



**TATA POWER-DDL**

Towards a *Greener* Tomorrow

# BATTERY ENERGY STORAGE SYSTEM

Presenter : Mr. Lalit Kumar Wasan

Asia Clean Energy Forum 2023

14<sup>th</sup> Jun'23, Manila

*Reinventing energy resilience: Exploring the  
boundless potential of battery storage in India*

# Presentation Outline

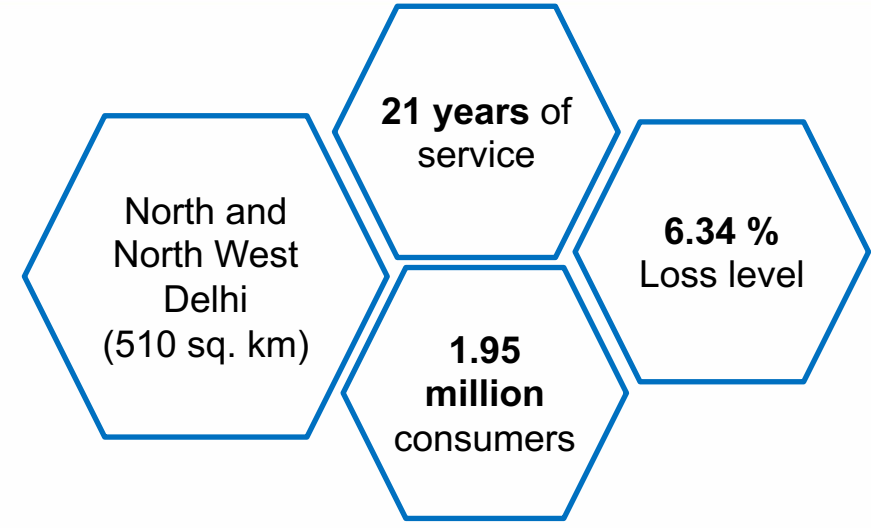
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- TATA Power-DDL – Overview & Journey
- Battery ESS – Drivers, Portfolio & Applications
- Conducive Policies and Regulations

# About Tata Power-DDL



51:49 Joint Venture  
of The Tata Power Company Limited  
(Tata Power)  
and  
the Government of Delhi  
Formed on 1st July 2002  
in



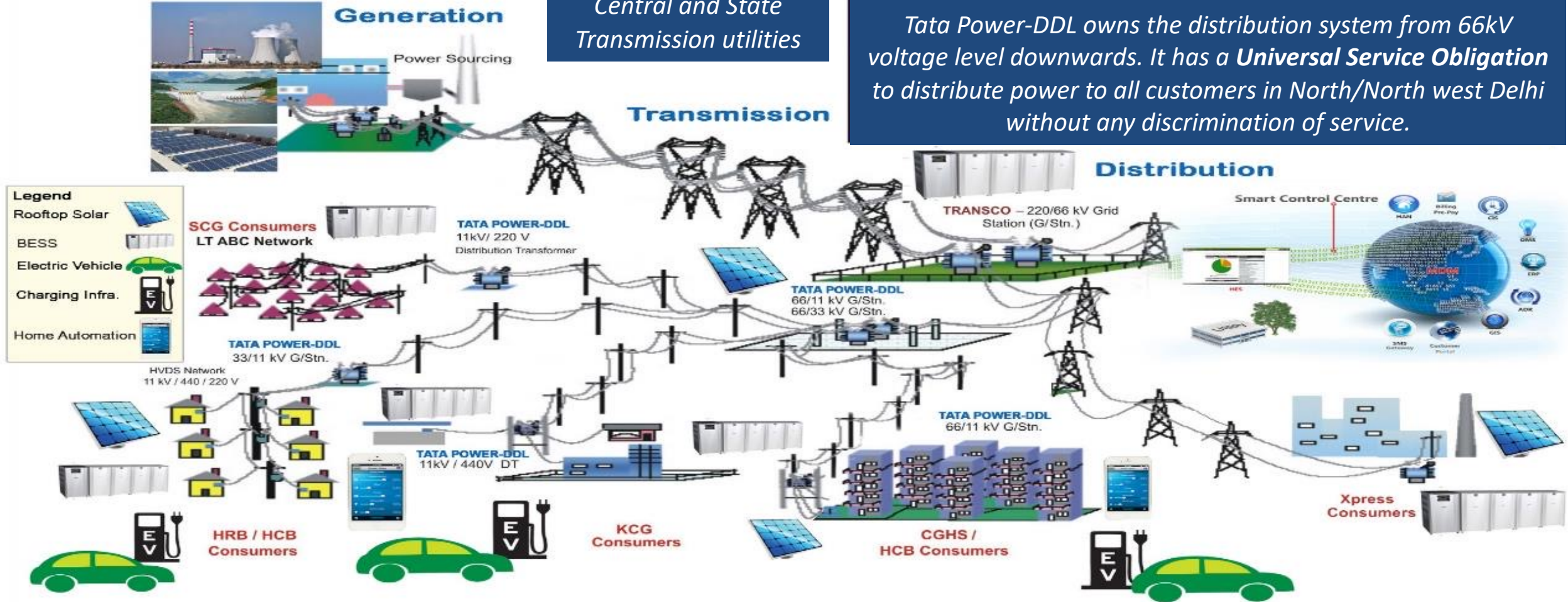
*TATA Power-DDL is an ISO 9001 (Quality Management Systems), ISO 14001 (Environmental Management Systems), ISO 45001 (Occupational Health and Safety), ISO 22301 (Security and Resilience), ISO 27001 (Information Security Management), ISO 31000 (Risk Management), ISO 50001 (Energy Management Systems), SA 8000 (Social Accountability), ISO 10002 (Customer Satisfaction - Guidelines for Complaints Handling), ISO 20400 (Sustainable Procurement) certified organization.*

# Tata Power-DDL in the Power Value Chain

We source power from Generators across India

Power is transmitted over lines owned by Central and State Transmission utilities

Tata Power-DDL owns the distribution system from 66kV voltage level downwards. It has a **Universal Service Obligation** to distribute power to all customers in North/North west Delhi without any discrimination of service.



Parameter	Unit	July 2002	March 2023
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### OPERATIONAL PERFORMANCE

AT&C Losses	%	53.1	6.34
System Reliability – ASAI -Availability Index	%	70	99.9
Transformer Failure Rate	%	11	0.68
Peak Load served	MW	930	2,229
Length of Network	Ckt. km	6,750	13,790
Street Light Functionality	%	40	99.17
Smart Meters Installed	Lakh	0	3.5

### CONSUMER RELATED PERFORMANCE

New Connection Energisation Time	Days	51.8	3
Meter Replacement Time	Days	25	3
Mean Time to Repair Faults	Hours	11	0.67
Consumer Satisfaction Index	%	-	97



**'Roshni'**

Our Brand Mascot

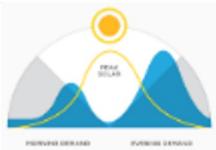
# Battery Technology Drivers : Need for grid flexibility



**Renewable Energy Integration  
– Grid & Rooftop Solar**



**Replacement of Diesel  
Generators**



**Demand variability – with  
Electric Vehicles**



**Opening of ancillary market  
in India**



**Network Congestion due to  
peaks in Demand-Supply**

**RE 100**

**RE 100 aspirations**

## Funding in battery storage, smart grid, energy efficiency jumped to \$19.5 bn in 2021

Corporate funding includes venture capital (VC) funding, public market and debt financing, global research firm Mercom Capital Group said in the report released on Thursday.

PTI • January 28, 2022, 07:52 IST



New Delhi: The corporate funding at the global level for battery storage, smart grid and energy efficiency sectors saw over a two-fold jump to USD 19.5 billion in 2021, according to a report.

Corporate funding includes venture capital (VC) funding, public market and debt financing, global research firm Mercom Capital Group said in the report released on Thursday.

"Total corporate funding for the battery storage, smart grid, and energy efficiency sectors in 2021 globally was up by 140 per cent to USD 19.5 billion, compared with USD 8.1 billion in 2020," the report said.

## Tata Power Solar bags Rs 386 cr battery storage system project at Leh

Tata Power Solar Systems has received a notice of award to build 50MWp solar PV plant with 50MWh battery energy storage system project at Phyang village in Leh, Ladakh.

## Bids for 4,000 MWhr battery storage projects to be invited soon: Power Minister R K Singh

Singh added that a battery project of 12 gigawatt hours (GWhr) will be set up in Ladakh

PTI • September 17, 2021, 14:52 IST

## Green hydrogen, battery storage can boost India's renewable energy efforts: IEEFA

It added that the green hydrogen industry would require the building of a domestic hydrogen production capacity.

ETEnergyWorld



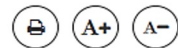
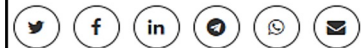
## Govt notifies ₹18,100 cr PLI scheme for promoting manufacturing of ACC batteries



## NTPC invites EoI to set up 1 GW battery energy storage system

NTPC produces around 300 billion units of electricity annually through its cluster of gas, coal, hydro and renewable energy based power stations of more than 65 GW capacity spanning across the country.

PTI • June 29, 2021, 08:05 IST



Iberdrola increases 2021 net profit 8% aided by renewables growth



Italy's Terna awards 41.5 GW in capacity market auction

Feb 23, 2022 12:19 CEST



UK government funds 24 projects to advance energy storage

# Storage Initiatives at TATA Power - DDL

## Grid Storage



## Community



## Pole Mounted



## Vehicle-To-Grid

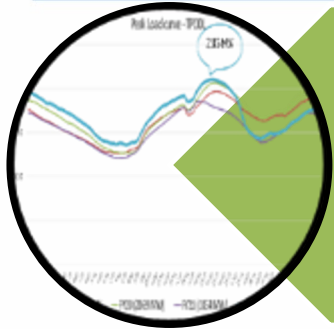




# 10 MWh Grid Connected BESS



# Key Applications Demonstrated by TATA Power-DDL



BESS can be efficiently used for Peak Load Management; this will also ensure the CAPEX deferral for upcoming years. Replacement to the end-of-life thermal plants



BESS can provide Dynamic power supply to Public Buses Grid to support unexpected peak charging requirements due to its fast-ramping feature



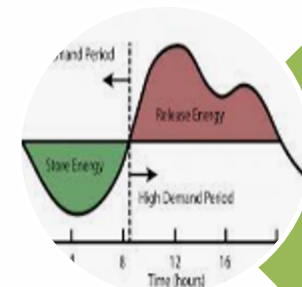
Dynamic change in Load behavior due to External factor results in forecast error and which can be catered through BESS thereby DSM/ADSM penalty can be reduced and ensure Grid discipline



Reactive Support: Provide Volt Var compensation to Maintain Power factor and Power quality in terms of maintaining Grid voltage



Support to Frequency regulation Ancillary market in terms of Second and Tertiary reserve for maintaining frequency of the Grid



Energy Arbitrage: Fill When Cheap, Drain When Price is high. This will reduce the Power Purchase cost during Peak load

# Govt. Supportive Environment

## R K Singh asks officials to focus on storage of surplus energy



**Power Minister R K Singh** on Thursday asked senior government officials to focus on the storage of surplus energy in the country.

"R K Singh, Union Minister of Power and New & Renewable Energy, chaired a virtual meeting today (Thursday) with senior officials from central government, central PSUs, **renewable energy** developers, **PSP** developers and **battery manufacturers** for discussion on the 'Report on comprehensive Policy Framework for promotion of **Energy Storage** in the Power Sector,'" the **power ministry** said in a statement.

The minister emphasised that the objective should be to ensure that no energy is lost. "For that, we need to be in a position to store all the energy, which is going to be surplus at any point of time."



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Pylontech, the force for rebalance  
C&I BESS Large Scale Utility/Grid Service

**Delhi government minister emphasises need for battery storage at visit to 10MW facility**

By Andy Colthorpe  
August 31, 2021

Grid Scale Policy Technology

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- US battery scrap recycling deal for SK, BASF building cathode materials and recycling plant in Canada
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Last Updated: 30th August, 2021 12:30 IST

## Satyendar Jain Visits Tata Power DDL, Says 10MW Battery Energy Unit Largest In South Asia

Delhi Power Minister Satyendar Jain visited the Tata Power DDL to see the 10-megawatt battery energy storage system project built at a cost of Rs 55 crore

Written By Piyushi Sharma




**POWERLINE**

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**MoP issues guidelines for procurement and utilisation of BESS as part of generation, transmission and distribution assets, along with ancillary services**

March 2022

The Ministry of Power (MoP) has issued guidelines for procurement and utilisation of battery energy storage systems (BESS) as part of generation, transmission and distribution assets, along with ancillary services on March 10, 2022.

The objectives of the guidelines include facilitating procurement of BESS, as part of individual renewable energy (RE) power projects or separately, for addressing the variability/firming power supply/increasing energy output/extending the time of supply from an individual RE project or a portfolio of RE

## Key Features of the MPD 2041

### Six objectives of the MPD:

- 01 Prioritizing Environmental Sustainability:**  
Prioritize environmental concerns and focus on rejuvenation of natural assets, reducing pollution, greening of built environments, supporting green economies like urban farming, and creating a diverse portfolio of natural and planned open spaces.
- 02 Facilitating Economic Development:**  
To promote clean economies, improve the overall investment climate and support a variety of work and workspace typologies.
- 03 Enhancing Heritage, Culture and Public Life**
- 04 Improving Housing and Social Infrastructure:**  
Meet a variety of housing demands across different income groups and typologies and foster walkable mixed-use neighbourhoods.
- 05 Moving Towards Low-Carbon Mobility:**  
Encourage modal shift in favour of public and shared modes of transport, reduce vehicular congestion and provide efficient, affordable and green mobility options.
- 06 Developing Resilient Physical Infrastructure:**  
To promote a sustainable approach towards the use of resources like water and energy.



### Primary Goal:

To make Delhi an environmentally responsible, future-ready city, focusing on ease of living, good quality, affordable, clean and safe living conditions.

## Prioritizing Environmental Sustainability

- Reducing pollution through more green energy and phasing out fossil fuel
- To compensate the unpredictable energy sources (solar / wind) with power quality issues like Harmonics, Adaptive Grid is need of an hour with integrated battery storage

## Moving Towards Low-Carbon Mobility

- Green mobility option
- Delhi Electric Vehicle Policy, 2020
- *Electric vehicle with V2G and G2V application*
- *Encouraging battery swapping stations*

## Developing Resilient Physical Infrastructure

- Sustainable approach toward use of resources like water and energy
- *Storing the energy during non-peak hours*
- *Battery connected solar generation*

# Delegates at 10 MWh BESS



Mr. P K Pujari (Chairperson, CERC)



Justice Shabihul Hasnain 'Shastri' (Chairperson, DERC)



Mr. Shixin Chen (Vice President, ADB)



**TATA POWER-DDL**

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**Thank You**