



# Electrical Energy Storage – An Overview of Indian Standards Ecosystem

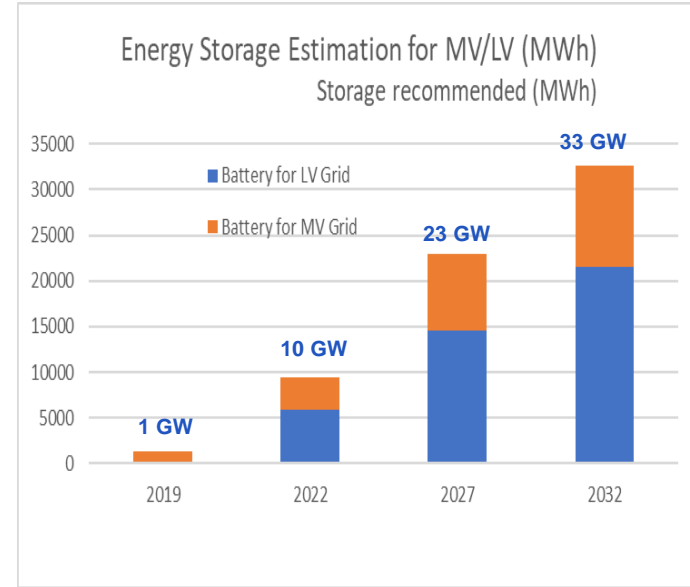
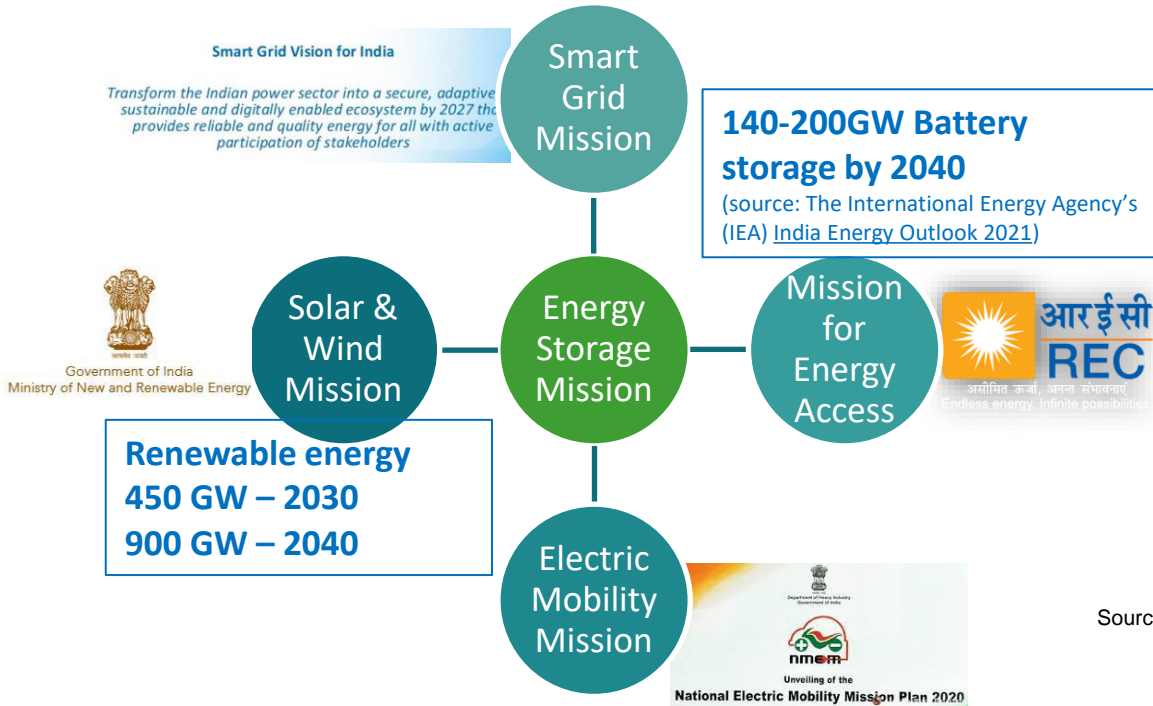
Battery Safety Science Symposium – August 11, 2021



# Agenda

1. Setting the context
2. India Quality eco-system
3. Indian standards for energy storage system
  - Developed
  - Under development
4. Way forward

# Setting the context – The India story



Source: ISGF report Energy Storage System (ESS) Roadmap for India: 2019-2032

Ministry of power (**MoP**), **NITI** Aayog, Solar Energy Corporation of India (**SECI**), Ministry of Urban Development (**MoUD**) are strategically driving the energy storage mission in India with Bureau of Indian Standards (**BIS**) supporting development of Indian standards.

# Setting the context – The India story (continued...)

3 stage solution for battery manufacturing :

## Stage 1:

- Incentivize and encourage direct investment
- Develop partnerships - joint research, development of battery technology and battery recycling
- Consortium to serve as a resource to government for recycling, battery standardization, and end-to-end strategy.

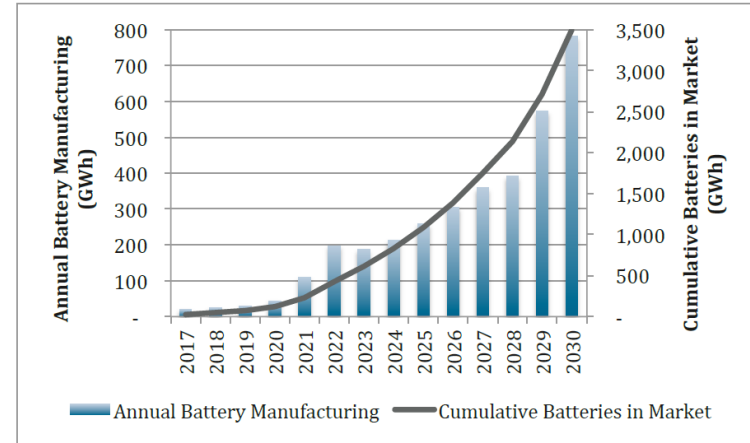
## Stage 2:

- Leverage research results - advise and help develop cell manufacturing growth strategy
- Best-practice plans for end-to-end battery manufacturing
- Development of supply chain

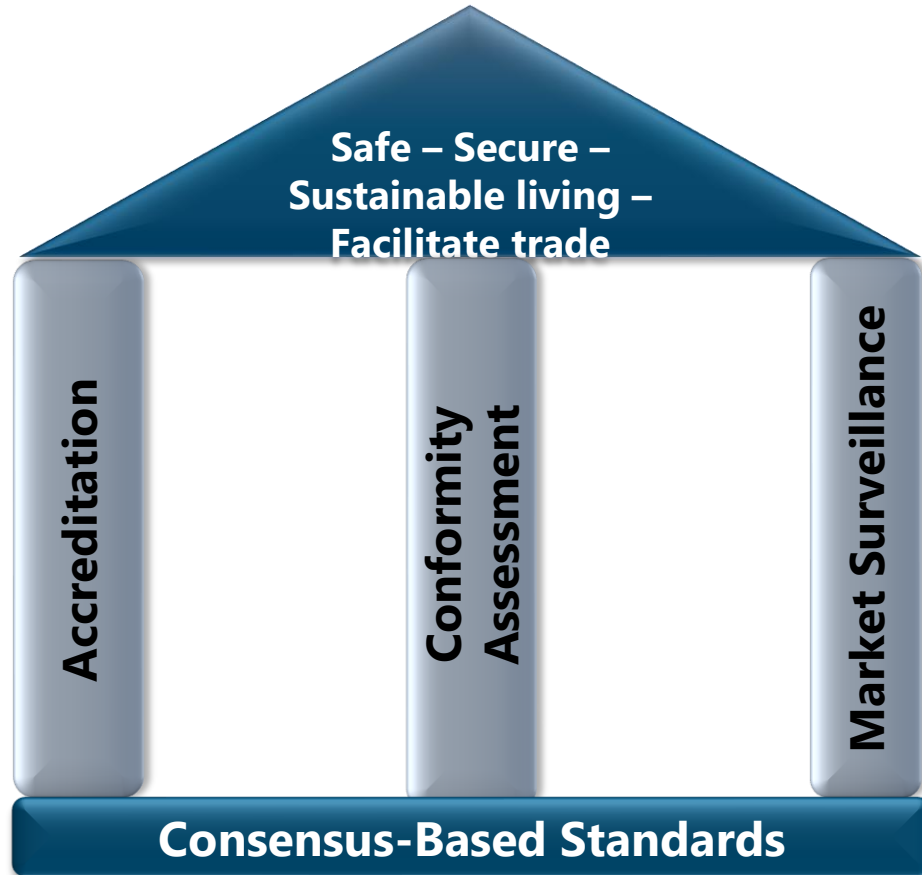
## Step 3:

- Coordination between manufacturing and infrastructure
- Rapid scaling of battery cell manufacturing

Source: India's Energy Storage Mission by NITI Aayog & RMI



# India's quality ecosystem



**Government of India, Regulators & AHJs**  
(E.g.: MeitY, MoP, CEA, CERC...)

**Bureau of Indian Standards (BIS)**

**Bureau of Indian Standards (BIS)**

**National Accreditation Board for  
Laboratories (NABL)**

**National Accreditation Board for Conformity  
Body (NABCB)**

**Bureau of Indian Standards (BIS)**

# Indian standards for battery energy storage system

## Electro Technical Department of BIS

### ETD 52-Electrical Energy Storage Systems Sectional Committee



#### **Scope:**

Standardization in the field of grid integrated Electrical Energy Storage Systems.

- a) Focus on system aspects on EES Systems rather than energy storage devices and shall prepare Indian Standards dealing with the system aspects of electrical energy storage.
- b) Any type of grid-connected energy storages

### ETD 51-Electrotechnology in Mobility Sectional Committee



#### **Scope:**

To prepare Indian Standards for electrotechnical aspects of totally or partly electrically propelled road vehicles



# ETD 52-Electrical Energy Storage Systems – Standards

#	IS Standard	Equivalent	Title	Scope
1	IS 17067: Part 1: 2018	IEC 62933-1: 2018	Electrical energy storage systems: Part 1 vocabulary	Defines terms applicable to electrical energy storage (EES) systems
2	IS 17067: Part 2: Sec 1:2019	IEC 62933-2-1: 2019	Electrical Energy Storage (EES) Systems Part 2 Unit Parameters and Testing Methods Section 1 General specification	Unit parameters and testing methods of EES systems
3	IS 17067: Part 4: Sec 1:2019	IEC 62933-4-1: 2017	Electrical Energy Storage (EES) Systems Part 4 Guidance on Environmental Issues Section 1 General specification	Technical Specification, specifies safety considerations
4	IS 17092 :2019	-	Electrical energy storage systems: safety requirements	Safety requirements of Electrical Energy Storage (EES)
5	IS 17387 :2020	-	General Safety and Performance Requirements of Battery Management Systems	Safety, performance requirement and control parameters of Battery Management System (BMS)

**New subject under consideration:** Standard for repurposed batteries

**UL Standards facilitated the development of standard for Safety of EES and BMS**



# ETD 51-Electrotechnology in Mobility– Standards

No	IS number	Title
1	IS/ISO 15118 (Part 1): 2013	Road Vehicles: Vehicle to Grid Communication Interface Part 1 General information and use-case definition
2	IS/ISO 15118 (Part 2): 2014	Road Vehicles: Vehicle to Grid Communication Interface Part 2 Network and application protocol requirements
3	IS/ISO 15118 (Part 3): 2015	Road Vehicles: Vehicle to Grid Communication Interface Part 3 Physical and data link layer requirements
4	IS/ISO 15118 (Part 4): 2019	Road Vehicles: Vehicle to Grid Communication Interface Part 4 Network and application protocol conformance test
5	IS/ISO 15118 (Part 5): 2018	Road Vehicles: Vehicle to Grid Communication Interface Part 5 Physical layer and data link layer conformance test
6	IS/ISO 15118 (Part 8): 2018	Road Vehicles: Vehicle to Grid Communication Interface Part 5 Physical layer and data link layer requirements for wireless communication
7	IS/ISO 17017 (Part 1): 2018	Electric vehicle conductive charging system – Part 1; General requirements

**UL Standards is an active member of standards development**



# ETD 51-Electrotechnology in Mobility– Standards

EV Infrastructure Categories			Indian Standards			
EV	Charging Device	Power level	Device & Charging Protocol	EV-EVSE Communications	Infrastructure Socket	Vehicle Connector
Light EV Battery < 120V	AC Light EV	Normal Power ~7 kW	IS-17017-3 {Approved :2021}	IS-17017-3 {Approved :2021} Bluetooth Low Energy	IS-60309 {Published}	Not specified
	DC Light EV		IS-17017-25 {Approved :2021}	IS-17017-25 {Approved :2021}	Not specified	IS-17017-2-4 {Approved :2021}
Cars & SUV Battery <500V	AC Parkbay	Normal power ~11kW/ 22 kW	IS-17017-1 {Published: 2018}	IS-15118 for Smart Charging {Published :2019}	IS-17017-2-2 {Published :2020}	IS-17017-2-2 {Published :2020}
	DC Parkbay		IS-17017-23 {Approved :2021}	IS-17017-24 {Approved :2021} IS-15118 {Published :2019}	To be developed (TBD)	IS-17017-2-3 {Published :2020}
	DC Fast Charger	50 kW --> 250 kW	IS-17017-23 {Approved :2021}	IS-17017-24 {Approved :2021} IS-15118 {Published :2019}	No socket	IS-17017-2-3 {Published :2020}
eBus Battery >700V	AC High Power	AC ~42 kW	IS-17017-1 {Published: 2018}	IS-15118 for Smart Charging {Published :2019}	IS-17017-2-2 {Published :2020}	
	DC Fast Charger	50 kW --> 250 kW	IS-17017-23 {Approved :2021}	IS-17017-24 {Approved :2021} IS-15118 {Published :2019}	No socket	IS-17017-2-3 {Published :2020}
	DC High Power Dual Gun	250 kW --> 500 kW	IS-17017-23 {Approved :2021}	IS-15118 {Published :2019}	No socket	IS-17017-2-3 {Published :2020}
			IS- Dual Gun {Preliminary- Draft}			
	DC High Power Automated Pantograph		IS- Pantograph -1 {Preliminary- Draft :2021}		IS- Pantograph -2 {Preliminary- Draft :2021}	

# Way forward



Consortia led research on repurposed batteries and recycling of batteries.



Participate in standard development for emerging technologies.



Building Safety awareness and preparedness

Questions?



# THANK YOU

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