Overview of ESS Tenders & Projects India

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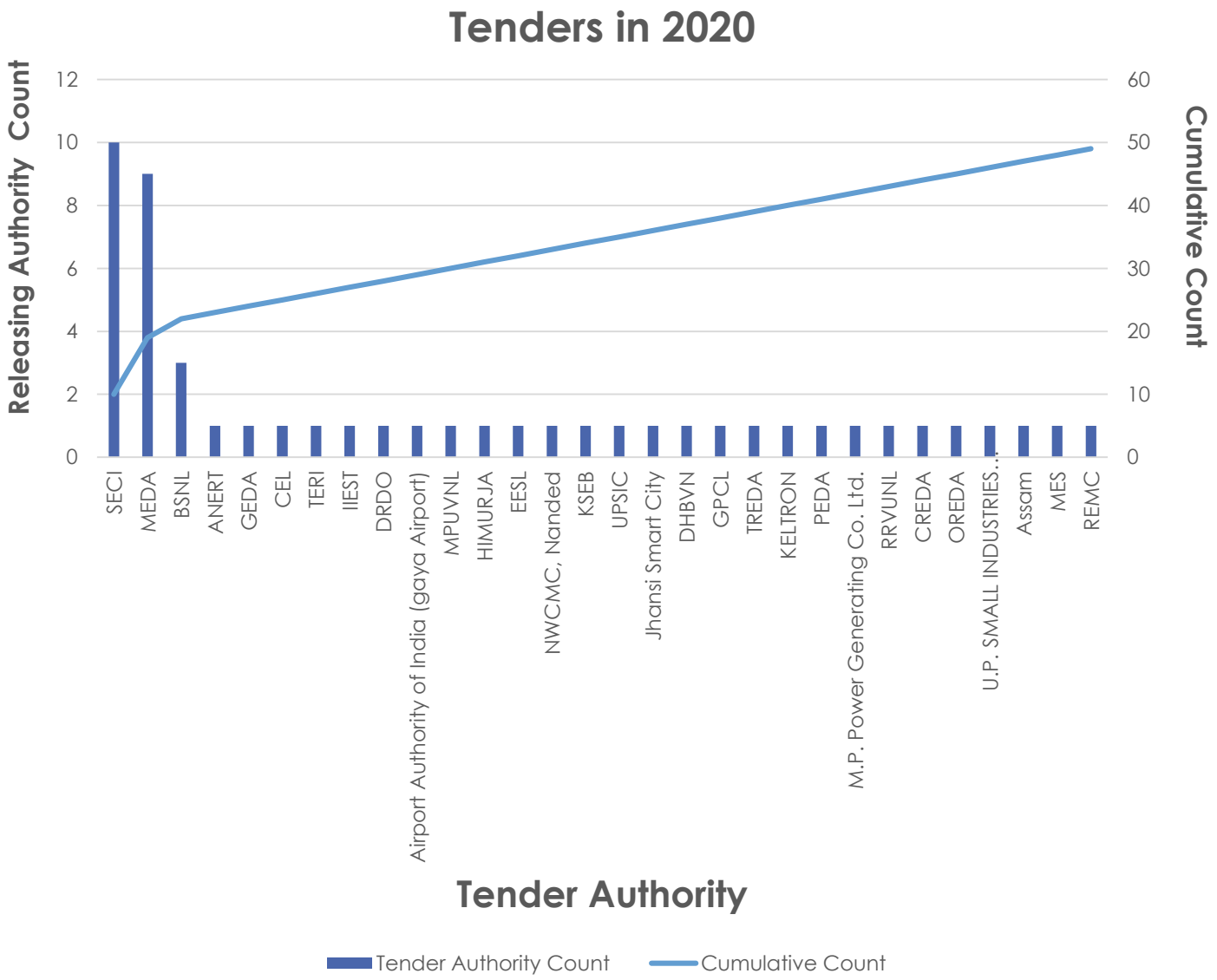
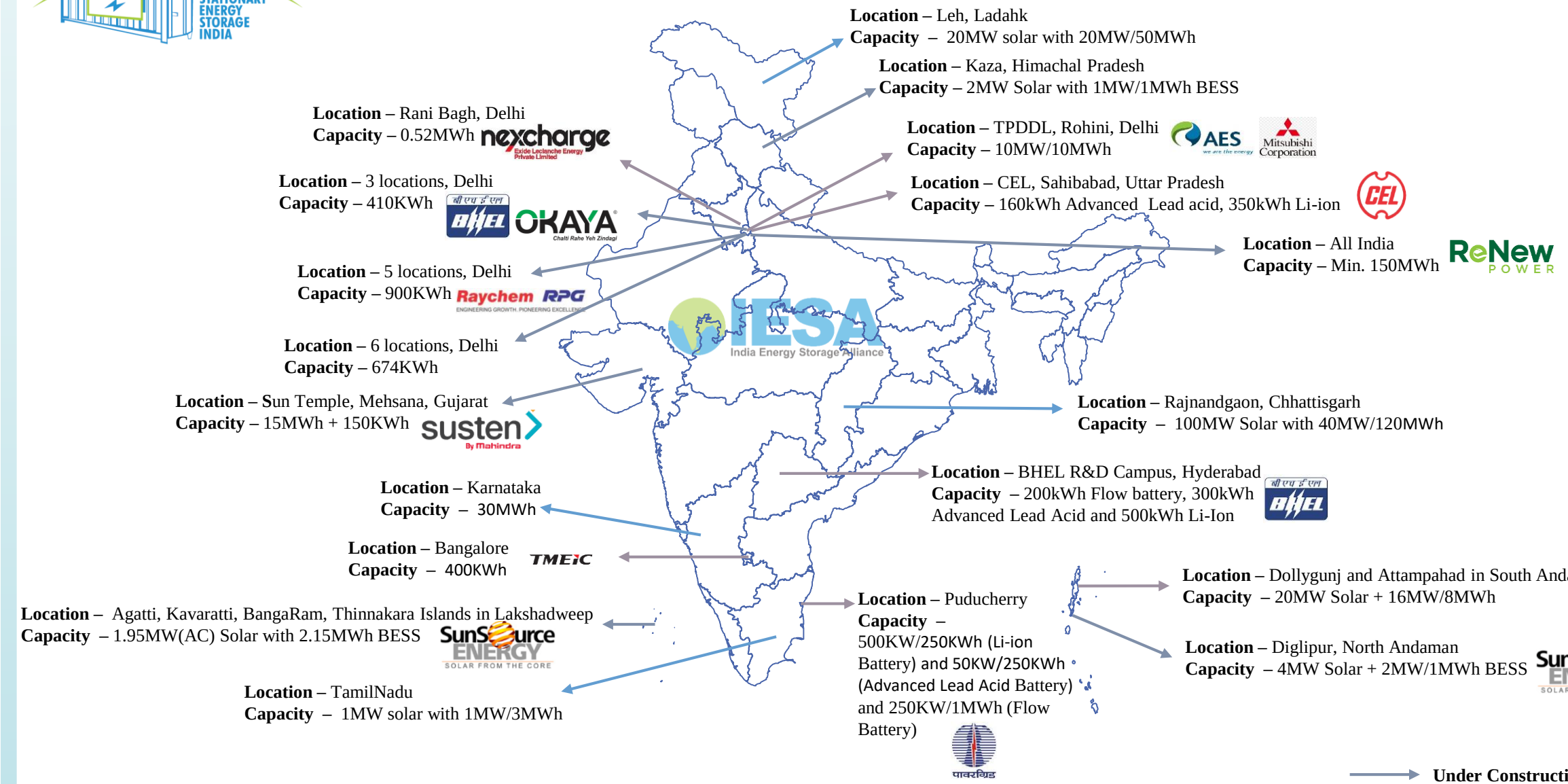
Current Open Tender

S.No.	Tender	Current Status	Remarks
1	200 MW Grid-Connected Solar PV Power Projects with 300 MWh BESS in the State of Andhra Pradesh	Delayed	
2	TANGEDCO - DESIGN, ENGINEERING, SUPPLY, CONSTRUCTION, ERECTION, TESTING, COMMISSIONING OF 1 MW (AC) SOLAR PV POWER PLANT WITH 1MW /3.0 MWH BESS INCLUDING 10 YEARS PLANT O&M IN TAMILNADU.	Last date for bid submission for subject tender - 22.04.2021	
3	SECI has issued Request for Selection (RfS) For Selection of RE Power Developers for Supply of 5000 MW of Round-the-Clock (RTC) Power from Grid-Connected Renewable Energy (RE) Power Projects, complemented with Power from Coal based Thermal Power Projects in India under Tariff-based Competitive Bidding (RTC-II)	Last date for bid submission for subject tender - 31.05.2021	**Capacity Reduced to 2.5 GW**

Tenders in 2020



India's BESS Projects Overview



AES and Mitsubishi Corporation – TPDDL Project

- **Project Name** – AES and Mitsubishi Corporation – TPDDL 10MW/10MWh Project
- **Owner** - AES and Mitsubishi Corporation
- **System Integrator –** Fluence
- **Battery Energy Storage System** – 10MW/10MWh BESS
- **Battery Supplier**: LG chem (NMC)
- **BMS** – LG Chem - Cell type
- **Inverter** – Parkinson Make with 88KVA capacity
- **Location** - Rohini 24 Grid TPDDL, Pocket 9, Sector 23, Rohini, Delhi – 110085

Source: TPDDL

BESS Key Applications	
1.	Peak Load Management
2.	Voltage Support
3	VAR Support

Announcement: February 2016

Commission: February 2019

Source - CES

L&T Solar + ESS Project for Frequency Regulation & PV Smoothening in India

- **Project Name** – NLC's 20MW solar with 16MW/8MWh BESS in Port Blair, South Andaman, India.
- **Owner** - Neyveli Lignite Corporation (NLC India Limited)
- **Operated by** – Larsen & Toubro Limited
- **Plant Scale –** 22 MWp (DC)/20 MW (AC) Solar PV Plant and 16MW/8MWh BESS
- **Inverter** – INGETeam (Eight inverters of 2.5MW capacity)
- **Battery Energy Storage System** – 16MW/8MWh BESS with LG (NMC) Batteries of 2C rating.
- **Location** - Attampahad & Dollygunj, Port Blair, South Andaman, India

Source - CES

Source: Saur Energy

BESS Key Applications	
1.	Integration of existing RE plants with existing system networks
2.	Renewable Power Smoothening
3	Frequency Regulation

Quick Fact –

- Substantial portion of the daytime power requirement of Port Blair is met through solar energy, which was hitherto dependent on diesel-based generation (reduction of approximately 5 million liters of diesel consumption is expected annually)

PGCIL – Pilot Project

- **Project Name** – PGCIL – Advanced Lead Acid Battery & Li-ion Pilot Project.
- **Owner** – Zhejiang Narada
- **System Integrator –** Exicom
- **Battery Energy Storage System** – 500kW/250KWh Advanced Lead Acid, 500kW/250KWh Li-ion (LFP).
- **Actual System Config.** –
  - Advanced Lead Acid - 691.2 kWh (useful Capacity at 2C was found 384 kWh) with DoD Rate - 65.1%.
  - Li-ion (LFP): 398 kWh(useful capacity at 2C 357 kWh) with DoD rate - 70%
- **Location** – PGCIL, Puducherry, India

Announced: 2013

Tender Awarded: July 2014

Commission: April 2017

Source - CES

Source: PGCIL

Parameters	Li-ion Battery	Advanced lead Acid Battery
Charging rate	3 hrs. from rated DoD to Full Capacity	3 hrs. from rated DoD to full capacity
DC-DC Round-trip efficiency	>90%	>80%
Service Life	10 years	10 years
Life-cycle	4000 cycles (900 MWh)	3000 cycles (675 MWh)

Quick Fact –

- Pilot also include Flow Batteries (250KW/1MWh) but due to issue in supply chain, this part was dropped later.

Nexcharge – TPDDL Project

Source: ETN

- **Project Name** – Nexcharge – TPDDL 150KW/528KWh Community Energy Storage System(CESS) Project.
- **Owner** – Nexcharge (JV b/w Exide Industries Limited and Leclanché)
- **Operated by** – Nexcharge
- **Battery Energy Storage System** – 150KW/528KWh Community Energy Storage System(CESS)
- **Location** - Rani Bagh, New Delhi.

Announcement: 2018

Commission: March 2021

Source - CES

BESS Key Applications	
1.	Peak Shaving
2.	VAR Compensation
3	Frequency Response - DSM

Quick Fact –

- Another capability of the project is its 'black start' facility; Therefore, this CESS can provide emergency supply to essential service providers like hospitals, commercial complexes, Delhi Jal Board and hundreds of consumers residing in the area in case of any exigency

ESS Ecosystem Map

IPPs/Project Developers

Invenergy, AEP American Electric Power, Xcel Energy, Sterling & Wilson, ReNew Power, SunSource Energy, AES, RES, NextEra Energy Resources, Greensmith, firstwind, L&T, Northern Powergrid, Greenko, BHEL

PCS Suppliers/ SI

NEC, SMA, Eaton, ABB, Schneider Electric, Princeton Power Systems, Siemens, Exicom Power Solutions, Parker, S&C, Dynapower Company, Bosch Invented for life, Fluence

Metal Air

PHINERGY, ACTXE 东深 High Power Multi Source Energy, NantEnergy, Fuji Pigment Co., Ltd., DE NORA

Thermal Energy Storage

CRYOGEL, PLUSS Technology for a better world, Alfa Laval, cristopia, TESSOL thermal energy solutions, promethean power systems

Chemical (Hydrogen) Storage

NUVERA, HYDROGENICS Shift Power | Energize Your World, BALLARD, Horizon Fuel Cell Technologies, Bloomenergy, THERMAX

Pumped Hydro Storage

SIEMENS Ingenuity for life, VOITH, ALSTOM, NEYRPIC

Compressed Air

DRESSER-RAND, GENERAL COMPRESSION Compressed Air & Gas Specialists, Storelectric

Sodium

NGK, agm batteries, SHARP, FIAMM, FARADION Advanced Energy Storage Solutions

Flywheel

POWERTHRU Clean Flywheel Energy Storage, OXTO ENERGY, temporal, AMBER KINETICS, ACTIVE POWER Driven by Motion

Flow Batteries

UET UniEnergy Technologies, redflow sustainable energy storage, VFLOW TECH, PRIMUS POWER, Sumitomo

Lithium-Ion Batteries

BYD, CATL, SK innovation, Panasonic, Kokam Great Power for Everyone, microvast, FARASIS, CODA ENERGY, saft, TESLA, KOREPOWER, Kokam Great Power for Everyone, TOSHIBA, LG Chem, SAMSUNG, OptimumNano

Lead Acid Batteries

Narada, LUMINOUS, HBL, OKAYA Never Stop India, COSLIGHT, Trojan Battery Company Clean energy for life., CSB Battery, EastPenn, GS YUASA, Su-Kam, EXIDE Industries Limited, MICROTEK Technology We Live, Amara Raja, ecoult energy storage solutions, ROCKET Since 1952, EnerSys, Johnson Controls

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