

Wind Energy- 60 GW and beyond



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New Delhi



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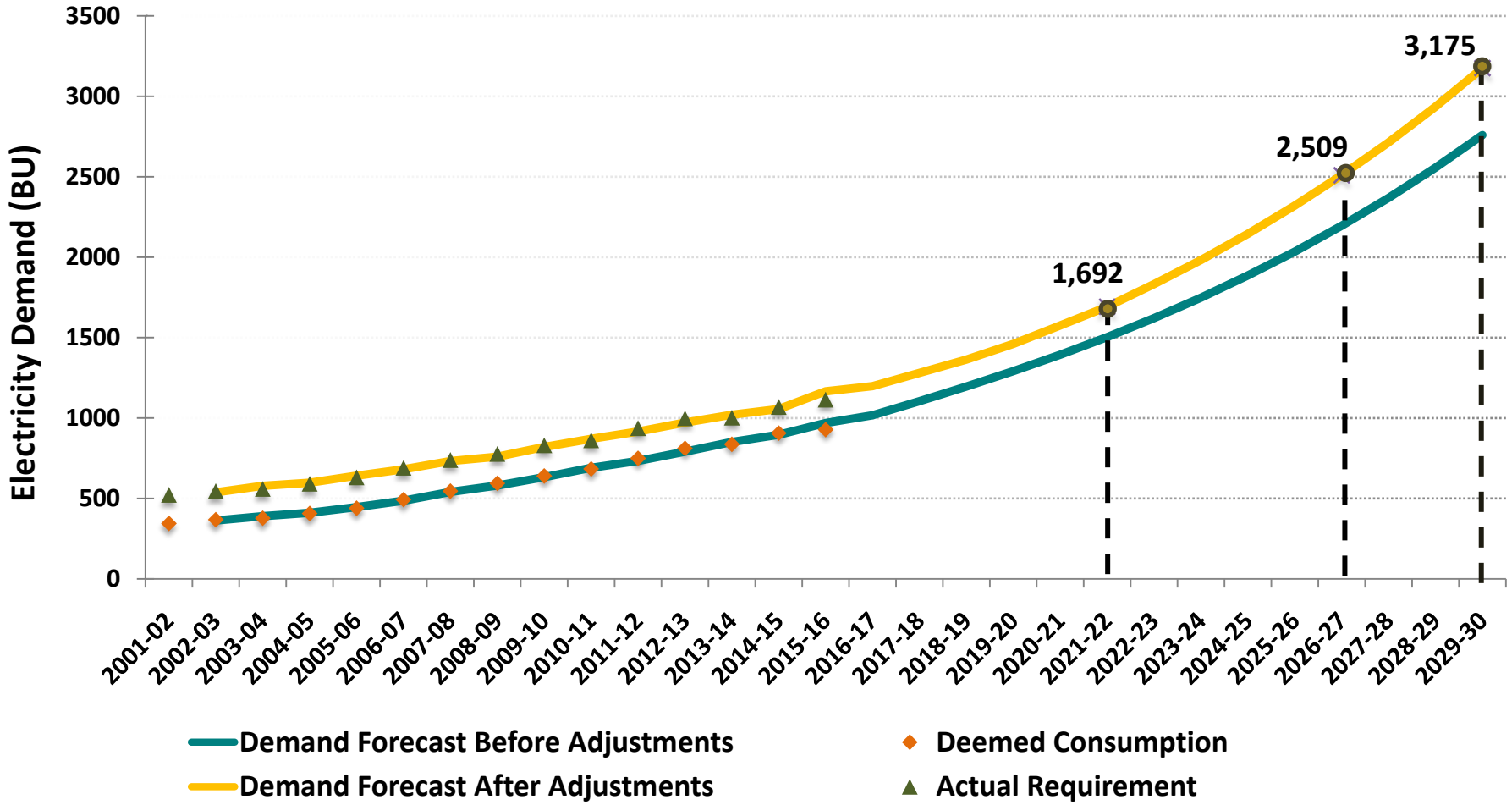
Setting the theme

- ↘ Growth of electricity sector in India
- ↘ Wind energy growth potential
- ↘ Conference theme – overview



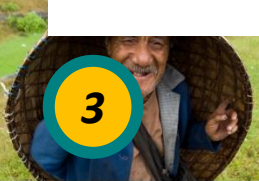
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DEMAND FORECAST- ALL INDIA LEVEL



— Demand Forecast Before Adjustments
— Demand Forecast After Adjustments

◆ Deemed Consumption
▲ Actual Requirement



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Growth of power sector

- High correlation observed
 - Total power consumption versus GDP and per capita GDP
 - Sectoral power consumption and respective sectoral GDP (Industrial and agriculture etc.)
- Electricity demand growth scenario and Installed Capacity

	Generation (BU)		Installed Capacity (GW)	
Years	High RE Scenario	Low RE Scenario	High RE Scenario	Low RE Scenario
2021 - 22	1692	1692	506	457
2026 - 27	2509	2509	802	542
2029 - 30	3175	3175	1185	872

- CAGR of electricity consumption in India - 7.4%



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Indian Power Horizon

- 69% of RE Installations are from Wind Energy.
- To meet the above demand scenario – the generation mix scenario would be:

INSTALLED CAPACITY (GW)						
	High RE Scenario			Low RE Scenario		
	2021-22	2026-27	2029-30	2021-22	2026-27	2029-30
Renewable Energy (Wind+ Solar)	160	470	853	110	210	284
Non RE excluding coal	98	114	114	98	114	114
Coal	248	218	218	248	218	474
TOTAL	506	802	1185	457	542	872



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Supply Side Scenarios- All India Level Upto 2030

COMMON ASSUMPTIONS/ METHODOLOGY

- **PLF/ CUF:** Nuclear(75%), Hydro(35%), Gas(22%), Solar(19%), Wind (25%)
- **Capacity addition** of coal, nuclear, hydro and gas based plants by & large based on draft NEP figures
- Coal based generation to cater to the residual demand left after the capacities of all other sources generate upto their assumed PLFs/ CUFs

Two scenarios considered...

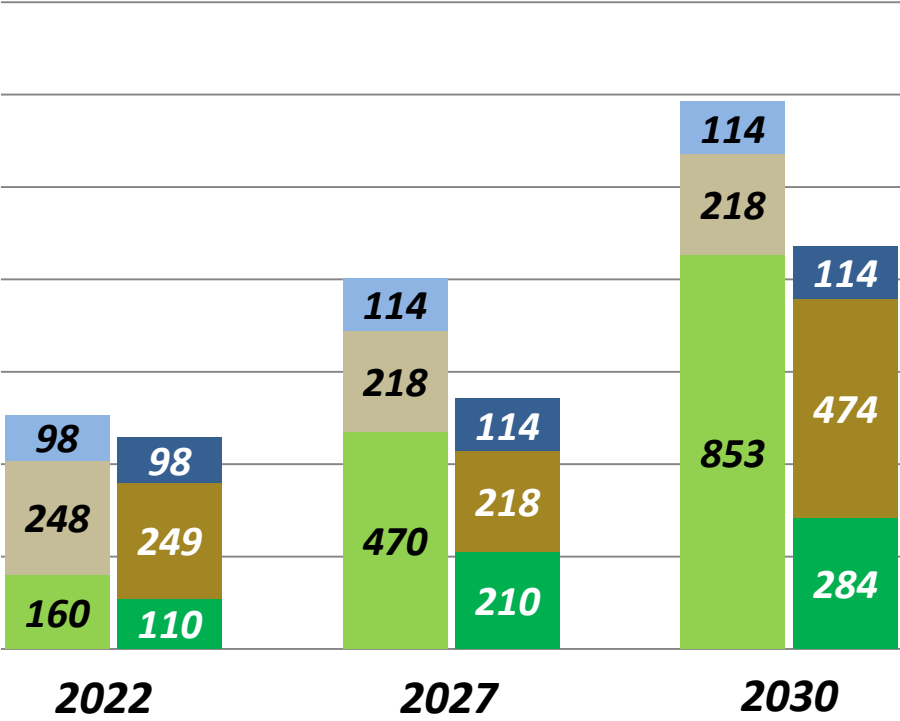
	High Renewable (HRES)	Low Renewable (LRES)
Renewable Capacity Addition	175 GW (2022) 25 GW p.a. thereafter	125 GW (2022) 20 GW p.a. (2022-27) 25 GW p.a (2027-30)
Grid related issues for RE	Resolved by 2027	Not completely resolved
Grid parity for Solar+ Storage	Achieved	Not achieved
Unmet demand met by	New RE capacity	Various options available; coal considered



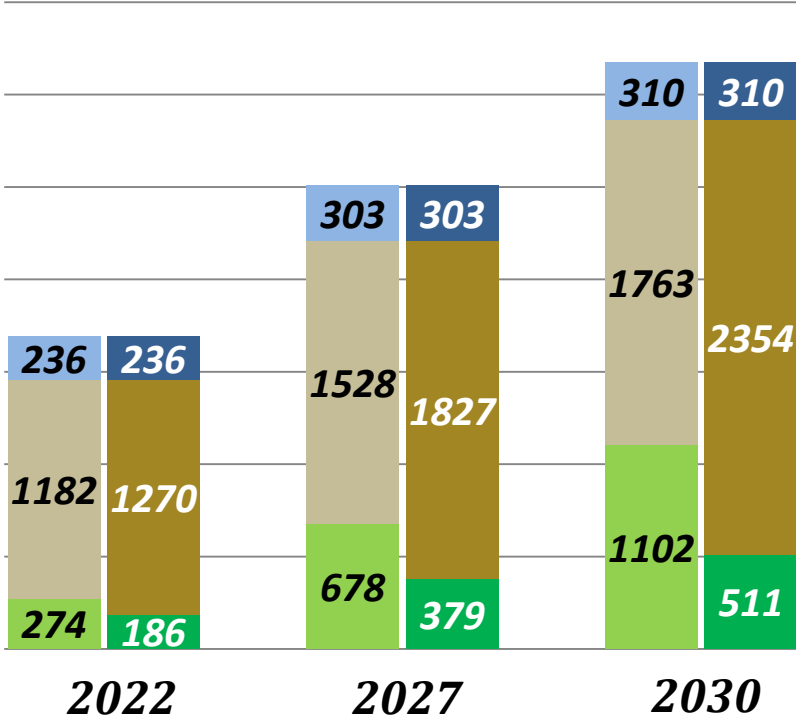
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Supply Side Scenarios- HRES & LRES Results

Installed Capacity (MW)



Generation (BU)



LEGEND: HRES: Wind + Solar (Green), Coal (Tan), Others (Blue) | LRES: Wind + Solar (Green), Coal (Olive), Others (Dark Blue)

Note: In the HRES, new RE capacity required to meet the unmet demand after 2026 would undergo a downward revision based on the extent of development in storage technologies



Wind sector Highlights

- ↘ The new global total at the end of 2016 was 487 GW, representing cumulative market growth of more than 17 percent.
 - Global Wind Power Installations at 54 GW during 2016

- ↘ India
 - Estimated wind energy potential in the country is 302 GW at 100 meters hub height
 - 32,280MW installed by March 2017
 - 3471.95 MW installed in FY 2015-16.
 - INR 25,000 crores (USD 3.73 billion) of total investment made in manufacturing in India
 - Manufacturing capacity of 9,500 MW
 - Export potential of over 2 billion \$ per annum



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Wind energy drivers

➤ Drivers:

- CoP21- Commitment: 40% RE in supply mix by 2030
- Economic growth is one of the demand drivers - GDP
 - House Hold Connectivity and 24x7 power availability
 - E-mobility (Electric Vehicles) and electrification of transport sector

➤ Wind, over the past twenty five years, has proved itself to be scalable, cost effective, source of Power Generation in India, with a bag of matured turbine technologies.



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Conference theme - Growth focus

- Strong policy and regulatory support
- Infrastructure planning
- Off-shore wind development
- Technology innovations
- Make in India – Export potential
- Cost and Variability to be addressed
 - Renewables (Wind) would achieve grid parity and would become dispatchable power. i.e Wind + Storage/balancing
 - Price of dispatchable Wind Power would be about Rs. 5/kWh and would be competitive with price of coal based electricity



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