


## 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

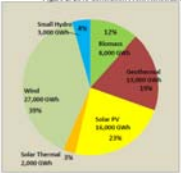
Figure 1: California's Progress to Meeting the Percent Renewables Portfolio Standard



Source: California Energy Commission staff. Data updated October 2016.

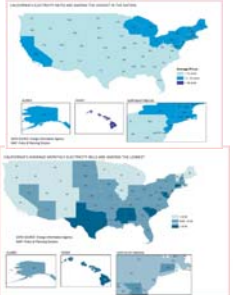
Figure 2 on the next page shows the estimated 2016 retail sales of renewable electricity by fuel type.

Figure 2: 2016 Generation From Renewable Facilities Serving California



2016 Adjusted Retail Sales: 236,891,000 kWh  
 2016 Estimated Generation: 88,962,000 kWh

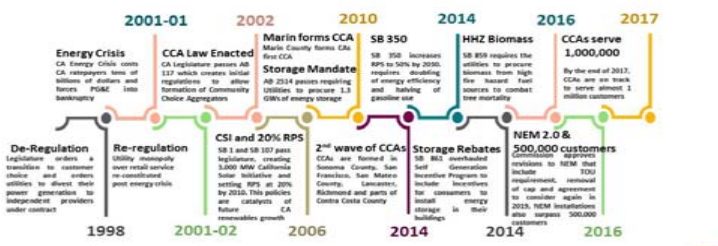
Source: California Energy Commission staff based on Southern Public and Energy Research (SPEER) 2016 Power Generation Database. Final 2016 RPS 33% and Energy Commission RPS Legislative Package (RPS) updated October 2016.



## 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

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



**1998**: De-regulation orders a transition to customer choice and orders utilities to attract their own generation to independent producers under contract.

**2001-01**: Energy Crisis. CA Energy Crisis costs CA taxpayers tens of billions of dollars and forces PG&E into bankruptcy.

**2001-02**: Re-regulation. Utility monopoly over retail and/or re-constituted power energy crisis.

**2002**: CCA Law Enacted. CA Legislature passes AB 127 which creates initial regulations to allow formation of Community Choice Aggregators.

**2006**: CSI and 20% RPS. SB 1 and SB 107 pass legislature, creating 2,000 MW California Solar Initiative and setting RPS at 20% by 2010. This policies are catalysts of future growth CA renewables growth.

**2010**: Marin forms CCA. Marin County forms CCA, first CCA.

**2010**: Storage Mandate. AB 2514 passes requiring utilities to procure 1.5 GW of energy storage.


**2010**: SB 350. SB 350 increases RPS to 30% by 2020, requires doubling of energy efficiency and halving of gasoline use.

**2014**: 2nd wave of CCAs. CCAs are formed in Sonoma County, San Francisco, San Mateo County, Llaneros, Richmond and parts of Contra Costa County.

**2014**: Storage Rebates. SB 863 overhauls Self Generation Incentive Program to include incentives for consumers to install energy storage in their buildings.

**2014**: NEM 2.0 & 500,000 customers. Commission approves revisions to NEM that include TDU requirement, removal of cap and agreement to consider NEM 2.0. NEM installations also surpass 500,000 customers.



**2016**: CCAs serve 1,000,000. By the end of 2017, CCAs are on track to serve almost 2 million customers.



### 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






## 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


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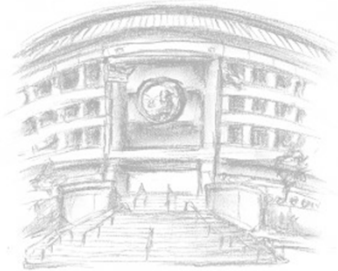

## Customer and Retail Choice in California: What are we doing about it?

- 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 hybrid 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](http://www.cpuc.ca.gov)



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