

The Changing Face of the Power Sector

August, 2016 Bengal Chamber of Commerce & Industry Kolkata This presentation is made for purposes of discussion and illustration only. This is not intended to be a recommendation. KPMG does not take any responsibility for actions taken on the basis of this presentation.



Renewables will rise rapidly over the next 10 years to contribute 20% to our power mix

Changing energy mix overlaps with a rise in 'Digitalisation' of our utilities

The rise of storage technologies will become another game changer

From a COP perspective, this will contribute over 5% reduction in our emissions target

The rise of renewables will be very rapid: 20% by 2025 and very rapidly thereafter



- Scale up and competitiveness of solar power could disrupt coal- based generators
- PLFs of conventional coal generators to fall by 10-15% by 2020
- Effect could be significant post 2020 with solar capacity additions in tune of ~20GW p.a

Storage Technologies Distributed solar combined with storage will be a game changer; will disrupt utilities(1/2)



Storage Technologies Storage to be a game changer: Example of the Solar House (2/2)



Description	Middle Income Group	High Income Group
Average Monthly Demand (kWh)	150	350
Rooftop Area for a typical house (sq.ft.)	500	1000
Rooftop Suitable for Solar Installation (sq.ft.) (Assuming 30 per cent availability)	150	300
Installable Capacity of Solar (kWp)	1.5	3
Average Monthly Generation from Solar (kWh)	200	400

A grid independent solar house is likely to be a reality after 2022: LCOE in INR/kWh



The utility of the future is going to look very different: digitalisation at its core



Demand Response is an established market in the U.S, is developing in Europe and is expected to be a \$60 billion worldwide market.



- Services provided:
- Recruiting
- Sign-up consumers
- Maintenance
- Forecasting
- Packaging
- Controlling
- Balancing mechanism

- Identifies and aggregates business with high potential for demand response ٠
- Provides the necessary tools & support for customers to schedule energy ٠ consumption/generation based on dynamic energy prices

Strategic Implication (1/2)

Planning needs a new paradigm



Transmission Connections



Storage and Ancillary Services

Need an integrated energy plan

- 1. Strengthen planning institutions
- 2. Guide States
- Develop protocols for planning

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 Ancillary services market

Strategic Implication (2/2)

Generators need to bring in flexibility

Impact of solar eclipse on Germany

In Germany, the optimized coal-fired power plants are able to operate at a partial-load level of less than 20 per cent of full-load capacity



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THANK YOU

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