



YOUR GATEWAY TO
**ENERGY STORAGE,
 H₂ & E-MOBILITY
 MARKETS**



Leadership Circle



Founding Partners of:



IESA Members Collage- Jan 2023

LEADERSHIP CIRCLE



PLATINUM



GOLD



SILVER



BRONZE



SPECIAL

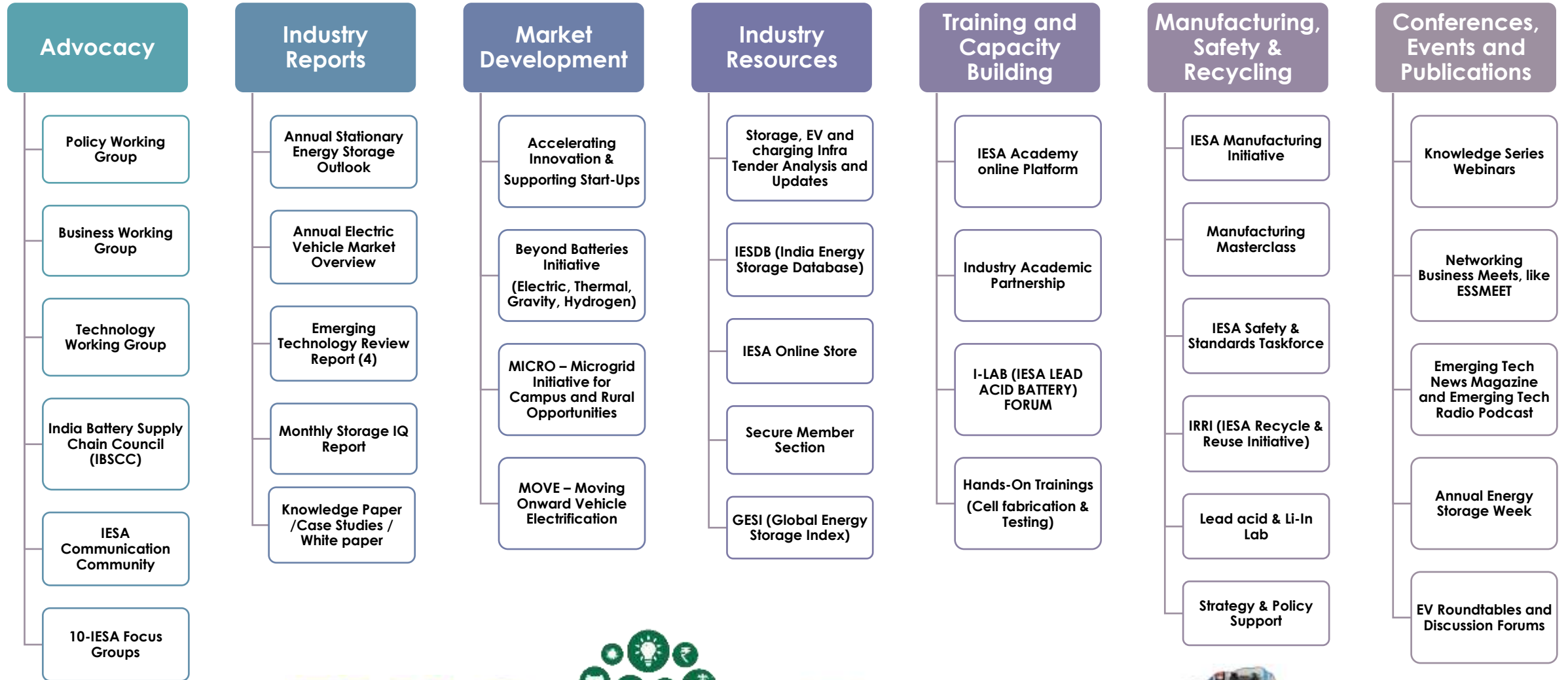


START-UPS



STRATEGIC PARTNERS

IESA OFFERINGS



India's evolving EV & Energy Storage Policies



IESA was launched in 2012

- MOP & CEA taskforce on Integration of Large Scale renewables
- National Electric Mobility Mission Plan
- IESA hosts's 1st Energy Storage India conference

2013

2014

- Creation of Standing Committee on energy storage by MNRE
- IESA releases report on the role of energy storage for ancillary services

2015

- CERC roadmap for ancillary Services
- MNRE India Energy Storage Roadmap and DHI FAME - I

2017

- **Launch of MOVE initiative by IESA**
- Karnataka & Telangana draft EV policy
- CERC staff paper on ESS



2016

- Launch of ESS pilots by MNRE
- **IESA proposes manufacturing policy for energy storage technologies to NIT Aayog**



2018

- MNRE National Wind – Solar Hybrid policy
- National Energy Storage Mission
- State EV Policies
 - Maharashtra , UP , Andhra Pradesh , Kerala, Uttarakhand, Delhi
- NITI Aayog MOVE Summit



2019

- NITI Aayog's National Mission for Transformative Mobility and Advanced Battery Manufacturing
- PMP - Phased Manufacturing Plan for EVs
- FAME-II scheme



PMO India @PMOIndia · 6h
 देश में ही Solar Panel की मैनुफैक्चरिंग, Power Storage Capacity बढ़ाने के लिए बेहतर Batteries के R&D और Manufacturing में निवेश करें।
 जो इस काम में जुटे हैं, ऐसे संस्थानों को, MSMEs को Handholding करें: PM @narendramodi

2020

- Peak power & RTC Hybrid RFPs from SECI
- Energy Storage recognized as Champion Sector
- ACC battery Manufacturing selected as a key sector for PLI with 50 GWh target

2021

- National Hydrogen Mission announced
- RFP for 50 GWh ACC Battery Manufacturing*
- 5 GWh – Niche ACC Framework Creation

Dt. 11/01/2023 : Meeting with Shri Kamran Rizvi, Secretary (HI), Dr. Hanif Qureshi, Joint Secretary, Department of Heavy Industries, MHI , Shri Sudhendu J. Sinha, Adviser (Infrastructure Connectivity – Transport and Electric Mobility), NITI Aayog, IESA Leadership Members and other government officials





POLICY ADVOCACY

We have been on the forefront in discussing and raising concerns in the Energy Storage & EV space with all Central and State Nodal Agencies like MNRE, DST, MoP, MeITY, NITI to name a few. A few snapshots of events are shown below



via NaMo App



Call on Prime Minister by panelists of Pravasi

MNRE Meeting on National Energy Storage mission (2018)



Advanced Energy Storage Manufacturing

India Energy Storage Roadmap (2018)



Discussion on Lithium Resources with Bolivia Embassy (2017)

MoU signing between MeITY and IESA (2019)



Shri Arjun Ram Meghwal, speaking at IESA e-Conference



Invited by MEA & PMO to discuss the Role of Indian Diaspora in Capacity Building for Affordable Solar Power & Energy Storage in August 2018.



IESA Initiatives



MICRO – Microgrid Initiative for Campus and Rural Opportunities



MOVE – Moving Onward Vehicle Electrification



IESA- EV Adopters Circle (EVAC)



Innovation & start-Ups



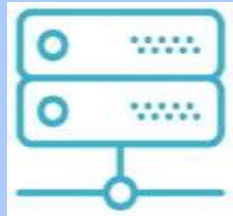
IESA Academy- Skill development Initiative



Industry- Academic Partnership



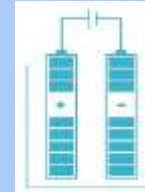
Industry Reports & Market Survey



India Energy Storage DataBase (IESDB)



IESA Store - Online Product Portfolio)



IESA- Lead Acid Battery Forum (I-LAB)



Energy Storage Safety & Standards Taskforce



Mobility and Infrastructure with Green Hydrogen Technology (MIGHT)



IRRI (IESA Recycle & Reuse Initiative)



Beyond Batteries Initiative (Electric, Thermal, Gravity, Hydrogen)



Global Energy Storage Index (GESI)



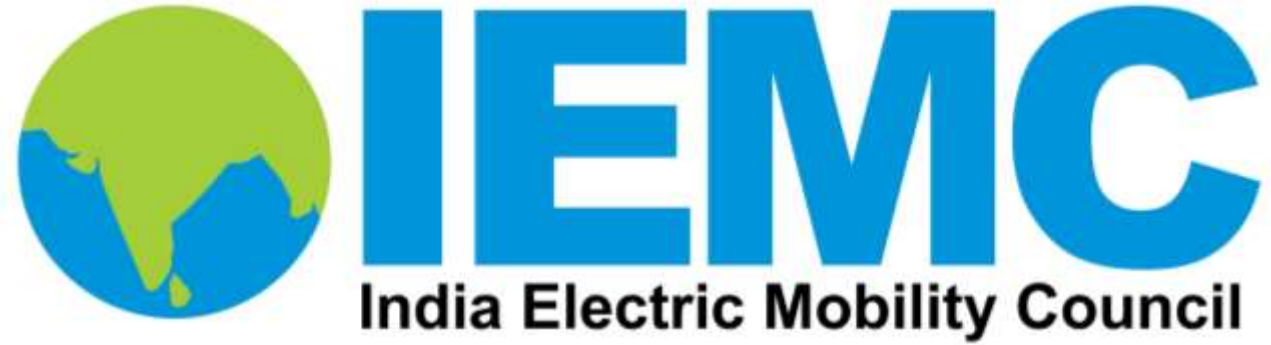
Make In India - IESA Manufacturing Initiative (IMI)



ESSMEET - Energy Storage Adoptions for C&I Consumers



IESA Start-Up Cohort

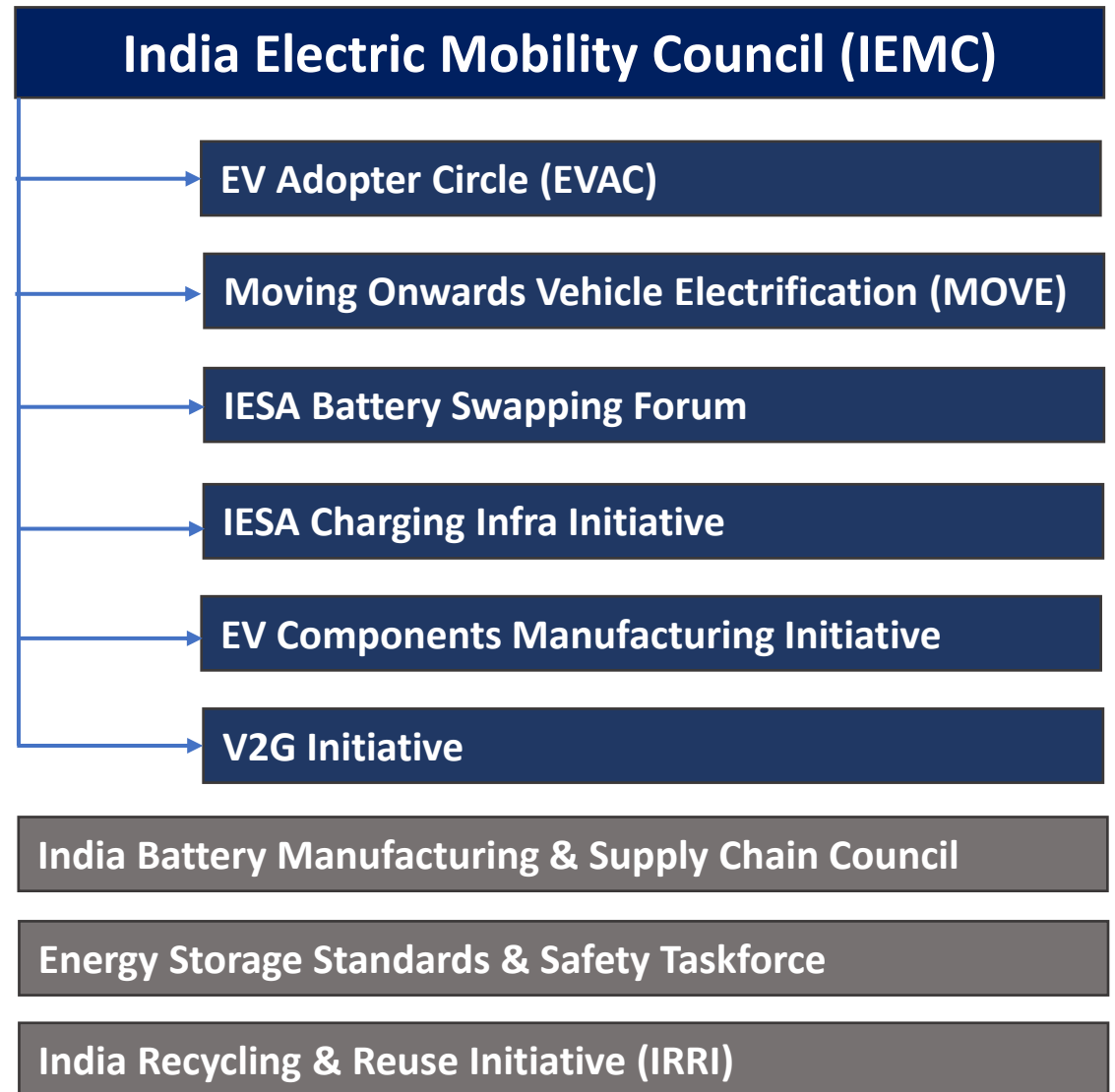


India Electric Mobility Council (IEMC)

An IESA Initiative

Why India Electric Mobility Council (IEMC)

IESA is focusing all its E-Mobility Initiatives under one umbrella **India Electric Mobility Council (IEMC)** and enhancing its EVAC (EV Adopter Circle) and MOVE (Moving Onwards Vehicle Electrification) activities to catalyze the industry growth.



IEMC

India Electric Mobility Council

EV Manufacturers



EV Components & Equipment



EV Battery Technology Companies



Battery Swapping Companies



Charging Infrastructure



EV Fleet Operators



Work With



Other EV Related Members



Thinktanks/ Consulting Organisations



Government Support



International Organisation



Key Focus Areas for 2023

1. **Electrification of Commercial and Heavy-Duty Vehicles**
2. **Vehicle to Grid** (Create white paper and collaboration with organizations for pilot projects)
3. **Retrofitting** (partner with industry members to understand the bottleneck)
4. **Battery Safety** (organize roundtables to address industry concerns)
5. **Battery Swapping** (continuous government interaction and industry needs)
6. **Safety/Guidelines of Charging Station/ swapping station** (Earthing, solar integrated in the system)
7. **Urban Air Mobility** (Create white papers, organize roundtable and partner with UAM companies)
8. **EV Supply chain** (helping industries to create a robust EV supply chain)
9. **EVAC** (promote and accelerate sustainable urban and rural transportation to catalyze the EV Adoption)
10. **EV Financing / loan / taxation** (collaborator with financial institutes to provide attractive incentive to member companies)

Our Activities in E-Mobility Space



December 2029
Karnataka EV Roundtable with industry players and govt. officials (In association with Karnataka Government)



5th June 2022
Submitted inputs on battery swapping policy



22nd October 2022
Organized 4 Global session on E-Mobility as part of WESD 2022



2020
MoU with EESL to catalyze the EV adoption in Private sector



21st June 2022
EVangelise '22: iCreate's EV Innovation Challenge (in partnership with iCreate)



21st Jan – 17th Nov 2022
UL Battery Safety master class



1st – 5th May 2022
Organized Conference on E-Mobility (India eMobility Day) as part of IESW 2022



28th Sept 2022
Submitted inputs on AIS 156 and AIS 038 (Rev 2)



12th Jan 2023
IEMC Launch

Our Activities in Battery Swapping



21st May 2020

1st Roundtable on Need for Swapping and Business Models



3rd July 2020

4th Roundtable on Final Recommendations on Battery Swapping Roadmap for India



1-3 June 2021

Training on EV Charging Infra and Battery Swapping (by IESA Academy & ARAI Academy)



3rd June 2020

2nd Roundtable on Technical Aspects & Role of Standards in Battery Swapping



1-3 June 2021

Training on EV Charging Infra and Battery Swapping (by IESA Academy & ARAI Academy)



5th June 2022

Submitted inputs on battery swapping policy



18th June 2020

3rd Roundtable on Policy Barriers and Drivers in Battery Swapping



28th Sept 2022


Submitted inputs on AIS 156 and AIS 038 (Rev 2)



29th November 2022

Meeting with Sun Mobility on Battery Swapping

Knowledge Hub for Electric Vehicle in India



12th Oct 2021
Roundtable
Discussion on EV
Battery Fire, Safety
& Challenges



25th May 2022
Article on The
Evolving Landscape
of Urban Air Mobility
in India



28th Sept 2022
Submitted inputs on
AIS 156 and AIS 038
(Rev 2)




22nd April 2022
Launch of India
Electric Vehicle and
Components Market
Overview Report
2021-30



5th June 2022
Submitted detailed
inputs on battery
swapping policy



7th Oct 2022
India EV Charger
Market Report 2022



**18th – 20th May
2022**
IESA – ARAI 3-day
training program on
ESS for EV



2nd Sept 2022
Published an article
on Requirement of
Electric Trucks in
Indian Market



19th Oct 2022
Workshop on
Transition from IC
engine to EV's for
Maruti Center of
Excellence

Our Events in Electric Mobility



19th May 2017
1st IESA-ICAT EV
Conclave



22nd April 2020
Clean Energy & Clean
Transportation : Key to
fight Climate Change
(In association with
EarthDay Network)



25th February 2021
6th India eMobility
Conclave (IMC)



9th August 2019
3rd International EV
Conclave (In
association with ICAT)



6th August 2020
5th India eMobility
Conclave (IMC)



22nd October 2022
Organized 4 session on
E-Mobility as part of
WESD 2022



5th February 2020
4th India eMobility
Conclave (IMC)



23rd Sept 2019
India Energy Storage –
EV Technology and
R&D Forum (Supported
by DST, Govt. of India)



**EV Battery safety
Conference**

Our Activities in Training & Capacity Building



2019
Training on FAME II Certification Process (in association with ARAI)



3rd July 2020
4th Roundtable on Final Recommendations on Battery Swapping Roadmap for India



1-3 June 2021
Training on EV Charging Infra and Battery Swapping (by IESA Academy & ARAI Academy)



6-7 June 2019
Electric Mobility & Advanced Battery Training with FAME 2 Certification Process along with ARAI Lab Visit



11-12 March 2020
Hands-on Li-Ion Cell Fabrication Workshop (In association with CMET)



21st Jan – 17th Nov 2022
UL Battery Safety master class



18th June 2020
3rd Roundtable on Policy Barriers and Drivers in Battery Swapping

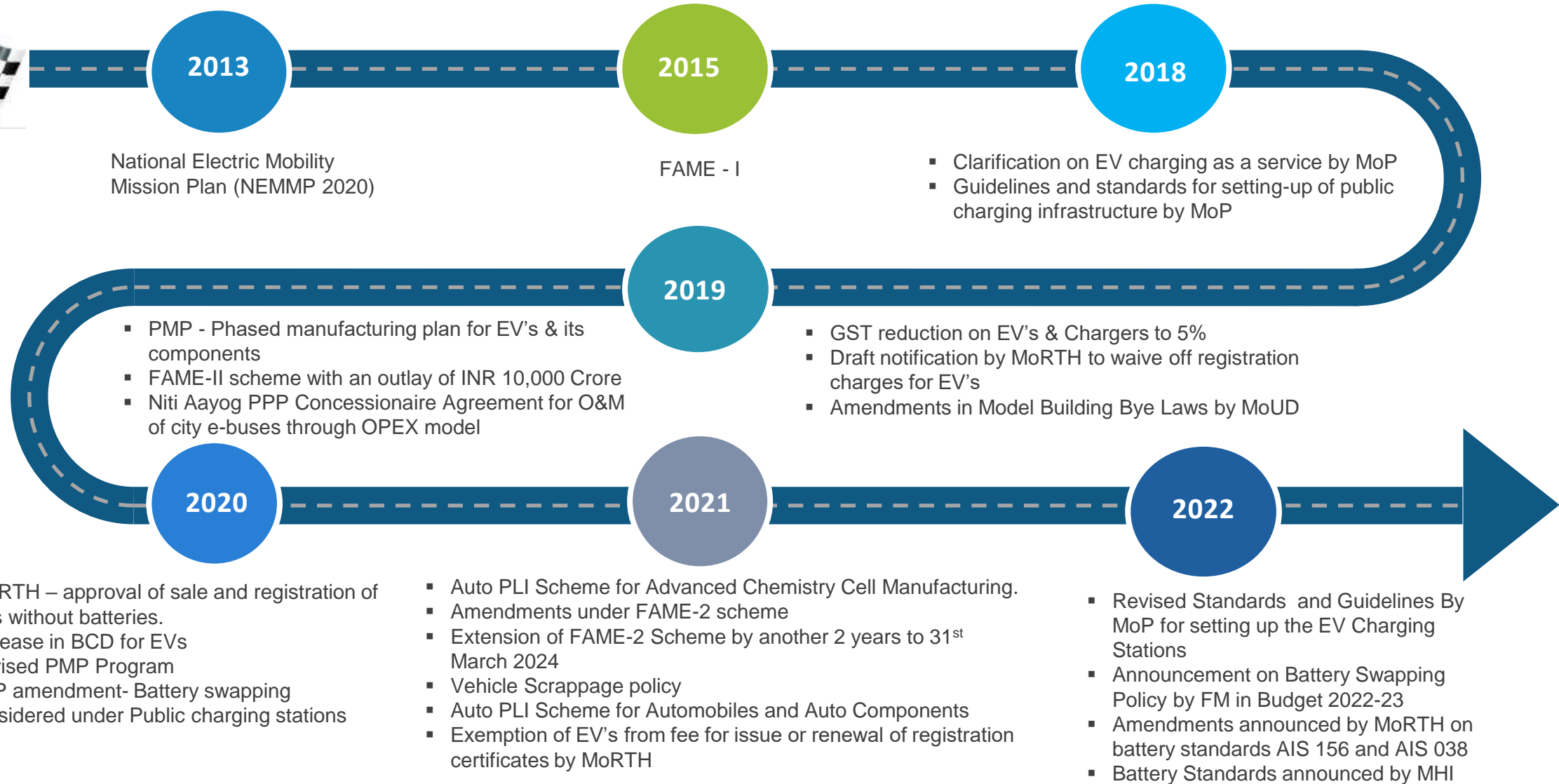


28th Sept 2022
Submitted inputs on AIS 156 and AIS 038 (Rev 2)



14th – 19th Nov 2022
Entrepreneurship Acceleration Program (EAP)

CENTRAL EV POLICY SCENARIO



2013

National Electric Mobility Mission Plan (NEMMP 2020)

2015

FAME - I

2018

- Clarification on EV charging as a service by MoP
- Guidelines and standards for setting-up of public charging infrastructure by MoP

2019

- PMP - Phased manufacturing plan for EV's & its components
- FAME-II scheme with an outlay of INR 10,000 Crore
- Niti Aayog PPP Concessionaire Agreement for O&M of city e-buses through OPEX model

- GST reduction on EV's & Chargers to 5%
- Draft notification by MoRTH to waive off registration charges for EV's
- Amendments in Model Building Bye Laws by MoUD

2020

- MoRTH – approval of sale and registration of EVs without batteries.
- Increase in BCD for EVs
- Revised PMP Program
- MoP amendment- Battery swapping considered under Public charging stations

2021

- Auto PLI Scheme for Advanced Chemistry Cell Manufacturing.
- Amendments under FAME-2 scheme
- Extension of FAME-2 Scheme by another 2 years to 31st March 2024
- Vehicle Scrappage policy
- Auto PLI Scheme for Automobiles and Auto Components
- Exemption of EV's from fee for issue or renewal of registration certificates by MoRTH

2022

- Revised Standards and Guidelines By MoP for setting up the EV Charging Stations
- Announcement on Battery Swapping Policy by FM in Budget 2022-23
- Amendments announced by MoRTH on battery standards AIS 156 and AIS 038
- Battery Standards announced by MHI

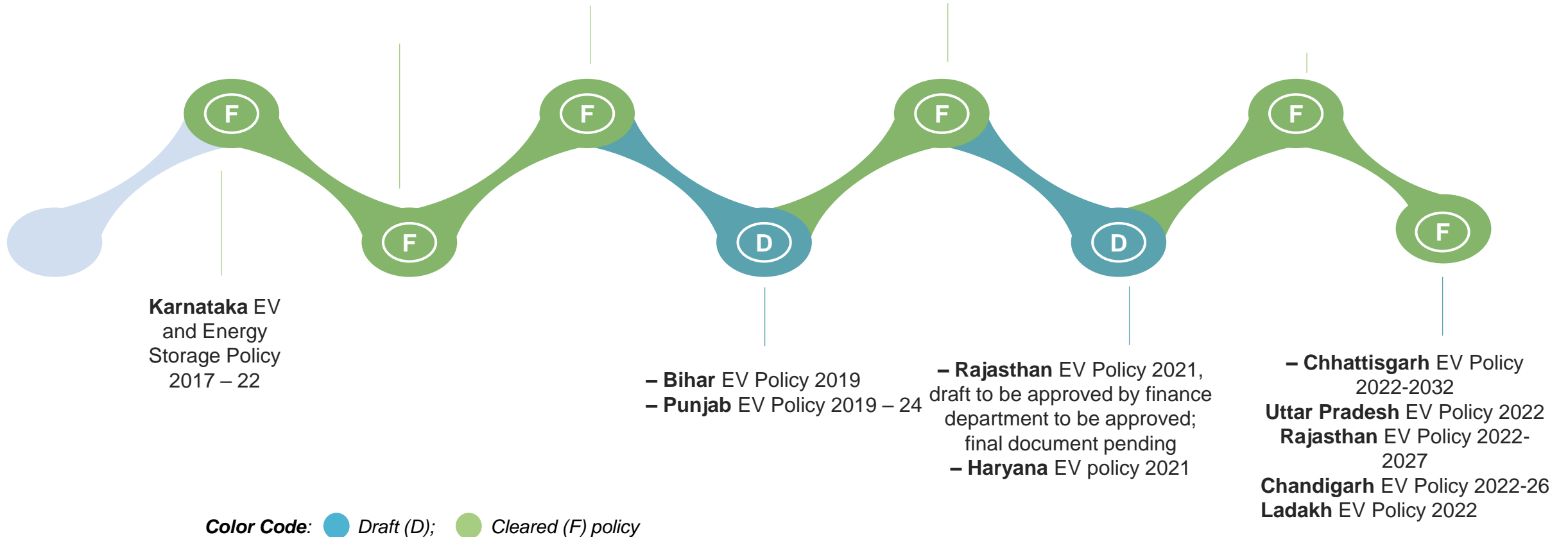
STATE LEVEL EV POLICY SCENARIO

- **Andhra Pradesh** Electric Mobility Policy 2018-23
- **Maharashtra** EV Policy 2018 – 2023
- **Uttarakhand** EV Policy 2018-2023

- **Kerala** EV Policy 2019- 22
- **Tamil Nadu** EV Policy 2019 -29
- **Chhattisgarh** – inclusion of EV sector in Industrial Policy 2019- 24
- **Uttar Pradesh** EV Manufacturing and Mobility Policy 2019 – 24
- **Madhya Pradesh** EV Policy 2019-24

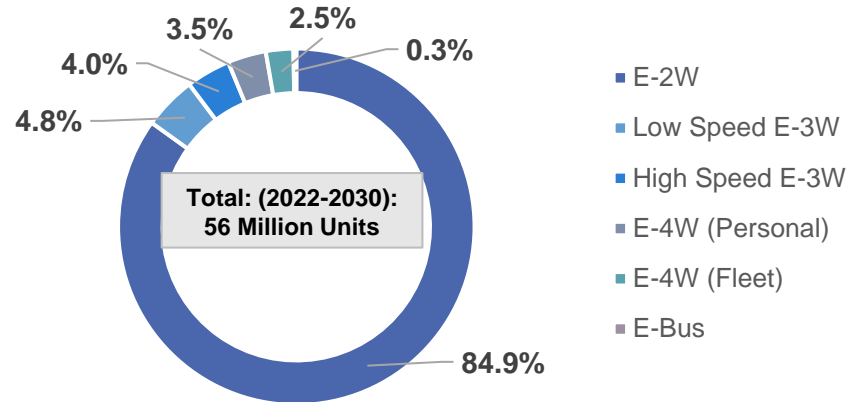
- **Delhi** EV Policy 2020
- **Telangana** EV Policy 2020-2030

- **Assam** EV Policy 2021-26
- **Maharashtra** EV Policy 2021-25
- **Gujarat** EV Policy 2021-25
- **Goa** EV Policy 2021-26
- **Meghalaya** EV Policy 2021-25
- **Odisha** EV Policy 2021-25
- **West Bengal** EV Policy 2021-26

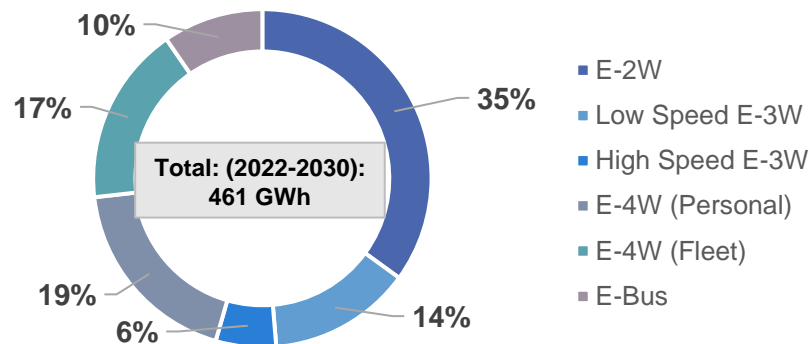


In BAU Scenario, it is predicted that the market will grow at a similar pace at which it is growing today in next couple of years. The market is expected to gain momentum rapidly after 2024-25 as upfront cost of electric vehicles are expected to achieve parity with the ICE vehicles due to drop in battery prices along with improvement in EV technology, local manufacturing & economies of scale. As per CES analysis, the EV market is expected to grow at a CAGR of 49% between 2021- 2030 whereas the battery demand for EV's is expected to grow at a CAGR of 41% by 2030.

EV Sales Forecast, BAU Scenario, 2022-2030



EV Battery Demand Forecast, BAU Scenario, 2022-2030



IEMC Initiatives



Moving Onwards Vehicle Electrification (MOVE)

MOVE Objectives

- Forward the interests of the EV and battery manufacturing sector
- Enable a platform for exchange ideas & technology to promote business
- Aid to support policy makers and implementing agencies

MOVE Highlights

- Supplier Meets for exploring business opportunities
- Regional EV Roundtables supported by state transport agencies, distribution companies, and city planners & corporations
- Annual EV conclaves with industry participants & central government bodies

Activities Carried Out:

- ✓ Provided recommendations to NITI Aayog and DIPP on manufacturing policy for storage & EVs
- ✓ Helped organize CEO roundtable with Invest India to discuss energy storage and EV manufacturing in India
- ✓ Addressed industry concerns related to push for swapping only policy at IESA Policy Forum
- ✓ Working with ICAT and ARAI for improving industry interactions
- ✓ Focusing on li-ion cell, battery pack as well as charging infrastructure manufacturing
- ✓ Working on EV components Manufacturing

India EMobility Conclave & Regional EV Roundtables

IESA organized 8 India EMobility Conclave (IMC) and regional EV Roundtable discussion on e-mobility in Bangalore, Pune, Delhi and Chennai, each. Objective of these events was to facilitate a one on one dialogue between the industry stakeholders and states government to accelerate the deployment of Evs and discussion on new-age technologies, opportunities for new Gol e-mobility policy (FAME II).



EV Roundtable Karnataka (2018)



EV Roundtable Maharashtra (2018)

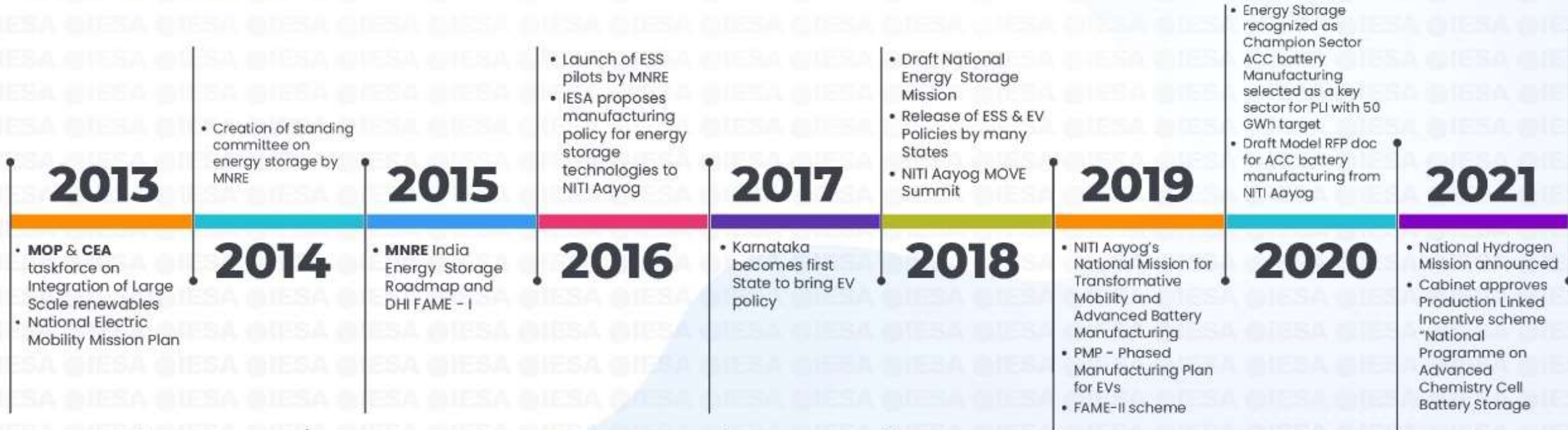


EV Roundtable Delhi (2019)

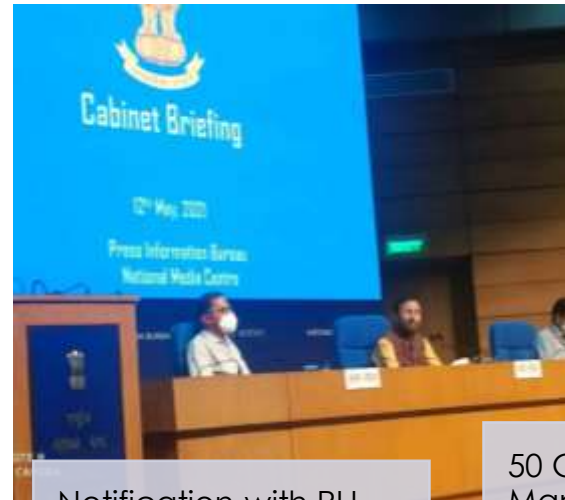
IESA Manufacturing Initiative (IMI)



EVOLUTION OF BATTERY MANUFACTURING POLICIES IN INDIA



India, the Emerging Market & New Destination for Battery Giga-factories



IESA submitted 1st whitepaper to NITI Aayog for advanced energy storage manufacturing policy

April 2016

Creation of ACC Battery Manufacturing PLI framework

2020

Notification with PLI details announced

June 2021

50 GWh Manufacturing Application Closure

Jan-Mar 2022

Possible extension for Stationary ACC battery PLI as well as 5 GWh Niche ACC Program notification

Nov-Dec 2022*

2018-19

Development of National Energy Storage Mission & National Mission for Transformative Mobility

12 May 2021

ACC Battery Manufacturing PLI Program announced by DHI, Govt. of India

Oct 2021

Global Tender announcement for 50 GWh ACC Manufacturing

Mar-June 2022

Award for 50 GWh ACC battery Storage PLI

June -Dec 2024*

Start of Commercial Production from Indian Giga Factories

ENERGY STORAGE STANDARDS TASKFORCE



UL and IESA signed a MoU to create an Energy Storage Standards Taskforce to work on Standards Framework for Energy storage in India (2016)



IESA part of BIS ETD 52 Committee for Electrical Energy Storage

- ❖ We are members in the panel on 'Technology Hub for EV Energy Storage' by DST, GoI.
- ❖ We are working on safety, cell and system level standards for India

LI-ION BATTERY TESTING LAB

POWERED BY IESA Customized Energy Solutions

Cell testing capabilities:

- Cycle life at different C-rates
- Measurement of energy efficiency
- Cell temperature monitoring during charge/discharge
- Cell performance study at different ambient temperatures (20% SOC) under development to increase the operation window from -10 to 50°C
- Cylindrical, pouch, and prismatic cell testing
- Measurement life of battery

Parameters analysed:

- Energy density
- Power density
- Cycle life
- Coulomb efficiency
- Voltage (1) ambient temperature performance
- Self-discharge
- End of cycle life

Thermocouples
Data logger

Cycle life comparison

Comparison between different DoD

Live temperature data

Temperature trend during cycling

Cycling efficiency comparison

FAST CHARGER FOR LEAD ACID BATTERY OPERATED E-RICKSHAW CHARGING STATIONS

POWERED BY IESA Customized Energy Solutions

E-Rickshaw:

- Quiet, light, clean and low-cost vehicle primarily used for last mile connectivity
- Energy storage: 400Wh (4 x 10000mAh) lead acid battery
- Rickshaw market projected growth: 51.8% CAGR (2009-2024), projected by Praxair & Strategic Intelligence Private Limited

Need for fast charging:

- Current state:
 - Over-night charging - 10-12 hours (full charge)
 - Mid-day charging - 3 hours (20-30% top-up)
- Chargers available: 3-5A CC, 10-12 hours for full charge
- Mid-day fast charging:
 - 1 hour - 20-30% top-up charge
 - 2 hour - 40-50% top-up charge
 - 2.5 hours - 50% charge
- Daily mileage:
 - Normal charger - 50-60km
 - Fast charger - 100-120km

High cycle efficiency

Negligible temperature rise

Proven process:

- An efficiency of 90%-95% achieved during fast charge
- Temperature rise in battery during fast charge is below 4°C
- Proven process: 100 cycles completed with 90-95% usable capacity after process against cycle life of 100-600 cycles
- Field testing: Trial on 20 electric rickshaws - Positive response

Lead acid testing lab:

Fast charger project:

- Research carried out by CES to develop a fast charger for thin tubular lead acid traction batteries
- Mid-day charging - 3 hours (20-30% top-up)
- R&D carried out by CES at battery & solar laboratory at PGCOE,Pune
- Funding by CES and support services from professors & students

Projects under development:

- Battery SOC gauges for E-rickshaws
- SOC of battery, range and run-time indication
- High accuracy
- Non-invasive test-meter for lead acid batteries
- SOC indication using short discharge
- High accuracy
- Highly portable

Lead acid testing:

Fast charger life cycle testing:

- 100+ cycles completed with negligible degradation
- Non-rectified process

EV Fire Incidents – The Indian Context

2022

FEB



Electric Bus catches fire while charging

MAR



March 25 | Electric Scooter catches fire while charging

March 27 | Electric Scooter catches fire when parked

APR



April 1 | Electric Scooter Dealership catches fire



April 9 | Truckload of Electric Scooters catches fire

APR



April 18 | Electric Scooter Dealership catches fire



April 20 | Electric Scooter catches fire while charging

April 30 | Electric Scooter catches fire while driving

JUN



June 8 | Fire at EV parking station



June 23 | Electric Car catches fire while driving

June 24 | Electric Scooter Dealership catches fire

Global EV Battery Safety Forum

Dated: 13th January 2023
Venue: Jacaranda Hall, India Habitat Centre, New Delhi

Organized by: **IESA** | Powered by: **Customized Energy Solutions** | Gold Partner: **MacDermid Alpha** | Knowledge Partner: **WRI INDIA** | **TRANSPORT INITIATIVE FOR INDIA**

Host Media Partner: **ETN** | **ARAI** | **SMEV** | **SOCIETY OF MANUFACTURERS OF ELECTRIC VEHICLES** | **ICAT** | Supporting Partner: **International Copper Association India** | **Cu**

Speakers



Dr. Judy Jeevarajan
Vice President & Executive Director, Electrochemical Safety Research Institute (ESRI), IIT Research Institutes

Akhiljit Malay
General Manager, Automotive Research Association of India (ARI)

Dr. Ravi Bhatkal
Managing Director (India), MacDermid Alpha Electronics Solutions

Joseph Kelly
President, Development & Engineering, Latent Heat Solutions LLC

Dr. Rahul Walawalker
President, India Energy Storage Alliance



Stefan Louis
CSO, Cadex Energy

Mayuresh Karmarkar
Managing Director, International Copper Association India (ICAI)

Rameshchandra R.
CTO, Walter Mobility

Pawan Melukutla
Director, Integrated Transport, Electric Mobility and Hydrogen, IISc India

Rajat Verma
CEO, Sofath



Dr. Harveen Kumar
Senior Program Manager, Electric Mobility, IISc India

Brijesh Malik
Sr. Sales India

Rahul Bhattacharya
GM, Energy & Business Head, Energy Solutions India, ABB India

Sadia A Siddiqui
GM - Industry Marketing, Keytech Technologies

Anandharan Srinivasan
Director, Electric Mobility, TV, Current and Energy Solutions

Rohan Singh Bala
Founder, Sofath



Alex Liang
Principal Engineer, IIS, Standards & Engineering

Neeraj Kumar Singal
CEO, SEMCO Group

Akshay Kashyap
MS, Greenleaf Energy

Viveet Osvaid
Solutions, Oorja Energy

Debi Prasad Dash
Senior Director, India Energy Storage Alliance

Pareet Jain
Co-Founder, Greenleaf Power

Contact Information: Akshay Kumar | 9354907399 | akshay.kumar@ces-Ind.com | Tushar Kakade | 9404999270 | tushar.kakade@ces-Ind.com

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Participating Partners



Contact Information: Akshay Kumar | 9354907399 | akshay.kumar@ces-Ind.com | Tushar Kakade | 9404999270 | tushar.kakade@ces-Ind.com

Presents

India Battery Swapping Roundtable

Dated: 12th January 2023
Time: 2:30 PM - 5:00 PM IST
Venue: La Meridien, New Delhi

Organized by: **IESA** | Powered by: **Customized Energy Solutions** | Host Media Partner: **ETN**

Tech Your partner: **MacDermid Alpha** | Organized by: **IESA** | Powered by: **Customized Energy Solutions** | Host Media Partner: **ETN**

IESA Tech Tour

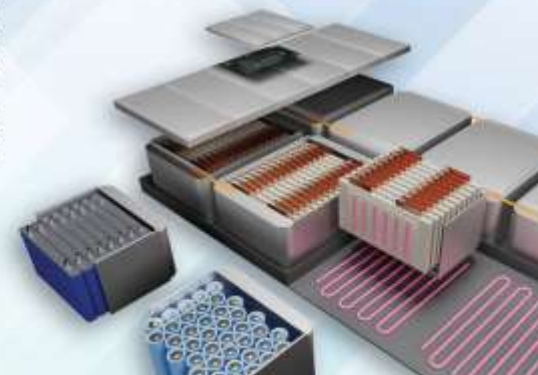
Date: 14th January 2023 | Time: 08:30 - 14:00 HRS IST

The battery temperature has a strong effect on charging and discharging rate of the battery. This makes the thermal management of an EV battery pack extremely important. Design of energy-dense packs have to employ robust cooling systems, often using liquid cooling loops with hundreds of channels. The complexity of these systems adds to the cost - somewhere around 10-15% of the overall cost of the battery pack. Li-ion batteries are particularly susceptible to thermal run-away events for a few different reasons, including their high energy content and their propensity to self-heat once the electrolyte reaches a certain temperature (from 70° to 130° C). Li-Ion cells are naturally subjected to deterioration with time due to their operating conditions and state of charge. Temperature has a major impact on the efficiency of nearly all batteries.

Due to popularity of rapid charging and performance driving, the heat losses in the cell increases due to high current in the cells. There are two main sources of heat generation in a battery cell: electrochemical operation and joule heating due to the motion of electrons within a battery cells. The temperature range of 25 °C to 40 °C provides the ideal working conditions for Li-ion batteries and if the temperature is elevated above 50 °C it becomes harmful for the lifespan of the batteries; Even a single cell's premature deterioration can reduce the performance and efficiency of the whole battery pack considerably.

Below are some of the key Thermal Management Solutions that we are currently offering to the EV Industry:

- Thermally conductive Gap fillers
- Thermal Pastes
- Thermal Gap Pads
- Adhesives & Encapsulants
- Flame-retardant PU Foams



Accelerating private adoption of xEVs in India

move 2020 Initiative: Optimized Fleet Electrification Strategy
 (Analysis of battery sizing and charging infrastructure requirements based on real driving patterns)

- ### Thought Process
- Driving patterns and battery usage of different vehicle operators: commuters, taxis, heavy vehicles, inter or intra city
 - Previously done studies in China and UK show 3x differences between energy consumption of EVs and Conventional ICE engine driven cars
 - Effect of stop and go traffic on battery usage (with regenerative braking). Comparison with ICE.
 - Due to large traffic congestion in India the difference between EV and ICE could be much higher
 - Effect of elevation change (with regenerative braking). Comparison with ICE.
 - If a round-trip involves a large change in elevation back and forth, the regenerative braking can reduce energy consumption dramatically.
 - Effect of intra city vs. inter city driving: True fuel consumption and comparison with BEV.



Energy Efficiency Services Limited
 16,437 followers
 1w • 🌍

We are pleased to announce that we have signed an MoU with **India Energy Storage Alliance (IESA)** to ensure faster adoption of **#emobility** & scaling up the **#EV** infrastructure in the country. The focus of the partnership will be on the development & deployment of a pilot **#ElectricVehicle** tracker tool, along with the analysis of the potential for Telecom towers to double as **#EV** charging stations in India. A joint study will be undertaken with telecom tower companies to determine the viability of retrofitting telecom tower facilities to allow them to also serve as **#ElectricVehicle** charging stations to promote the use of **#greenenergy**.



Entrepreneurship Opportunities & Start-Up Ecosystem

IESA closely works with various start-up companies and promote entrepreneurship. To accelerate fast growth in the energy storage & EV domain, IESA is launching a virtual accelerator program to drive the industry.



MoU with MeITY

Ministry of Electronics & Information Technology, Government of India (MeitY) and India Energy Storage Alliance (IESA) came together and signed an MoU to promote Start-Ups in Indian energy storage & EV sector.

As part of this partnership both the parties will help & support the start-ups to grow in this space.

All IESA start-Up member companies will be a part of MEITY Start-up Hub and Meity will support them through various schemes, centre of Excellence, Industry connect, Mentorship, Learning centre and other facilities.

IESA Startup members



ACCELERATOR

In order to promote fast growth in the energy storage domain an accelerator has been planned.

Researchers with innovative technologies can avail the benefits of fabrication, prototyping and industrial testing of their lab-scale setups

Active engagement with key members from the industry who can act as mentors to guide young and enthusiastic researchers and also assist with commercialization.



Hands-on Training for Lithium cell manufacturing



Training on Manufacturing Masterclass for CXOs and FAME II Certification Process



India –Norway Research Roundtable organised by IESA



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Hands-on Training for Lead Acid & Li-Ion Battery



IESA-InterSolar Solar + Energy Storage Workshop

FLAGSHIP IESA EVENTS

INDIA ENERGY STORAGE WEEK
INTERNATIONAL CONFERENCE & EXHIBITION ON ENERGY STORAGE, EV & MICROGRIDS IN INDIA
Mumbai | 02 Nov - 06 Nov 2020

Clean Energy & Clean Transportation: Key to fight climate change
On the occasion of Earth Day (23rd April 2020)
Time: 10:00 Hrs. - 13:00 Hrs. IST
<https://indiaesw.info>

CHIEF GUEST
GUEST OF HONOUR

INVITED SPEAKER

The world has never felt the 50th anniversary of Earth Day on April 22. This year's theme "Climate Change" couldn't be more appropriate than in these pandemic times.



ENERGY STORAGE SOLUTIONS MEET
ESSMEET WEB CONFERENCE
24th June, 2020
10:00 am - 4:00 pm

India Energy Storage Alliance (IESA) is organizing 7th Energy Storage Solutions Meet (ESSMEET) as a Web Conference on 24th June, 2020 from 10:00 am - 4:00 pm. The major motive behind this meet is to provide appropriate energy storage solutions for Commercial & Industrial consumers in 4 specific applications.

- To Increase Revenue by Solving Power Quality & Reliability Issues
- To Reduce Diesel consumption adopting Energy Storage as back-up
- To develop Rooftop Solar + Energy Storage Installations
- Energy Cost savings through Open Access & Energy Storage

ORGANISED BY: **IESA**
CO-ORGANISED BY: **Customized Energy Solutions**
POWERED BY: **ETN**
KNOWLEDGE PARTNER: **ARPI**

OUR PARTNERS: **STERLING & WILSON**, **iggf**

PARTICIPANTS
Commercial and Industrial Users: Open for all
Solutions Providers: IESA members: Free • Non IESA members: ₹10,000/-

UPCOMING EVENTS

ESSMEET CHENNAI September 2018	ESSMEET PUNE October 2018	ESSMEET DELHI NCR March 2019	ESSMEET WEB CONFERENCE June 2020
ESSMEET BANGALORE May 2019	ESSMEET MUMBAI July 2019	ESSMEET KANPUR November 2019	

Stationary Energy Storage India
Theme: Defining roadmap and outlook for stationary energy storage in India
APRIL 8, 2021, CONFERENCE & VIRTUAL EXPO

The government of India has come up with an ambitious plan to achieve 450 GW of renewables by 2030, committing to generate 40% power from clean energy sources by 2022. In Union Budget 2020, government announced to plan to retire all thermal plants that are not able to meet environmental regulations. Recent reports from IESW indicate that 80% of the 100 GW of solar capacity to be installed by 2030 will be in the form of rooftop solar. In addition, government is also working on 24*7 Power for all and there is a growing realization of need power for integration in achieving this goal in a cost effective and timely manner. High penetration of renewable energy and its associated technical as well as commercial solutions and a variety of policy decisions around considering the impact of intermittency and enabling grid integration of renewable energy.

IESA estimates the energy storage market in India to be US \$2.1 billion in 2019 and forecasts a CAGR of 9% by 2027. In 2020, the market size grows to 21 GW from 16 GW last year, primarily due to better sales in the major markets such as telecom and investor suburbs in 2020.

In next 7 years, the top growing markets for ESS are renewable integration into the grid, diesel optimization, solar storage, and distributed utility scale storage. Renewable integration into the grid is slated to grow at CAGR of 20% by 2027 due to the focus on high renewable targets by Solar Energy Corporation of India (SECI) and other government agencies. Due to high renewable target of 450 GW by 2030, Diesel optimization is a key sector for ESS used for more than 3-4 hours a day and is slated to grow at CAGR of 50% in short term till 2027, with a slower growth in long term at 30% till 2030 accounting for a more mature national grid which may have less scope for growth of battery application market. For rooftop solar, a rise in GOV rate in India has been a boost for the market, with analyses additionally showing that for solar installation rates in Maharashtra, Tamil Nadu, Karnataka, West Bengal, Assam, cost of rooftop solar with 50% storage systems could meet grid parity by end of 2023. COVID-19 slowed down the growth of the market, but towards 2027 the market is slated to achieve a strong uptake of energy storage technologies. Another top market for energy storage is distribution utility market, with top players (DCECO) such as MP&S and TPDCL, in their already in different stages of Stationary Energy Storage (SES) installation. The strain on DCECO's due to a higher penetration of solar rooftop, EV charging stations, and ever-increasing CBIL loads can be supported by energy storage technologies. This fact is likely to become more apparent in the long term with the market size potentially increasing to about \$1.5 Bn in 2027.

The most popular battery technologies used for energy storage are flooded lead-acid batteries, valve regulated lead acid batteries (VRLA), lithium-ion batteries and other technologies such as flow batteries, sodium & zinc based batteries, thermal batteries etc. Our analysis shows that the contribution of lead acid batteries will reduce over the forecasted period and other technologies will take major portion of the new implementation.

Currently, the forecasting, scheduling and DSM are the only drivers for wind integration application. Central Electricity Regulatory Commission (CERC) plans to introduce market mechanism for ancillary services market. IESA suggested the Commission to introduce ESS for secondary and tertiary regulatory ancillary services as it provides faster response and ramp regulation per MW. In 2010, the first large grid-scale ESS project was commissioned at Tata Power Co Ltd (Distribution Ltd) (TPDCL), Rathi Substation in Naraoda for 0.2 MW - 10 MWh for application such as peak load management, frequency regulation and energy arbitrage. In 2020, NLC and IAT also commissioned another project at Andaman Island with a capacity of 10 MW-4 MWh for solar integration.

Rooftop PV policy subsidies, falling battery prices, increase in the electricity tariffs, energy storage with rooftop solar are all expected to pick up in the short term. The rural electrification sector majority consists the solar home lighting systems under Saubhagya scheme, solar streetlights under AMW schemes, and microgrids. In 2018-19, market was driven by Saubhagya SWS deployment; however, the sector looks unattractive due to lack of policies existing in the market to drive it beyond 2021.

Presently, India has already installed 26+ MWh of large-scale storage for grid and renewable integration through pilot and demonstration projects at different locations. Apart from these commissioned projects, IESA MWh of energy storage projects in India are on the verge of tender allocation or at construction stage. IESA is hopeful, that this time the government will prioritize energy storage projects and see them through to implementation. We are also seeing strong leadership from private commercial and industrial consumers to develop storage projects for solving the major applications for different commercial and industrial hubs to create private projects.

With the same intent, we are delighted to announce the Stationary Energy Storage in India (SES2) Conference & Virtual Expo on 8 April 2021 focused on the roadmap and outlook for stationary energy storage. This is a unique platform to interact, network and learn about market dynamics, government policies, new projects & tender updates, insights from national and international storage projects, current and future technology outlook for stationary storage.

For Delegate Registration:
Registration Fee: ₹20,000/- (including 18% GST)
Venue: The Ashok, New Delhi
Dates: April 8, 2021 | 10:00 AM - 5:00 PM
Contact: info@indiaesw.info | [+91 8879832200](tel:+918879832200)

INDIA ENERGY STORAGE WEEK
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VIRTUAL CONFERENCE AND EXHIBITION



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Thank You !!

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