



Government of India



Empowering Manufacturing 9 Years of Achievements Ministry of Heavy Industries



FAME –I & II

(National Mission of Electric Mobility)

- Production Linked Incentive**
- ✓ **Advanced Chemistry Cell**
- ✓ **Automobile and Auto Components**



**Enhancement of competitiveness in the
Indian Capital Goods Sector Scheme I & II
(National Capital Goods Policy)**





सत्यमेव जयते

Government of India

Ministry of Heavy Industries



Dr. Mahendra Nath Pandey
Hon'ble Minister



Shri Krishan Pal Gurjar
Hon'ble Minister of State



heavyindustries.gov.in

Ministry of Heavy Industries



dash.heavyindustries.gov.in

Ministry of Heavy Industries Dashboard



fame2.heavyindustries.gov.in

FAME 2 Scheme



darpan.heavyindustries.gov.in

Ministry of Heavy Industries Darpna



gecs.heavyindustries.gov.in

GST Exemption Certificate Scheme

Table of Contents

Auto Sector

Comprehensive Govt. Support for EVs	5
FAME India Phase II	6-7
EV Sales (2W, 3W, 4W, e-Buses)	8-11
EV Public Charging Stations (PCS)	12
Production Linked Incentive Scheme for Automobile and Auto Components	13-14
Production Linked Incentive Scheme for Advanced Chemistry Cell	15

Capital Goods Sector

Capital Goods Sector Overview/ Sub sector under Capital Goods Sector	16-17
Capital Goods Scheme	18-19
Technology Innovation Platform (TIPS)	20
Industry 4.0	21
Skill Development through SAMARTH Centers	22

Table of Content

Capital Goods Sector	Technology Acquisition Fund Programme (TAFP)	23
	Integrated Machine Tools Park, Tumukuru, Karnataka	24
	National Conference on Industry 4.0, Kevadia, Gujarat	25
	National conference on Robotics, Bengaluru, Karnataka	26
Heavy Electrical Industries Sector	Heavy Electrical Industries	27-28
	Towards Net Zero : Advanced Ultra Supercritical (AUSC) Technology	29
	Towards Net Zero : Coal Gasification	30
	Towards Net Zero : Carbon Capture	31
	Towards Net Zero : Hydrogen Ecosystem	32-33
	Special Equipment for Space Missions	34

Comprehensive Govt. Support for EVs

Demand Side

Reduce upfront cost –
subsidy to buyer

FAME – II

- Outlay of **Rs. 10,000 crore (\$1.22 billion)**
- Apr, 2019 – Mar, 2024



Electric
Vehicles

Supply Side

Reduce manufacturing
cost

PLI-AUTO

- Outlay of **Rs. 25,938 crore (\$3.16 billion)**
- Sep, 2021 – Mar, 2027

PLI-ACC

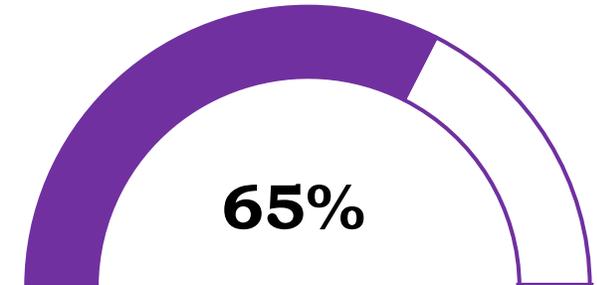
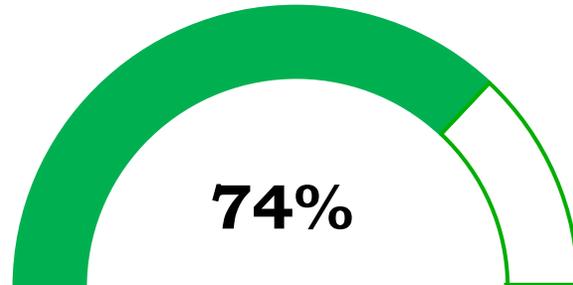
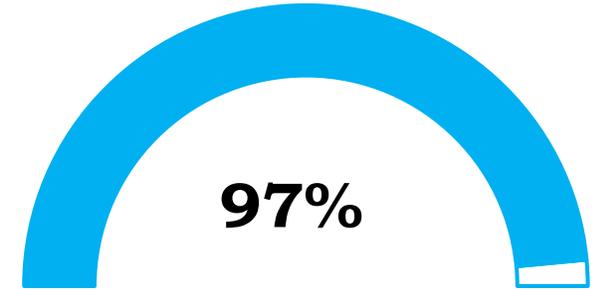
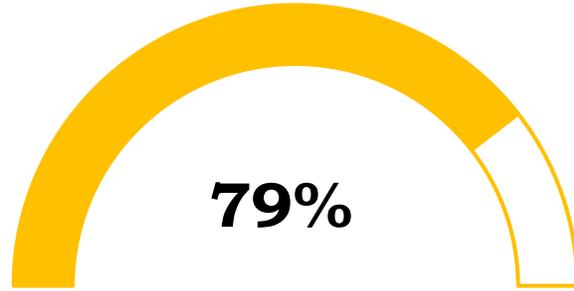
- Outlay of **Rs. 18,100 crore (\$2.21 billion)**
- **50 GWh**
- Jun, 2021 – Dec, 2029



Faster Adoption and Manufacturing of Electric Vehicles (FAME India Phase II)



FAME-II: Physical Progress

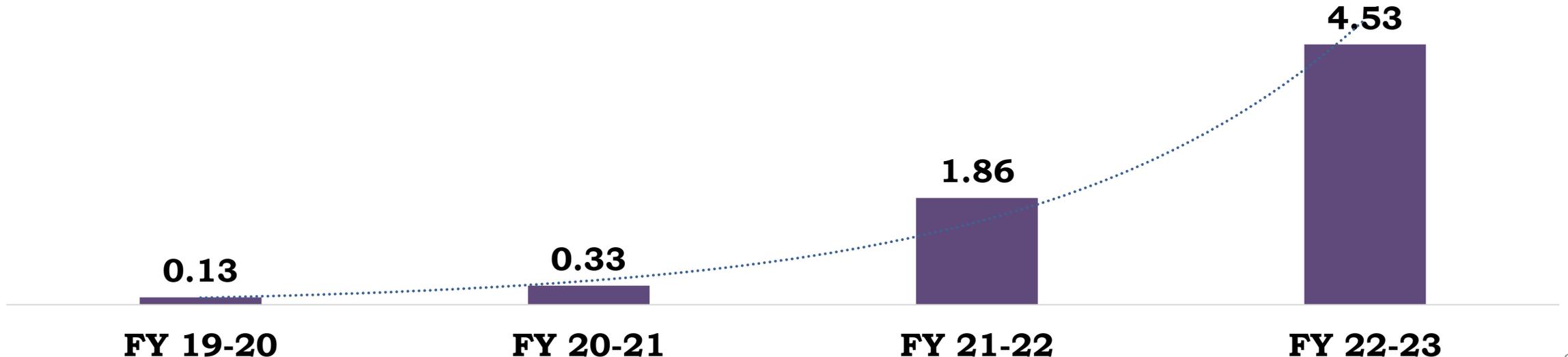




e-2W Sales (Nos. in lakh)

Description	FY 19-20	FY 20-21	FY 21-22	FY 22-23
ICE vehicles	190.08	132.01	132.54	152.92
Registered EVs	0.26	0.44	2.52	7.27
Vehicles under FAME-II	0.14	0.38	2.09	3.03
% of e2W sold	0.13	0.33	1.86	4.53

e-2W as % of total 2W sold

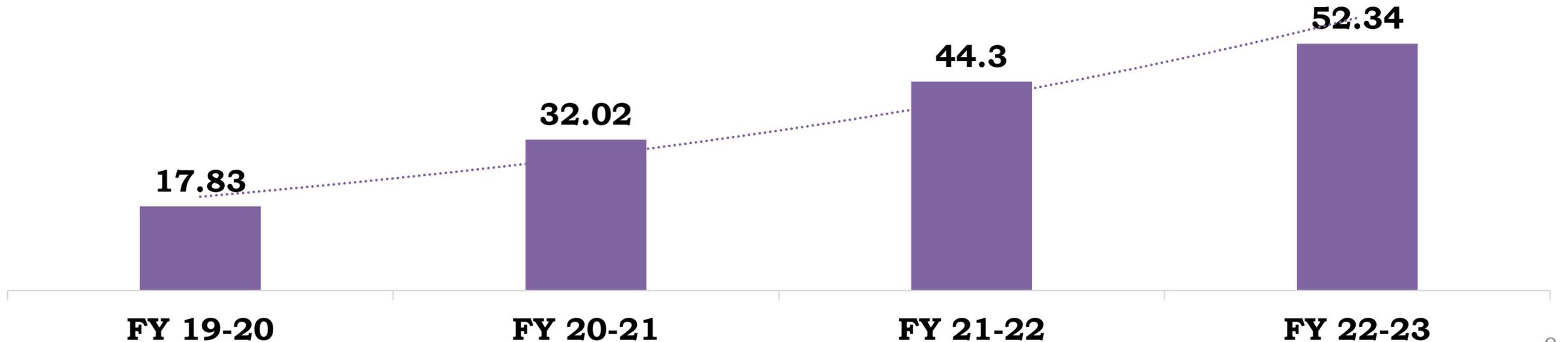




e-3W Sales (Nos. in lakh)

Description	FY 19-20	FY 20-21	FY 21-22	FY 22-23
ICE vehicles	6.59	1.91	2.30	3.65
Registered EVs	1.43	0.90	1.83	4.01
Vehicles under FAME-II	0.04	0.10	0.28	0.32
% of e3W sold	17.83	32.02	44.3	52.34

e-3W as % of 3W sold

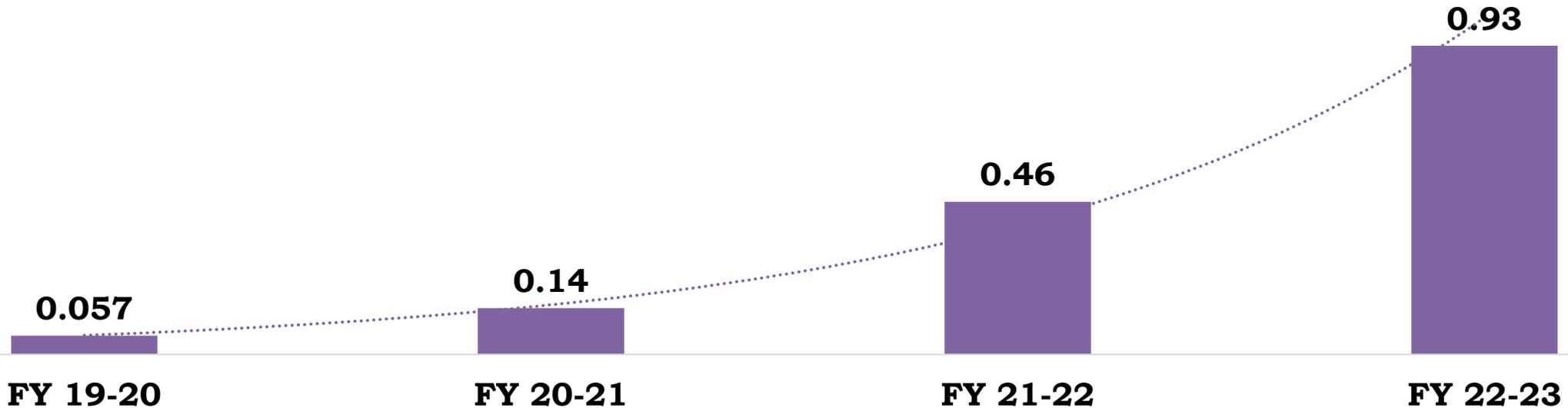




e-4W Sales (Nos. in lakh)

Description	FY 19-20	FY 20-21	FY 21-22	FY 22-23
ICE vehicles	43.8	38.03	42.2	50.64
Registered EVs	0.025	0.053	0.199	0.48
Vehicles under FAME-II	0.01	0	0.01	0.04
% of e4W sold	0.057	0.14	0.46	0.93

e-4W as % of 4W sold

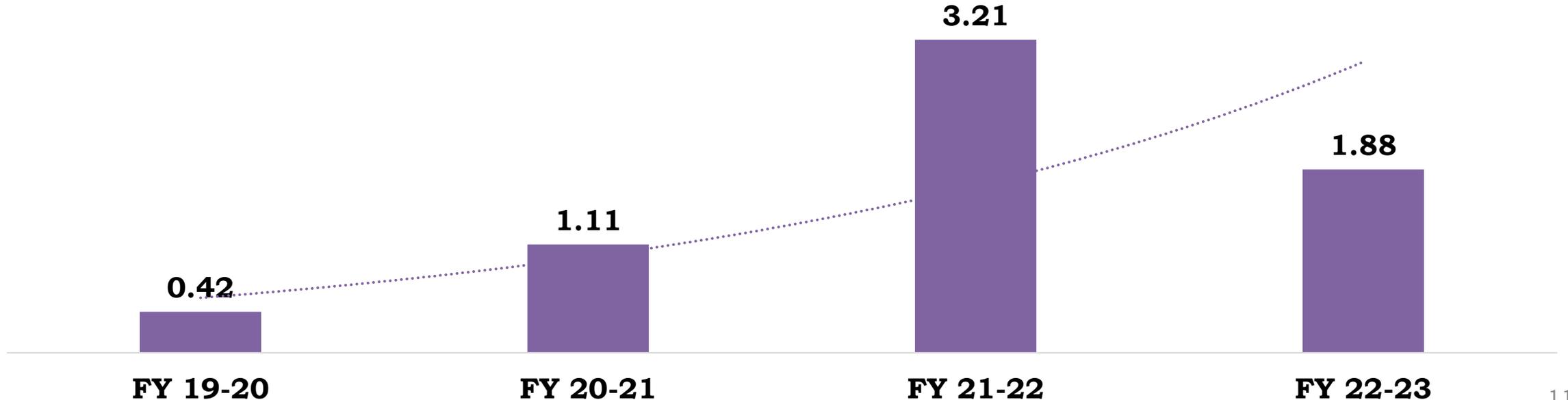




e-Buses Sales (In Nos.)

Description	FY 19-20	FY 20-21	FY 21-22	FY 22-23
ICE vehicles	85,830	19,410	31,761	82,725
Registered EVs	363	217	1,066	1,585
Vehicles under FAME-II	-	428	718	1,580
% of eBuses sold	0.42	1.11	3.21	1.88

e-Buses as % of buses sold



EV Public Charging Stations (PCS)



- MHI sanctioned - Rs. 800 crore to 3 OMCs
- Rs. 560 crore disbursed by MHI.
- Commissioning - 7,432 EV PCS.
- Eligible use – Public Transport.
- 148 EV PCS being commissioned by other entities.

Production Linked Incentive Scheme for Automobile and Auto Components (PLI-AUTO)

	Parameter	Projected for 5 years (2022-27)	Actual for FY2022-23 as per QRR
	Investment	Rs. 67,690 crore	Rs. 8,898 crore
	Employment	1,48,147	19,086
	Incremental Sales over Base Year FY2019-20	Rs. 2,31,500 crore	Nil/ Rs. 22,591 crore*

* 50 applicants reported incremental sales of ₹22,591 crore. However, products are not “pre-approved” for DVA of minimum 50%, through Testing Agencies of MHI.

Ease of Doing Business in PLI-AUTO: Issued SOP for DVA

❑ **Standardization of approach:**

- 19 categories of AAT vehicles & 103 AAT Components.
- 4 Testing Agencies of MHI.

❑ **Lessons learnt from FAME-II:**

- Use of imported parts,
- Change in supply chain after issue of certificate,
- Routing of imports through traders,
- Destruction/ non-maintenance of Records,

❑ **Need for Desk Appraisals, Field**

Visits & Period Surveillance Assessments.

Production Linked Incentive (PLI) Scheme for
Automobile and Auto Components (PLI-AUTO)

STANDARD OPERATING PROCEDURE (SOP)

For Certification of Domestic Value Addition (DVA)



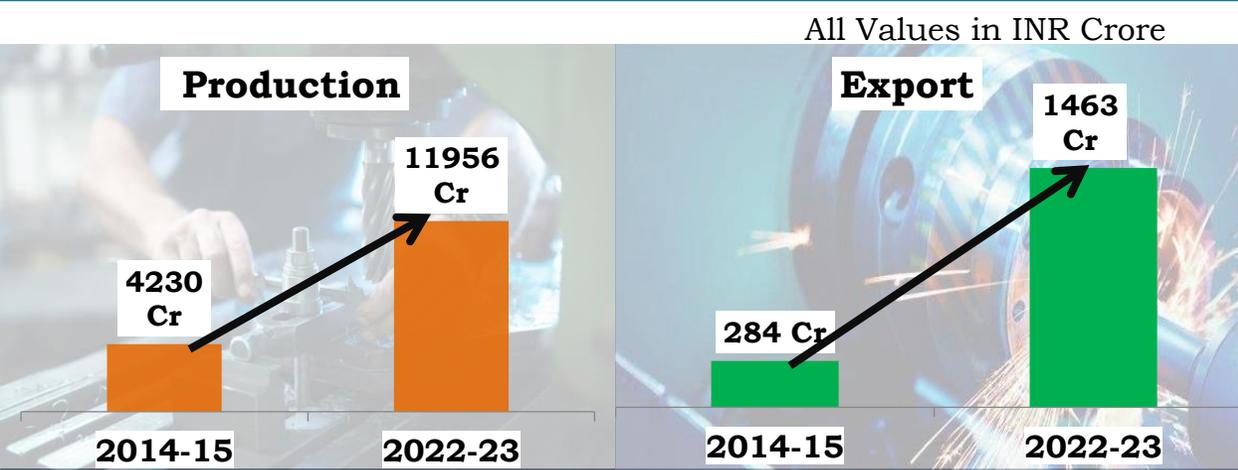
Production Linked Incentive Scheme National Programme on Advanced Chemistry Cell (PLI-ACC)

Name of SPV	Capacity Awarded (GWh)	Investment up to 31/03/2023 (Rs. Crore)	Technology
Ola Cell Technologies Pvt. Ltd.	20	34	in-house
ACC Energy Storage Pvt. Ltd.	5	77	in-house
Reliance New Energy Battery Storage Ltd.	5	2003	acquired technology from Lithium Werks, Faradion and Ambri
Total	30	2,114	
Rebidding for Balance 20 GWh – Under Process			

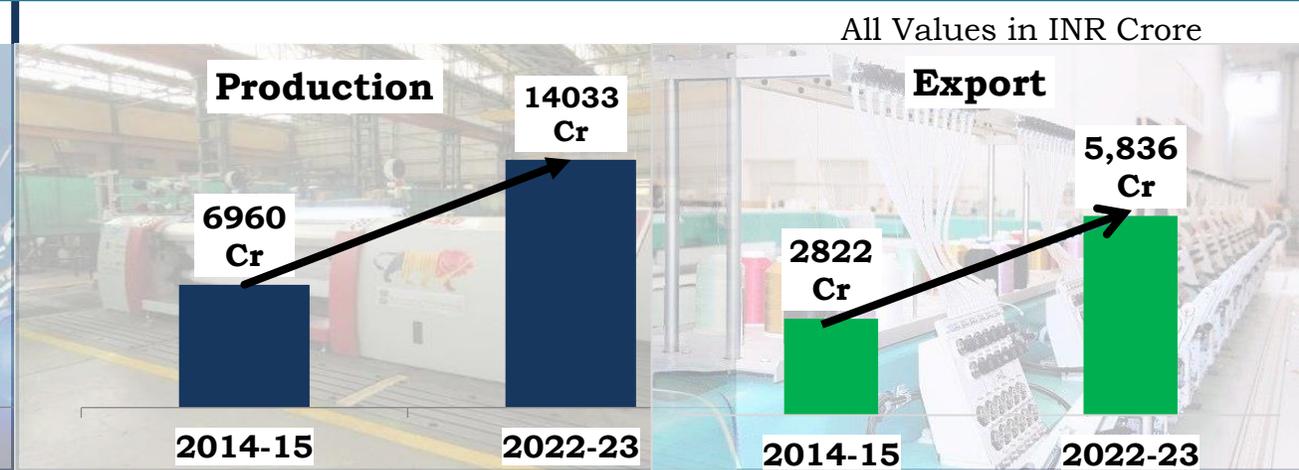
Subsectors under Capital Goods Sector



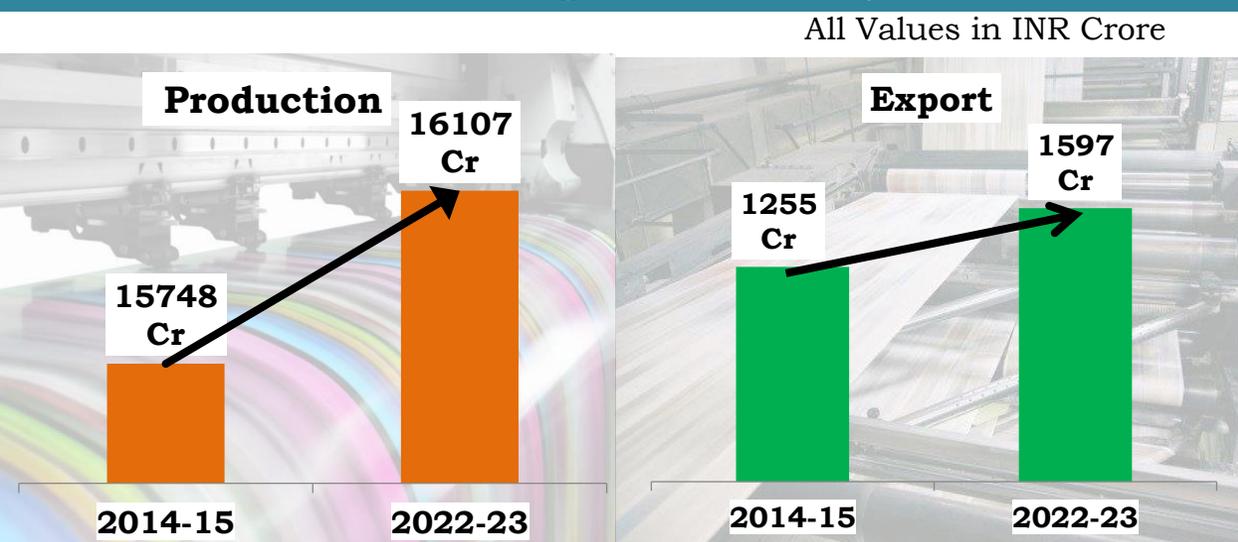
Machine Tools



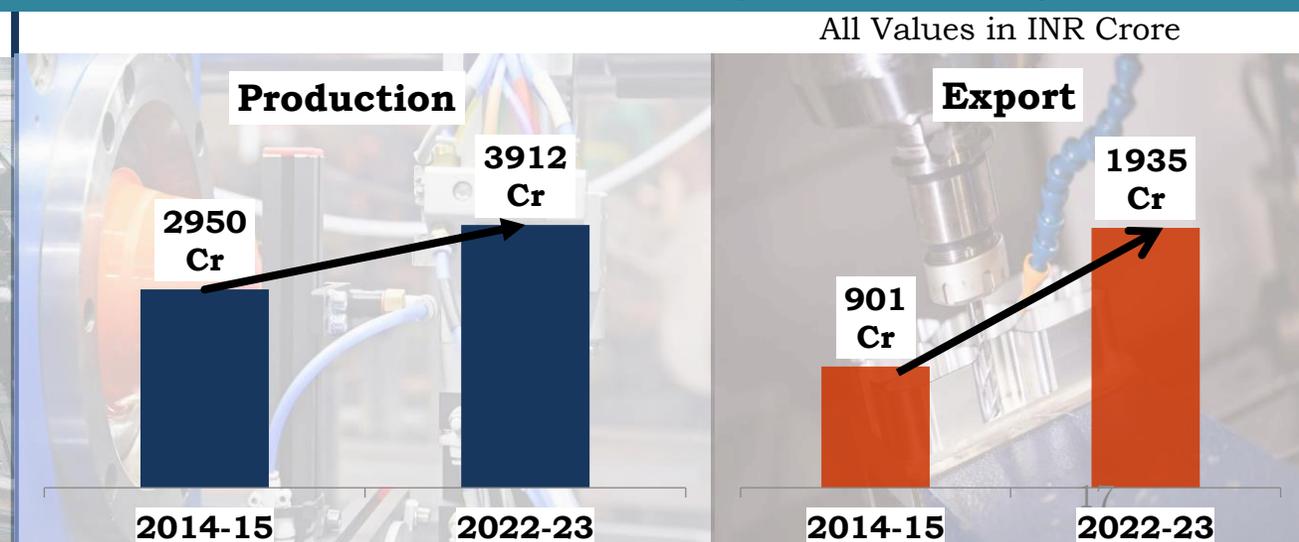
Textile Machinery



Printing Machinery



Plastic Processing Machinery

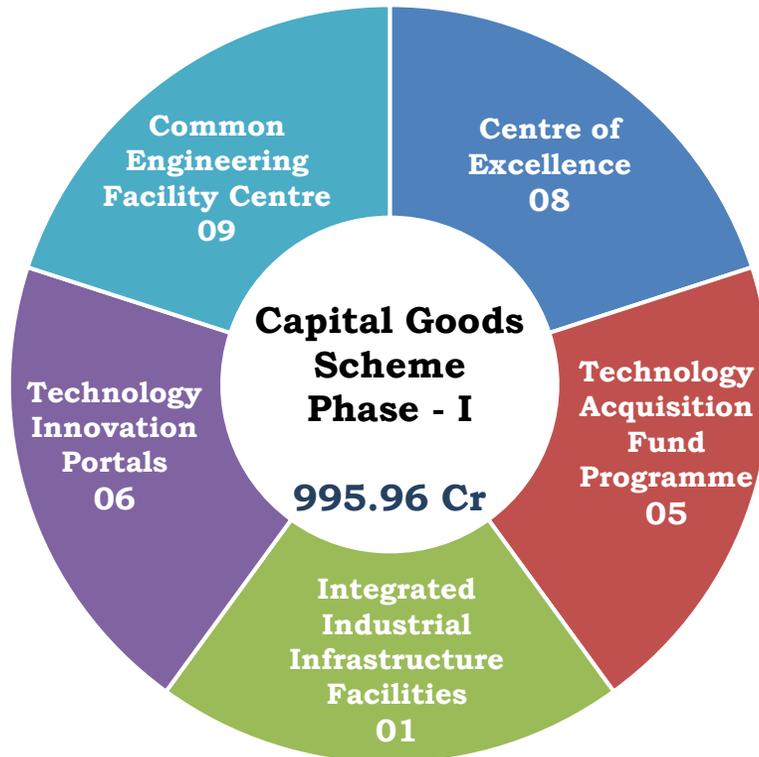




Capital Goods Scheme

Capital Goods Scheme- Phase-I

- ✓ **33 projects** sanctioned for advanced manufacturing technology
- ✓ **Total Number of patents filed in Phase -I: 12**
- ✓ **Total Budgetary Support of Rs. 995.96 Crore**



S.No	Name of the component	No of proposal sanctioned till date
1	Centre of Excellence(CoE)	8
2	Technology Acquisition Fund Programme (TAFP)	5
3	Common Engineering Facility Centre (CEFC)	9
4	Technology Innovation Portals (TIPS)	6
5	Integrated Industrial infrastructure Facilities (IIIF)	1
6	Other projects	4
Grand total		33

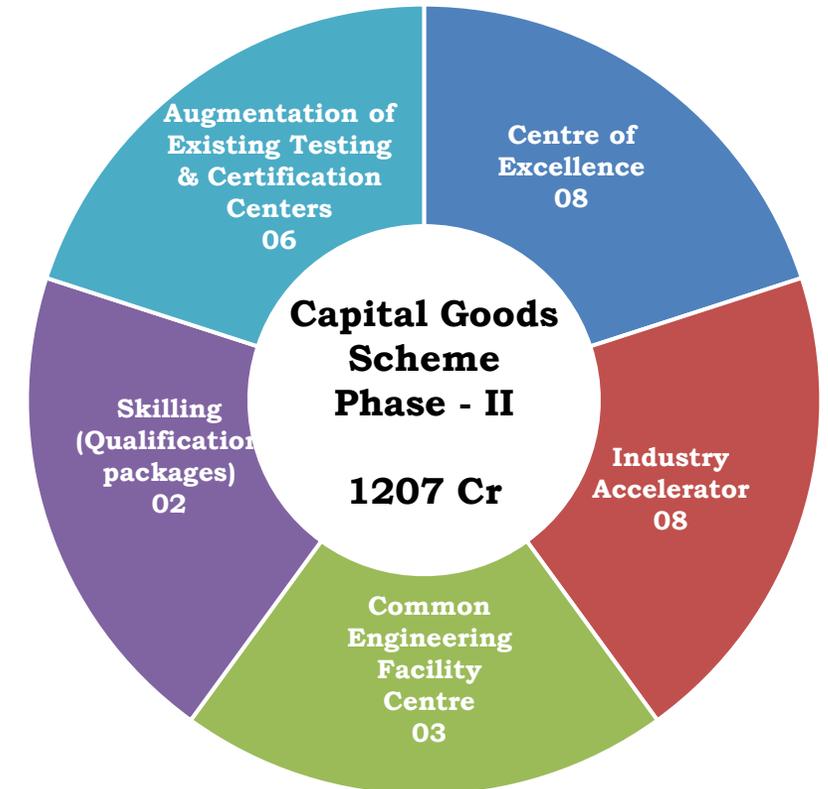


Capital Goods Scheme



Capital Goods Scheme- Phase-II

- ✓ During Phase-II, Total **27 projects** dedicated to advancing manufacturing technology
- ✓ Total Budgetary support of Rs. 909.71 Crore



Sr. No.	Name of the component	No of proposal sanctioned till date
1	Centre of Excellence (CoE)	8
2	Industry Accelerator	8
3	Common Engineering Facility Centre	3
4	Augmentation Of Existing Testing And Certification Centres	6
5	Skilling (Qualification packages)	2
Grand Total		27

Technology Innovation Platform (TIPS)

- To bridge the gap between Students, Academia and Industries, **Six** Technology Innovation Platforms (**TIPs**) have been established to bring nation's technical resources and the concerned Industry on one platform to kick start and facilitate identification of technology problems faced by Indian Industry and crowd source solutions for the same. TIPs have been already subscribed by more **76500** professionals across India.

3200	Public / Pvt. Companies (Incl. MSMEs)	2300	Academia
2070	Experts	320	Start-ups
167	R&D/Testing Centers	64000	Students





Industry 4.0

- [SAMARTH \(Smart Advanced Manufacturing and Rapid Transformation Hub\) Udyog Bharat](#)
- To boost present technology levels
- Created a “**Smart Factory**” with cyber physical systems, creates a virtual copy of physical world and make decentralized decisions



- 01 Smart Manufacturing Demo & Development Cell, CMTI Bengaluru
<https://cmti.res.in/smart-manufacturing-iiot-artificial-intelligence/>
- 02 IISc Smart Factory, Bengaluru
<https://cpdm.iisc.ac.in/smartmanufacturing/>
- 03 IITD-AIA Foundation for Smart Manufacturing, Delhi
<https://www.iafsm.in/>
- 04 Centre for Industry 4.0, Pune
<https://www.c4i4.org/>



Skill Development through SAMARTH Centers

579

Professionals educated by
Digital Champion Program,
Centre for Industry 4.0 (C4i4)
Lab, Pune

1,200

Professionals



200

Professionals participated in
Smart Manufacturing Program,
Indian Institute of Technology,
Delhi

196

Professionals Certified by
PG Certifications,
Indian Institute of Science,
Bangalore

60

Professionals participated in Smart
Manufacturing Short-term Courses,
Indian Institute of Technology,
Kharagpur

150

Professionals participated in
Smart Manufacturing Program,
Central Manufacturing Technology
Institute, Bangalore



Technology Acquisition Fund Programme (TAFP)

- ✓ TAFP provided financial assistance to industries to acquire critical technologies
- ✓ **Five** projects were supported under TAFP
 1. Four Guide way CNC Lathe
 2. Heavy Duty High-Reliability Electrical Specialty Power Cables
 3. Titanium Casting with Ceramic Shelling Technology
 4. Robotic Laser Cladding Technology
 5. Turn Mill Centre



**Developed & Commercialized of Turn Mill Centre
(HMT Machine Tool Ltd, Bengaluru)**



**Developed & Commercialized of Titanium Casting
with Ceramic Shelling Technology
(PTC Industries Ltd)**



Integrated Machine Tools Park, Tumukuru, Karnataka

- ✓ Indian Machine Tool Industry ranks 11th in production and 8th in consumption
- ✓ Setting up a Machine Tool Park is essential to invite domestic and foreign companies to establish manufacturing units
- ✓ Spread across around 200 hectares (529.50 acres)
- ✓ 158 plots of various sizes are available for large and MSME industries.
- ✓ It will help in making cost effective, Hi-tec machine tools and increase Export Capacity.



**Integrated Machine Tools Park near
Tumakuru, Karnataka**



**Aerial View of Tumakuru Machine Tool
Park, Karnataka**

National conference on Industry 4.0, Kevadia, Gujarat



Ministry of Heavy Industries
Government of India

75
Azadi Ka
Amrit Mahotsav

- ✓ Held in Kevadia, Gujarat on 7th October 2022
- ✓ Enhanced Academia and Industry collaboration to enable them to work together towards widespread implementation of I4.0
- ✓ Sensitized the Industry about the importance and relevance of I4.0 and spread awareness to adopt emerging I4.0 technologies
- ✓ 150 people Attended in person and 15000 people attended virtual

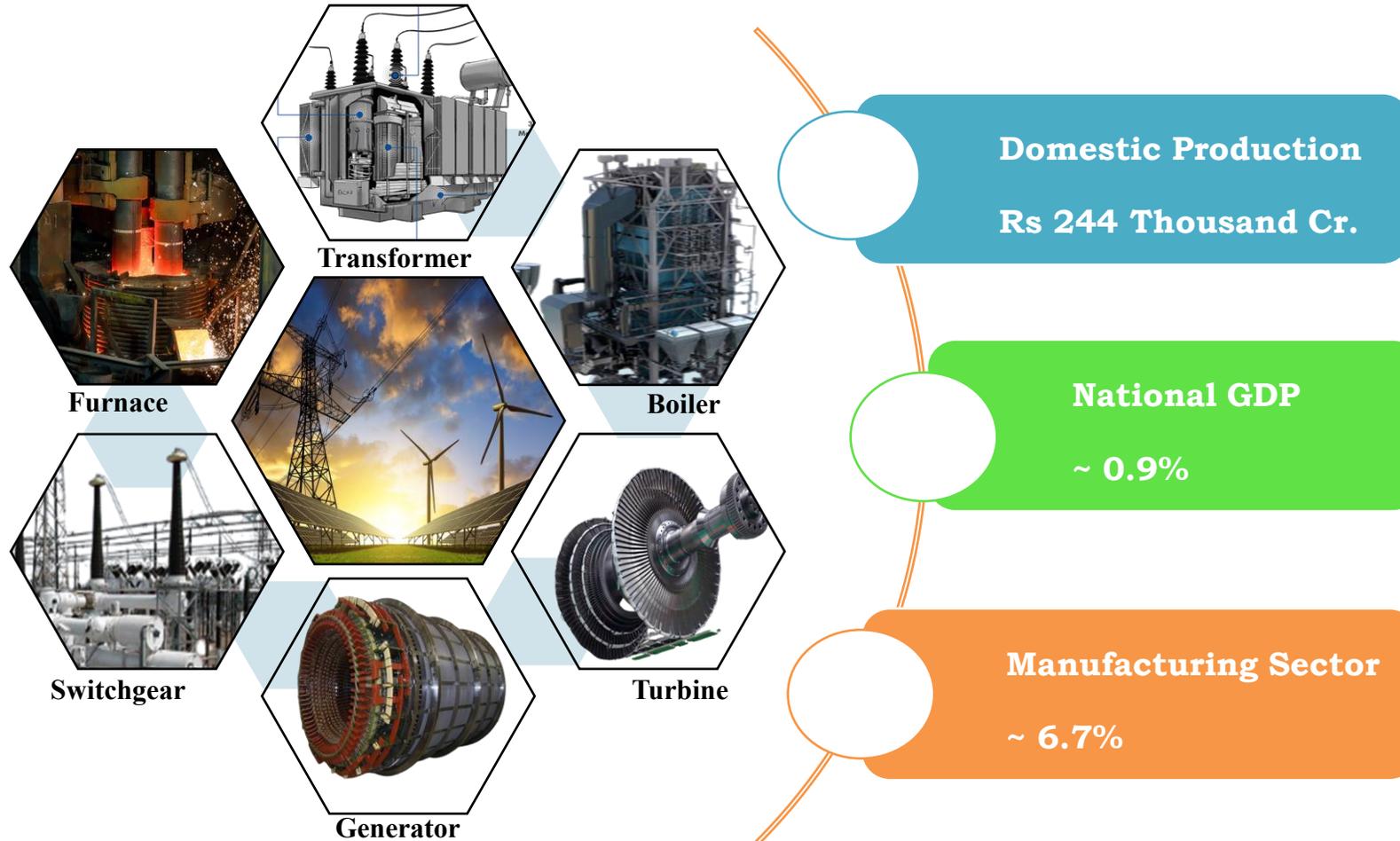


National conference on Robotics, Bengaluru, Karnataka

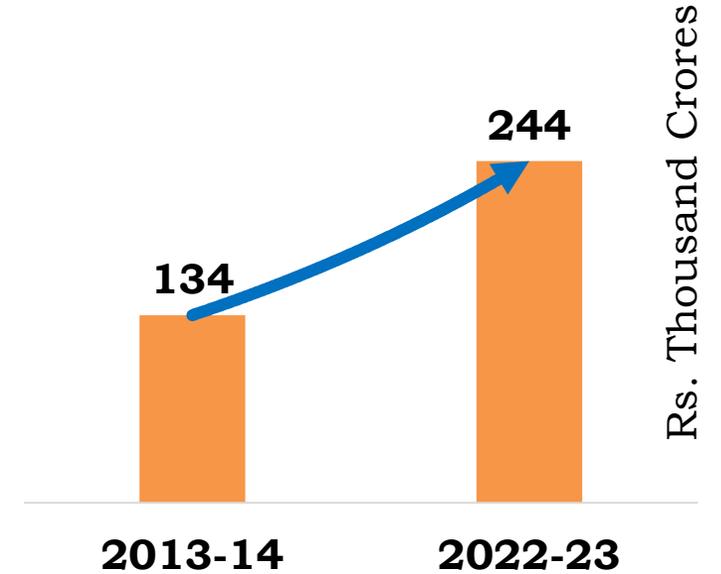
- ✓ Held in CMTI, Bengaluru on 3rd and 4th July 2023
- ✓ A step towards making India a global leader in robotics & autonomous systems in manufacturing.
- ✓ It enabled the participants to discover synergies through keynote sessions, panel discussions, robotics exhibition and robotics competition
- ✓ Robotics Exhibition was also organised to showcase of innovation and automation.
- ✓ The conference was attended by 350 people in person.



Current Growth & Contribution



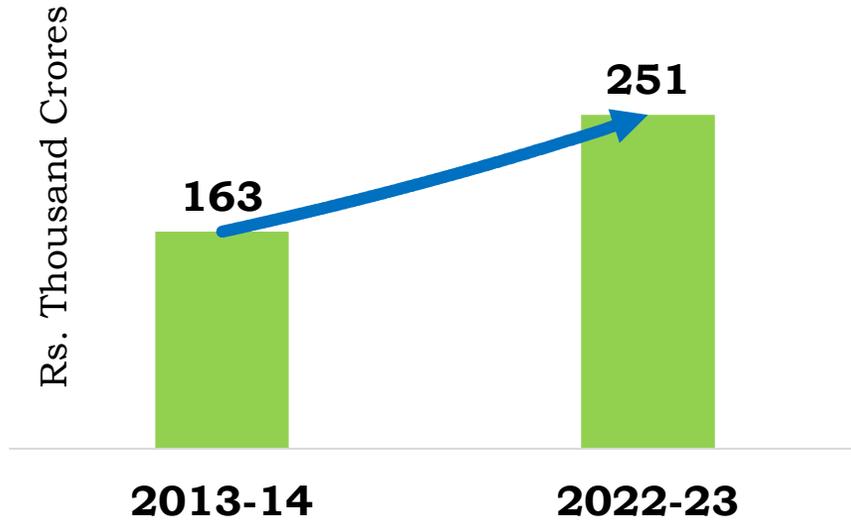
Domestic Production



- ✓ Production of Domestic Industry Growth at CAGR of 6.89 % in last 9 Years.

Market Trends

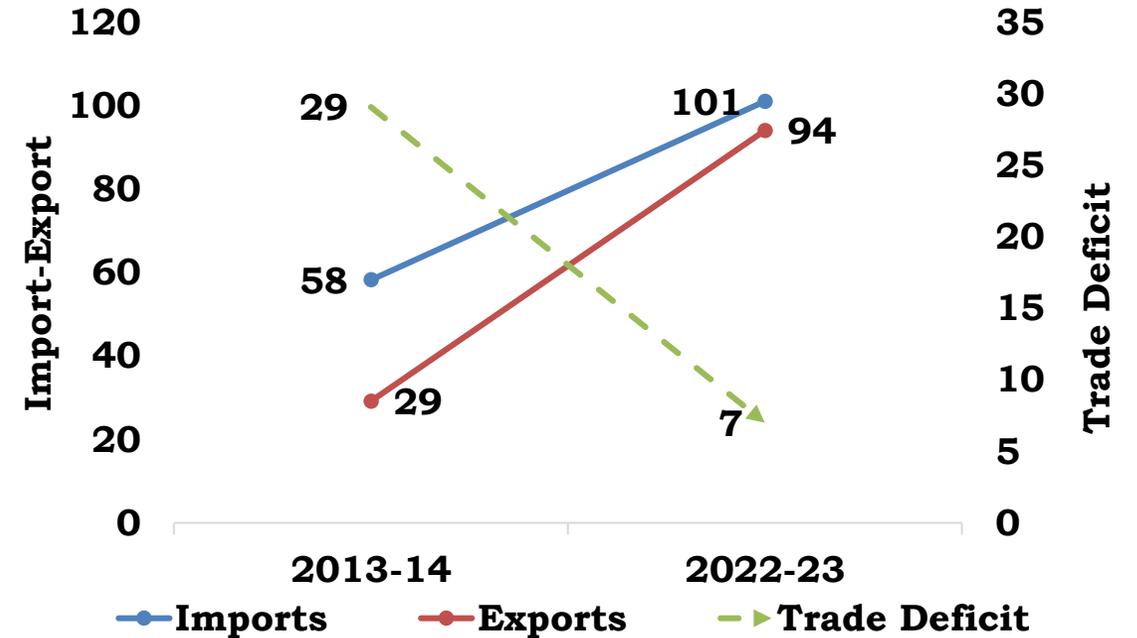
Market Size



- ✓ Market Production Growth at CAGR of 4.91 % in last 9 Years.

Bridging the Gap

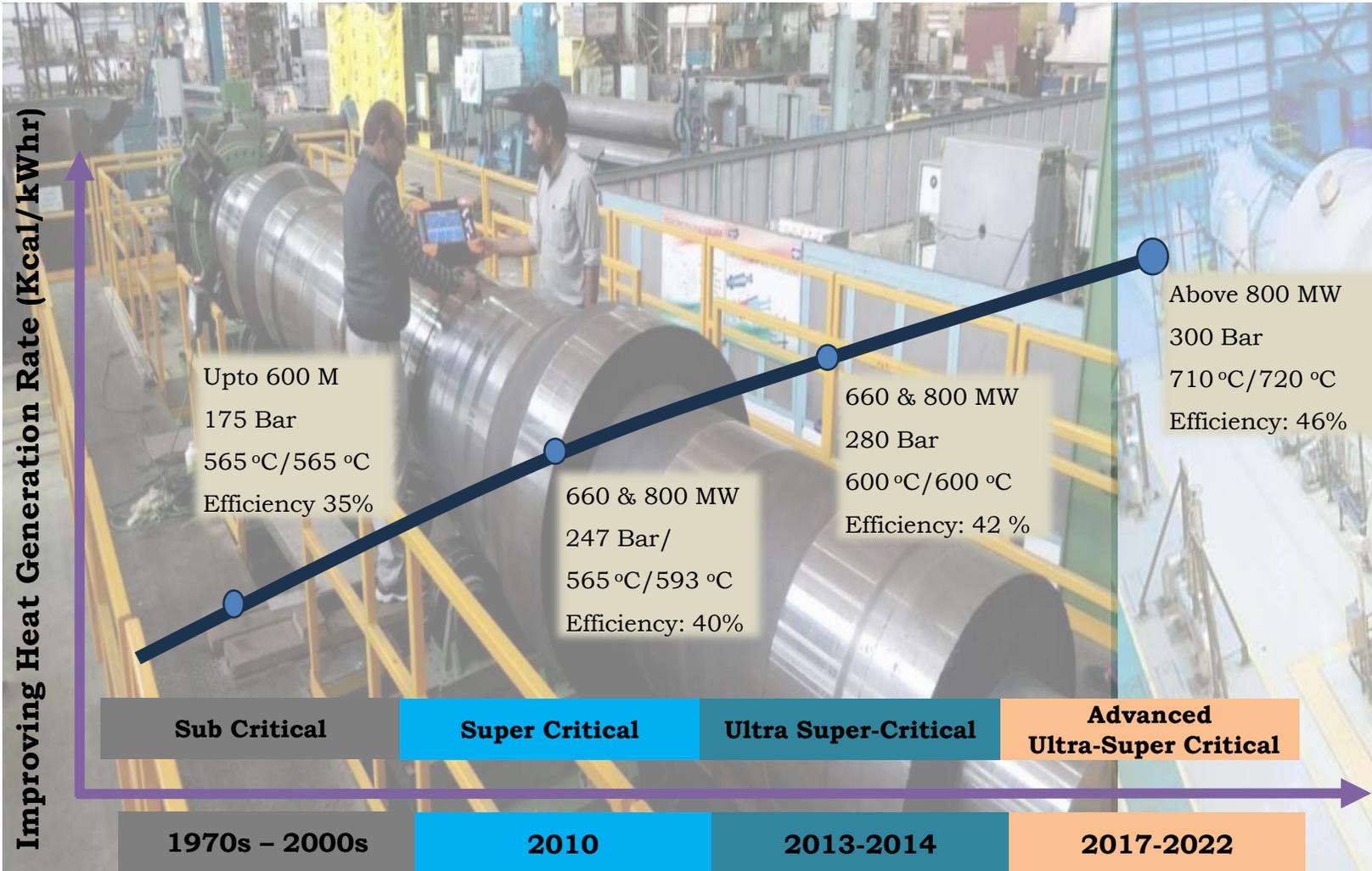
Rs. Thousand Crore



- ✓ Exports Grown 3 times, to Rs. 94 Th. Cr. in FY22-23 from FY13-14.
- ✓ Trade deficit reduced to Rs. 7 Th. Cr. from Rs. 29 Th. Cr. over the same period



Towards Net Zero : Advanced Ultra Supercritical (AUSC) Technology



Joint project of MHI, BHEL, IGCAR, DST and NTPC.

Project Cost ~900 Cr.
MHI support Rs. ~ 470 Cr.

Technology will improve Plant Efficiency of Thermal Power Plants to 46%.

Reduction in CO₂ emissions by
~11% vis-à-vis Supercritical power plants.
~20% vis-à-vis Subcritical power plants.



Towards Net Zero : Coal Gasification



Coal to Methanol Plant (0.25 TPD) at Corp R&D, Hyderabad



6.2 MW PFBG Plant (168 TPD) at BHEL, Trichy

- BHEL, a CPSE under MHI, Developed Pressurized Fluidized Bed Gasification (PFBG) Technology for various type of high-Ash Coal and Lignite.

- BHEL has set up a 168 TPD (Tonnes Per Day) Coal Gasification Plant at Trichy.

- BHEL has set up a first of its kind Coal to 0.25 TPD Coal to Methanol Plant at Hyderabad.

- International experts validated design of PFBG Gasifiers for 2000 TPD for Coal to Ammonium Nitrate Plant.

Towards Net Zero : Carbon Capture



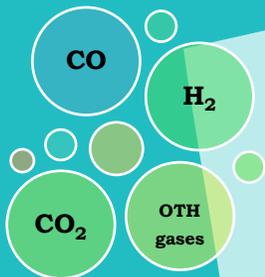
BHEL Trichy

- ✓ 2016, Design and development 1 TPD(Tonnes Per Day) of CO₂ Capture Plant from Syn-Gas .
- ✓ Developed novel materials and membranes for lower energy consumption.
- ✓ 86 % CO₂ Capture efficiency.



BHEL, Hyderabad

- ✓ Developed Indigenous Technology.
- ✓ 2021, Demonstrated CO₂ Capture Plant (1.4 TPD) from Syn-Gas in Coal to Methanol Plant.
- ✓ CO₂ Capture using Amine solvent from Syn-Gas.
- ✓ 90 % CO₂ Capture efficiency.

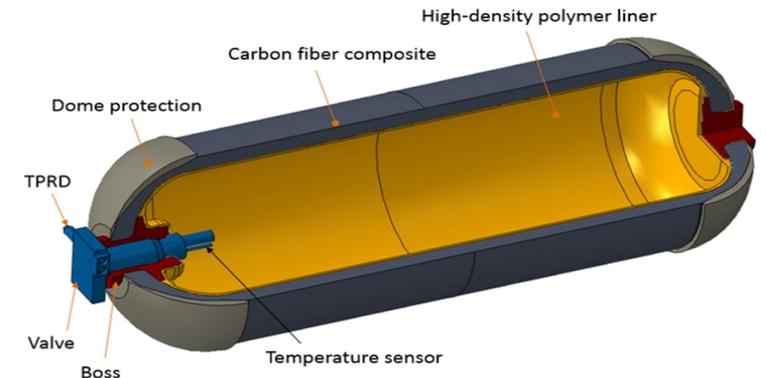
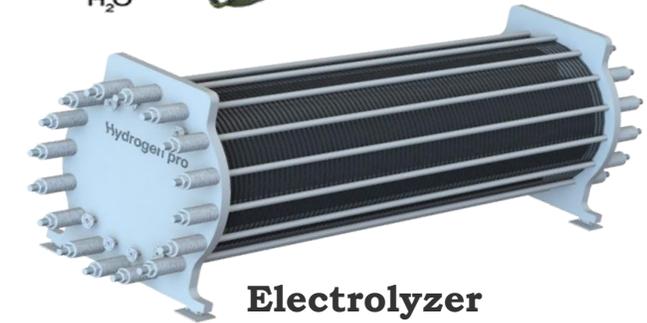
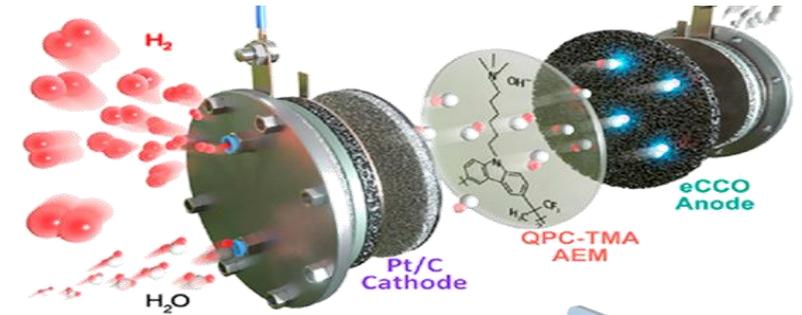


Synthetic (Syn) Gas

Green Hydrogen Value Chain

BHEL is setting up “**Centre of Excellence (CoE)**” for **Hydrogen Value Chain Technologies** at Karkhiyaon, Varanasi with support of MHI:

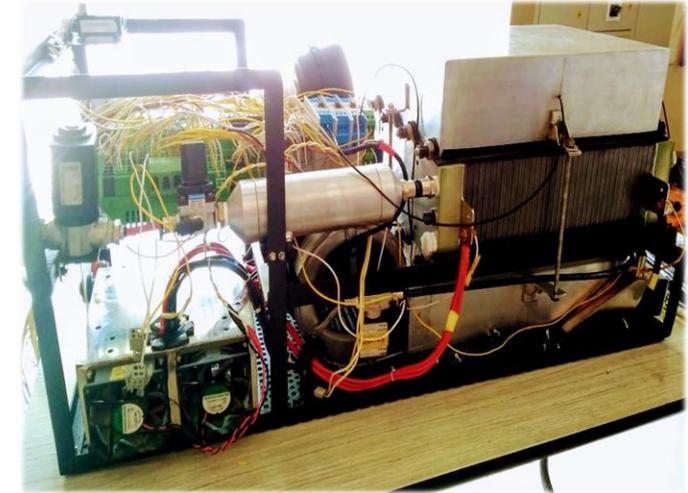
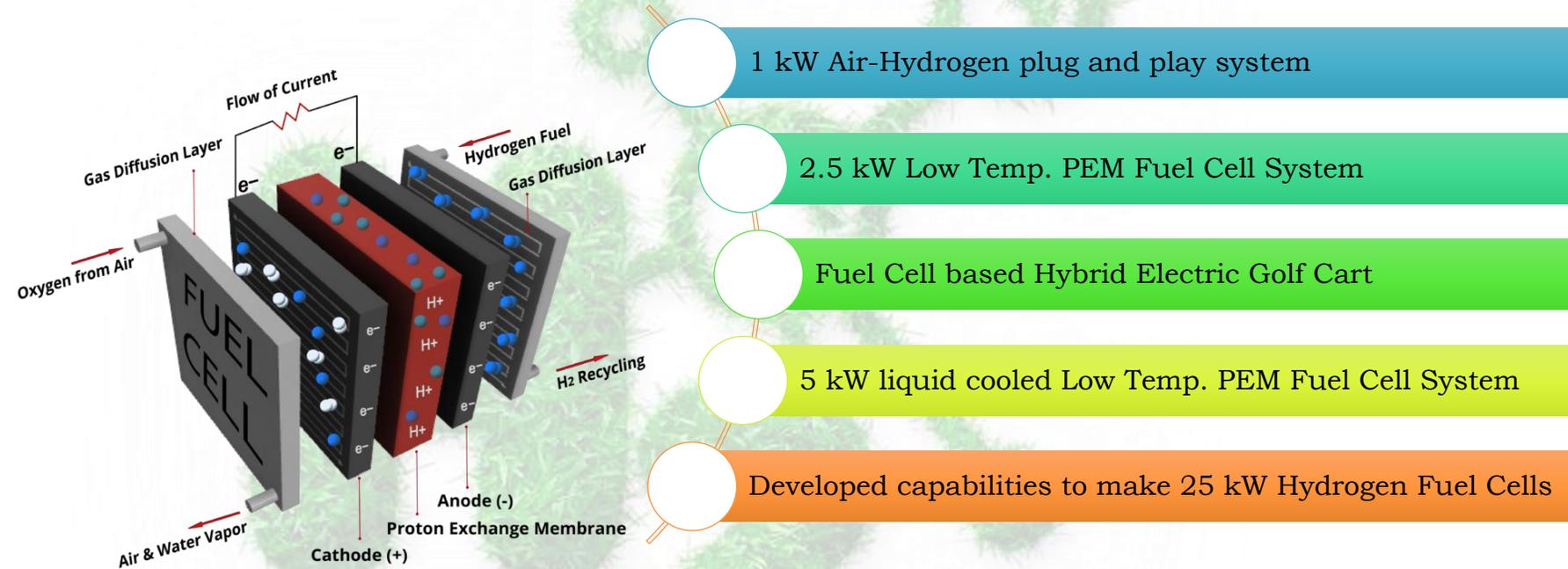
- ✓ CoE for Type IV Hydrogen and CNG Cylinder
- ✓ Manufacturing facility for Type IV Hydrogen and CNG Cylinder
- ✓ National Facility for testing of Type IV Cylinders
- ✓ CoE for Hydrogen Electrolysers
- ✓ Manufacturing of containerised Hydrogen Electrolyser System(s)



Type-IV Composite Cylinders

Towards Net Zero : Hydrogen Ecosystem

Hydrogen Fuel Cell : BHEL a CPSE under MHI has developed

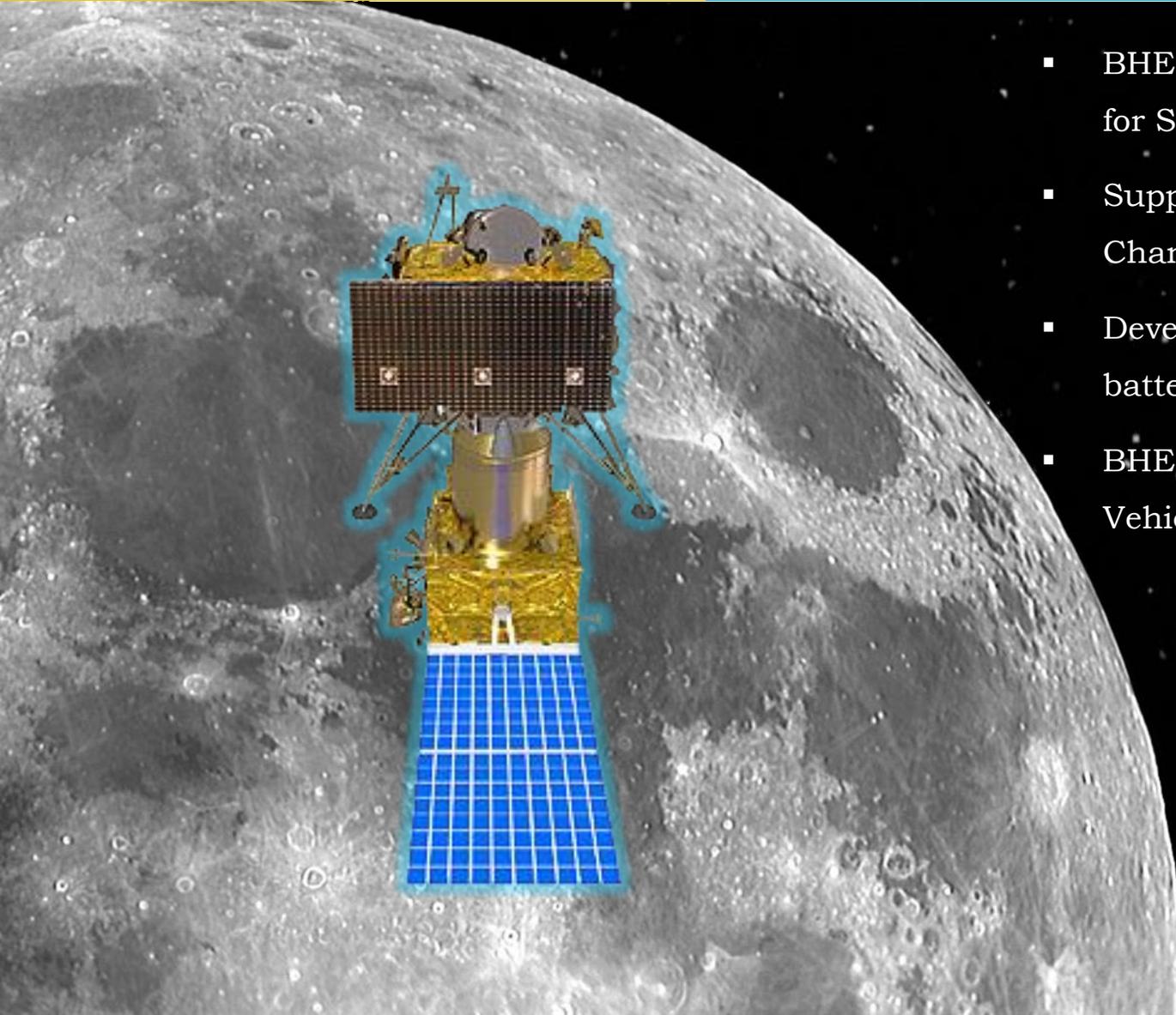


Future Application :



Special Equipment for Space Missions

- BHEL in collaboration with ISRO developed State of the art facility for Space Grade: Li-ion, Ni-Cd and Ni-H₂ cells.
- Supplied batteries to ISRO for key Space Mission(s) including Chandrayaan 2 & 3.
- Developed domestic production capability for Space Grade batteries ranging from 2KWh to 20KWh.
- BHEL also supplied Titanium Propellant Tanks for Launch Vehicles (PSLV/ GSLV).





सत्यमेव जयते

**Government of India
Ministry of Heavy Industries**



भारत 2023 INDIA

वसुधैव कुटुम्बकम्

ONE EARTH • ONE FAMILY • ONE FUTURE



Azadi Ka
Amrit Mahotsav