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<th>17-IEPR-03</th>
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<tr>
<td><strong>Project Title:</strong></td>
<td>Electricity and Natural Gas Demand Forecast</td>
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<tr>
<td><strong>TN #:</strong></td>
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<tr>
<td><strong>Document Title:</strong></td>
<td>Preliminary Self-Generation Forecast</td>
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<tr>
<td><strong>Description:</strong></td>
<td>8.3.17 Presentation by Asish Gautam of CEC</td>
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<td><strong>Filer:</strong></td>
<td>Raquel Kravitz</td>
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<tr>
<td><strong>Organization:</strong></td>
<td>California Energy Commission</td>
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<tr>
<td><strong>Submitter Role:</strong></td>
<td>Commission Staff</td>
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<td><strong>Submission Date:</strong></td>
<td>8/2/2017 8:37:09 AM</td>
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Preliminary Self-Generation Forecast

California Energy Commission

August 3, 2017

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Energy Assessment Division
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Data Sources

- CPUC NEM Interconnection
- Self-Generation Incentive Program
- New Solar Homes Partnership
- CSI Thermal
- POU SB 1 Filings
- Energy Commission data from co-generation plants
Forecasting Approach

- Based on customer response to cost benefit/economic metrics
- Adoption follows a Bass Diffusion curve
- Results for adoption differ by demand scenario since projected fuel rates and number of homes/floor space and assumptions regarding NEM vary by scenario
Changes to PV Forecast Methodology

• Residential Sector:
  – Incorporates TOU rates/periods for IOUs and SMUD
  – Rates and periods based on utility filings regarding proposed default TOU pilots
  – Using average annual residential rate for other POU's
  – Residential profiles also further segregated by annual electric usage
Changes to PV Forecast Methodology

• Residential Sector:
  – Adoption based on revised cost-benefit approach
    • Switch from payback period to monthly bill savings for IOU/SMUD
    • Updated payback curve from CPUC/E3 NEM tool for other POUs

• Commercial Sector:
  – Revised adoption curve based on payback (NEM 2.0 tool)
CEC Battery Storage

- Model development ongoing
- Adoption targets 3 segments:
  - Standalone battery storage
  - Battery storage paired with PV
  - Storage from past adopters of PV systems
- Primarily focused on residential sector
  - 5kW/15kWh
  - 85% RTE
  - Cost trends from SGIP
CEC Battery Storage

- Standalone storage operation based on retail rate arbitrage
  - Limited potential due to relatively small differential between peak/off-peak
  - Negligible differential in non-summer months
- Storage paired with PV
  - Maximizes onsite use of PV before storing PV energy
  - Discharge based relative to retail TOU rates
Other Updates

- **NEM:**
  - Options presented at March 17 DAWG workshop
  - Presented to JASC group on April 4/April 20
- **Low Demand:** Assumes current NEM over forecast period
- **Mid Demand:** Assumes exports credited at $0.10/kWh
- **High Demand:** Same as Mid but adds $3/kW charge based on PV system size
- **Updated assumptions regarding Federal ITC**
Statewide Results (PV Energy- GWh)
All 3 scenarios above CEDU 2016 mid case
New mid case grows 13% per year compared to 9.6% per year for CEDU 2016 mid case
PV Capacity (MW) by Planning Area and Scenario

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<th>Planning Area</th>
<th>High_Demand</th>
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California Energy Commission

Statewide Results (Non-PV)

New mid case grows ~4% per year compared to ~3% per year for 
CEDU 2016 mid case
Statewide Battery Storage Capacity (MW)
Residential New Construction PV

- Focus on single family homes
- Serves as proxy for ZNE
- Accounting of upcoming 2019 building standards
  - Baseline forecast vs managed forecast
Key Uncertainties

• Rate and NEM reform
• Technology cost/performance trends
• Regulatory/utility transition
• Development of market opportunities for aggregating preferred resources in retail and wholesale markets
Next Steps

• Near Term:
  – Update historical data
  – Complete storage analysis
  – Incorporate stakeholder comments for revised forecast
  – Kickoff project with NREL to prepare for 2018/2019 IEPR

• Longer Term:
  – Rulemaking proceeding to modernize data collection activities related to DERs
  – Coordination with stakeholders in other venues regarding IEPR demand forecast
    • DRP, TPP, IRP