BUY

CMP: **INR 12,729** Target Price: **INR 16,617** ▲ 31%

ICICI Securities Limited is the author and distributor of this report

17 April 2025

India | Equity Research | Initiating Coverage

Hitachi Energy India

Capital Goods

In the catbird seat

The grid is set for an upgrade; an upgrade that would pave the way to integrate and increase the share of renewables. This improves the total addressable market (TAM) for high voltage (HV) equipment. Total inter-state transmission capex (INR 3.4trn) over the next six years is likely to double the existing stock. We also expect demand for HV equipment in the next decade to be 2.5x that of the earlier decade, while the demand for HVDC is likely to be 5x. Hitachi Energy, a global market leader, is in the catbird seat to benefit from this rising investment. It has already begun reaping benefits – we estimate the order book (OB) as of FY25E at ~INR 290bn (book to bill of ~4.5x). In our view, order outlook remains strong for the next 4-5 years. Its margins are set to improve on the back of operating leverage and better pricing environment. We expect its revenues/EBITDA/profit to grow at 38%/72%/96% CAGRs over FY24–27E. Initiate coverage with **BUY** and a TP of **INR 16,617**.

"We must invest in grids today or face gridlock tomorrow"

– Fatih Birol, Exec. Director of the IEA

The USD 40bn opportunity...

India has identified projects worth INR 3.4trn of inter-state transmission capex to meet demand and increased RE penetration by 2030. Note, the current grid needs to expand to evacuate ~2x of the existing capacity (~450GW).

...leading to demand for HV equipment

The grid needs HV equipment. Demand for adding sub-stations at higher voltage is 2.5x compared to the last decade. We also expect the equipment for grid stabilisation to multiply. Besides, demand for HVDC equipment is seeing traction with two projects bagged by Hitachi Energy in the last four months and two more projects are likely to be awarded in FY26E (over and above, we expect another five HVDC projects in the medium term).

Market leader to benefit...

Hitachi Energy is the market leader in transmission equipment in India and globally. It is #1 in HVDC projects, transformers, etc. It has best credentials to benefit from upcoming market opportunities. Its market share in HVDC is >80% in India.

...amped up by few addons

Hitachi Energy is likely to benefit from an improved pricing environment for transmission equipment. Also, India's railways need specialised transformers to upgrade. Hitachi supplied the first lot of Scott transformers to Indian Railways. It is likely to benefit from data centre opportunities and high-speed railways (HSR).

Financial Summary

Y/E March (INR mn)	FY24A	FY25E	FY26E	FY27E
Net Revenue	52,375	63,595	88,977	1,36,530
EBITDA	3,490	5,087	9,819	17,779
EBITDA Margin (%)	6.7	8.0	11.0	13.0
Net Profit	1,638	3,182	6,725	12,350
EPS (INR)	38.6	71.4	150.8	277.0
EPS % Chg YoY	74.4	84.8	111.3	83.6
P/E (x)	325.5	176.2	83.4	45.4
EV/EBITDA (x)	152.4	104.8	54.6	30.1
RoCE (%)	15.4	13.0	16.3	24.5
RoE (%)	12.7	11.6	15.0	22.7

Mohit Kumar
kumar.mohit@icicisecurities.com
+91 22 6807 7419

Abhijeet Singh
abhijeet.singh@icicisecurities.com

Mahesh Patil
mahesh.patil@icicisecurities.com

Abhinav Nalawade
abhinav.nalawade@icicisecurities.com

Nidhi Shah
nidhi.shah@icicisecurities.com

Market Data

Market Cap (INR)	560bn
Market Cap (USD)	6,536mn
Bloomberg Code	POWERIND IN
Reuters Code	HITN.BO
52-week Range (INR)	16,550 /7,080
Free Float (%)	25.0
ADTV-3M (mn) (USD)	20.5

Price Performance (%)	3m	6m	12m
Absolute	(0.8)	(22.0)	74.7
Relative to Sensex	(0.8)	(15.8)	70.1

ESG Score	2023	2024	Change
ESG score	70.7	70.1	(0.6)
Environment	52.0	52.9	0.9
Social	73.4	72.0	(1.4)
Governance	82.3	84.5	2.2

Note - Score ranges from 0 - 100 with a higher score indicating higher ESG disclosures.

Source: SES ESG, I-sec research

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Investment Argument

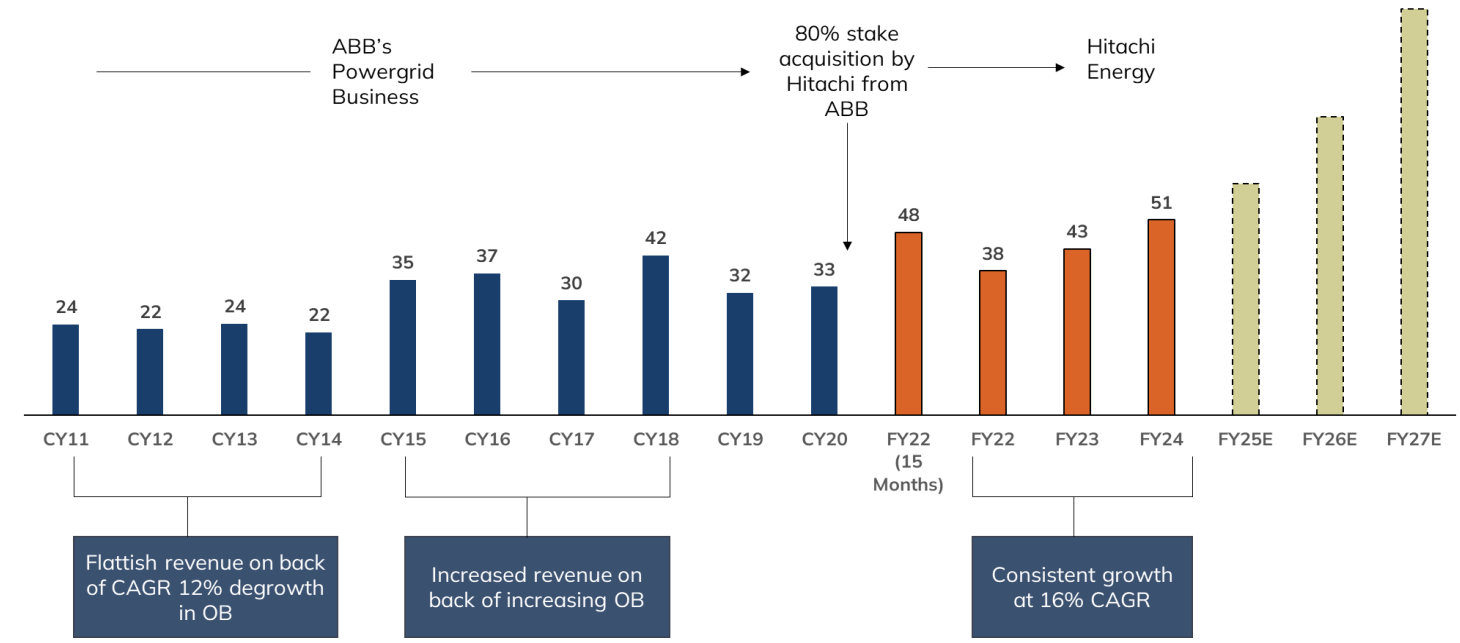
- India's grid is upgrading. Indian grid is evacuating currently ~450GW and it has to ramp up to evacuate 900GW.
- India envisages 43% of electricity consumption by renewables by 2030. Note that this is currently at 14% of electricity consumption.
- India electricity demand has grown at 5%. We expect demand to grow at 7%, leading to increased transmission to meet the demand.
- As a result, transmission capex is set to pick up after a subdued investment cycle from FY20–24. We reckon, the inter-state transmission capex has declined from INR 332bn in FY19 to INR 149bn in FY24.
- We estimate an INR 3.4trn capex on inter-state transmission over the next 5–6 years. Out of which, the need for high-voltage equipment is on the rise – transformers at high-voltage, Gas-Insulated Switchgears (GIS), HVDC etc.
- The grids are growing complex. Grid with renewables faces unique challenges for stability. To ensure a stable grid, the need for specialised equipment such as STATCOMS, reactors etc. are increasingly becoming necessities.
- Hitachi Energy is a global and domestic leader in transmission equipment – from grid automation, grid integration, transformers and high-voltage products.
- Hitachi Energy is best-placed to capitalise on the HVDC equipment opportunity worth ~INR 400bn from the near-term awards. It has already received HVDC equipment orders in consortium with BHEL, for two major HVDC projects – Khavda-Nagpur and Bhadla-Fatehpur; the total order value is estimated at ~INR 200bn.
- Hitachi Energy had strong FY25; we estimate its order inflow at ~INR 277bn in FY25 given the 2 HVDC orders. We estimate order inflow of INR 97bn and INR 111bn in next two years (with upside risk). This will lead to improvement in execution to double the current levels.
- Railway electrification is another big opportunity. Indian Railways is looking to upgrade its grid for increasing the speed. Hitachi with its Scott transformer is ready to tap into this opportunity.
- High-speed rail (HSR) could be another opportunity where Hitachi can strike success. Note that L&T has received the order for electrification of HSR and Hitachi may be able to secure the orders for equipment.
- Indian factories are feeder factories for the global markets. We believe uptick in global transmission will lead to higher opportunities for Hitachi Energy.
- Hitachi Energy has struggled with subdued margins. We expect improvement in margins with: 1) volume growth; 2) improvement in gross margins; and 3) improved productivity. Note that Hitachi Energy Global has already improved its margin from 6.1% to 8.5% in the last two years; further, it reported double digit margins in last 3 quarters.

  We expect revenue to grow at 38% CAGR over the next three years and profit at a CAGR of 96%. We initiate coverage on the stock with **BUY** rating and a target price of **INR 16,617** valuing the stock at 60x FY27E earnings. Hitachi Energy is currently trading at 46x FY27E earnings.

Hitachi Energy – a pure play in high-voltage transmission

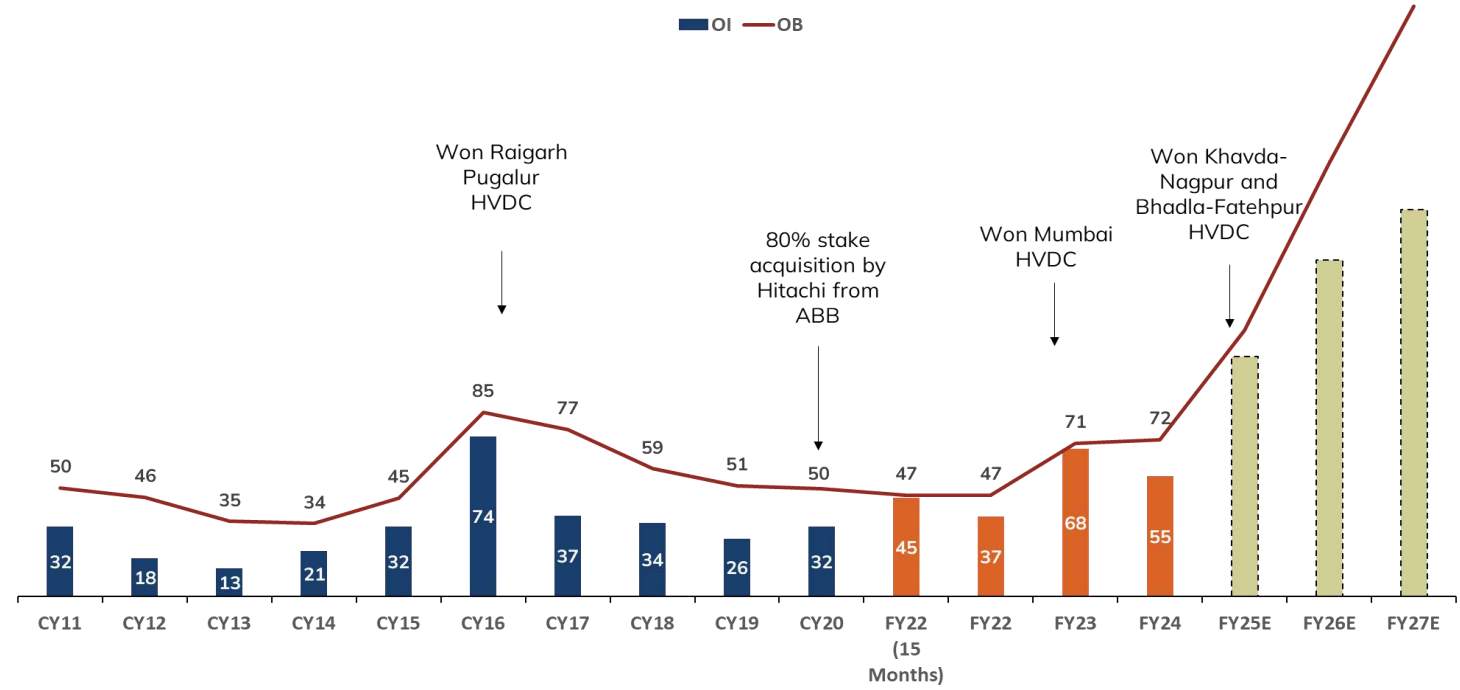
- Hitachi Energy, is a subsidiary of Hitachi Energy Global. Hitachi Global is a market leader in grid automation, grid integration, transformers and high-voltage transmission equipment.
- Hitachi Energy (erstwhile ABB India) has been present in India for the past 75 years. The company setup its first factory in Vadodara, Gujarat in 1962.
- Hitachi Energy acquired 80% stake in ABB's power grid business to form a standalone entity. In 2020, Hitachi Energy got listed on the NSE and BSE.
- Hitachi Energy has market share of over 80% in existing HVDC projects.

Exhibit 1: A run through revenue over the years (INR bn)



Source: I-Sec research, Company data

Exhibit 2: OB and OI over the years (INR bn)



Source: I-Sec research, Company data

Genesis

- In 1949, **Hindustan Electric Company** is incorporated and later **acquired by Brown BoveriCie (BBC).**
- In 1961, it **expanded manufacturing of transformers and HT air blast circuit breakers <220kV** in Howrah and Baroda (Vadodara) as part of a technical collaboration with Brown Boveri & Cle (BBC).
- New manufacturing facility set up in Maneja, Baroda – **flagship circuit breaker factory.**
- Hindustan Electric Company name changed to Hindustan Brown Boveri Ltd. after merging with BBC.
- ASEA and BBC merged globally to form ABB in 1988
- Hindustan Brown Boveri Ltd. name changed to **Asea Brown Boveri (ABB)** Ltd. in 1989.
- Commissioned the first back-to-back HVDC transmission link for NTPC at Vindhyachal, connecting India's northern and western grids.

FY00-15

- India Operations Centre – second-largest base of HVDC engineers; launched in Chennai.

FY15-FY17

- Installed end-to-end power solution for Delhi Metro, and SCADA to monitor and control the power network.
- Energised the world's highest rated 1,200kV transformers.
- Commissioned the world's first multi-terminal UHVDC link – a 6,000MW, 800kV DC link connecting North-East India to Agra.
- First digital sub-station for reliable, round the clock (RTC) power to serve the 350 companies for India's largest information technology park.

FY18-FY20

- **ABB Ltd. (global) decided to sell its power grid business (mostly high-voltage products and solutions) in 2018 to Hitachi.**
- The first tranche of the transaction was completed in 2020 where in Hitachi bought 80% of ABB's global power grid business for a total consideration of USD 6.9bn.
- The power grid business was catering largely to four business lines i.e. 1) Grid automation, 2) Grid integration, 3) HV products, and 4) Transformers.
- As part of the global transaction, ABB India demerged its Power grid business from ABB India Ltd. with existing shareholders being allotted shares on a pro-rata basis.
- And thus, the demerged business was rebranded as Hitachi Energy post completion of acquisition by Hitachi. Hitachi held 75% stake in the demerged business while rest 25% was held by public.
- Partnered with Indian Railways' electrification ambitions with extensive traction equipment orders.
- Standalone entity formed; **2020** listed on NSE and BSE.

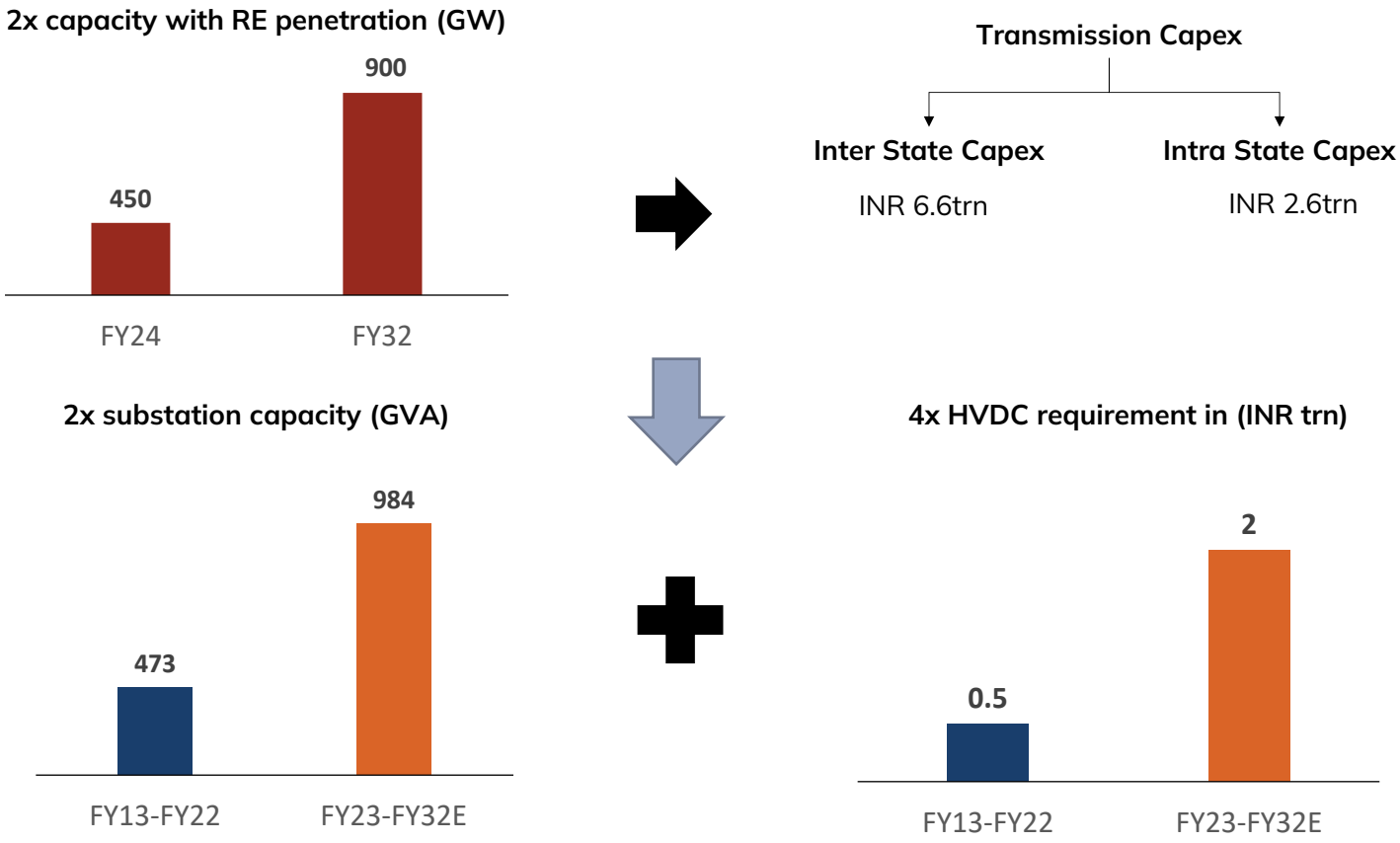
FY20–23

- Inaugurated factories in Chennai and Bengaluru for manufacturing of HVDC and power quality products.
- Completed acquisition of the remaining 19.9% stake from ABB

FY24 onwards

- Hitachi Energy announced plans to invest INR 20bn over a 5-year period for expanding capacity and portfolio
- Bagged an order from Hitachi Energy Australia to supply HVDC VSC equipment for Marinus Link project in Australia
- In a major win, Hitachi Energy along with BHEL were awarded Khavda-Nagpur HVDC transmission project; the project cost is estimated at ~INR 280bn
- Hitachi Energy and BHEL's consortium won its second HVDC order in FY25, Bhadla-Fatehpur HVDC transmission project with an estimated cost of INR 250bn
- Hitachi Energy raised equity of ~INR 25bn through qualified institutional placement (QIP) in Mar'25; ~INR 15bn of the equity raised to be utilised for future capex

Exhibit 3: Summary in a chart – Hitachi is a leader



Source: I-Sec research, CEA, NEP

USD 40bn opportunity in inter-state transmission capex

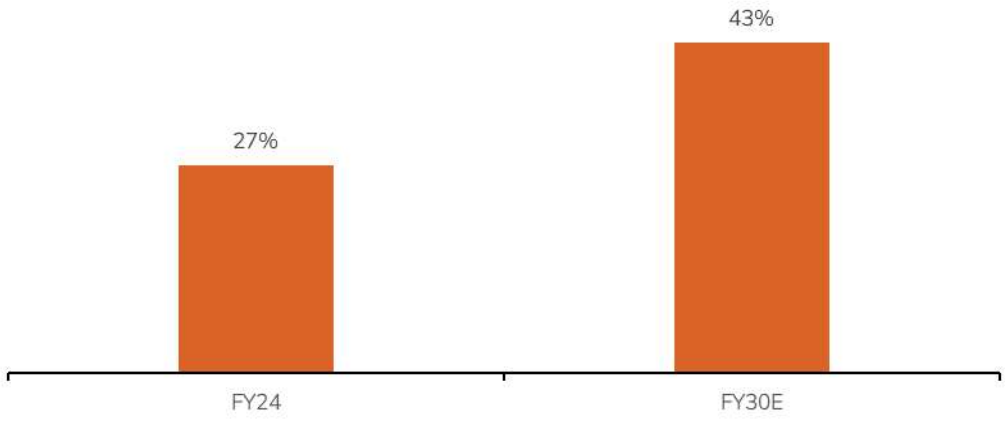
- India's inter-state transmission capex slowed to a low post the achievement of "One Nation and One Grid". The grid was upgraded to 765KV ring and the grid was unified under a single network.
- The increase in demand aided by electrification of the economy is likely to improve demand and consequently should lead to increase in transmission capex.
- Also, greening of the grid is underway. The grid needs to evacuate 2x of current capacity by FY32E.
- As a result, India's inter-state transmission capex is set to increase from its current levels of INR 150bn to INR 500bn in the next few years.
- To build and evacuate the RE, India has penciled a capex of INR 2.4trn till FY30. Also, we expect the increase in transmission capex to build up for capex related to hydrogen and conventional power.
- As a result, India is looking to bid out INR 1.8trn worth of projects in the near term; note that 2 HVDC projects worth INR 0.5trn have been awarded recently. We expect this to flow into the OI of transmission equipment players.

India is working on integrating higher shares of variable RE into the energy mix. It is looking to upgrade its inter-state transmission to integrate RE in the energy mix.

Increasing RE mix in the grid

As per MNRE's Renewable consumption obligation (RCO) trajectory, RCO target for FY30 is set at 43.33% from 27.08% for FY24; a significant jump, especially considering the estimated increase in overall power consumption. Incremental renewables mix is to be met by wind and solar capacities. This necessitates continuous development of a robust National Grid comprising of high-capacity AC and HVDC systems along with investment in grid stability and grid automation.

Exhibit 4: RCO target set at ~43% for FY30

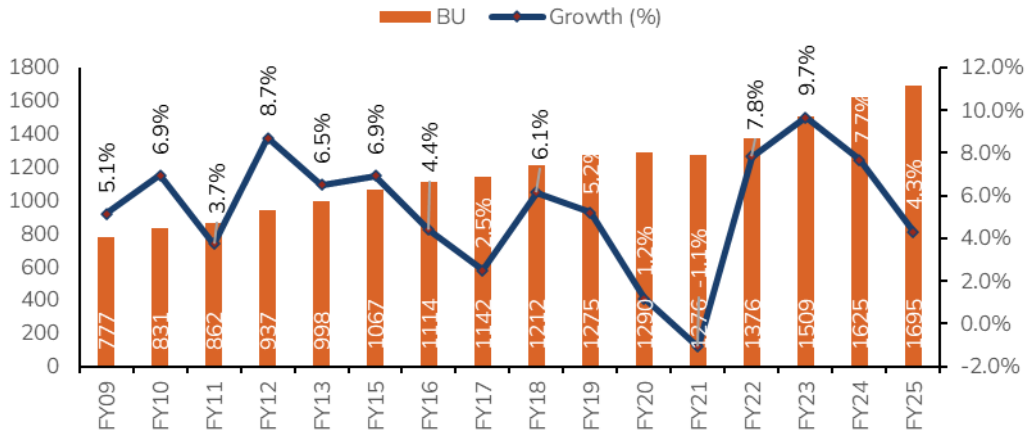


Source: I-Sec research, NEP

Plus, increase in electricity demand

India's electricity demand has risen at 5.5% over last 15 years. Growth, recently, has been better than national average. The grid is being planned to meet the load reliably with higher penetration of renewables. We estimate growth to be at 7% in the near to medium term.

Exhibit 5: Increasing electricity demand

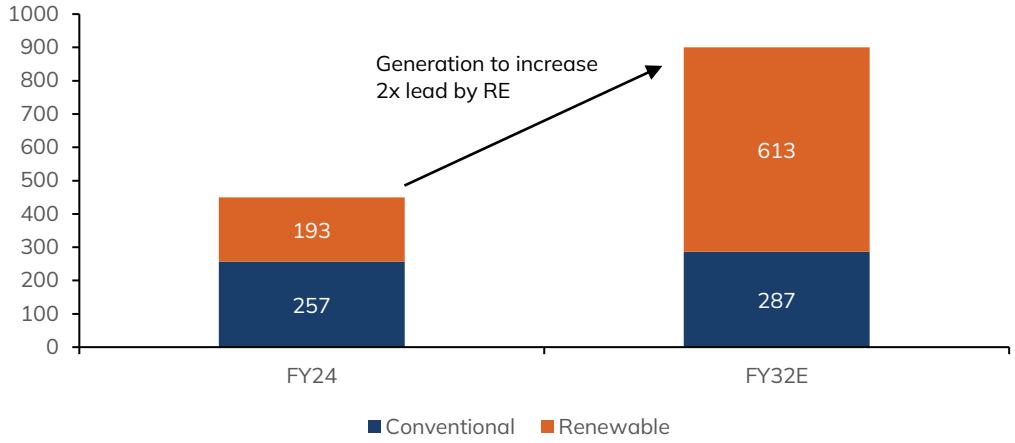


Source: I-Sec research, CEA, NEP

... resulting in 2x increase in generation capacity

Total capacity of 900GW shall be required to meet the renewables obligations. As per NEP, India needs to add 450GW by FY30. Renewable generation capacity in total installed capacity mix is expected to change from 34% at present to about 51% by the year FY30.

Exhibit 6: Generation capacity to increase 2x (GW)

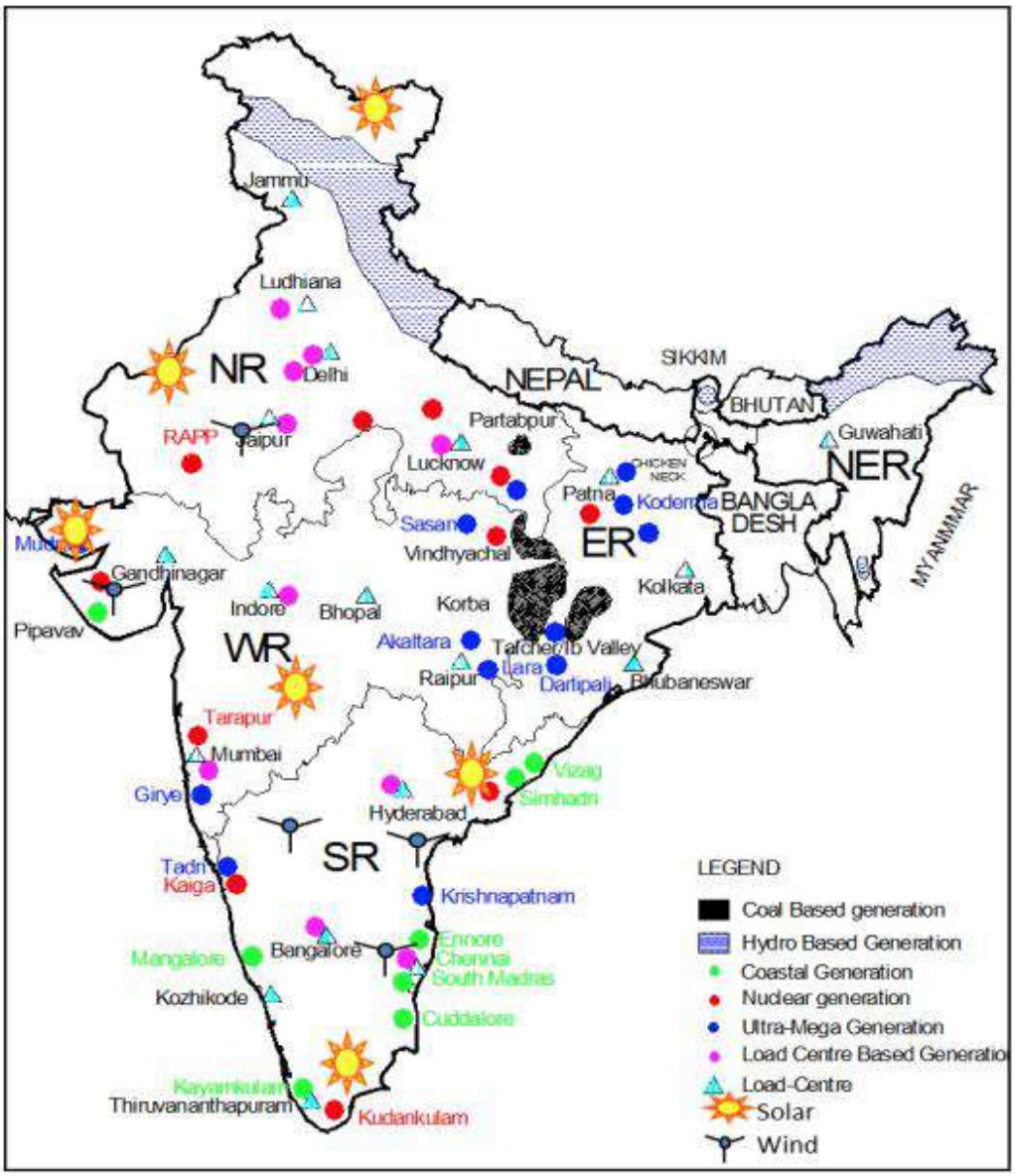


Source: I-Sec research, NEP

...leading to sharp rise in transmission capex

As a result, the government is stepping up transmission capex to evacuate renewables from renewable resource rich locations to load centers.

Exhibit 7: Generation plants and load centres



Source: I-Sec research, Advances in Energy Technology by Ramesh Bansal

A host of estimates of transmission capex; indicate a step jump

Different studies by different government agencies have estimated huge capex required to meet the RE integration and meet the demand. Below are three estimates which highlights the need to accelerate transmission capex:

Renewables evacuation plan – estimate of INR 2.4trn (CEA)

To integrate the RE capacity in the grid, the Central Electricity Authority (CEA) has assessed that the total investment required is INR 2.4trn by FY30 (published in Dec 22)

Exhibit 8: Transmission capacity addition plan by FY30 for RE evacuation

INR bn	Till FY30
Total	**2,440**
- Onshore	2,140
- Offshore	300
Transmission Line ('000 ckm)	**51**
HVDC	8
765KV	26
400KV	16
220KV	1
Transformation Capacity (GVA)	**315**
HVDC	25
765KV	274
400KV	13
220KV	0

Source: I-Sec research, CEA

Exhibit 9: RE capacity addition plan

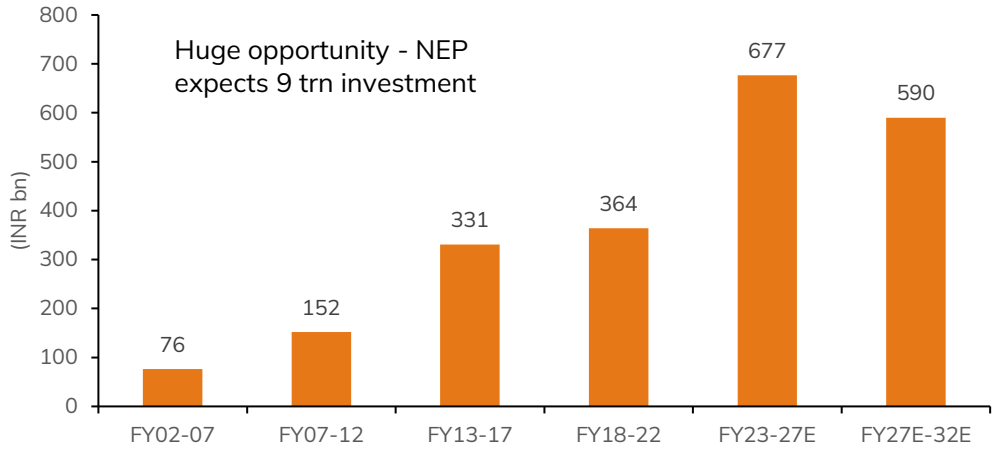
Transmission plans for 500GW	in GW
Existing Capacity of renewables	**165**
Existing space in transmission grid	32
Intra state grid	24
Hydro capacity	15
System has to be designed for	**264**
Battery (GW)	50
TS to be planned for (INR bn)	**2,140**
INR/MW	10

Source: I-Sec research, NEP

National Electricity Plan (NEP) expects INR 9trn over a decade (CEA)

The NEP pegs total inter-state transmission capex at INR 9.2trn over 10 years till FY32. This also includes intra-state expenditure. It expects an investment of INR 4.7trn, which includes INR3.1trn in inter-state and INR1.6trn in intra-state over FY22–27E (published in Oct 24). **Exhibit 10** show a snapshot of the plan:

Exhibit 10: NEP investment plan (INR bn)

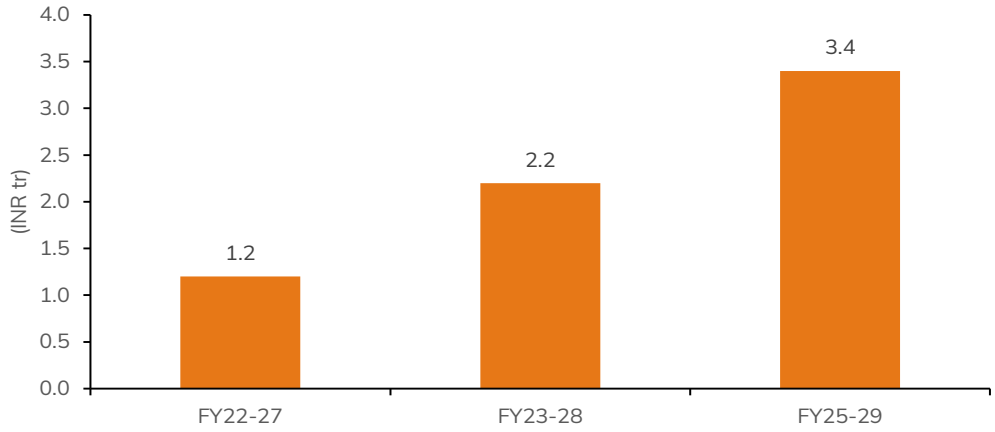


Source: I-Sec research, NEP

Rolling plan expects INR 3.4trn capex

CTU is drawing up plan for Inter-State Transmission System (ISTS) for up to next five years on rolling basis every year. The report covers year wise ISTS planned and under implementation across the country to integrate the RE generation and to cater the growing demand. The power project under implementation has gone up every year. Latest report pegs the expenditure at INR 3.4trn.

Exhibit 11: CTUIL rolling plan (INR trn)



Source: I-Sec research, CTUIL

Building into a strong pipeline

India has recently approved projects worth >INR 3trn. Out of which, INR 0.5trn was awarded in FY24 and 0.3trn was awarded on nomination basis. Bidding activity increased in FY25; we estimate the awards worth >INR 1.2trn in FY25. We reckon potential bidding of INR 0.9trn over the next 18 months. **Exhibit 12** tabulates the status of the projects approved:

Exhibit 12: Project pipeline

Status of projects since Jan'21	INR bn	Details
Bids to be floated	488	
Bids floated	358	Near-term pipeline
Bids completed	1,779	
Cost Plus	830	Includes Paradeep Andaman HVDC
Total	**3,455**	

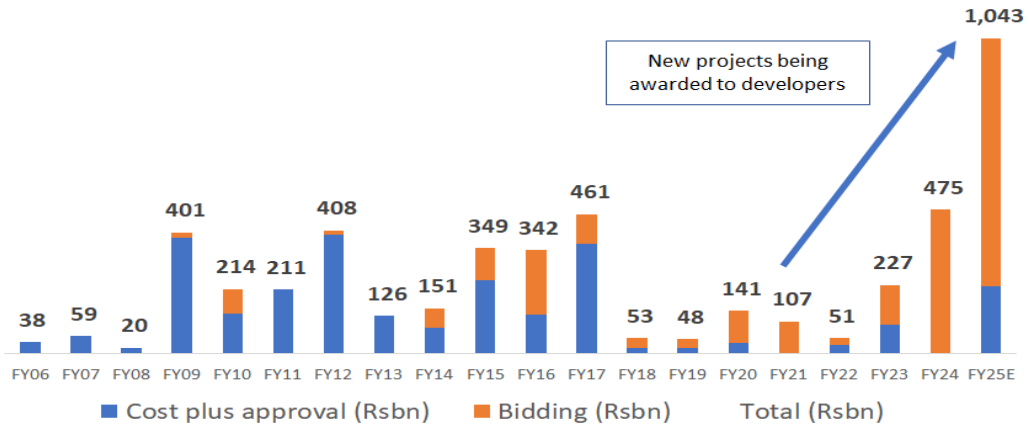
Source: I-Sec research, NEP

Equipment awards will pick up as corollary

Thus, we expect equipment awards to pick up for the sector**. Note that >INR 2trn worth of projects have been finalised with a number of projects moving to finalise awarding of the equipment.**

Note that projects approved for cost plus (~approved by PGCIL investment board) and finalised for bidding in last 18 months were worth over INR 1.5trn.

Exhibit 13: Cost plus + projects bid



Source: Powergrid

New grid needs HV equipment

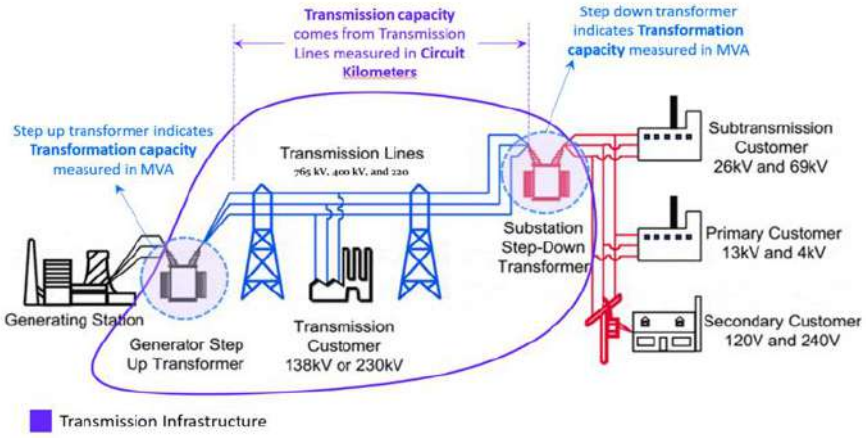
- The new transmission capex requires higher transmission capex at high voltage compared to earlier times.
- India needs to add 1.2GVA of transformation capacity. This is 2x compared to capex in last five-year plan.
- Out of which, the addition at HV capacity (>400kv) shall grow by 2.5x. This may entail addition of sub-stations, transformers and reactors
- Also, there is a higher need to add HVDC and STATCOMs to bring more renewables on the grid (explained later).
- Competition in the HV remains low. We estimate competition between 5–6 players for equipment.

India needs to double its sub-station capacity in the next ten years. This would create demand for power transformers, gas insulated switch gears, circuit breakers and reactors.

Transmission capex needs 2x sub-station capacity

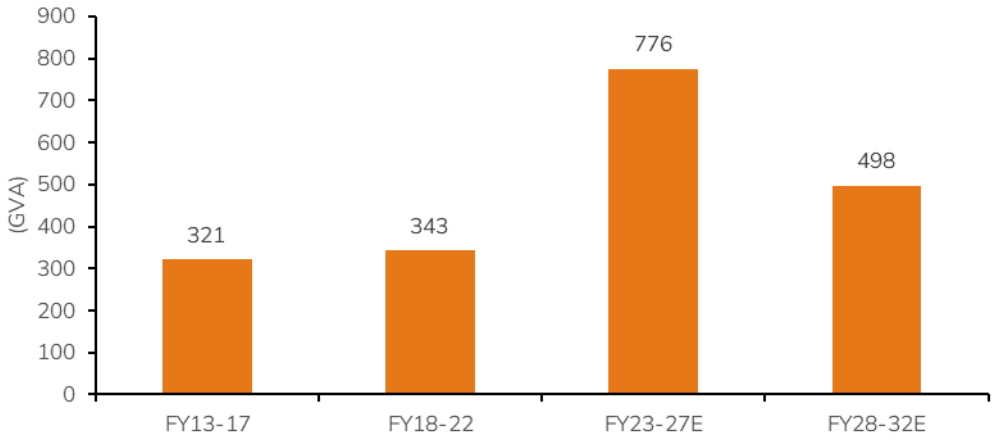
To reduce the losses, the power is stepped up to higher voltage at substations and transmitted to load centers through step down transformers. The total capacity of substation is transformation capacity. As per the national electricity plan, India needs to add 1.2GVA of transformation capacity (vs. 0.6GVA between FY13–22).

Exhibit 14: Transmission infrastructure



Source: I-Sec research CERC, Powergrid

Exhibit 15: Sub-station capacity addition (GVA)

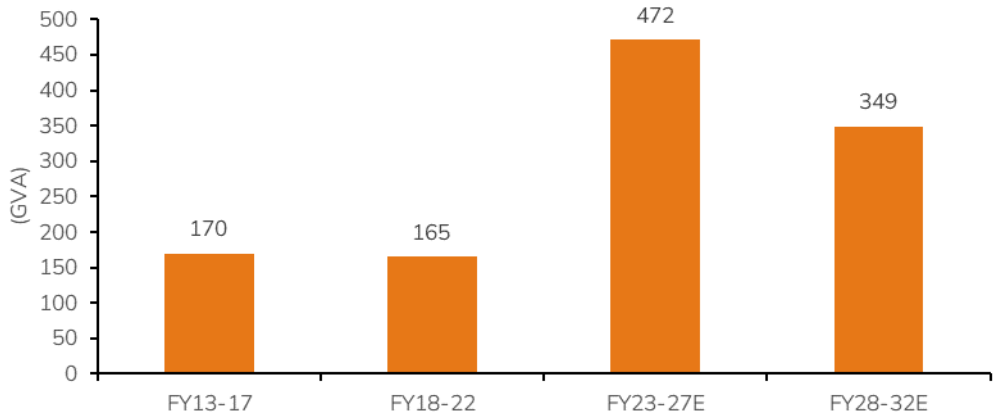


Source: I-Sec research, NEP

HV sub-stations (>400kV) addition is 2.5x

The demand to add substations at higher voltages will likely grow by 2.5x. As the grid is now operating at higher voltage, most of the new transformation capacity is coming at higher voltages.

Exhibit 16: Interstate transformation capacity addition (GVA)

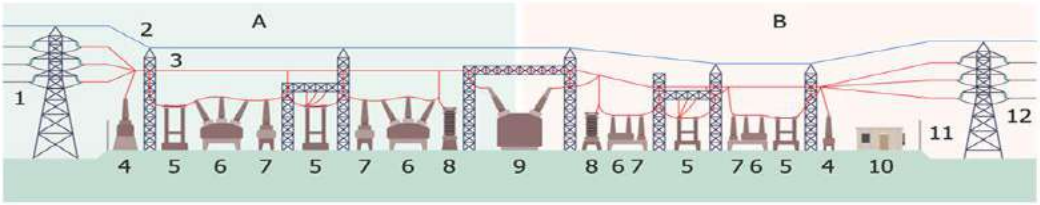


Source: I-Sec research, NEP

Sub-station components

The main components of an electrical sub-station include transformers, switchgear, circuit breakers, busbars, insulators, protection devices, grounding system, and control equipment. Each of these components plays a vital role in the successful operation of a substation, ensuring the safe and efficient distribution of electrical power.

Exhibit 17: Sub-station components



A: Primary power lines' side B: Secondary power lines' side

1. Primary power lines
2. Ground wire
3. Overhead lines
4. Lightning arrester
5. Disconnect switch
6. Circuit breaker
7. Current transformer
8. Transformer for measurement of electric voltage
9. Main transformer
10. Control building
11. Security fence
12. Secondary power lines

Source: I-Sec research, Powergrid

Exhibit 18: Cost of a substation

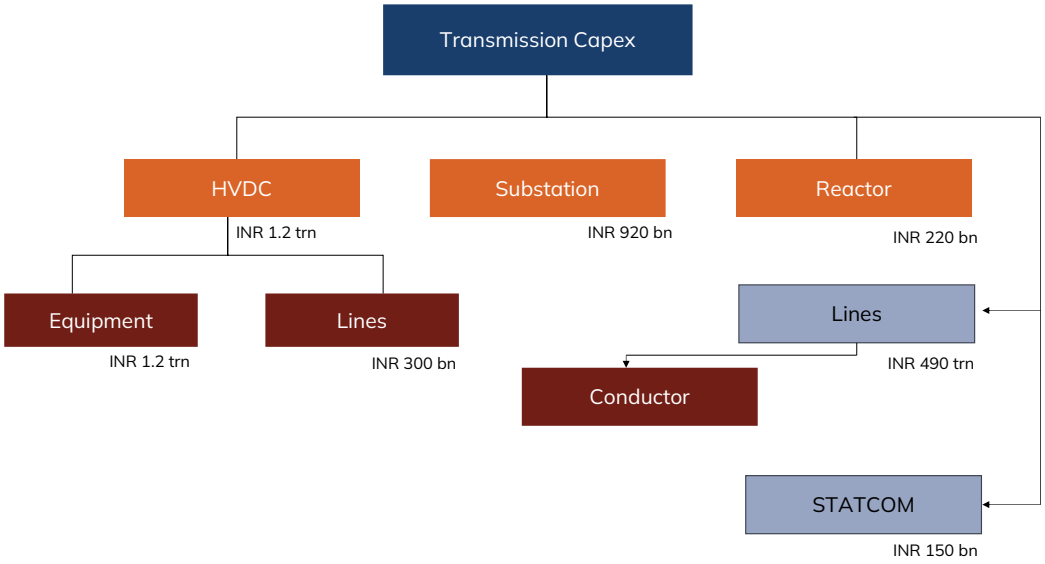
Particulars	INR mn
Land development & civil engineering works	77
Electrical works	161
EPC works	13
Transformers	2,246
Reactors	586
765kV Bays & Equipment	509
400kV Bays & Equipment	233
220kV Bays & Equipment	76
Steel Structurals	97
Civil Works	104
Total	**4,102**

Source: I-Sec research, CERC

Need to stabilise the grid

Intermitted and variable renewable energy sources like solar and wind power poses challenges to grid stability. STATCOM provides dynamic voltage support and reactive power compensation, enhancing grid reliability and enabling the seamless integration of renewable energy (discussed later).

Exhibit 19: Broad break up of transmission capex, based on our estimates



Source: I-Sec research, NEP

A less competitive field

Higher the voltage, lower the competition. Industry competition at the higher voltages is reduced to 5-6 players for various equipment. Below is the participation in tenders called by Power Grid for various high voltage equipment.

Exhibit 20: Limited competition in HV equipment supply

Packages	Competition
STATCOM Package ST-02T	Hitachi and Siemens
Transformer Package- LOT-7TR-06-Bulk for procurement of 765KV	BHEL, CG Power, GETD, Hitachi and TRIL
765kV Reactor Package 7RT13 Bulk	TRIL and GETD
Circuit Breaker Package -CB02 associated with Bulk Procurement of Substation	CG Power, GETD and Siemens
765kV Transformer Package 7TR-09-BULK	Hitachi, CG Power, TRIL, Toshiba
765kV Transformer Package 7TR-03-BULK	Hitachi, CG Power, BHEL, GE T&D
Establishment of Renewable Energy Management Centre (REMC) in Telangana	Hitachi, GETD and Siemens
Package I Replacement Upgradation of existing SCADA EMS at ERLDC and SLDCs	Larsen and GETD
HVDC VSC Thrisuur Pugalur	Hitachi and Siemens

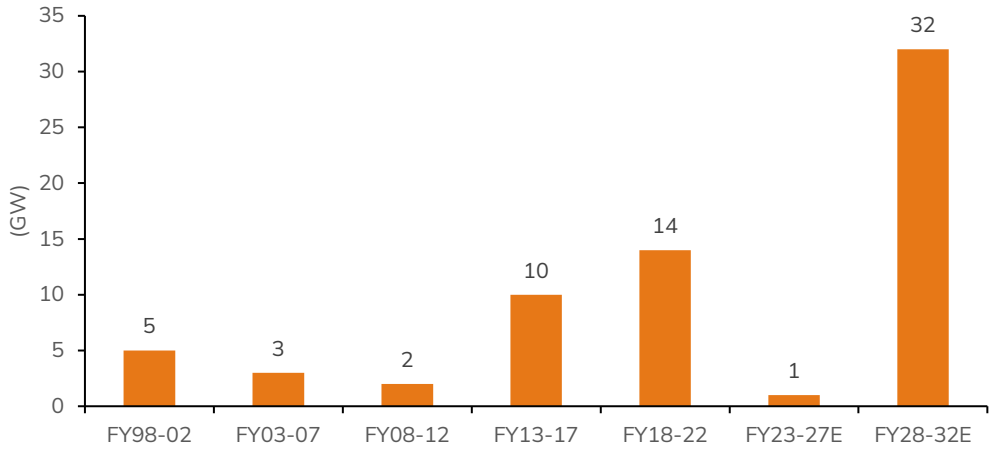
Source: I-Sec research, Powergrid

Also, needs a step up in HVDC projects

- India has planned four HVDC projects in the near term, two of which have recently been awarded. The other two are likely to be awarded in the next 12 months. We estimate total project cost at INR 0.9trn.
- It is also looking to add five HVDC projects in the medium term. We estimate total project cost at INR 1190bn.
- HVDC is considered for transmitting power >2GW over long distance (>700 km) or connecting asynchronous grids.
- Two technologies – LCC and VSC are being used in HVDC. Competition in LCC is a two- player field while VSC is seeing competition between 3 players
- Equipment constitutes ~45% of the total HVDC project cost. We estimate a TAM of INR 400bn for the players in immediate term and another ~INR 540bn in the medium term (2–5 years).

HVDC is very important for a carbon-neutral energy system. It is highly efficient for transmitting large amounts of electricity over long distances. HVDC is a high capacity, long-distance transmission system with low losses.

Exhibit 21: HVDC addition over the years (GW)



Source: I-Sec research, NEP

Advantages of HVDC

HVDC allows for connection of remote renewable power to load centers where it is needed, hundreds or even thousands of kilometers away. Below is a comparison between HVDC and HVAC.

Exhibit 22: Comparison between HVAC and HVDC

HVAC	HVDC
Transformer for voltage conversion.	Solid-state semiconductor-based converters for voltage conversion.
Voltage conversion is Simple & inexpensive.	Voltage conversion is complex & expensive.
Minimum of three conductors.	The HVDC requires only two conductors in bipolar transmission.
< less than 600 Km distance.	> bulk power more than 600Km distance.
flexibility allowing multiple tappings in the pathway.	Transmit power from point to point.
Affected by reactive power losses.	No reactive power losses in HVDC transmission.
The conductors are affected by corona losses.	The corona losses in HVDC are reduced by a factor of approximately 3.
The HVAC has a broader right-of-way.	The HVDC has a narrower right-of-way.
The HVAC transmission requires tall sized towers.	The HVDC transmission requires a smaller tower.
Not preferred for submarine or underwater power transmission	Preferred & used for submarine power transmission offshore.
HVAC does not offer controllability.	Controllability over the power flow, frequency control

Source: I-Sec research, Industry

Two HVDC technologies – a comparison of VSC and LCC

HVDC systems use converters in order to switch from DC to AC and vice-versa. There are two main types of energy converters used, the Current Source Converters (CSC) and the Voltage Source Converters (VSC).

Conventional HVDC transmission is based on line commutated converter (LCC). Although this mature technology has large transmission capacity, it still has some disadvantages. VSC-based HVDC is recent technology that provides higher operational flexibility.

Exhibit 23: Difference between LCC and VSC

S. No.	LCC	VSC
1	Large Power up to 10GW	Low Power up to 2GW
2	Thyristor based	IGBT based
3	Mature Technology	Still in Infancy
4	Large site Area	Low site area
5	HV capability	Low voltage (LV) capability
6	Lower losses	Higher losses
7	NA	Black-start capability
8	Suited for large power flow	Suited for RE and underground and submarine

Source: I-Sec research

A list of Indian HVDC projects

India has put eight HVDC projects into use till date, and three more HVDC projects are under construction.

Exhibit 24: India's HVDC transmission portfolio

Project	Voltage	Supplier	Project cost (INR bn)	Developer	Power rating (MW)	Year of commissioning
Operating HVDC						
Champa Kurukshetra	800KV	GE	63	Powergrid	1500	2010
Vindhyachal Back-to-Back	400KV	Hitachi (ABB)	6.2	Powergrid	500	1989
Mundra - Mohindergarh	500KV	Siemens	29	Adani Energy Solutions	1500	2012
Biswanath Chariali - Agra	800KV	Hitachi (ABB)	120	Powergrid	6000	2015
Gazuwaka Back-to-Back	400KV	GE (Alstom)	3.6	Powergrid	500	1999
Talcher - Kolar	500KV	Siemens	27	Powergrid	2500	2003
Bhadrawati Back-to-Back		GE		Powergrid	1000	1997
Raigarh Pugalur	800KV	Hitachi (ABB)	170	Powergrid	6000	2021
Chandrapur Padghe	500KV	Hitachi (ABB)	9.9	Hitachi (ABB) & BHEL (MSEB owned)	1500	1999
Ballia Bhiwadi	500KV	Siemens	43	Powergrid	2500	2010
Rihand Dadri	500KV	Hitachi (ABB)	15	Powergrid	1500	1990
Under construction						
Mumbai	800KV	Hitachi	63	Adani Energy Solutions	2000	NA
Khavda - Nagpur	800KV	Hitachi + BHEL	260	Powergrid	6000	NA
Bhadla-Fatehpur	800KV	Hitachi + BHEL	250	Adani Energy Solutions	6000	NA
Total			**1,060**			

Source: I-Sec research, Company data, NEP, CEA

Near-term prospects in HVDC

India has identified host of HVDC projects to bring renewables onto the grid. Apart from the two recently awarded projects (Khavda - Nagpur and Bhadla - Fatehpur), the near-term HVDC pipeline of INR 0.9trn consists of two more projects (with total estimated cost of INR 380bn). We expect work to start on these projects in the next 18 months.

Exhibit 25: Near term HVDC pipeline

HVDC Pipeline	Status	Cost (INR bn)	MW	Type
Khavda - Nagpur	Awarded	280	6000	LCC
Bhadla-Fatehpur	Awarded	250	6000	LCC
Leh Ladakh	under bid	260	5000	VSC
Khavda	under bid	120	2500	VSC
Total		**910**		

Source: I-Sec research, NEP, CEA

Medium-term prospects of HVDC projects

The grid is looking to add another five projects in the next decade. We believe that the work can start on all identified projects in the next 3–4 years. **Exhibits 26** lists down projects with our estimates of timeline and cost:

Exhibit 26: Medium term HVDC pipeline

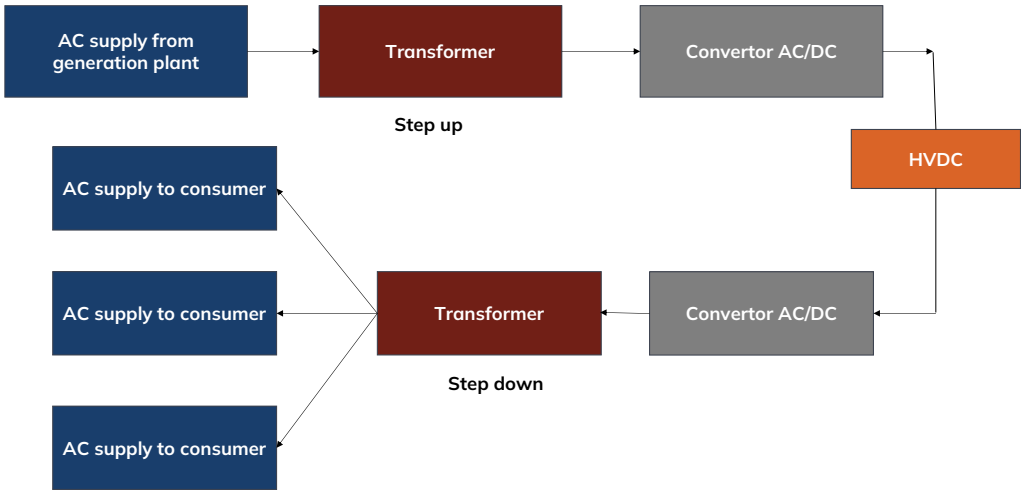
HVDC Pipeline	Status	Cost (INR bn)	MW	Type
Barmer III	Under planning	240	6000	LCC
Bikaner Begunia	Under planning	250	6000	LCC
Beawar	Under discussion	220	6000	LCC
Andaman Paradeep	Under planning	380	500	VSC
Sri Lanka HVDC	Under planning	100	500	VSC
Total		**1,190**		

Source: I-Sec research, NEP, CEA

HVDC System

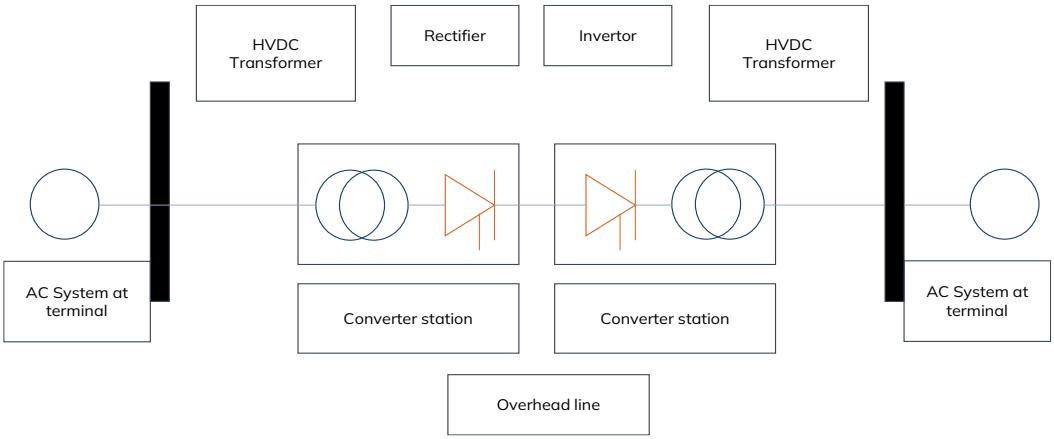
HVDC transmission system is classified into the following functional blocks, illustrated in the exhibit below:

Exhibit 27: HVDC system



Source: I-Sec research, Industry

Exhibit 28: HVDC system



Source: I-Sec research

Break up of cost of HVDC projects

Below is the breakup of Raigarh Pugalur HVDC project. Raigarh HVDC project consists of two parts – 1) 6GW HVDC line connecting Raigarh to Pugalur; and 2) 2GW HVDC VSC line connecting Pugalur to Thrissur:

Exhibit 29: Breakup of cost of Raigarh Pugalur HVDC projects

Break up of work (INR mn)	6,000MW HVDC	2,000MW VSC
Civil Works	NA	NA
HVDC Terminals	65	30
Sub - Stations	5	2
Terminal Lines	42	3
Cables	NA	7
Total	**147**	**51**
% Contribution		
HVDC	43.8%	59.6%
Sub - Stations	3.1%	4.0%
Terminal Lines	28.6%	6.6%
Cables		13.2%
Total	**100%**	**100%**

Source: I-Sec research, PGCIL, CERC

Note that Hitachi had received INR 50bn worth of HVDC terminal order and BHEL has received INR 14bn worth of order for Raigarh Pugalur.

Total Addressable Market (TAM) for new equipment

Equipment players such as Hitachi Energy are interested in building converter terminals. They are not looking to supply conductors or build transmission lines. **As a result, we estimate TAM for equipment players at ~INR 940bn (or 45% of total project cost).**

Exhibit 30: TAM (45% of the below HVDC project cost)

HVDC Pipeline	Cost (INR bn)
Leh Ladakh	260
Khavda-Nagpur	250
Khavda	120
Bhadla Fatehpur	250
Barmer III	250
Bikaner Begunia	250
Beawar	220
Andaman Paradeep	380
Sri Lanka HVDC	100
Total	**2,080**

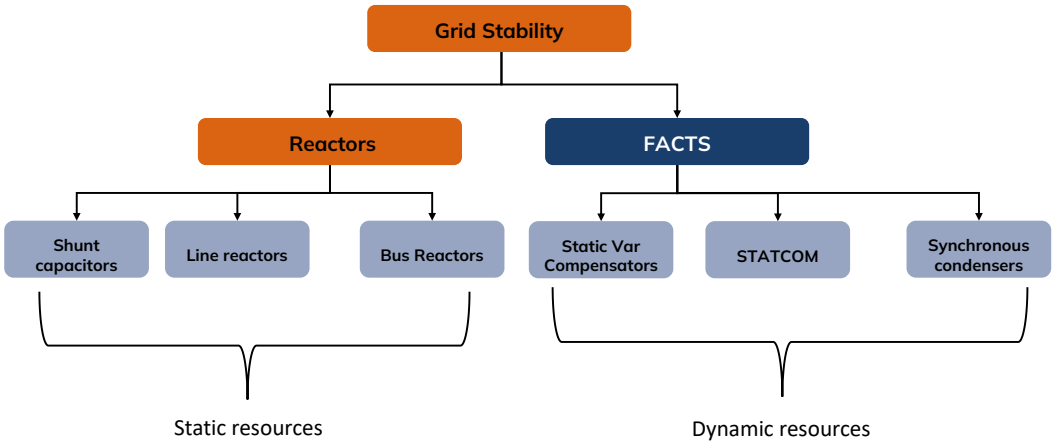
Source: I-Sec research, CEA

Also, the rise of equipment needed to stabilise the grid

- Grid's stability has become a major issue with increasing variable RE.
- Solutions range from static responses such as reactors, to dynamic responses such as STATCOMs.
- As a result, static responses like reactors are likely to grow.
- Also, dynamic responses like STATCOMs will likely address the concerns more effectively.
- We estimate TAM for HV reactors at INR 20bn p.a. and STATCOM at ~INR 15-20bn p.a. This is substantial growth from current base.

The grids may see higher penetration of renewables over the next decade. The higher RE in the mix could lead to an issue with the instability of the grid. To solve the issue, the grid shall need more equipment like reactors, STATCOMs and DVC. To ensure the Indian grid is ready, 30 STATCOMs and reactors have been identified. We estimate a market size of INR 20bn p.a for reactors and INR 15-20bn p.a. for STATCOMs.

Exhibit 31: Grid stability equipment



Source: I-Sec research

A comparison of various sources

Reactive power management is an important consideration both in planning and operation of power grids. Different resources of reactive power have different performance under different scenarios of grid.

Exhibit 32: Reactive power performance

Parameters	Reactor	Shunt Capacitor	Series compensation	Static Var Compensator	STATCOM
Reactive Power Absorption	M	–	M	M	H
Reactive Power Generation	–	M	M	M	H
Voltage Control	M	L	M	H	H
Voltage Stability improvement	M	M	M	M	H
Increases transfer capability of lines	L	L	M	M	M

Source: I-Sec research, Industry

L-Low, M-Medium, H-High

The step-up jump in TAM for reactors

High fluctuations of renewables may lead to higher challenges with the existing grid. To ensure that the grid is able to absorb more renewables, India is looking to add more and more HV reactors and STATCOMs. Low-voltage (LV) fluctuations are being taken care of by reactors while HV fluctuations will be taken care of by STATCOMs.

Exhibit 33: Reactor addition plan

GVA	Existing stock*	FY23-FY32E
Line reactor	79	98
Bus Reactor	108	84
Total	187	182

Source: Posoco, CEA

*As of Oct' 20

Energy transition to rely on FACTs

Incorporating renewable resources without shutting down the whole grid requires a balance between developing renewable energy and system reliability to avoid power outages and disruptions. Flexible AC Transmission System (FACTS) are modern power electronic devices that have the capacity to provide inductive or capacitive reactive power to the electricity grid in turn improving the reliability and power quality of the power grid network.

Static var compensator (SVC)

SVC has been used for voltage regulation since the 1960s, predating modern power electronics. It utilizes conventional passive components to provide variable reactive power compensation. Till date, India has installed three static var compensators. All three were supplied by Siemens at a cost of ~INR 6bn – or ~INR 2bn each.

Need for STATCOMs

STATCOM is a power conversion device designed primarily for voltage regulation on transmission networks. It provides fast-acting dynamic reactive power compensation completely using solid-state electronics. Till date, India has installed 19 STATCOMS worth INR 60bn.

Exhibit 34: Existing STATCOMs

Sr. No.	Location	OEMs	Origin	Cost (INR mn)
1	Nalagarh	RXPE	China	1860
2	Lucknow	RXPE	China	1897
3	Solapur	RXPE	China	1891
4	Aurangabad	RXPE	China	2056
5	Satna	RXPE	China	1955
6	Gwalior	RXPE	China	1888
7	Kishanganga	Siemens	India	1915
8	Ranchi	Siemens	India	1915
9	Jeypore	Siemens	India	1915
10	Rourkela	Siemens	India	1915
11	NP Kuntha	Hyosung	Korea	1044
12	Hyderabad	Hyosung	Korea	1514
13	Trichy	Hyosung	Korea	1811
14	Udumpalet	Hyosung	Korea	1495
15	Bhadla-II (STATCOM I)	Siemens	India	NA
16	Bhadla-II (STATCOM II)	Siemens	India	NA
17	Fatehgarh - II (STATCOM -I)	Siemens	India	NA
18	Fatehgarh - II (STATCOM -II)	Siemens	India	NA
19	Bikaner -II	Siemens	India	NA

Source: I-Sec research, NEP, CEA

New opportunities in STATCOMs

As per Hitachi Energy's annual report, India is looking to add additional 30 STATCOMs (approved by national committee on transmission). We estimate total TAM for this opportunity is at INR 60bn (INR 15-20bn per annum). The grid is making provisions for space for STATCOMs in all substations.

Shunt FACTS devices such as Static VAr Compensation (SVC) and STATCOM shall be provided where found necessary to damp the power swings and provide the system stability under conditions defined in the 'Reliability Criteria'. As far as possible, the dynamic range of static compensators shall not be utilised under steady state operating condition.

Cost of different reactive compensation

Static responses are cheaper versus dynamic responses. However, dynamic responses are necessary to take care of fluctuating generation of RE. **Exhibit 35** illustrates the costs incurred by a power grid on various reactive compensation elements:

Exhibit 35: Cost of different reactive compensation elements

Sr. No.	Reactive sources	MVAR	INR per MVAR
1	Capacitor at 132kV		0.15
2	Capacitor at 220kV		0.34
3	Bus reactor at 400kV	125	0.6
4	Bus reactor at 765kV	240	0.8
5	SVC at Ludhiana	600/-400	3.4
6	SVC at New Wanpoh	300/-200	6
7	SVC at Kankroli	400/-300	4.5
8	STATCOM at Lucknow	±300	7.2
9	STATCOM at Nalagarh	±200	8.4

Source: I-Sec research, Industry

...and Hitachi Energy has best credentials

- Hitachi Energy is market leader globally in grid automation, grid integration (HVDCs), HV products and transformers.
- Hitachi Energy has been supplying high voltage equipment in India for last seven decades. As a result, it has best credentials to benefit from upgradation of the grid.
- Hitachi Energy has been the market leader by a wide margin in HVDC in India. Its market share in India is over 80% based on capital cost of projects. Given the upcoming equipment awards for HVDC, it will be key beneficiary.
- Hitachi Energy has been indigenizing HVDC and STATCOMS. It hasn't installed STATCOM in India yet. However, it has already won an order for STATCOM.

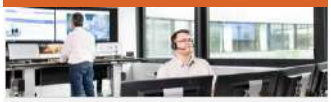
Hitachi Energy is a market leader in HV grid equipment. India is an important market for Hitachi Energy with presence over the last seven decades. Thus, we believe it is best suited to benefit from the increasing TAM for high voltage equipment (as explained in earlier section).

Market leader in grid equipment globally

Hitachi Energy is market leader globally in power grids technologies with highest market share in transformers, high-voltage products, grid integration and grid automation technologies. It was part of more than 150GW of HVDC links integrated. Hitachi Energy is serving in more than 140 countries to customers in utility, industry, transportation, data centers and infrastructure sectors.

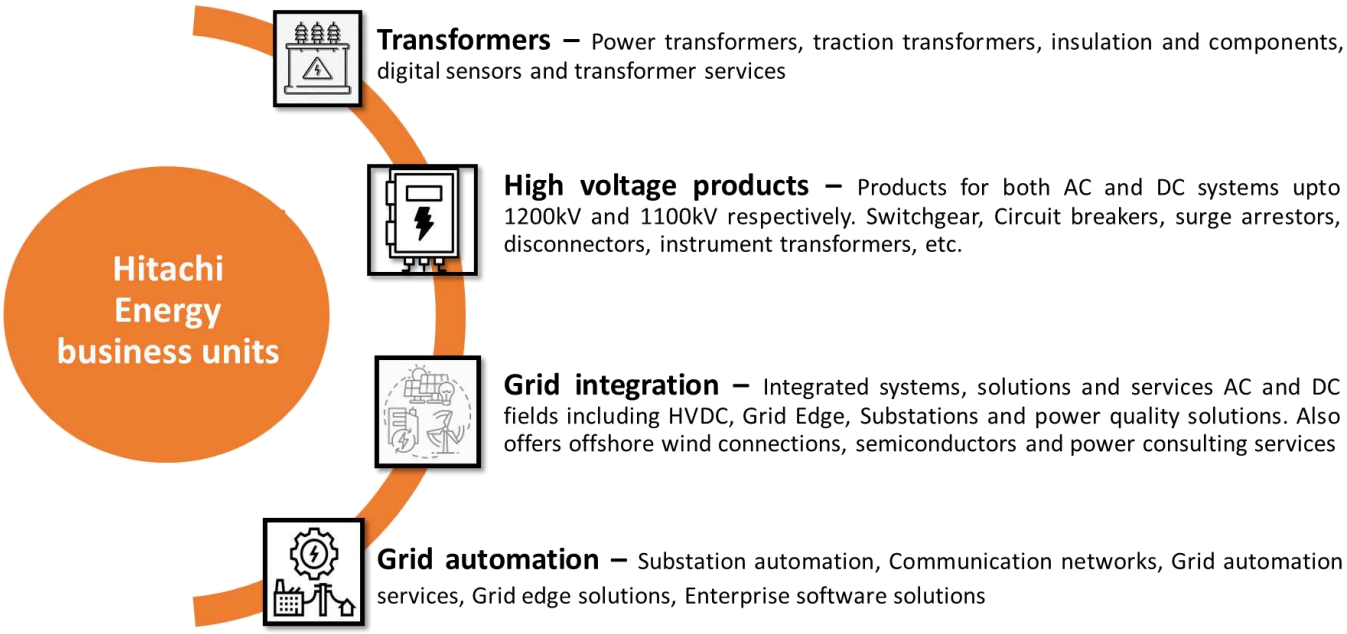
Exhibit 36: Market leadership of Hitachi Energy

Hitachi Energy – Market leader globally

Grid Automation	Grid Integration	High Voltage Products	Transformers
			
Supporting 50% of top 250 global electric utilities Leading Grid Edge References &> 5.5GW grid integrated $4 trn + critical infrastructure assers managed	Global leader in HVDC > 150GW of HVDC linkd 4000+ power quality systems operating globally 15k systems operating globally across 50+ countries	Installed 1 out of 4 high voltage switch gear > 500kv high voltage circuit breakers installed gloab SF6 Free high voltage product portfolio	Global leaders across complete range of transformers, components and services From distribution upto ultra high voltage & 1100kv DC Largest installed base
			

Source: I-Sec research, Company data

Exhibit 37: Hitachi Energy business units



Source: I-Sec research, Company data

Exhibit 38: Serving multiple business segments through diversified offerings

Key segments	Offerings
Transmission	• Transformers • Reactors • HVDC • Static compensators (STATCOM) • Digital substation • Communication networks – Teleprotection, cybersecurity, SCADA, Power line carrier
Industries	• Lumada Asset Performance Management (APM) • Enterprise asset management • Communications
Data Centers	• Digitalisation – Transformer monitoring, Substation automation systems, real time monitoring and control, energy management system • Grid connection – Power transformers, Gas Insulated Switchgear (GIS) • Backup power– Energy Storage (BESS solution), Hydrogen fuel cell systems • Services – Substation services, round the clock support
Railways and metros	• Substation – Railway trackside transformers, HV products such as switchgears, capacitors and filters, surge arrestors, instrument transformers • Rolling stock – traction transformers including Scott connected transformers • Communication systems - wireless communication and SCADA
Renewables	• Energy portfolio management, microgrid and BESS solutions • Power conversion, transformers, HV products portfolio • Power quality products • Communication – wired and wireless • Asset management – Lumada portfolio (Enterprise asset management, field service management and asset Performance management) • Network manager – Built on SCADA platform

Source: Company data

Dominant share in HVDC

Hitachi Energy is a leader in HVDC technology. It offers HV products up to 1,200 kV. More than half of India's HVDC links transmit power with Hitachi Energy technologies. Hitachi Energy has market share of over 80% of India's HVDC portfolio (operational and under-construction projects) based on the project cost. Notably, Hitachi Energy was chosen to be part of the four largest HVDC projects – Biswanath-Agra, Raigarh-Pugalur, Khavda-Nagpur and Bhadla-Fatehpur.

Exhibit 39: Hitachi Energy – leading supplier in India's HVDC portfolio

Project	Voltage	Supplier	Project cost (INR bn)	Developer	Power rating (MW)	Year of commissioning
Operating HVDC						
Champa Kurukshetra	800KV	GE	63	Powergrid	1500	2010
Vindhyachal Back-to-Back	400KV	Hitachi (ABB)	6.2	Powergrid	500	1989
Mundra - Mohindergarh	500KV	Siemens	29	Adani Energy Solutions	1500	2012
Biswanath Chariali - Agra	800KV	Hitachi (ABB)	120	Powergrid	6000	2015
Gazuwaka Back-to-Back	400KV	GE (Alstom)	3.6	Powergrid	500	1999
Talcher - Kolar	500KV	Siemens	27	Powergrid	2500	2003
Bhadrawati Back-to-Back		GE		Powergrid	1000	1997
Raigarh Pugalur	800KV	Hitachi (ABB)	170	Powergrid	6000	2021
Chandrapur Padghe	500KV	Hitachi (ABB)	9.9	Hitachi (ABB) & BHEL (MSEB owned)	1500	1999
Ballia Bhiwadi	500KV	Siemens	43	Powergrid	2500	2010
Rihand Dadri	500KV	Hitachi (ABB)	15	Powergrid	1500	1990
Under construction						
Mumbai	800KV	Hitachi	63	Adani Energy Solutions	2000	NA
Khavda - Nagpur	800KV	Hitachi + BHEL	260	Powergrid	6000	NA
Bhadla-Fatehpur	800KV	Hitachi + BHEL	250	Adani Energy Solutions	6000	NA
Total			**1,060**			

Source: I-Sec research, Company data, NEP, CEA

Bidding for new STATCOMS

Hitachi Energy has not installed a STATCOM in India yet. However, it has been indigenising the technology and is already participating in new bids. The company has secured STATCOM order for 600MVAr Fatehgarh-3 project from Sterlite Power.

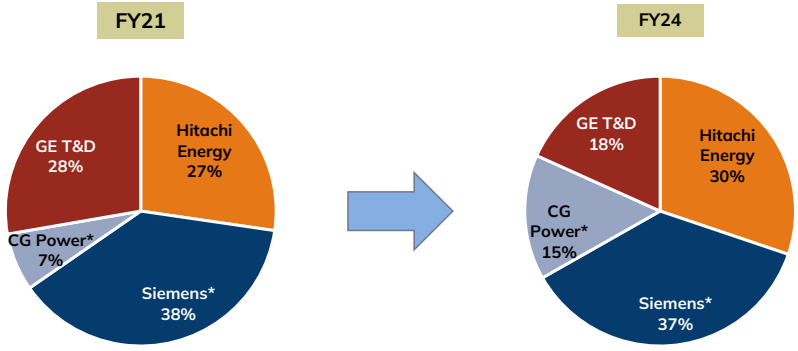
Indigenised HVDC and STATCOM

Hitachi Energy has been consistently investing in India. It has opened its new factory in Chennai for HVDC and power quality products. The factory is manufacturing components for HVDC Light (VSC technology), HVDC Classic (LCC technology), and STATCOMs. This is a reflection of the higher activities in HVDC transmission and expected electrification of high-speed railways (HSR). HVDC products and STATCOMs are expected to see increased traction in line with India's plans for transmission connectivity through HVDC and modernization of railways.

Hitachi has high revenue share

Hitachi Energy's revenue share in overall revenue of players operating in the transmission and power systems equipment (comparable segment revenue considered for Siemens and CG Power) has been growing. Its revenue share has grown from 27% in FY21 (CY20 for Hitachi Energy) to 30% in FY24. During FY21–24, Hitachi Energy's revenue grew at a 16% CAGR owing to strong OI from domestic as well export markets and its execution capabilities.

Exhibit 40: Growth in revenue share in last 4 years



Source: I-Sec research, Company data; *Only comparable segment revenue considered

...Resulting in strong order inflow

- Hitachi Energy is well positioned to capture the opportunity, leveraging its diverse offerings including the high growth products/services; new factory set up to manufacture HVDC products and STATCOMs.
- Hitachi Energy is facing limited competition with only other 2 major players operating in the space – Siemens and GE T&D
- As a result, order inflow has risen to ~4.5x (FY25E) compared to last 2 year-average and order book is estimated at ~INR 287bn.
- Hitachi Energy has finalized a capex of INR 20bn or 5x (vs INR 4bn) of last 4 years to tap the emerging Indian and global high voltage equipment opportunities
- It is targeting 25% of the order inflow from export market; strategy is to use India's and global feeder factories to service domestic orders and increase share of exports

Hitachi is among 3 players to benefit from tailwind in improving outlook for high voltage equipment. It is investing 5x capex of last four years to expand capacity in the country to meet the demand

Huge transmission opportunity in India

As discussed earlier, increase in power demand resulting in higher electrification and rising share of RE in power supply, has brought transmission infrastructure into focus. India is aiming to substantially improve its InSTS and ISTS network with focus on HVDC links for long-distance transmission lines and STATCOMs for integration of RE into the grid. India is estimated to spend INR 3.4tn over next 5 years on transmission projects.

Step up in capex to capture the market

Hitachi Energy intends to capture a good chunk of the transmission opportunity in India. It set up a new factory in Chennai in 2023 to manufacture HVDC products and STATCOMs which are expected to be high growth segments in medium to long term. It has further announced plans to invest INR 20bn over next 4-5 years for expanding its capacity and portfolio.

It is investing in

- Large and Small Power Transformers
- Dry and Traction Transformers
- HVDC & components
- Network control solutions offering

Indian factories are important for global ambitions

Hitachi Energy is targeting to increase contribution of exports in the order mix. Export contribution in order inflow and has reached ~25% and the company plans to further improve the same. The company has set up feeder factories in India and globally to form integrated global supply chain structure. It has its India feeder factory in Chennai, Gujarat and Bangalore.

Limited competition in high growth segments

Hitachi Energy is at a vantage given its diverse offerings and by being equipped with indigenous and global manufacturing of high-growth HVDC products and STATCOMs. The company is likely to be one of the major beneficiaries of India's transmission network boost given: 1) the size of the HVDC transmission opportunity in the next five years; 2) limited major players (Hitachi Energy/Siemens/GE T&D) with enough scale and capability to fulfill the orders; and 3) Hitachi Energy's dominant share in India's HVDC market including the recent major wins – Khavda-Nagpur and Bhadla-Fatehpur HVDC projects.

Exhibit 41: Technology offerings of Hitachi Energy and peers

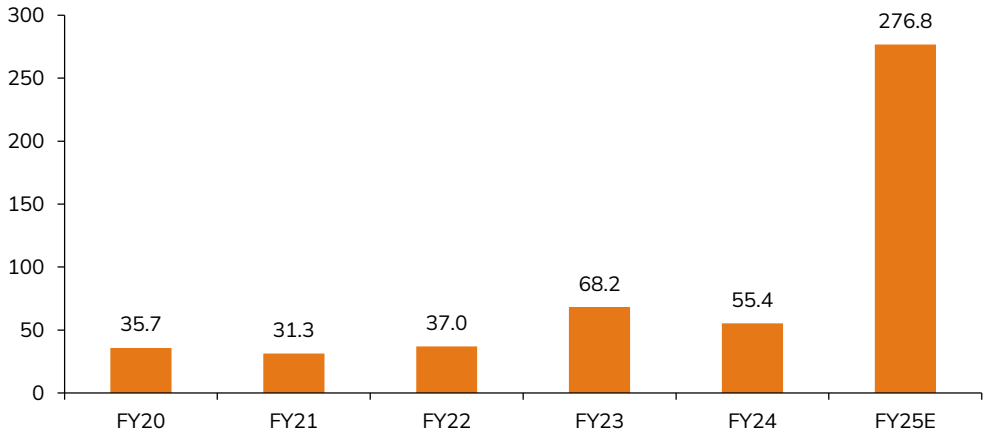
Offering	Hitachi Energy	Siemens	CG Power	GE T&D
Generator transformers	✔	✔	✔	✔
Reactors	✔	✔	✔	✔
HVDC - LCC	✔			✔
HVDC - VSC	✔	✔		✔
Statcoms	✔	✔		✔
SCADA systems	✔	✔		✔
Trackside transformers	✔	✔	✔	
Scott transformers (100 MVA 132kV and 230 kV)	✔			
Traction transformers	✔	✔	✔	✔

Source: I-Sec research, Company data

Order book increased to 6x (in last 36 months)

Hitachi Energy has seen strong order inflow in last few years. Order inflow in FY23, FY24 and FY25E are at INR 68bn, INR 55bn and INR 277bn (including HVDC orders). Note that the company has recently won two major orders in consortium with BHEL for Khavda-Nagpur and Bhadla-Fatehpur HVDC transmission projects. We estimate cost for the two projects at INR 510-550bn out of which equipment cost is estimated at INR 230-250bn; we estimate Hitachi Energy's share at ~INR 200bn. The two HVDC projects are likely to be executed over the next 4-5 years.

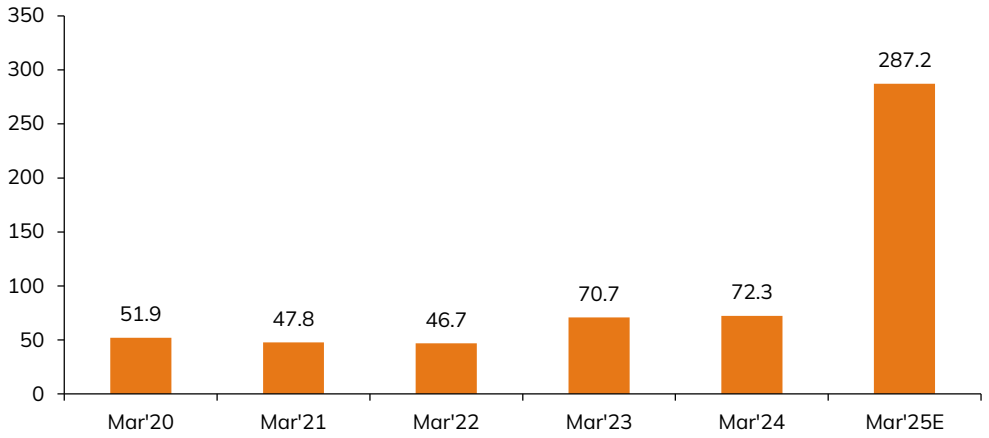
Exhibit 42: Strong order inflow in last 36 months (INR bn)



Source: I-Sec research, Company data

Hitachi Energy's order book (OB) stands at INR 190bn, as of Dec'24. However, considering the recently received Bhadla-Fatehpur HVDC order, **we estimate its OB to have crossed INR 280bn (~5x FY24 revenue)**.

Exhibit 43: Strong growth in OB (INR bn)



Source: I-Sec research, Company data

Buttressed by a series of strong addons

- Hitachi Energy has a strong mobility portfolio – Electrification of railways, SCADA and traction transformers.
- It is in contention to participate in electrification of first high speed railway network of the country.
- Hitachi Energy supplied the first large Scott transformer to upgrade the speed of existing Indian railways network. Indian Railways has a plan to upgrade its entire network on Scott transformers.
- Hitachi Energy Global is looking to utilise the Indian factory for meeting its global requirements.
- It also has strong electrification portfolio to cater to data centre opportunity.

Hitachi Energy is set to benefit from strong tailwinds in transmission. We believe a set of other strong drivers will likely aid its revenues and growth in the medium term.

Hitachi Energy has strong mobility portfolio

Indian railway is adding new trains sets, electrifying its network and upgrading its existing network for increasing the speed of its trains. Hitachi Energy has supplied traction transformers in the past and is likely to benefit from the opportunity.

Exhibit 44: Hitachi Energy's key mobility offerings

Offerings	Key orders won by Hitachi Energy
Trackside Transformers	Trackside transformers for Central Organization for Rail Electrification (CORE)
Traction Transformers	• 157 traction transformers for Chittaranjan Locomotive Works • 47 traction transformers for Banaras Locomotive Works • From Alstom for Delhi and Chennai metro rail
Scott Transformers	India's largest Scott transformers with multiple units of 100 MVA, 132kV and 230 kV
GIS	132kV GIS from L&T for Chennai metro rail

Source: I-Sec research, Company data

Hitachi Energy has the first-mover advantage in Scott transformers

High speed rail needs a new category of transformers, Scott transformers, which may lead to high load carrying capacity, increased power and efficiency of trains. A Scott transformer primarily converts a three-phase power supply to a two-phase power supply. Thus, a Scott transformer is likely to improve the supply of power, reduce harmonics and thus improve efficiency, lower fluctuation in voltage and result in higher speed of trains. Recently, Hitachi Energy supplied Scott transformers to Indian Railways.

Submitted bids for electrification of first High Speed Rail

India is developing its first high speed rail network between Mumbai and Ahmedabad. A consortium of Sojitz of Japan and Larsen & Toubro (L&T) of India has been awarded an INR 108.6bn (USD 1.32bn) contract for the electrification of the entire 508km Mumbai-Ahmedabad high-speed line. Hitachi has submitted its bid to be part of the electrification contract.

Indian factories are acting as feeder factories

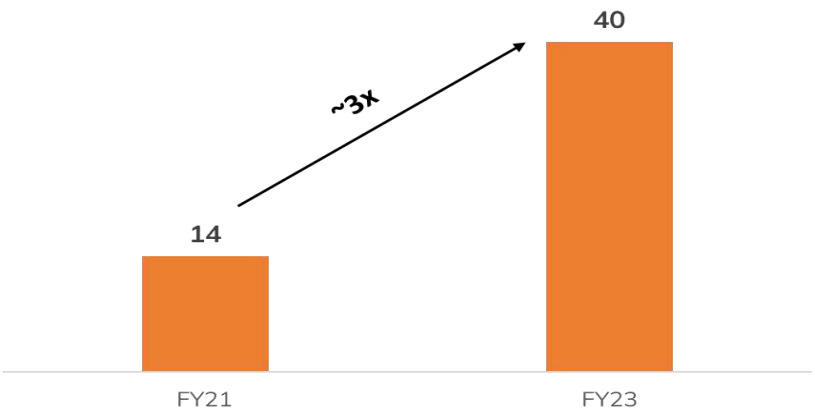
Hitachi Energy Global is setting up feeder factory across the world. The strategy is to a) standardise parts and components b) economies of scale in feeder factories and c) local value addition close to customers. Note that 8 products have their global feeder factories in India. Recently, Hitachi Energy Global tapped its Indian arm to supply HVDC components for supplying to Australian HVDC project.

Global order book is at a high

Hitachi Energy's order book has increased by 3x in last three years to USD 40bn. Also, the outlook on world grid investment is very strong. As a result, we believe that Hitachi Energy's Indian arm is also likely to continue to benefit from the global tailwinds.

Also, the visibility of order book has improved from 2 years to 5+ years. It has highlighted the new order book has higher margins compared to the earlier years.

Exhibit 45: Increase in Hitachi Energy Global's order book (USD bn)



Source: I-Sec research, Company data

Data centre investments will aid further

India data centre capacity is expected to rise from its current 900MW to 4000MW in the next 5–7 years. Hitachi Energy, as one of the world's leading providers of electrical grid infrastructure, is a major supplier of energy solutions for data centre operators. Its offerings to cater data centre requirements include substations, GIS, transformers and automation solutions. Hitachi Energy received major orders for Microsoft data centres in Hyderabad and Pune in FY24.

Operating margins set to improve

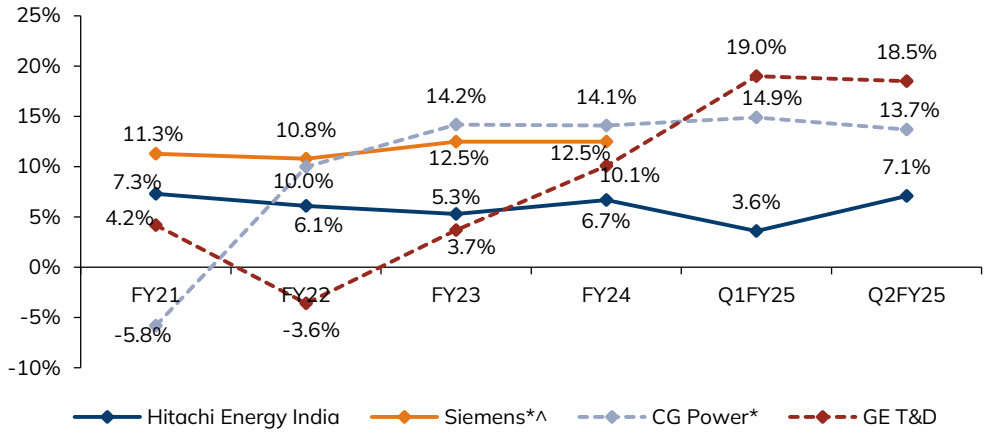
- Hitachi Energy's margins have been lower than industry as it had been struggling with older orders and demerger costs.
- Margin improvement is the focus. Hitachi Energy Global has improved its margin from 6.1% in FY21 to 8.5% in FY23; it has also reported double-digit margins in the last 3 quarters
- Few of the expenses incurred in the last nine months are likely to reverse, aiding in margin improvement in FY25.
- Hitachi Energy is looking to increase its export and service orders in the basket, which we expect to be margin accretive.
- Hitachi Energy had earlier guided for double-digit margins Q4FY25 onwards on a sustainable basis; it achieved double-digit margin of 10.3% in Q3FY25.

Hitachi Energy's margin is expected to improve in double digit in next few quarters on back of improved pricing environment and operating leverage.

Industry margins has improved on improving pricing environment

Hitachi Energy has struggled in last few years. While the competition has performed strongly on margins, Hitachi's margin improvement is delayed on account of legacy issues. However, industry margins have improved; expect Hitachi to follow.

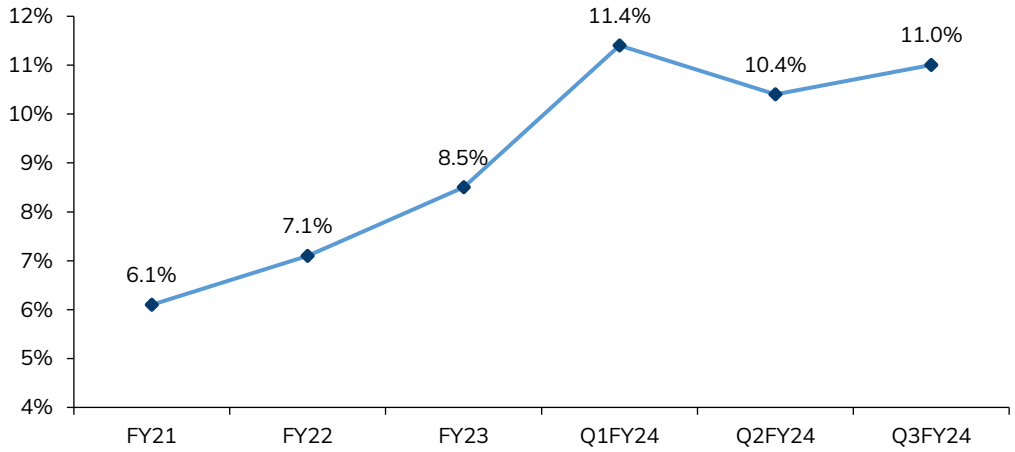
Exhibit 46: Industry EBITDA margins improving; Hitachi Energy to follow suit



Source: I-Sec research, Company data; *Includes other businesses with higher margins, ^September ending FY

Hitachi Energy Global has seen an EBITA margin improvement of 240bps in last 2 years; further it has reported double-digit margins in last 3 quarters.

Exhibit 47: EBITA margins improved for Hitachi Energy Global



Source: I-Sec research, Company data

Targeting increased export and service orders

Hitachi Energy is looking to increase its export and services orders to 25% of overall revenues. Export and services orders are likely to have better margins vs. its base business. In FY24, export orders and service orders contributed 25% and 8% respectively to the revenue. Both service orders and export orders were up 43% YoY in FY24.

Pricing benefit to kick in

The grid solutions are receiving huge tailwind leading to improvement in pricing powers. Also, revenues are likely to jump given the huge order inflow. As a result, we expect margins to improve substantially over the next 24 months.

Guidance for double-digit margins

Hitachi Energy is targeting to achieve double-digit margins. The company expects to achieve this with improving pricing power and increase in export and services orders, which command better margins. We expect the company to achieve double-digit margins FY26 onwards; please note that it achieved double-digit margin in Q3FY25.

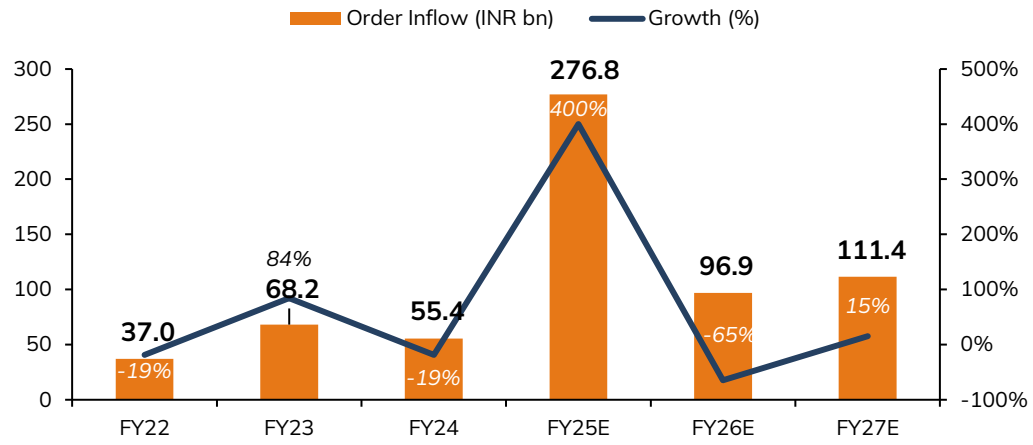
Financials

- With India's efforts to strengthen its grid to accommodate the upcoming renewables additions and the growing demand for electricity, we expect an uptick in awards of HVDC transmission projects in the near term; two HVDC projects have already been awarded in FY25.
- We expect HVDC transmission capex of INR 3.4trn over the next five-six years, resulting in an estimated TAM of INR 1.7trn for HVDC equipment suppliers during the period.
- We estimate Hitachi Energy's OI of ~INR 490bn over FY25–27E; the OI to be driven by India's grid transformation and rail infrastructure enhancement efforts.
- We estimate the company's revenue/EBITDA/PAT to grow at CAGRs of 38%/72%/96% over FY24–27E.
- We envisage a healthy order outlook and considerable capex for Hitachi Energy over FY25–27E.

Strong OI in FY25; OB expected to remain robust over FY25-FY27E

The company has three major segments in its OB – utilities, industries, and transports and infrastructure. Given the TAM outlined, we assume a strong pipeline in FY25E, wherein we see ~5x OI (vs. FY24) to ~INR 277bn. We also believe further growth (%) to come in at a declining level; nonetheless, exceeding past levels of OI.

Exhibit 48: Hitachi Energy to receive OI of ~INR 490bn over FY25–27E (INR bn)



Source: I-Sec research, Company data

Revenue growth of 38% over FY24–27E

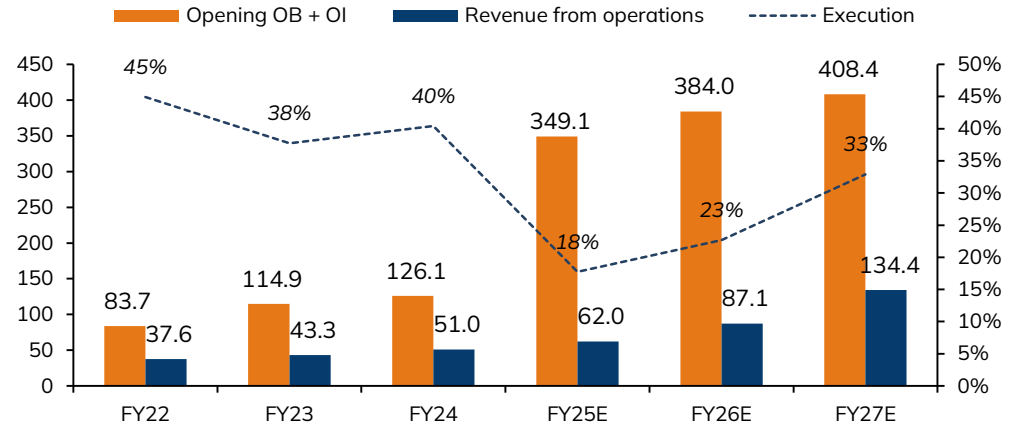
With the expectation of a bloated OB, we expect the rate of execution to fall during the course of the next three years. While the rate of execution stood at ~40% over the last 4 years, we build-in execution of 18%/23%/33% in FY25E/FY26E/FY27E given the jump in OI in FY25E due to large HVDC equipment orders.

Exhibit 49: Drop in execution on account of a bulging OB (INR bn)

	FY22	FY23	FY24	FY25E	FY26E	FY27E
Opening OB	46.7	46.7	70.7	72.3	287.2	296.9
Order Inflow	37.0	68.2	55.4	276.8	96.9	111.4
Opening OB + OI	**83.7**	**114.9**	**126.1**	**349.1**	**384.0**	**408.4**
Revenue from operations	37.6	43.3	51.0	62.0	87.1	134.4
Execution	**45%**	**38%**	**40%**	**18%**	**23%**	**33%**

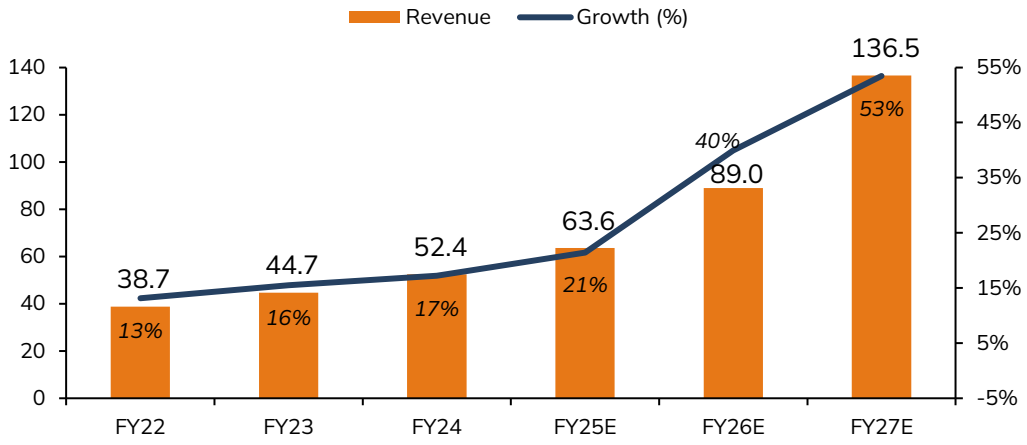
Source: I-Sec research, Company data

Exhibit 50: Drop in execution on account of a bulging OB (INR bn)



Source: I-Sec research, Company data

Exhibit 51: Revenue growth of 38% over FY24–27E (INR bn)

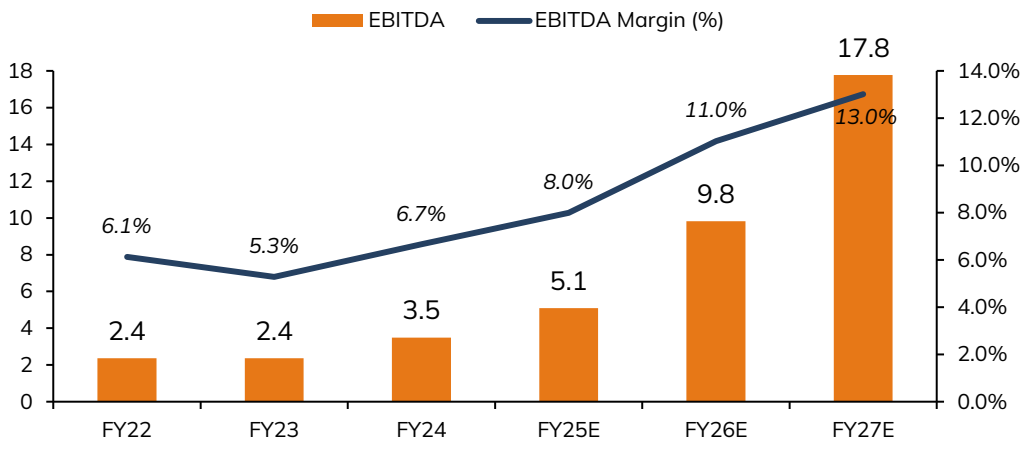


Source: I-Sec research, Company data

EBITDA margin to improve to ~13% in FY27E (vs. ~7% in FY24)

Margins have historically been low, since the company had been struggling with older orders and demerger costs. However, margins are set to improve hereon, due to: 1) focused margin improvement (as seen with the parent); 2) expected expense reversal in FY25E; and 3) growth in the export basket.

Exhibit 52: EBITDA margin to improve to ~13% in FY27E

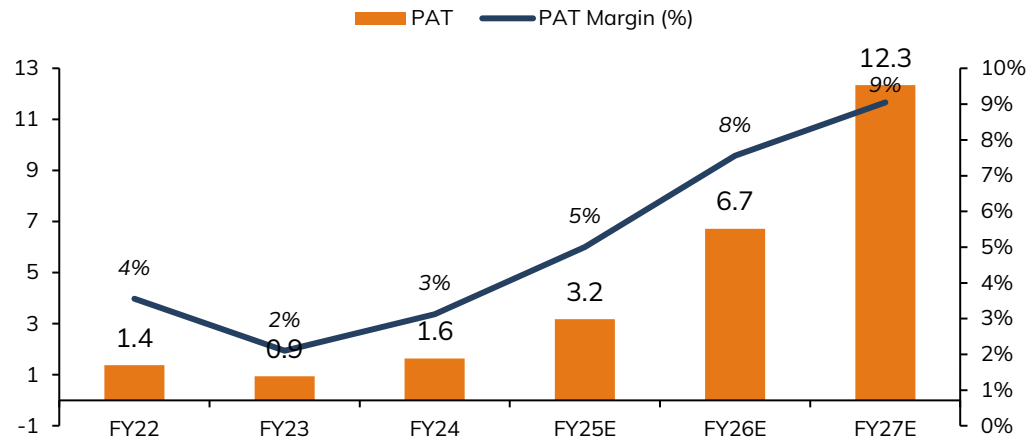


Source: I-Sec research, Company data

PAT to grow at a 96% CAGR over FY27E

The culmination of a sanguine order pipeline and margin efficiencies are expected to lead to a 96% CAGR for PAT over FY24–27E.

Exhibit 53: PAT to grow 96% CAGR over FY27E (INR bn)

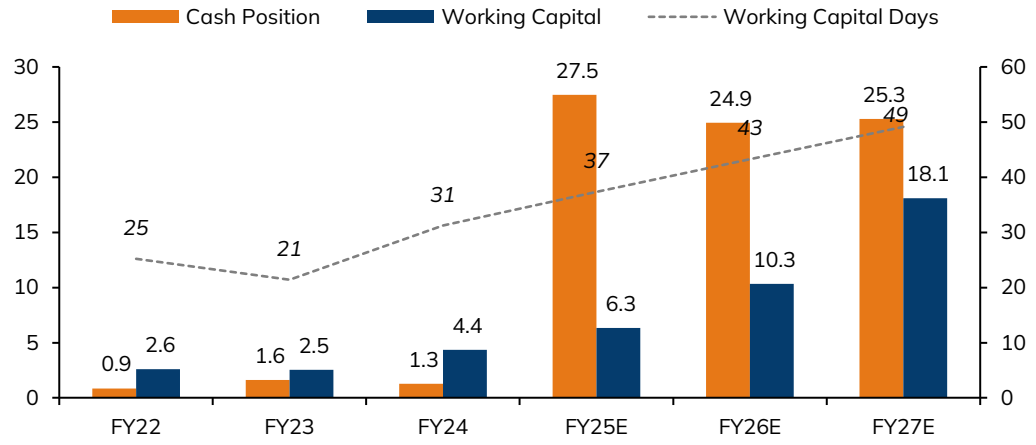


Source: I-Sec research, Company data

Cash position and working capital to inflate

Given the estimated profit growth and proceeds from its recently concluded QIP, we estimate the company to hold a larger cash position, despite the upcoming capex requirements. Its working capital requirement is also expected to increase in-line with the revenue growth.

Exhibit 54: Increase in cash position and working capital (INR bn)



Source: I-Sec research, Company data

Valuation and outlook

India is upgrading its grid to prime for evacuation of ~900GW (vs. 400GW now). The nation is also targeting 43% of electricity consumption by renewables by 2030 (vs. 23% now). As a result, transmission capex is set to pick up after FY20–24's subdued investment cycle. We estimate INR 3.4trn capex on inter-state transmission over the next 4–5 years. Out of which, the need for HV equipment is on the rise. With rising complexity of the grid due to a potential influx of renewables, unique challenges in stability shall emerge. To ensure a stable grid, the need for specialised equipment like STATCOMS, reactors etc. shall become a necessity. With Hitachi Energy being at the fore-front of this transition, we believe the company will likely see maximum benefit in India's pursuit of grid strengthening. It has already received equipment orders for two large HVDC transmission projects, in consortium with BHEL; this has translated into strong estimated OB of ~INR 290bn as of FY25E.

Railway electrification is another big opportunity. Indian Railways is looking to electrify and upgrade its network to increase the speed of the trains. Hitachi Energy, with its Scott transformers, trackside and traction transformers, is ready to tap into this opportunity.

We initiate coverage on Hitachi Energy with a **BUY** rating and a target price of **INR 16,617** per share, valuing the stock at 60x FY27E earnings. The stock is currently trading at **46x FY27E** EPS. The multiple factors in Hitachi Energy's strong foothold in transmission equipment especially HVDC (with presence in both LCC and VSC technologies). It has already won orders for both the HVDC projects awarded in FY25 significantly improving the OB; we estimate the OB as of FY25E at ~INR 287bn (book to bill of ~4.5x). It is expected to further benefit from the HVDC project pipeline. Given the OB, we expect the company to have strong execution over the next 3 years; we estimate the company's profit to grow at 96% CAGR over FY24-FY27E, significantly higher than peers.

Exhibit 55: Initiate at BUY; INR 16,617 TP

	Earnings	P/E Multiple (x)	Valuation
FY27E PAT (INR mn)	12,350		7,40,974
No. of shares (mn)	44.6	60x	44.6
Per share (INR)	277		16,617

Source: I-Sec research, Company data

Peer valuation

Exhibit 56: Peer set valuations

Name	P/E (x)			EV/EBITDA (x)		
	FY25E	FY26E	FY27E*	FY25E	FY26E	FY27E*
ABB India*^	59	56	49	46	44	38
Honeywell Automation	54	43	36	40	31	26
Grindwell Norton^	49	41	36	33	27	24
Carborundum Universal^	41	35	29	26	22	19
GE Vernova T&D	60	48	39	45	31	26
Cummins India Ltd^	43	37	32	38	34	29
Siemens Ltd^	35	29	25	60	49	42
CG Power and Industrial Solutions Ltd^	89	65	51	65	48	38

Source: I-Sec research, Company data, ^Bloomberg, *Calendar year; Based on CMP as of 15 Apr'25

Key Risks

Delay in award of HVDC transmission projects

India has ambitious grid integration plans. There is a strong near-term pipeline of HVDC transmission projects; two of the four projects have already been awarded, while the other two are expected to be bid out in the next 12 months. Hitachi Energy is likely to be a key beneficiary of India's transmission capex over the next five years. Any significant delays in award of these projects can impact the company's earnings.

Delay in award of railway and metro projects

IR is electrifying and upgrading its existing network for trains with higher speed. Hitachi Energy is expected to benefit from this with its offerings such as traction transformers, trackside transformers, Scott transformers, etc. However, significant delays in railway capex can have a bearing on the order inflow and company's earnings.

Slowdown in industrial capex

Hitachi Energy has diverse products/services offerings for the industrial segment. Slowdown in capex by the industries can impact the company's order inflow and earnings.

Delay in achieving double-digit margins

Hitachi Energy is looking to improve its EBITDA margin to double digits. It has achieved double digit-margin in Q3FY25; on full-year basis, it is expected to achieve double-digit margin FY26 onwards. It is expected to achieve so through a combination of better pricing power and increase in share of higher-margin export and services orders. Any delay in achieving the double-digit EBITDA margins could impact the company's earnings.

Annexure

HVAC vs. HVDC (detailed comparison)

In earlier days, during the era of war of current (**AC vs. DC**, late 1880s), The DC transmission was first introduced but it was considered very inefficient due to the lack of equipment for its voltage conversion such as a transformer, which can easily convert AC voltages from low to HV and vice versa. While there were some low-voltage **DC generating stations** that could only supply power to a couple of miles radius, any further than that, the voltage dropped significantly. Thus, they require multiple generating stations in a small area which was very expensive.

While DC shows very low losses at HV transmission as compared to AC, a **Mercury Arc Valve** (Rectifier) was used to convert HVAC into DC for long-distance transmission but the equipment used at the terminal stations was very bulky, expensive and required frequent maintenance. While AC transmission only needs a transformer, which is more efficient, inexpensive and reliable. Therefore, the AC transmission system was adopted for power transmission over long distances.

While transmitting HV AC or DC, there are few points that need to be taken into consideration before choosing an efficient form of power transmission.

HVAC and HVDC

HVAC stands for High Voltage Alternating Current while HVDC stands for High Voltage Direct Current. These are generally the range of voltages either AC (HVAC) or DC (HVDC) that are used, for power transmission over long distances. However, HVDC is preferred for transmitting power over long distances usually more than 600km.

Nowadays both types of power transmission are used all over the world. While these both have some merits & demerits, we are going to discuss each of them briefly in this article below.

Cost of transmission

We note that power transmission over long distances requires high voltages. The power is transmitted between terminal stations that convert the voltage levels. So, the total cost of transmission depends on the terminal station's cost and the cost of the transmission line.

Terminal station

The high voltages are transmitted between electrical terminal stations and their job is voltage conversion. In the case of AC, the equipment used for voltage conversion at these terminals is mainly transformers that convert between high and low voltage. While in the case of DC, the terminal stations use thyristor or IGBTs based converters for conversion between high and low DC voltage.

Since the transformers are more reliable and cheaper than these solid-state converters, the AC terminal stations are cheaper than DC terminal station. Therefore, voltage conversion in AC is inexpensive then DC.

Transmission line

The transmission line cost depends on the number of conductors being used and the cost of the transmission tower.

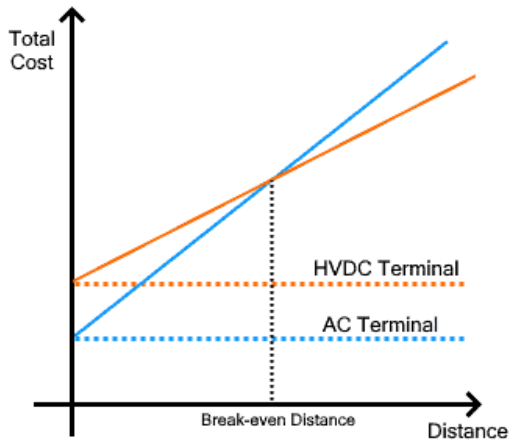
In the case of conductors being used for transmission, the HVDC transmission requires only two conductors, while the HVAC transmission system requires three or more than three conductors (including the bundled conductor due to corona effect).

Because of the heavy mechanical load on AC transmission towers, their support needs to be stronger and it must be wider and taller than HVDC transmission towers. The transmission line cost increases with the distance and it is far greater than the HVDC line per 100km of a transmission line.

Overall cost of transmission

The overall cost of transmission depends on terminal cost (remains constant) and line cost (increases with distance). Therefore, the overall cost of the transmission system increases with distance.

Exhibit 57: HVDC vs HVAC transmission cost



Source: I-Sec Research; Siemens; Electrical Technology

The transmission distance at which the overall investment cost for HVAC starts increasing than HVDC is called break-even distance. This distance is estimated at ~400–500 miles (600–800 kilometres). HVDC is a better choice for power transmission over the break-even distance. However, below this distance, HVAC is more economical than HVDC. This information can be easily understood by the graph above.

Related Post: ***What Happens When an AC Line Touches a DC Line?***

Flexibility

Since the HVDC transmission is used for transmission over long distances between two points, we cannot take power at any point in-between because it would need an expensive converter to step down such high DC voltages. While HVAC transmission offers **flexibility** by utilizing inexpensive equipment like transformers at multiple terminal stations to step down these high voltages.

Power Losses

The HVAC power transmission experiences multiple power losses such as Corona losses, skin effect, radiation losses, Induction losses, etc.

When the voltage increases above a certain limit, the air surrounding the conductor starts ionizing & generates sparks that waste some energy, this is called **corona discharge**. The losses due to corona discharge also depend on the frequency & since DC has zero frequency, the corona loss in HVAC is almost 3 times more than in HVDC.

The alternating current flow in a conductor is divided in such a way that the current density tends to stay largest at the surface of the conductor & less at the center, this is called **skin effect**. Since much of the cross-sectional area is ineffective & we know that the resistance is directly proportional to the cross-sectional area, the resistance of the conductor increases. However, the DC current in a conductor is uniformly distributed

because the skin effect only depends on the frequency. Therefore, only HVAC transmission experience power loss due to skin effect.

Current & Voltage Ratings of Cable

As we know, the voltage & current ratings of a cable are the maximum allowable limit that it can tolerate. The AC has a peak voltage & current that is actually 1.4 times larger than its average (the actual average power delivered) or its DC value. But in DC the peak & average values are the same.

The Skin Effect

The skin effect causes the conductor to carry most of the current at its surface & less current at the core. It depends on the frequency & it is directly proportional to it. It decreases the **efficiency of the conductors** being used. Therefore, in order to supply a larger current, the cross-sectional area of the conductor needs to be increased.

Right-of-Way

The right of way is the right to occupy land to & from another piece of land. In the case of HVDC transmission, it has a **narrower** right-of-way because it can use smaller transmission towers with fewer conductors being used i.e. two in case of DC & 3 in case of 3-phase AC. Also, the insulators installed on the transmission tower must be rated for peak voltages in the case of AC.

The right-of-way affects the cost of materials, & construction requirements for the said transmission system. We can say HVDC has a narrower right-of-way than HVAC.

Controllability of Power Flow

The HVAC lacks in controllability of Power flow whereas HVDC links use semiconductor converters based on IGBTs which can be switched on & off multiple times in a cycle. However, these converters are complex but it helps in optimizing the distribution of power flow to the entire system & also improves the harmonic performance. These controlled electronic converters offer quick protection against line faults & fault clearance as opposed to the HVAC system.

Generating Interference

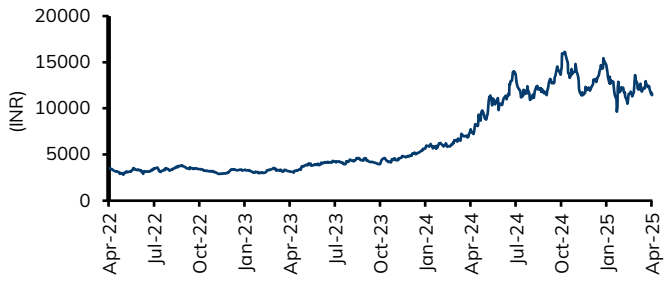
The alternating current generates a continuously variable magnetic field that can cause interference in the nearby communication conductors. Since DC has a uniform magnetic field and it does not cause such interferences.

Exhibit 58: Shareholding pattern

%	Sep'24	Dec'24	Mar'25
Promoters	75.0	75.0	71.3
Institutional investors	14.1	13.7	17.3
MFs and others	6.7	6.7	8.4
FIs/Banks	0.0	0.0	0.8
Insurance	2.0	2.1	2.4
FIIs	5.4	4.9	5.7
Others	10.9	11.3	11.4

Source: Bloomberg, I-Sec research

Exhibit 59: Price chart



Source: Bloomberg, I-Sec research

Financial Summary

Exhibit 60: Profit & Loss

(INR mn, year ending March)

	FY24A	FY25E	FY26E	FY27E
Net Sales	**52,375**	**63,595**	**88,977**	**1,36,530**
Operating Expenses	14,860	18,888	23,281	33,010
EBITDA	**3,490**	**5,087**	**9,819**	**17,779**
EBITDA Margin (%)	6.7	8.0	11.0	13.0
Depreciation & Amortization	900	927	1,020	1,101
EBIT	2,590	4,160	8,799	16,678
Interest expenditure	466	541	801	1,297
Other Non-operating Income	93	681	1,090	1,308
Recurring PBT	**2,217**	**4,301**	**9,088**	**16,689**
Profit / (Loss) from Associates	**-**	**-**	**-**	**-**
Less: Taxes	579	1,118	2,363	4,339
PAT	1,638	3,182	6,725	12,350
Less: Minority Interest	-	-	-	-
Extraordinaries (Net)	-	-	-	-
Net Income (Reported)	**1,638**	**3,182**	**6,725**	**12,350**
Net Income (Adjusted)	**1,638**	**3,182**	**6,725**	**12,350**

Source Company data, I-Sec research

Exhibit 61: Balance sheet

(INR mn, year ending March)

	FY24A	FY25E	FY26E	FY27E
Total Current Assets	38,288	72,926	89,271	1,25,136
of which cash & cash eqv.	1,282	27,468	24,940	25,302
Total Current Liabilities & Provisions	32,645	39,111	53,991	81,727
Net Current Assets	**5,643**	**33,815**	**35,279**	**43,410**
Investments	-	-	-	-
Net Fixed Assets	5,961	5,649	8,715	12,910
ROU Assets	665	665	665	665
Capital Work-in-Progress	626	626	2,800	2,800
Total Intangible Assets	324	359	388	424
Other assets	674	694	714	734
Deferred Tax Assets	-	-	-	-
Total Assets	**13,892**	**41,807**	**48,562**	**60,942**
Liabilities				
Borrowings	**-**	**-**	**-**	**-**
Deferred Tax Liability	**(270)**	**(270)**	**(270)**	**(270)**
provisions	-	-	-	-
other Liabilities	564	592	622	652
Equity Share Capital	85	89	89	89
Reserves & Surplus	13,514	41,396	48,121	60,471
Total Net Worth	**13,599**	**41,485**	**48,211**	**60,560**
Minority Interest	-	-	-	-
Total Liabilities	**13,892**	**41,807**	**48,562**	**60,942**

Source Company data, I-Sec research

Exhibit 62: Cashflow statement

(INR mn, year ending March)

	FY24A	FY25E	FY26E	FY27E
Operating Cashflow	**2,523**	**1,989**	**3,462**	**5,673**
Working Capital Changes	(493)	(1,980)	(3,993)	(7,767)
Capital Commitments	(889)	(650)	(6,290)	(5,332)
Free Cashflow	**3,413**	**2,639**	**9,752**	**11,005**
Other investing cashflow	**2**	**661**	**1,070**	**1,288**
Cashflow from Investing Activities	(887)	11	(5,220)	(4,044)
Issue of Share Capital	-	24,700	-	-
Interest Cost	(409)	(543)	(801)	(1,297)
Inc (Dec) in Borrowings	(1,250)	28	30	31
Dividend paid	(143)	-	-	-
Others	-	-	-	-
Cash flow from Financing Activities	(1,986)	24,185	(771)	(1,266)
Chg. in Cash & Bank balance	**(351)**	**26,186**	**(2,529)**	**363**
Closing cash & balance	1,282	27,468	24,940	25,302

Source Company data, I-Sec research

Exhibit 63: Key ratios

(Year ending March)

	FY24A	FY25E	FY26E	FY27E
Per Share Data (INR)				
Reported EPS	38.6	71.4	150.8	277.0
Adjusted EPS (Diluted)	38.6	71.4	150.8	277.0
Cash EPS	59.9	92.2	173.7	301.7
Dividend per share (DPS)	-	-	-	-
Book Value per share (BV)	320.7	930.4	1,081.2	1,358.1
Dividend Payout (%)	-	-	-	-
Growth (%)				
Net Sales	17.2	21.4	39.9	53.4
EBITDA	47.9	45.8	93.0	81.1
EPS (INR)	74.4	84.8	111.3	83.6
Valuation Ratios (x)				
P/E	325.5	176.2	83.4	45.4
P/CEPS	210.1	136.4	72.4	41.7
P/BV	39.2	13.5	11.6	9.3
EV / EBITDA	152.4	104.8	54.6	30.1
P / Sales	10.2	8.8	6.3	4.1
Dividend Yield (%)	-	-	-	-
Operating Ratios				
Gross Profit Margins (%)	35.0	37.7	37.2	37.2
EBITDA Margins (%)	6.7	8.0	11.0	13.0
Effective Tax Rate (%)	26.1	26.0	26.0	26.0
Net Profit Margins (%)	3.1	5.0	7.6	9.0
NWC / Total Assets (%)	0.4	0.8	0.7	0.7
Net Debt / Equity (x)	(0.1)	(0.7)	(0.5)	(0.4)
Net Debt / EBITDA (x)	(0.4)	(5.4)	(2.5)	(1.4)
Profitability Ratios				
RoCE (%)	15.4	13.0	16.3	24.5
RoE (%)	12.7	11.6	15.0	22.7
RoIC (%)	15.4	13.0	16.3	24.5
Fixed Asset Turnover (x)	8.6	11.0	12.4	12.6
Inventory Turnover Days	67	67	70	71
Receivables Days	114	121	133	143
Payables Days	136	135	140	142

Source Company data, I-Sec research

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Name of the Compliance officer (Research Analyst): Mr. Atul Agrawal, Contact number: 022-40701000, **E-mail Address** : complianceofficer@icicisecurities.com

For any queries or grievances: Mr. Bhavesh Soni Email address: headservicequality@icicidirect.com Contact Number: 18601231122