Role of Demand Flexibility in Maharashtra

Maharashtra Power System Transformation Workshop, IEA

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Should we care for Demand Flexibility?

Savings in power procurement costs

- **February 2019 - MSEDCL**: 1 GW grid-connected solar PV (Phase –II)  
  2.74 Rs./kWh
- **August 2018 – SECI 500 MW inter-state wind auction**: 2.59 Rs./kWh

Benefits from decarbonization of the economy

- **High RE versus low RE scenario comparison in E3 India Model**
  - State GDP: +0.20%
  - Electricity consumption: +1.01%
  - Electricity Costs: -2.67%
  - Avg Household Income: +0.70%

- Flexibility helps bring down power procurement costs while adding significant amounts of renewables

- Higher share of renewables in the energy mix >> cheaper electricity >> higher electricity demand >> higher GDP and consumer spending
Let’s be more flexible!

Demand-side flexibility is going to be vital
New role for Responsive Demand

- Traditionally discoms have tried to overbuilt supply to meet demand – not the most cost-effective option anymore
- Moving from a world where we forecast load and schedule generation, to a world where we **forecast generation and schedule load**
New era >> New solutions

- Load shifting >> higher consumption
- Sector coupling >> more opportunities to shift load
- Storage >> fast flexibility
2 Tools in the tool-box

Demand-side flexibility comes from a combination of options
Different Strategies for Different Time-periods

Source: LBNL, Charting California’s Demand Response Future, 2016
## Different Technologies for Different Loads

<table>
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<tr>
<th>Controllable Technologies</th>
<th>Residential</th>
<th>Commercial</th>
<th>Industrial</th>
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<td>Heat pumps</td>
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<td>Thermal storage</td>
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<td>Water pumping solutions</td>
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<td>Electric Vehicles</td>
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<td>Cold storage</td>
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Cocktail recipe

Price + Policy + Regulation
Getting prices right is crucial

Source: Hawaiian Electric Company, (2014 April 30), Minimum Day Time Load Calculation and Screening: Distributed Generation Interconnection Collaborative (DGIC) webinar

Interim Time-of-Use Rates*
(For illustrative purposes only)

*Illustration reflects February 2016 electric rates with applicable surcharges.

Source: Faruqui et al., Time-varying and Dynamic Rate Design, 2012
Incentivize controlled loads

- By providing **source of revenue**
  - Enable to participate in wholesale markets
  - Enable to participate in ancillary services markets

- By allowing **newer business models**
  - Load aggregators
  - Behind-the-meter load shift service providers
Regulatory oversight essential

- Responsibility of Consumer Education
- Transaction Costs and Risks are minimized
- Entry for New Service Providers
- Need for Data Transparency & Privacy
Summary

• **Demand Flexibility** is going to be vital

• Benefits for the **overall economy** of the State

• **Pilots are essential** to find the right solutions
About RAP

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