

# PART C: Business Models for BTM Resources

## Session Content

- Business Models for Promoting BTM Resources
- Rooftop PV
- ESS
- EVs
- Heat Pumps /Electric Water Heaters
- Business Models for Demand Response (DR)
- Business Models for EV-Grid Integration

## Speaker:

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# What are the Behind the Meter (BTM) resources?

- BTM Resources include following:
  - Solar Rooftop PV
  - Battery Energy Storage Systems (BESS) at Customer Premises
  - Equipment/Resources Capable of Participating in Demand Response (DR) Programs
  - Electric Vehicles
  - Electric Water Heaters
  - Heat Pumps

# Business Models for Promotion of Solar Rooftop PV

- Government Subsidies
- Gross Metering
- Net Metering
- P2P Trading of Solar Energy
- Green Certificates

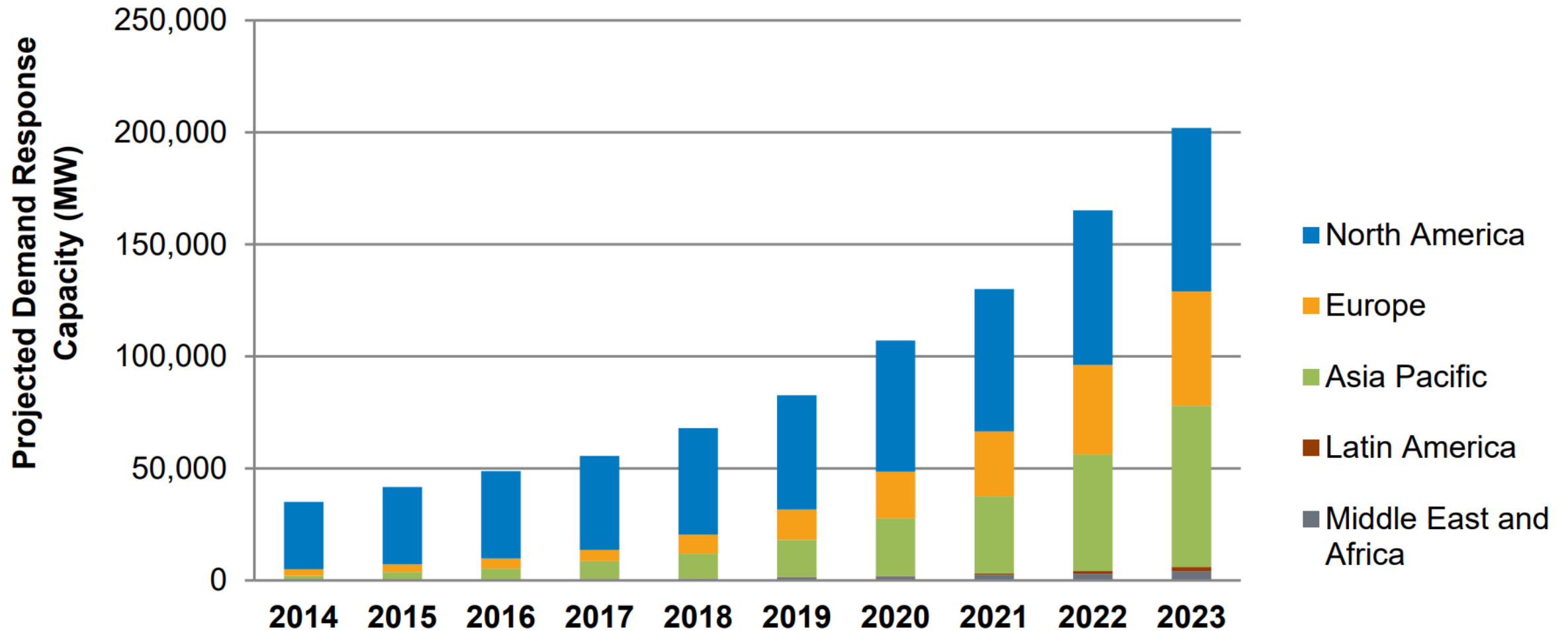
# Business Models for BESS

- Time of Use (TOU) or Time of the Day (TOD) Tariffs for Electricity
- Local Energy Markets (LEM)
- Demand Response (DR) Incentives
- Subsidy/Grants by Governments or Utilities

# Business Models for Demand Response

- Who can provide Demand Response to Utilities?
  - Large Industrial Customers with Interruptible Loads – machines that can be switched off during peak hours
  - Large Commercial Buildings where Cooling/Heating Loads can be manipulated – precool or preheat the buildings during off-peak hours and shut-off cooling/heating during peak time for few hours
  - Campuses (Microgrids) and Communities (LEM) who can island from the grid during peak (or) supply electricity back to the grid during peak hours
- DR Business Models
  - Typically, Utilities provide financial incentives to DR Aggregators who in turn offer incentive to the participating customers
  - Regulatory Support for DR
  - Need to undertake survey of DR potential in a Utility

# Global Demand Response Market



Source: NREL

# Business Models for Vehicle-Grid Integration

- Electric Vehicles with Vehicle to Grid (V2G) functionality is ideal resources for enhancing grid flexibility
- Large number of EVs connected to the grid can be aggregated as virtual power plants (VPP) – when there is surplus generation on the grid that can be stored in EV batteries; and EVs can pump back electricity to the grid during peak hours
- With regulatory support Utilities can incentivize V2G participants
- Another method is large building owners incentivize V2G participants (V2B) under TOU/TOD tariff regimes
- Typical numbers we have seen is in the range of USD1200-1500 per year for a medium sedan

# Business Models for Water Heaters and Heat Pumps

- Electric Water Heaters and Heat Pumps can also offer flexibility to the grid
- During surplus generation heat water and store in insulated tanks and do not run water heaters during peak hours – France has been successfully doing this since 1960s
- TOU/TOD tariffs incentivize customers for investing in the thermal storage



**Thank You**

Any questions?

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