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Role of Demand Flexibility in Maharashtra

Maharashtra Power System Transformation Workshop, IEA

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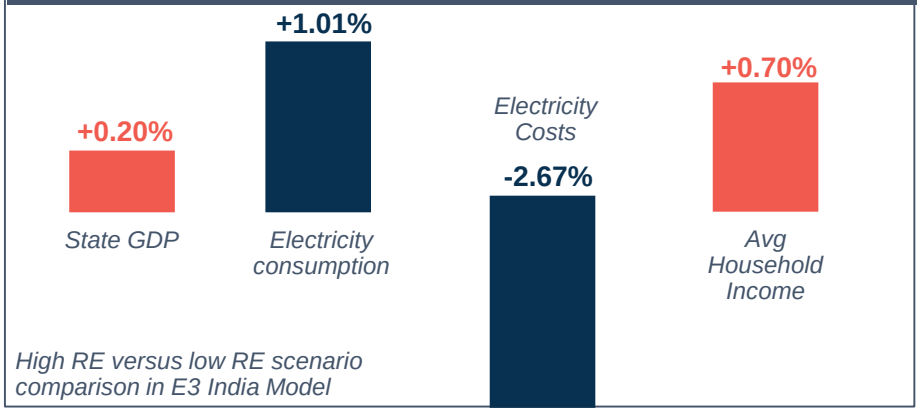
Should we care for Demand Flexibility?

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



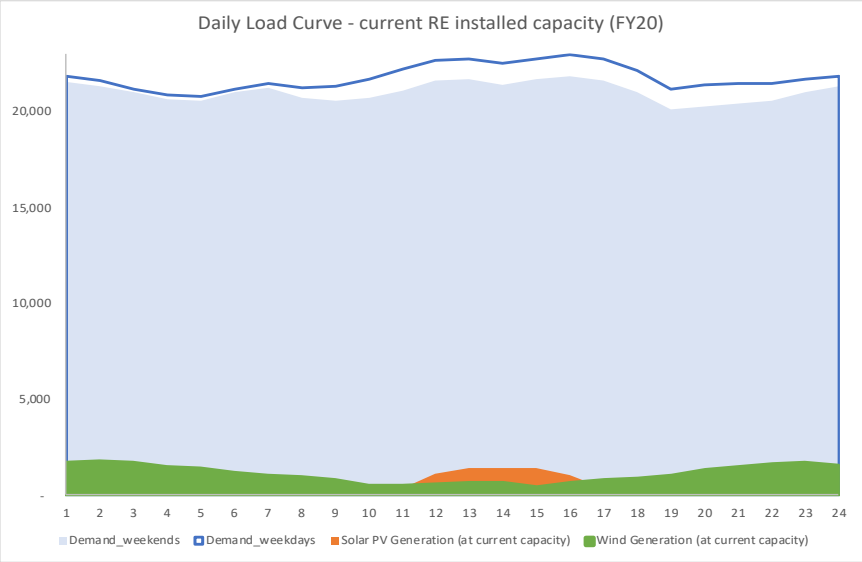
High RE versus low RE scenario comparison in E3 India Model

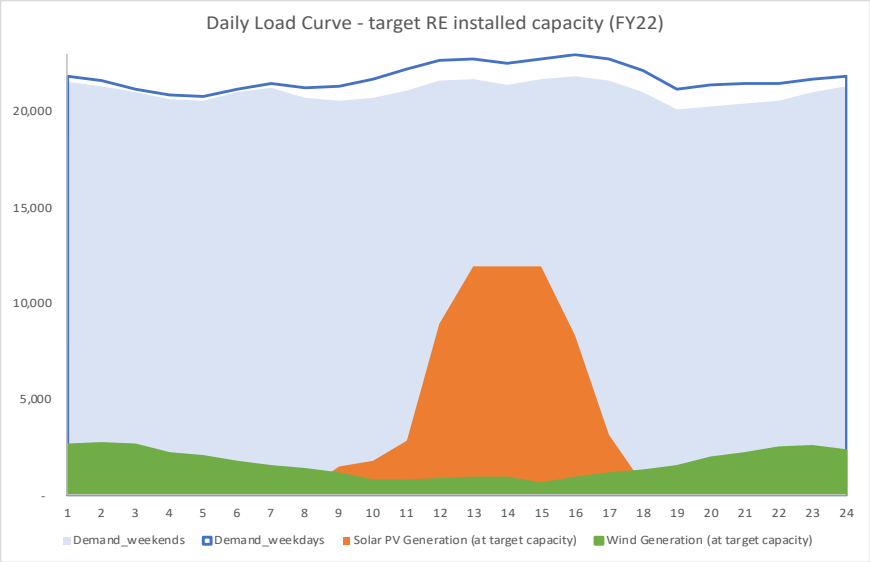
- Flexibility helps bring down power procurement costs while adding significant amounts of renewables
- Higher share of renewables in the energy mix >> cheaper electricity >> higher electricity demand >> higher GDP and consumer spending

1 Let’s be more flexible!

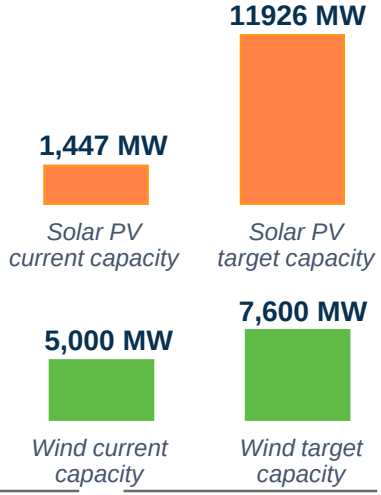
Demand-side flexibility is going to be vital

New role for Responsive Demand

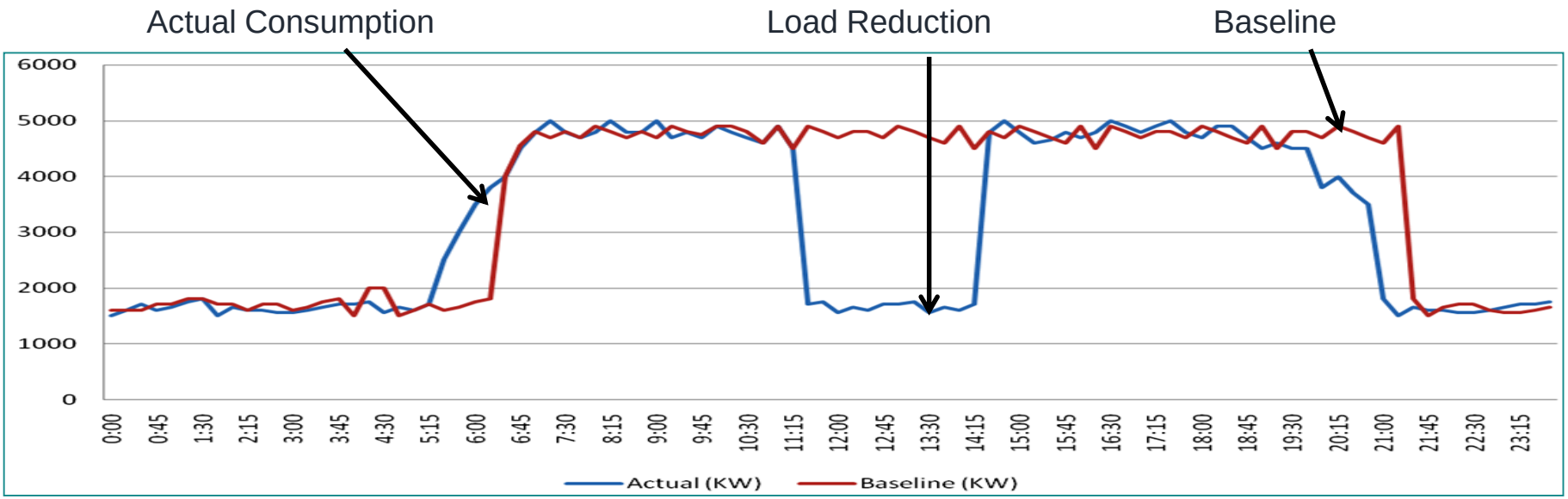




- Traditionally discoms have tried to overbuilt supply to meet demand – not the most cost-effective option anymore
- Moving from a world where we forecast load and schedule generation, to a world where we **<u>forecast generation and schedule load</u>**



New era >> New solutions

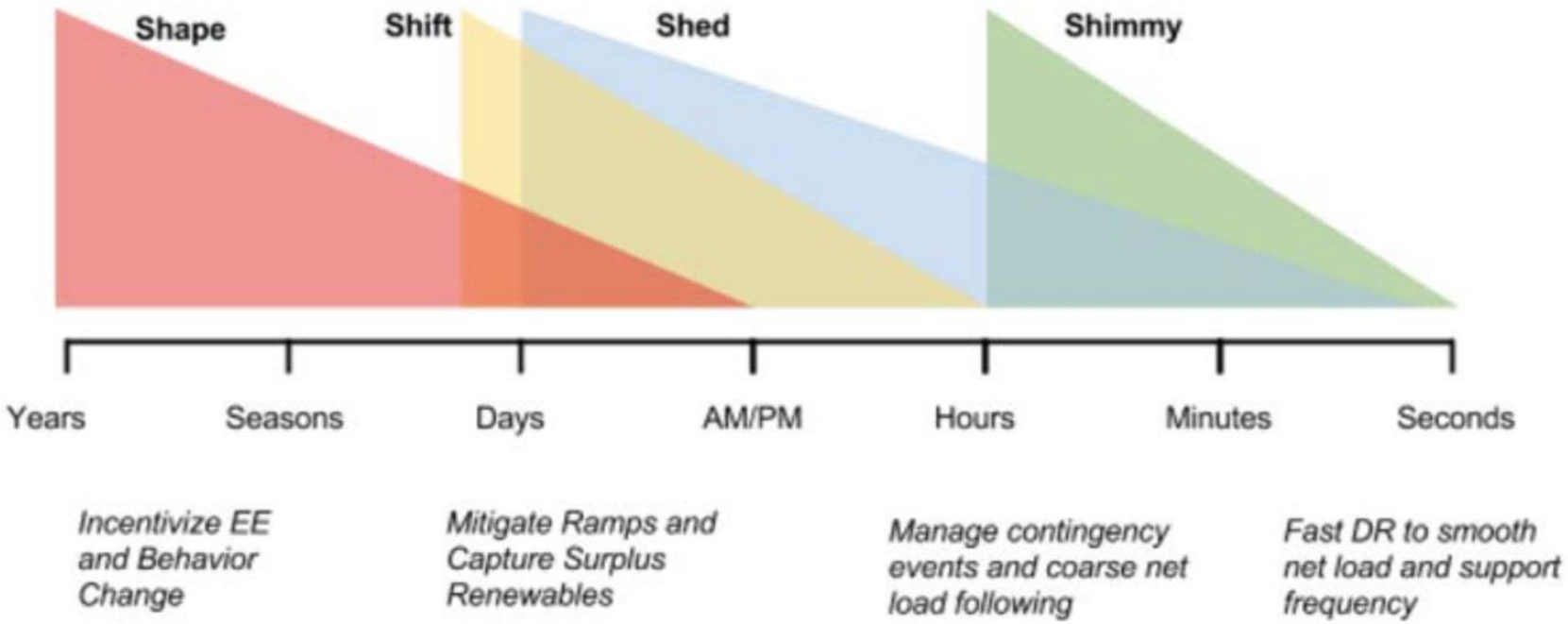


- Load shifting >> higher consumption
- Sector coupling >> more opportunities to shift load
- Storage >> fast flexibility

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

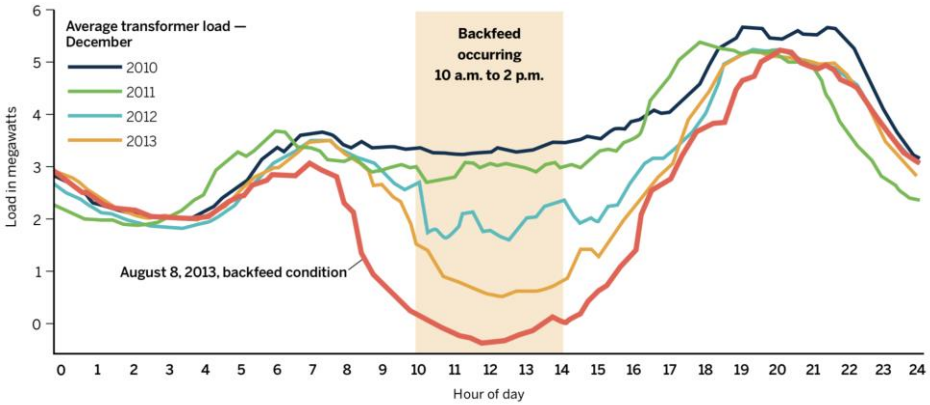
Different Technologies for Different Loads

Controllable Technologies	Residential	Commercial	Industrial
Heat pumps	✓	✓	✓
Thermal storage	✓	✓	✓
Water pumping solutions	✓		
Smart appliances	✓	✓	✓
Behind-the-meter batteries	✓	✓	✓
Electric Vehicles	✓		
Cold storage		✓	✓

3 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

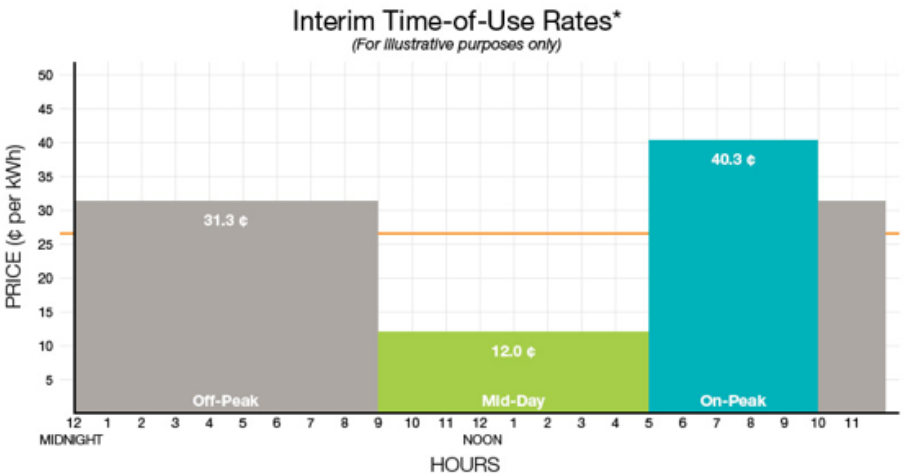
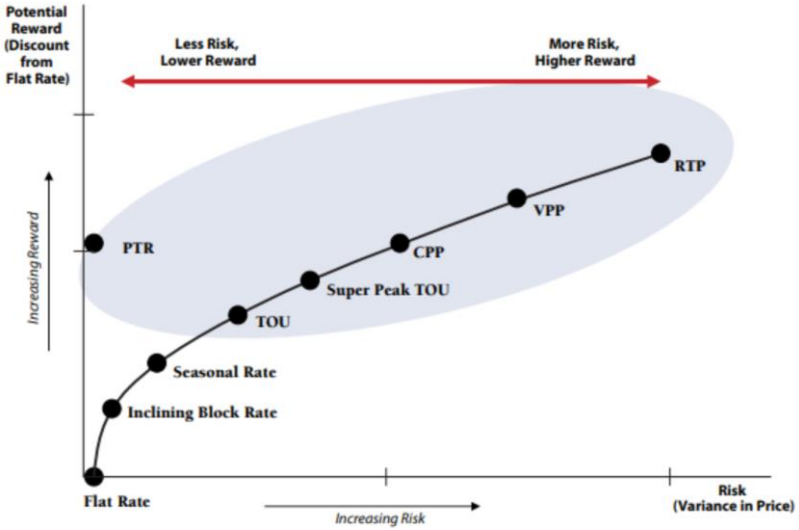


*Illustration reflects February 2019 electric rates with applicable surcharges.



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

Placeholder for graph TOU from various regions

Incentivize controlled loads

- **By providing <u>source of revenue</u>**
  - Enable to participate in wholesale markets
  - Enable to participate in ancillary services markets

- **By allowing <u>newer business models</u>**
  - 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

The Regulatory Assistance Project (RAP)® is an independent, non-partisan, non-governmental organization dedicated to accelerating the transition to a clean, reliable, and efficient energy future.

Learn more about our work at raponline.org

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