD might retain only 70% of its original capacity after 1,000 cycles, while one cycled to 50% DoD might retain closer to 90%.
2. Operating at high DoD can generate more heat, which can further contribute to capacity loss and degradation. Keeping batteries cooler and at lower DoD can help mitigate these effects.

For applications requiring longevity, it's advisable to limit the DoD to around 20-50%.

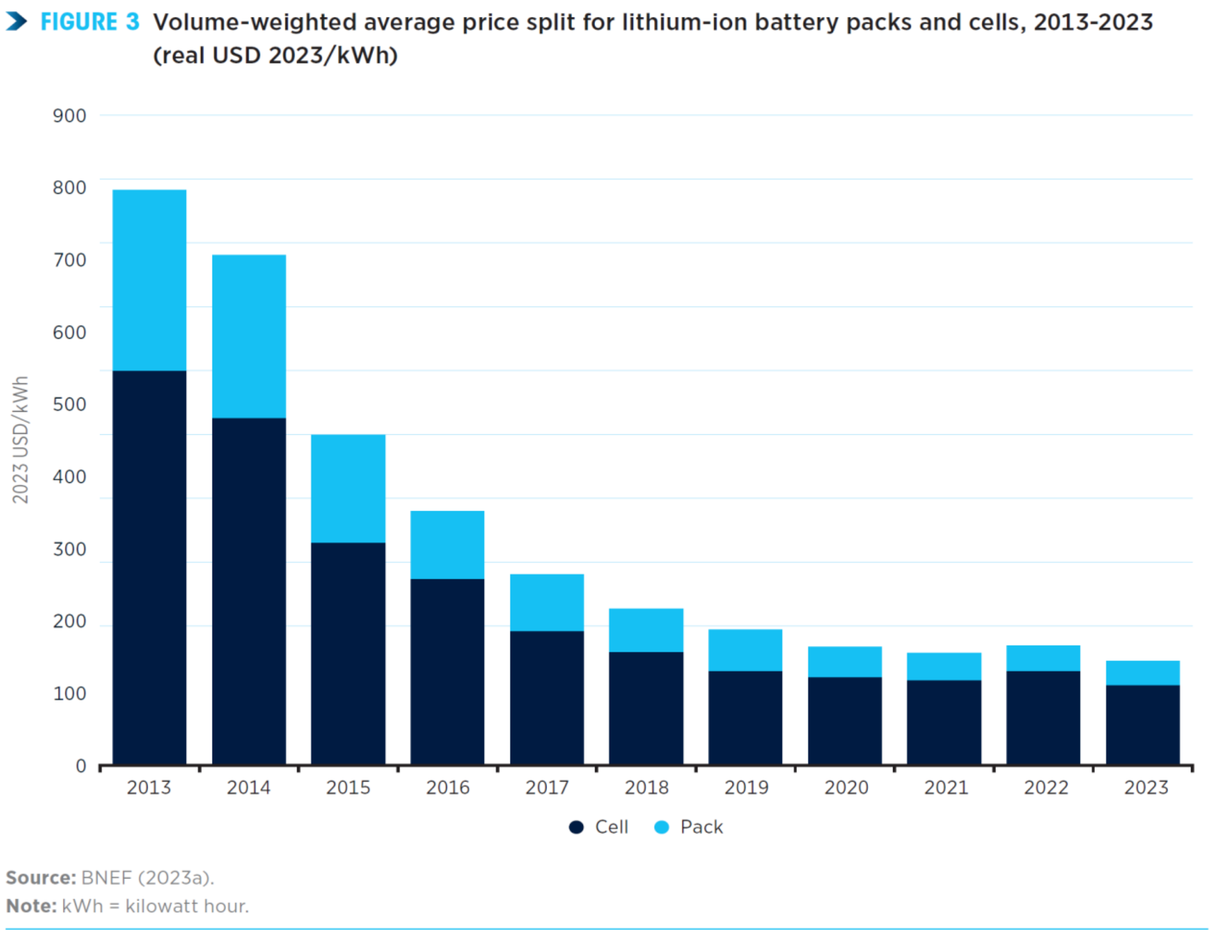
Figure 4: The life cycle curve of Li-ion batteries and different levels of depth of discharge are shown below; assuming an 80% discharge level, grid-level Li-ion batteries will have a life of 1,000 cycles



SOURCE: INCRED RESEARCH, HTTPS://WWW.RESEARCHGATE.NET/FIGURE/LIFECYCLE-CURVE-OF-THE-LI-ION-BATTERY-FOR-DIFFERENT-DEPTHS-OF-DISCHARGES_FIG3_330973403

Hence, the lifecycle cost of Li-ion battery, even at US$100/kWhr (40% below current price), will be ~Rs6/unit

Figure 5: The current Li-ion battery pack cost is approximately US$160–165/ kWh, or around Rs13,400 per unit; assuming battery prices fall to US$100/kWh by 2030F, the real storage cost will be around Rs6/unit in 2030F



SOURCE: INCRED RESEARCH, WWW. IRENA.COM

We don't believe Indian consumer businesses can pay a levelized storage cost of Rs6/unit. That's why the assumption that India can have 43GW of storage capacity is just misplaced.

The solution is flow batteries, and there are multiple types of such batteries

Flow batteries are a promising technology for large-scale energy storage, particularly suitable for grid applications due to their scalability, long cycle life, and ability to decouple energy and power. The following are the main types of flow batteries available in the market:

1. **Vanadium Redox Flow Battery (VRFB)**
   a. Chemistry: Uses vanadium ions in different oxidation states in both the positive and negative electrolytes.
   b. Advantages: High cycle stability, long lifespan (up to 20 years), and reduced cross-contamination risk as both electrolytes use the same active material.
   c. Applications: Suitable for grid energy storage, renewable energy integration, and back-up power systems.
2. **Zinc-Bromine Flow Battery**
   a. Chemistry: Utilizes zinc as the anode and bromine as the cathode, with an electrolyte that contains zinc bromide.
   b. Advantages: High energy density and relatively lower costs compared to some other flow batteries.
   c. Applications: Effective for commercial and industrial applications and for renewable energy storage.
3. **All-Vanadium Flow Battery (AVFB)**
   a. Chemistry: Similar to VRFB but focuses on using only vanadium for both electrodes, which helps reduce potential issues with cross-contamination.
   b. Advantages: Long cycle life and good efficiency, with an emphasis on safety and environmental sustainability.
   c. Applications: Ideal for renewable energy integration and grid-scale energy storage.
4. **Iron-Chromium Flow Battery**
   a. Chemistry: Uses iron and chromium in the electrolytes.
   b. Advantages: Cost-effective due to the abundance of iron and chromium. Good cycle stability and can operate in varying temperatures.
   c. Applications: Suitable for large-scale energy storage applications, though not as widely adopted as vanadium-based systems.
5. **Organic Flow Battery**
   a. Chemistry: Utilizes organic compounds as active materials in the electrolytes.
   b. Advantages: Potential for low-cost materials and environmental sustainability. Research is ongoing to improve efficiency and lifespan.
   c. Applications: Still in development and research phases, but has potential for renewable energy integration.
6. **Manganese Flow Battery**
   a. Chemistry: Employs manganese-based compounds in the electrolyte.
   b. Advantages: Lower costs and environmental impact due to the use of abundant materials.
   c. Applications: Primarily in research and development; potential for grid-scale applications in the future.
7. **Hybrid Flow Battery**
   a. Chemistry: Combines different types of active materials, such as lithium and flow chemistry, to optimize performance.

b. Advantages: Can leverage the strengths of different materials to improve efficiency, energy density, and cost-effectiveness.

c. Applications: Emerging technology with potential in various energy storage applications.

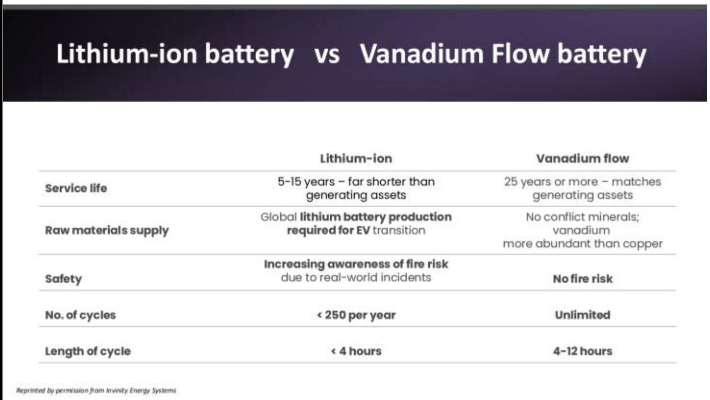
Vanadium flow batteries are already here and are being installed for energy storage

There are multiple such plants which have been ordered and are operational. India's NTPC has also ordered such plants.

1. https://etn.news/energy-storage/h2-vanadium-flow-battery-project-spain-details
2. https://www.pv-magazine-india.com/2022/11/02/tdafoq-energy-partners-indias-delectrik-systems-for-gwh-scale-vanadium-flow-battery-plant-in-saudi-arabia/
3. https://www.energy-storage.news/nearly-140mwh-of-vanadium-flow-battery-sales-and-fundings-for-invinity-last-year/
4. https://balkangreenenergynews.com/vanadium-flow-megabattery-comes-online-in-china/
5. https://www.energy-storage.news/indias-biggest-power-producer-ntpc-tenders-for-3mwh-flow-battery-at-research-facility/
6. https://solarquarter.com/2024/09/24/delectrik-systems-wins-ntpc-tender-to-deploy-3-mwh-vanadium-flow-battery-at-netra-for-long-duration-energy-storage/

The Vanadium flow battery technology is already mature

Figure 6: Vanadium flow battery lifecycle cost is miniscule in comparison to Li-ion battery



Lithium-ion battery vs Vanadium Flow battery

	Lithium-ion	Vanadium flow
Service life	5-15 years – far shorter than generating assets	25 years or more – matches generating assets
Raw materials supply	Global lithium battery production required for EV transition	No conflict minerals; vanadium more abundant than copper
Safety	Increasing awareness of fire risk due to real-world incidents	No fire risk
No. of cycles	< 250 per year	Unlimited
Length of cycle	< 4 hours	4-12 hours

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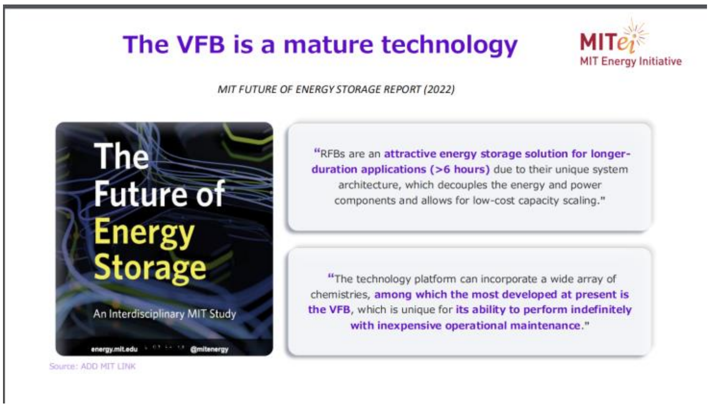
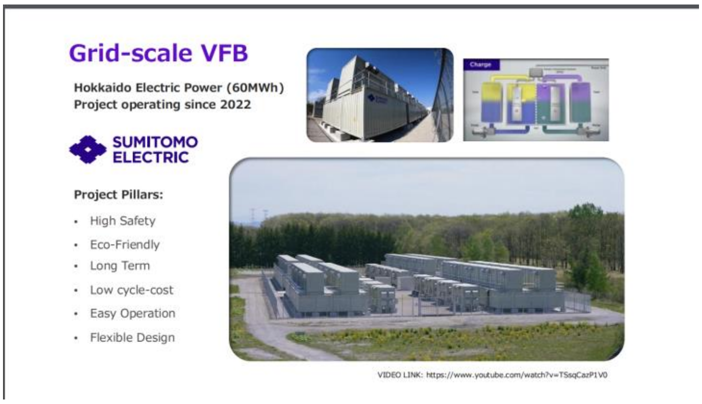
SOURCES: INCRED RESEARCH, HTTPS://S203.Q4CDN.COM/650773386/FILES/DOC_PRESENTATIONS/2024/AUG/13/VRB_PRESENTATION_AUG13.PDF

Figure 7: MIT acknowledges that VFB is mature technology



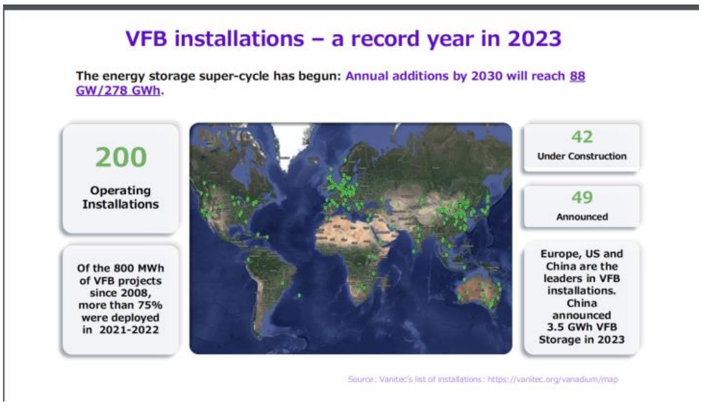
SOURCES: INCRED RESEARCH, HTTPS://S203.Q4CDN.COM/650773386/FILES/DOC_PRESENTATIONS/2024/AUG/13/VRB_PRESENTATION_AUG13.PDF

Figure 8: For grid-scale installation, VFB is the only solution



SOURCE: INCRED RESEARCH, HTTPS://S203.Q4CDN.COM/650773386/FILES/DOC_PRESENTATIONS/2024/AUG/13/VRB_PRESENTATION_AUG13.PDF

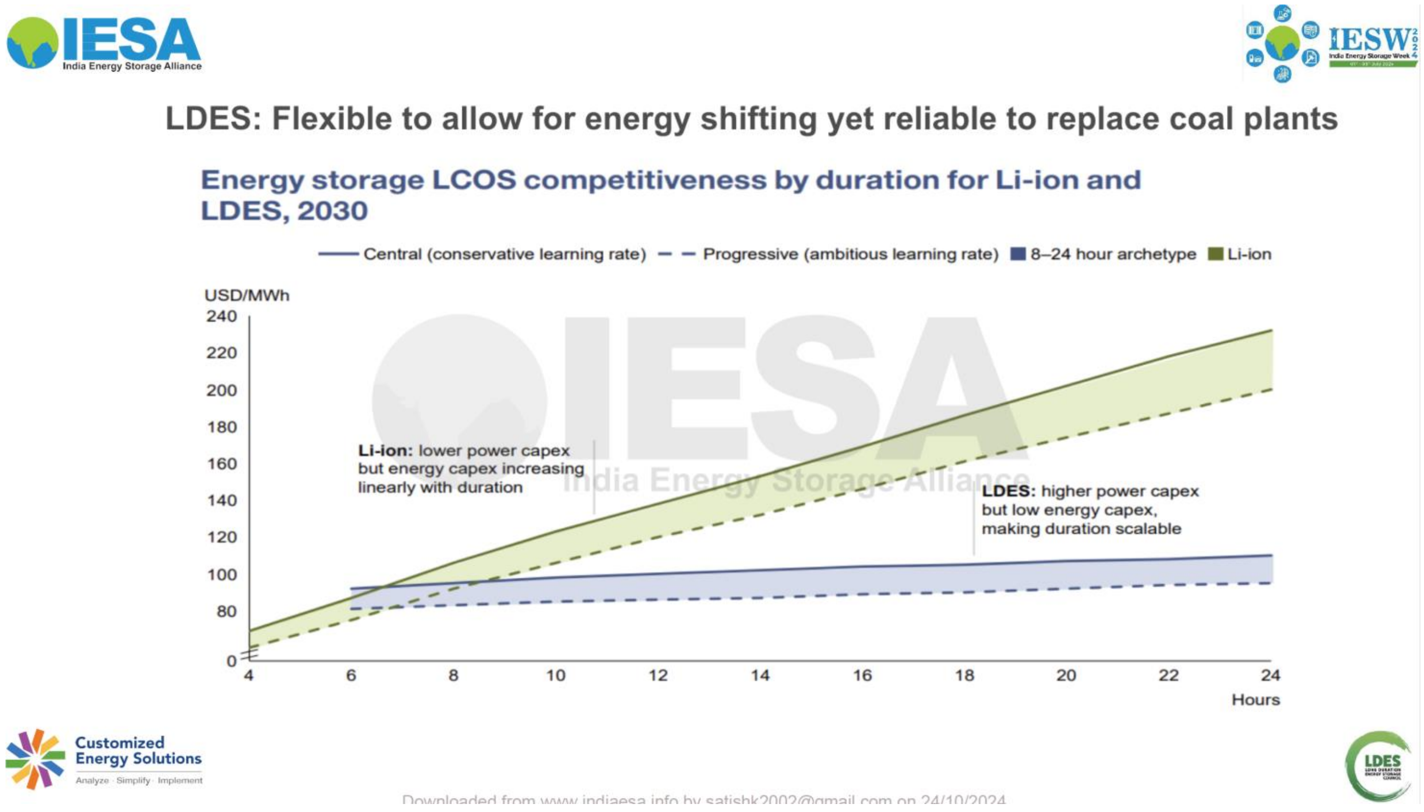
Figure 9: VFB installations are progressing rapidly



SOURCE: INCRED RESEARCH, HTTPS://S203.Q4CDN.COM/650773386/FILES/DOC_PRESENTATIONS/2024/AUG/13/VRB_PRESENTATION_AUG13.PDF

The lifecycle costs of vanadium flow batteries are miniscule compared to Li-ion batteries ➤

Figure 10: For long-duration storage, Li-io batteries are prohibitively costly while VFB batteries are much cheaper



SOURCE: COMPANY REPORTS, INCRED RESEARCH

BY THE NUMBERS

Profit & Loss

(Rs mn)	Mar-23A	Mar-24A	Mar-25F	Mar-26F	Mar-27F
Total Net Revenues	**56,847**	**42,808**	**40,668**	**44,735**	**46,971**
Gross Profit	**41,423**	**28,602**	**26,434**	**29,077**	**30,531**
Operating EBITDA	**20,472**	**9,548**	**9,389**	**11,711**	**13,084**
Depreciation And Amortisation	(2,361)	(2,861)	(2,960)	(3,202)	(3,216)
Operating EBIT	**18,111**	**6,687**	**6,429**	**8,508**	**9,868**
Financial Income/(Expense)	(1,168)	(1,331)	(830)	(536)	(286)
Pretax Income/(Loss) from Assoc.					
Non-Operating Income/(Expense)	904	595	1,500	1,500	1,500
Profit Before Tax (pre-EI)	**17,848**	**5,951**	**7,099**	**9,472**	**11,082**
Exceptional Items					
Pre-tax Profit	**17,848**	**5,951**	**7,099**	**9,472**	**11,082**
Taxation	(4,617)	(1,601)	(1,789)	(2,387)	(2,793)
Exceptional Income - post-tax					
Profit After Tax	**13,231**	**4,350**	**5,310**	**7,085**	**8,289**
Minority Interests					
Preferred Dividends					
FX Gain/(Loss) - post tax					
Other Adjustments - post-tax					
Net Profit	**13,231**	**4,350**	**5,310**	**7,085**	**8,289**
Recurring Net Profit	13,231	4,350	5,310	7,085	8,289
Fully Diluted Recurring Net Profit	**13,231**	**4,350**	**5,310**	**7,085**	**8,289**

Cash Flow

(Rs mn)	Mar-23A	Mar-24A	Mar-25F	Mar-26F	Mar-27F
EBITDA	20,472	9,548	9,389	11,711	13,084
Cash Flow from Invt. & Assoc.					
Change In Working Capital	(8,827)	(1,440)	10,057	(891)	(490)
(Incr)/Decr in Total Provisions					
Other Non-Cash (Income)/Expense	4,156	1,111			
Other Operating Cashflow	(2,545)	325	2,330	2,036	1,786
Net Interest (Paid)/Received	(1,168)	(1,331)	(830)	(536)	(286)
Tax Paid	(4,700)	(1,949)	(1,789)	(2,387)	(2,793)
Cashflow From Operations	**7,389**	**6,264**	**19,158**	**9,932**	**11,301**
Capex	(6,750)	(9,556)	(5,511)	(200)	(200)
Disposals Of FAs/subsidiaries	49	146			
Acq. Of Subsidiaries/investments	191	2			
Other Investing Cashflow	1,745	(256)			
Cash Flow From Investing	**(4,764)**	**(9,665)**	**(5,511)**	**(200)**	**(200)**
Debt Raised/(repaid)	(1,305)	5,101	(6,731)	(5,000)	(5,000)
Proceeds From Issue Of Shares					
Shares Repurchased					
Dividends Paid		(220)			
Preferred Dividends					
Other Financing Cashflow	(1,336)	(1,406)			
Cash Flow From Financing	**(2,641)**	**3,476**	**(6,731)**	**(5,000)**	**(5,000)**
Total Cash Generated	(16)	75	6,916	4,733	6,102
Free Cashflow To Equity	**1,320**	**1,700**	**6,916**	**4,733**	**6,102**
Free Cashflow To Firm	**3,793**	**(2,070)**	**14,477**	**10,269**	**11,388**

SOURCE: INCRED RESEARCH, COMPANY REPORTS

BY THE NUMBERS…cont'd

Balance Sheet

(Rs mn)	Mar-23A	Mar-24A	Mar-25F	Mar-26F	Mar-27F
Total Cash And Equivalents	1,612	1,985	5,645	9,843	15,658
Total Debtors	11,068	8,446	8,024	8,826	9,267
Inventories	14,854	15,713	15,744	17,318	18,184
Total Other Current Assets	8,469	7,892	7,892	7,892	7,892
Total Current Assets	**36,003**	**34,036**	**37,304**	**43,878**	**51,001**
Fixed Assets	41,051	51,458	54,008	51,006	47,990
Total Investments	42	42	42	42	42
Intangible Assets	314	511	257	257	257
Total Other Non-Current Assets	6,304	6,295	8,868	8,868	8,868
Total Non-current Assets	**47,711**	**58,305**	**63,175**	**60,173**	**57,157**
Short-term Debt	12,950	16,227	13,227	8,227	3,227
Current Portion of Long-Term Debt					
Total Creditors	6,910	5,189	14,855	16,340	17,157
Other Current Liabilities	3,529	3,612	3,612	3,612	3,612
Total Current Liabilities	**23,389**	**25,028**	**31,694**	**28,179**	**23,996**
Total Long-term Debt	1,832	3,731			
Hybrid Debt - Debt Component					
Total Other Non-Current Liabilities	477	1,443	1,443	1,443	1,443
Total Non-current Liabilities	**2,309**	**5,174**	**1,443**	**1,443**	**1,443**
Total Provisions	2,808	2,776	2,776	2,776	2,776
Total Liabilities	**28,507**	**32,977**	**35,912**	**32,397**	**28,214**
Shareholders Equity	55,207	59,363	64,675	71,761	80,051
Minority Interests			(107)	(107)	(107)
Total Equity	**55,207**	**59,363**	**64,568**	**71,654**	**79,944**

Key Ratios

	Mar-23A	Mar-24A	Mar-25F	Mar-26F	Mar-27F
Revenue Growth	43.8%	(24.7%)	(5.0%)	10.0%	5.0%
Operating EBITDA Growth	70.9%	(53.4%)	(1.7%)	24.7%	11.7%
Operating EBITDA Margin	36.0%	22.3%	23.1%	26.2%	27.9%
Net Cash Per Share (Rs)	(119.90)	(163.62)	(69.02)	14.71	113.17
BVPS (Rs)	502.57	540.40	588.75	653.26	728.73
Gross Interest Cover	15.51	5.02	7.75	15.86	34.46
Effective Tax Rate	25.9%	26.9%	25.2%	25.2%	25.2%
Net Dividend Payout Ratio					
Accounts Receivables Days	60.51	83.19	73.91	68.74	70.30
Inventory Days	287.83	392.68	403.33	385.37	394.11
Accounts Payables Days	142.52	155.43	256.99	363.60	371.85
ROIC (%)	22.7%	6.8%	5.9%	8.3%	9.9%
ROCE (%)	27.3%	8.7%	7.9%	10.4%	11.7%
Return On Average Assets	18.5%	6.0%	6.2%	7.3%	8.0%

SOURCE: INCRED RESEARCH, COMPANY REPORTS

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Add	The stock's total return is expected to exceed 10% over the next 12 months.
Hold	The stock's total return is expected to be between 0% and positive 10% over the next 12 months.
Reduce	The stock's total return is expected to fall below 0% or more over the next 12 months.

The total expected return of a stock is defined as the sum of the: (i) percentage difference between the target price and the current price and (ii) the forward net dividend yields of the stock. Stock price targets have an investment horizon of 12 months.

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Overweight	An Overweight rating means stocks in the sector have, on a market cap-weighted basis, a positive absolute recommendation.
Neutral	A Neutral rating means stocks in the sector have, on a market cap-weighted basis, a neutral absolute recommendation.
Underweight	An Underweight rating means stocks in the sector have, on a market cap-weighted basis, a negative absolute recommendation.

Country Ratings	Definition:
Overweight	An Overweight rating means investors should be positioned with an above-market weight in this country relative to benchmark.
Neutral	A Neutral rating means investors should be positioned with a neutral weight in this country relative to benchmark.
Underweight	An Underweight rating means investors should be positioned with a below-market weight in this country relative to benchmark.