Customer and Retail Choice in California

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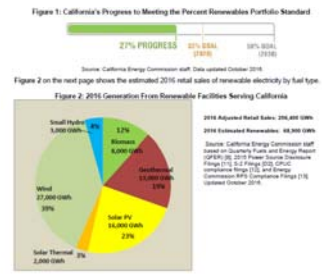
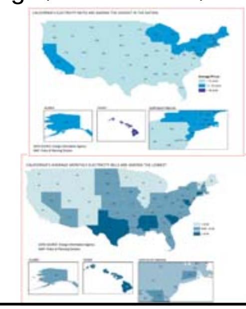
Customer and Retail Choice in California: California Electricity 101

As of end of 2016, 27% Renewable Energy Mix



CA has high electric rates but low electric bills:

Avg: \$0.16/kWh - \$90/month



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Customer and Retail Choice in California: California Electricity 101 cont

- 3 Large Investor Owned Utilities (IOUs) serve 75% of CA (Gen + T&D)
- 48 Publicly Owned Utilities (POUs) serve 25% (LADWP/SMUD make up majority)
- CA IOUs own very little generation
- IOU profits de-coupled from electric sales (i.e. CA IOUs make all their money from T&D infrastructure investments)
- CA IOU transmission system and wholesale market managed by Independent System Operator

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Customer and Retail Choice in California: Brief History of CA Electricity Mkt 1998 - 2017

Customer and Retail Choice in California: Major Trends: CCA

- Community Choice Aggregators are legal entities formed by cities and counties to aggregate customer electric demand and procure electricity on behalf of these customers as an alternative to the incumbent utility
- First CCA was formed in Marin County in 2010
- CCAs now serve almost 1,000,000 (mostly around the Bay of San Francisco)
- CCAs are under consideration in every major city/county in CA – up to 15m Californians could be served by a CCA by middle of 2020s

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Customer and Retail Choice in California: Major Trends: NEM

- CA has over 5,200 MWs and 650,000 customers on Net Energy Metering (NEM) (roughly 5% of peak demand)
- 1/16 CPUC revised NEM to require all new NEM customers to take Time of Use rates, pay $100 connection fee and include $0.02-$0.03/kWh non-bypassable charge. At same time, CPUC eliminated cap on NEM
- NEM installations have slowed since new NEM rules came into place and industry coming to grips with Time of Use requirements
    - 323 MWs in Q4 2016
    - 157 MWs in Q1 2017

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Customer and Retail Choice in California: Major Trends: Energy Storage

- AB 2541 (2010) required CPUC to develop energy storage mandate
- CPUC approves requirement for IOUs to procure 1.3 GWs of energy storage by 2020
- Customer sited energy storage can currently access $500m in incentives through Self Generation Incentive Program
- SCE leading way in energy storage procurement with over 250 MWs of energy storage contracts
    - 30 MWs Tesla project installed in under 6 months to respond to Aliso Canyon outage

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Customer and Retail Choice in California: Where are we going?

- Between CCA, NEM and legacy Direct Access, 25% of IOU load will be served by a 'competitive' supplier by end of 2017
- Set to grow significantly – up to +80% by middle of 2020s – under current regulatory framework
- Major theme driving departure from IOU bundled service to NEM and CCA is technology innovation and cost reduction (i.e. very low cost solar PV that allows thirds parties to undercut IOU rates)
    - CCAs typically sell electricity that is more renewable and 5% to 10% cheaper than IOU
    - CCAs benefitting from utility scale PV cost declines while IOUs have higher cost legacy contracts

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Customer and Retail Choice in California: What are we doing about it?

- CPUC is starting to review a number of major regulations
  - Power Charge Indifference Adjustment: tool used to allocate costs of above market generation to CCAs and Direct Access providers
  - Integrated Resource Planning: As part of implementation of 50% RPS, CPUC considering how it would oversee procurement plans from potentially dozens of providers – today IOUs procure 85% of load so CPUC can focus on their three plans
  - NEM 3.0: CPUC in early planning for further refinement of NEM

And….

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Customer and Retail Choice in California: What are we doing about it?

- CPUC is opening Rulemaking on Utility and Regulatory Model in Technology Driven Market
  - Expect to review role of IOU as primary load serving entity (i.e. what are implications if IOU doesn't sell kWh anymore?)
  - Consider lessons learned from fully-competitive markets like Texas, technology-driven markets like Hawaii, and hydrid markets like New York
  - Assess how CPUC can effectively regulate in environment where millions of customers can respond to price signals automatically and technology moves faster than market design or regulations
  - All while focusing on positioning California to achieve its BOLD energy goals
    - 40% Below 1990 GHG Levels by 2030 while Accelerating CA Economic Growth
      - 50% RPS by 2030
      - 1.5 million zero emission vehicles by 2025
      - 2x Energy Efficiency

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Thank you!
For Additional Information:
www.cpuc.ca.gov

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