



Policy Direction Workshop

October 9, 2017



AGENDA

- Foundation Materials
- Regulatory & Legislative Update
- Customer Survey
- Power Supply Options
- Customer Considerations (if time permits)

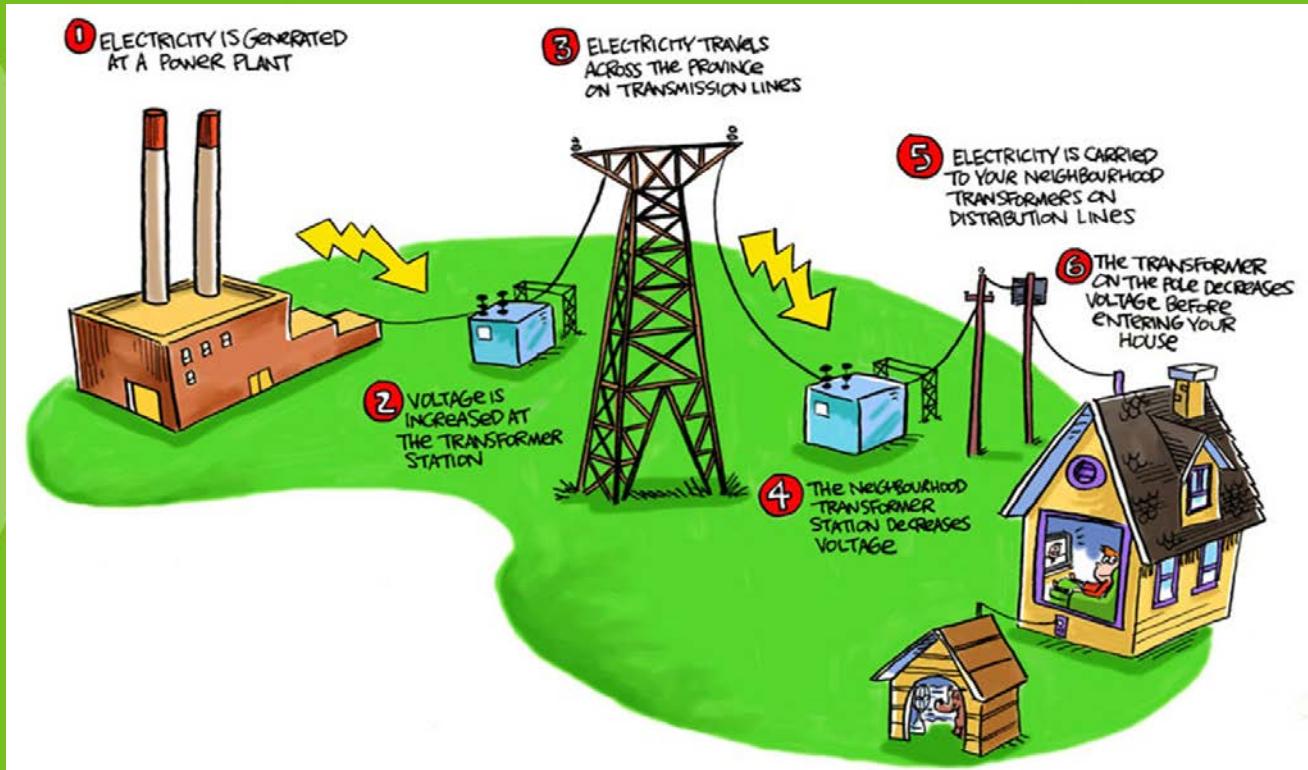


Foundation Materials

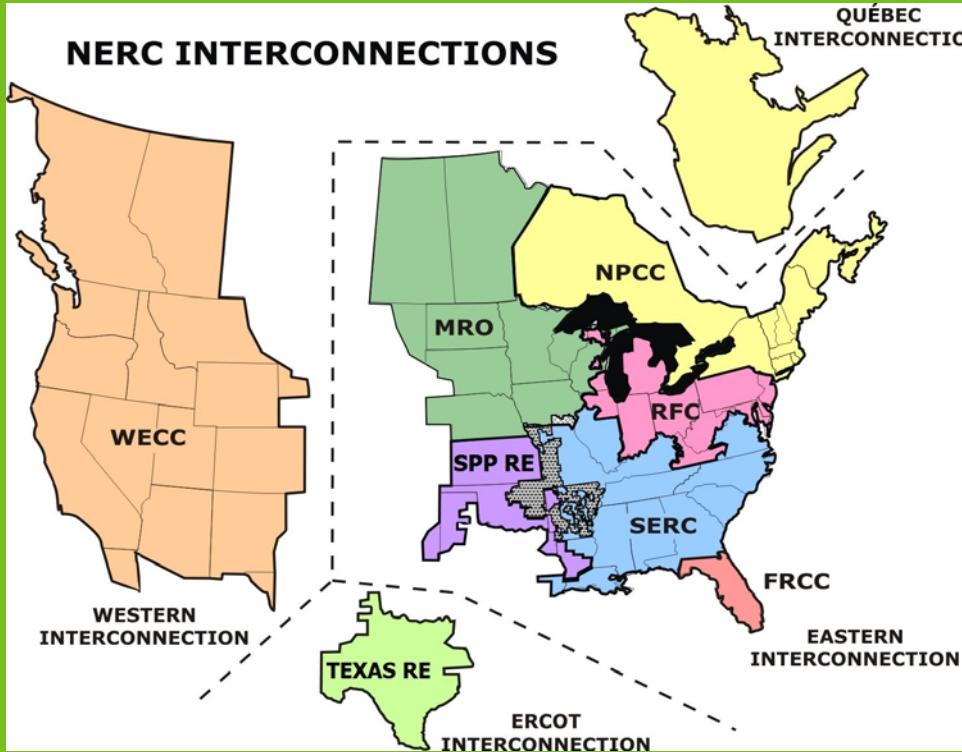


How “The Grid” Works

Utility Infrastructure



How “The Grid” Works Utility Infrastructure



NERC = North American Electric Reliability Corporation

Who Manages the Grid?

- Balancing Authorities(BAs) are responsible for real-time balancing of supply (generating resources) and demand (load) to ensure grid reliability
- Eight Balancing Authorities exist in California, with the largest being the California Independent System Operator (CAISO)



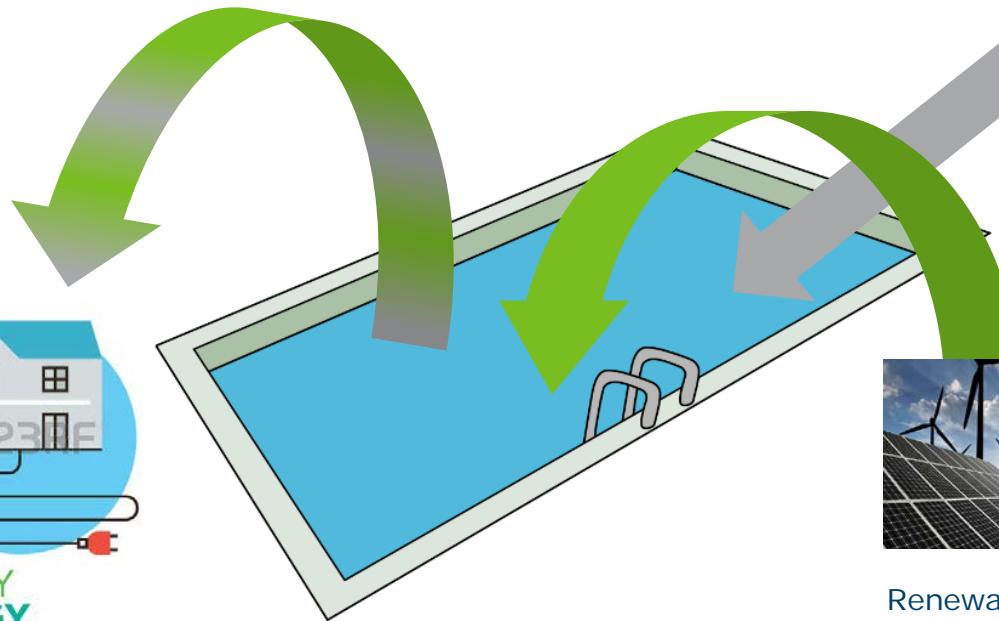
Electricity: Power Flow

The CAISO is responsible for the *second-to-second (real-time)* monitoring and maintenance of demand and supply balance

All load-serving entities in the CAISO, such as SVCE, receive electricity from the supply mix from the CAISO at that instant in time



SVCE customers consume energy from the CAISO grid



Conventional energy is produced onto the CAISO grid



Renewable energy is produced onto the CAISO grid

Electricity: Power Flow vs. Attribute Tracking

Once delivered to the grid, electrons ("green" or "brown") are indistinguishable from one another.

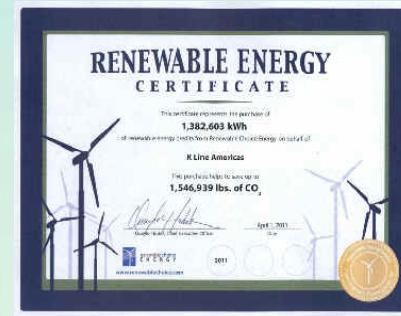
Furthermore, there is no way to physically track these specific electrons after they are injected onto the grid. That is, we cannot know who consumed the electrons that were supplied by Wind Farm A.

Therefore, for regulatory compliance and for substantiation of marketing claims, a load-serving entity, such as SVCE, must use power supply contracts to specify ownership of the "attributes" associated with supplying electricity.

- Power supply contracts specify ownership of product attributes (examples: electric energy volumes, resource adequacy/RA, and RECs).
- Owners of product attributes can make claims with regard to renewable energy content and environmental impacts.
- RECs, e-tags and contract documents are typically referenced to substantiate such claims.
- SVCE's renewable and carbon free energy portfolio is balanced not in real-time, but over a year.

What is a Renewable Energy Certificate (REC)?

- California Law (Public Utilities Code S. 399.12 [f]) defines a REC as:
 - A certificate of proof, issued through the accounting system established by the Energy Commission...that one unit of electricity was generated and delivered by an eligible renewable energy resource
 - “Renewable energy credit” includes all renewable and environmental attributes associated with the production of electricity from the eligible renewable energy resource, except for an emissions reduction credit issued pursuant to Section 40709 of the Health and Safety Code and any credits or payments associated with the reduction of solid waste and treatment benefits created by the utilization of biomass or biogas fuels.”
- The CPUC further defines the attributes, including the avoided greenhouse gas (GHG) attributes, associated with a REC in D.08-08-028. Pursuant to this decision, the GHG attributes associated with the RPS energy generation are transferred to the buyer of the REC.



REC ≠ Carbon Free

- RECs represent *avoided* GHG (Greenhouse Gas) emissions.
 - *Example, renewable energy delivered by a landfill gas power plant has avoided GHG emissions that would have resulted when the gas created by decomposing municipal solid waste at the landfill escapes into the atmosphere.*
- Carbon Free sourcing means there are zero GHG emissions associated with the electricity production serving SVCE's retail customers.
- To date, GHG emissions reporting for load serving entities to retail customers has been voluntary.
- Common approaches have been to deem renewable energy, hydroelectric energy and nuclear energy as carbon free.
- Treatment varies among retailers in GHG emissions reporting for geothermal, biofuel generation, and unbundled RECs.

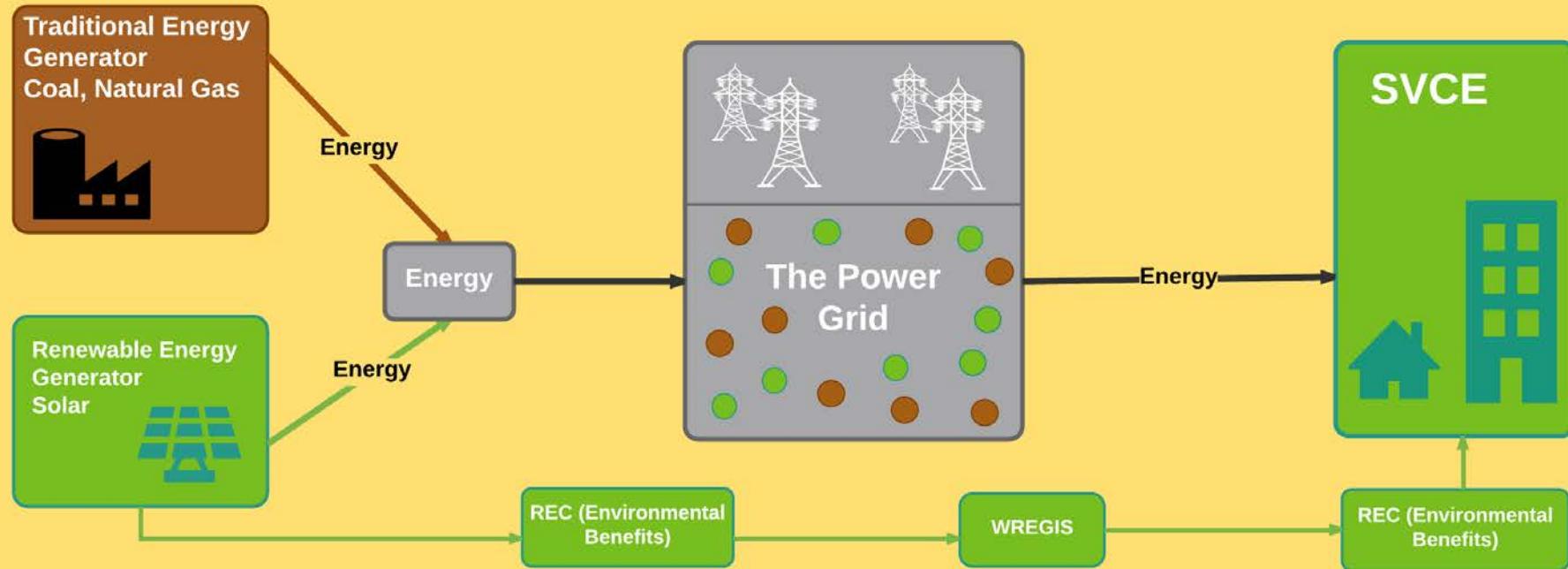
RENEWABLE vs. CARBON FREE

- **Renewable Energy** - electricity from a source that is not depleted when used, and is not derived from fossil or nuclear fuel.
- **Carbon-Free Energy** - electricity that does not emit carbon or other greenhouse gases.

| Renewable | GHG-Free |
|---------------------|---------------------|
| Biomass and Waste | |
| Geothermal | |
| Solar | Solar |
| Wind | Wind |
| Small Hydroelectric | Small Hydroelectric |
| | Large Hydroelectric |
| | Nuclear |

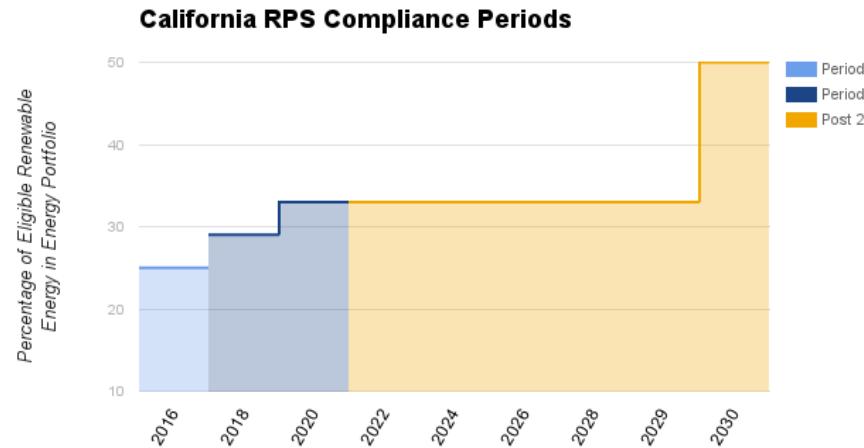
REC Lifecycle

A Renewable Energy Certificate (REC) represents the environmental and renewable attributes associated with 1 MWh of energy delivered to the grid from an eligible renewable energy resource, given electrons are indistinguishable from one another



Renewable Energy In California

California's Renewable Portfolio Standards (RPS) – requires retail sellers of electricity to source a certain percentage of electricity that they generate from renewable sources by fixed dates.

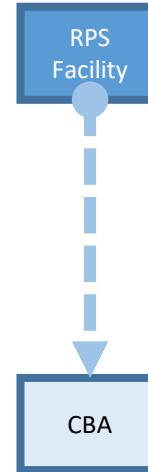


Renewable Energy In California

California RPS Portfolio Content

Requirements – all renewable energy procured from contracts after June 1, 2010 are separated into three categories, or “buckets.” Retailers are required to meet RPS obligations with a minimum percentage of bucket 1 RECs and a maximum percentage of bucket 3 RECs.

- **Category 1 RECs** – Energy and RECs (typically from CA) delivered to a California balancing authority (CBA) without substituting electricity from another source.

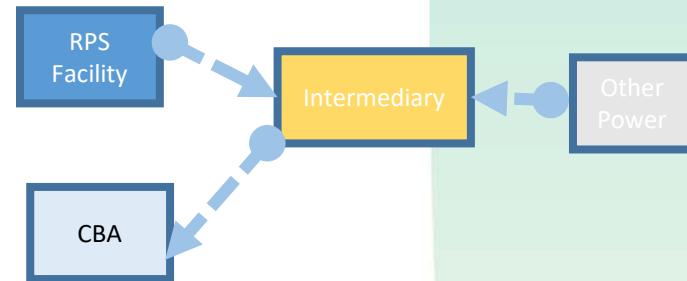


Renewable Energy In California

California RPS Portfolio Content

Requirements – all renewable energy procured from contracts after June 1, 2010 are separated into three categories, or “buckets.” Retailers are required to meet RPS obligations with a minimum percentage of bucket 1 RECs and a maximum percentage of bucket 3 RECs.

- **Category 2 RECs** – Energy and RECs (typically from an out-of-state renewable energy project) that cannot be delivered to a CBA without substituting energy from another source (i.e. intermittent wind energy needs to substitute in another energy source to meet demand during times when the wind facility is not generating electricity).



Renewable Energy In California

California RPS Portfolio Content Requirements – all renewable energy procured from contracts after June 1, 2010 are separated into three categories, or “buckets.” Retailers are required to meet RPS obligations with a minimum percentage of bucket 1 RECs and a maximum percentage of bucket 3 RECs.

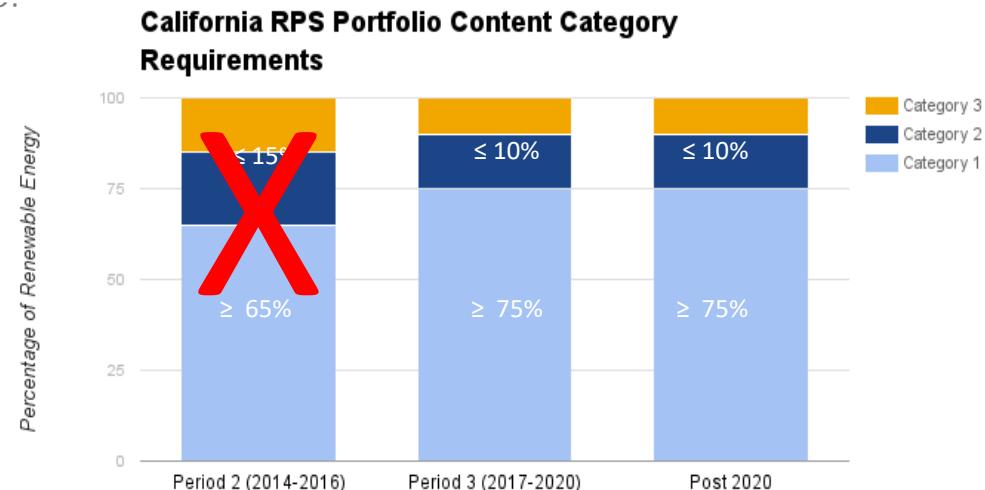
- **Category 3 RECs** – Unbundled RECs, or RECs that do not meet Category 1 and 2 conditions.

Renewable Energy In California

California RPS Portfolio Content

Requirements – retailers are required to meet RPS obligations with a minimum percentage of Bucket 1 RECs and a maximum percentage of Bucket 3 RECs over time.

Trend toward increasing PCC1
and decreasing Unbundled RECs





Regulatory & Legislative Update

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Power Source Disclosure and AB 1110

- The Power Content Label has been in place since 2009, and is used to show customers where their electricity dollars go.
- AB 1110 (Ting, 2016) modifies the Power Content Label by requiring reporting and disclosure of the GHG emissions intensity associated with the electricity serving retail customers.
- CEC AB 1110 implementation rulemaking will impact reporting beginning in 2020 for the 2019 reporting year.
- May result in GHG emissions being reported for geothermal, biofuel generation, unbundled RECs, and Firmed/Shaped (i.e., Bucket 2) renewable energy purchases.

Current Power Source Disclosure Program

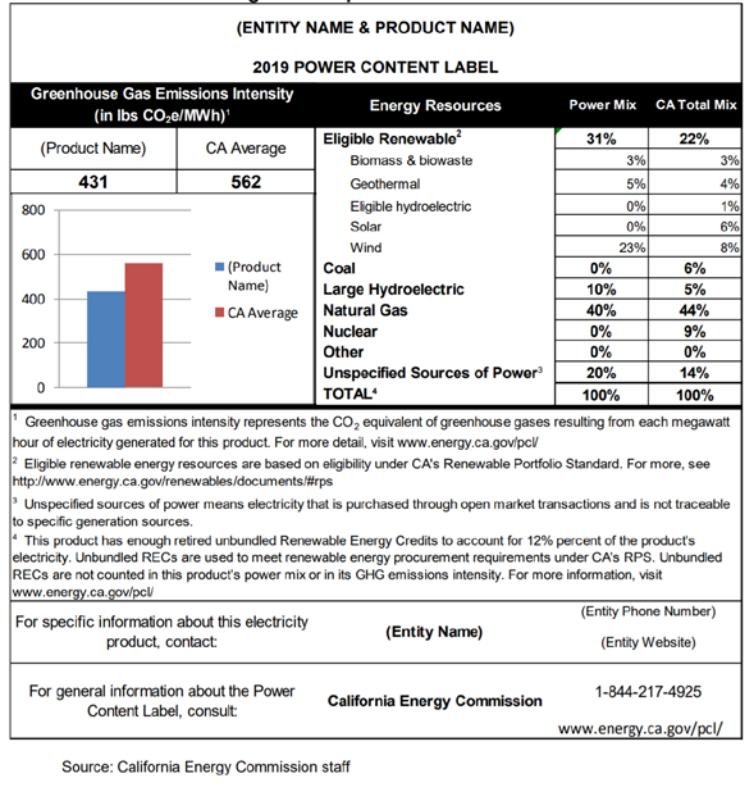
Annual Power Content Label

| Electric Power Generation Mix* | PG&E | PG&E Solar Choice | SVCE | |
|---------------------------------------|-------------------------------------|-------------------|------------|------------|
| | | | GreenStart | GreenPrime |
| Specific Purchases | Percent of Total Retail Sales (kWh) | | | |
| Renewable | 33% | 100% | 50% | 100% |
| • Biomass & Biowaste | 4% | 0% | 15% | 0% |
| • Geothermal | 5% | 0% | 0% | 0% |
| • Eligible Hydroelectric | 3% | 0% | 0% | 0% |
| • Solar Electric | 13% | 100% | 5% | 20% |
| • Wind | 8% | 0% | 30% | 80% |
| Coal | 0% | 0% | 0% | 0% |
| Large Hydroelectric | 12% | 0% | 50% | 0% |
| Natural Gas | 17% | 0% | 0% | 0% |
| Nuclear | 24% | 0% | 0% | 0% |
| Other | 0% | 0% | 0% | 0% |
| Unspecified Sources of Power** | 13% | 0% | 0% | 0% |
| TOTAL | 100% | 100% | 100% | 100% |

Power Source Disclosure Program

AB1110 Proposed Power Content Label

Figure 1: Proposed Power Content Label



Other Policy Variables

- PCIA trajectory is uncertain, but new PCIA methodology expected to take effect in 2019
- Regionalization may resurface in the next legislative session (Governor Brown's last), and would have significant effects on treatment of in-state vs out-of-state resources
- Other topics such as the CCA bond methodology and Integrated Resource Planning contribute to the spectrum of financial and political possibilities



Residential Survey

Key Takeaways

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Background

- 07/2016: **General Residential Customer Survey**
 - Customer understanding of climate change
 - Customer understanding of CCE
 - Willingness to pay for CCE services
- 04/2017: **SVCE launch**
- 09/2017: **Directed Residential Customer Survey**
 - Customer understanding of SVCE product offerings
- NOTE: Future workshops/focus groups planned for our commercial customers.



Purpose

To inform agency strategies as power supply mix may shift in the future

- Assess customer perception of the importance of addressing climate change.
- Assess customer understanding the difference between carbon-free and renewable energy.
- Understand inducements to switching energy plans.
- Determine the degree to which California-sourced energy is important to customers.

NOTE: This is **NOT** an awareness study.

Conducted by an anonymous, third-party marketing firm.



Methodology

A survey approx. **13 minutes in duration** among SVCE **residential customers**.

- Detailed database of customers provided by SVCE
- Surveys conducted over **2 weeks**: 10/9/2017 – 10/24/2017
- Questionnaire developed by Nichols Research in close collaboration with SVCE project team.
- Interviews were completed as follows: **n=602**
 - Online, N=109
 - By landline, N=113
 - By mobile phone, N=380

- Data was tabulated across **various demographic and behavioral variables**.
- Some interviews conducted in native language (Spanish & Chinese)



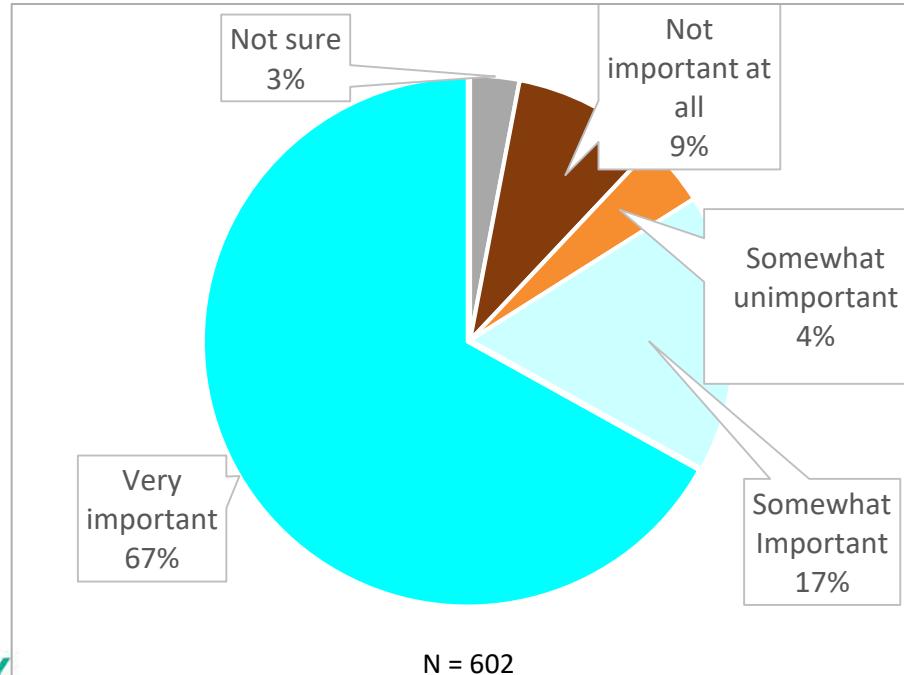
Key Takeaways

1. Customers feel it is important to address climate change in Santa Clara County.
2. Customers are more familiar with the term “renewable energy” than “carbon-free energy”.
 - Though carbon reduction is the slightly more valued objective.
3. Cost-savings is not a significant motivation to switch energy providers; customers are more motivated to switch to cleaner energy than to switch for cost savings.
 - From last year’s survey we know that people are willing to pay more for cleaner energy.
4. Not a large consensus on the importance of CA-sourced energy.
 - There is high PR value in investing in some nominal local project.

84% feel that addressing Climate Change
is important

67% **very** important to them personally

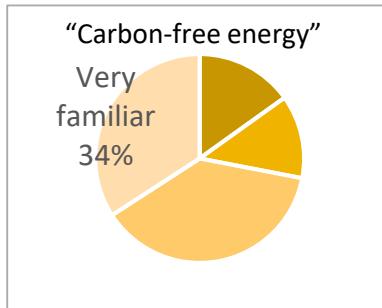
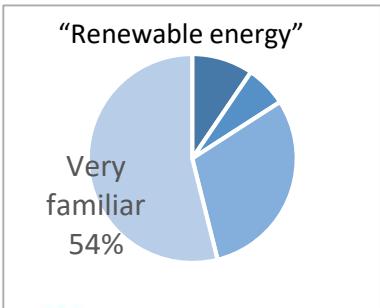
Importance of addressing Climate Change



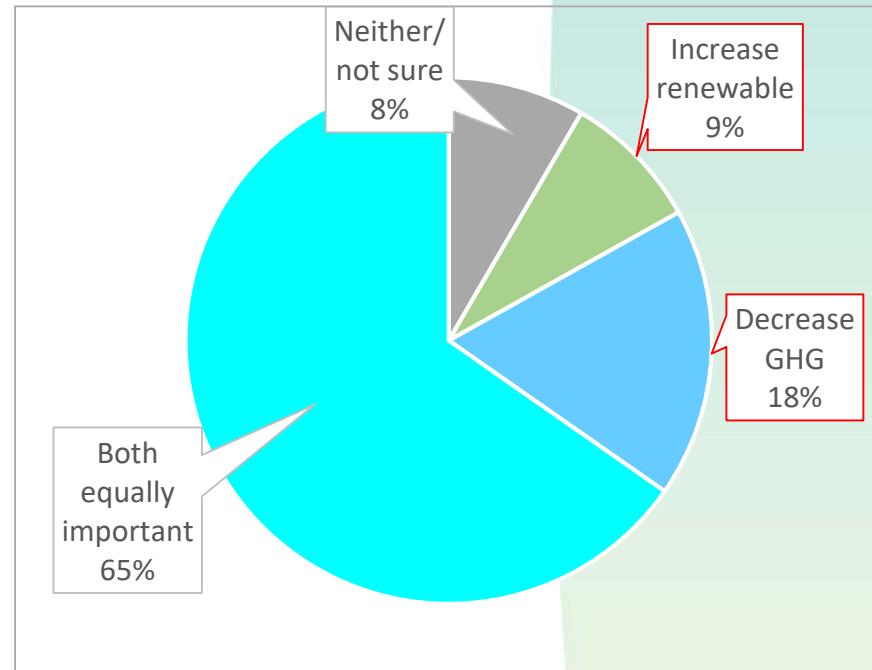
“Renewable energy” vs. “Carbon-free energy”

Terminology

- **84%** somewhat or very familiar with the term “renewable energy”
- **72%** somewhat or very familiar with the term “carbon-free energy”

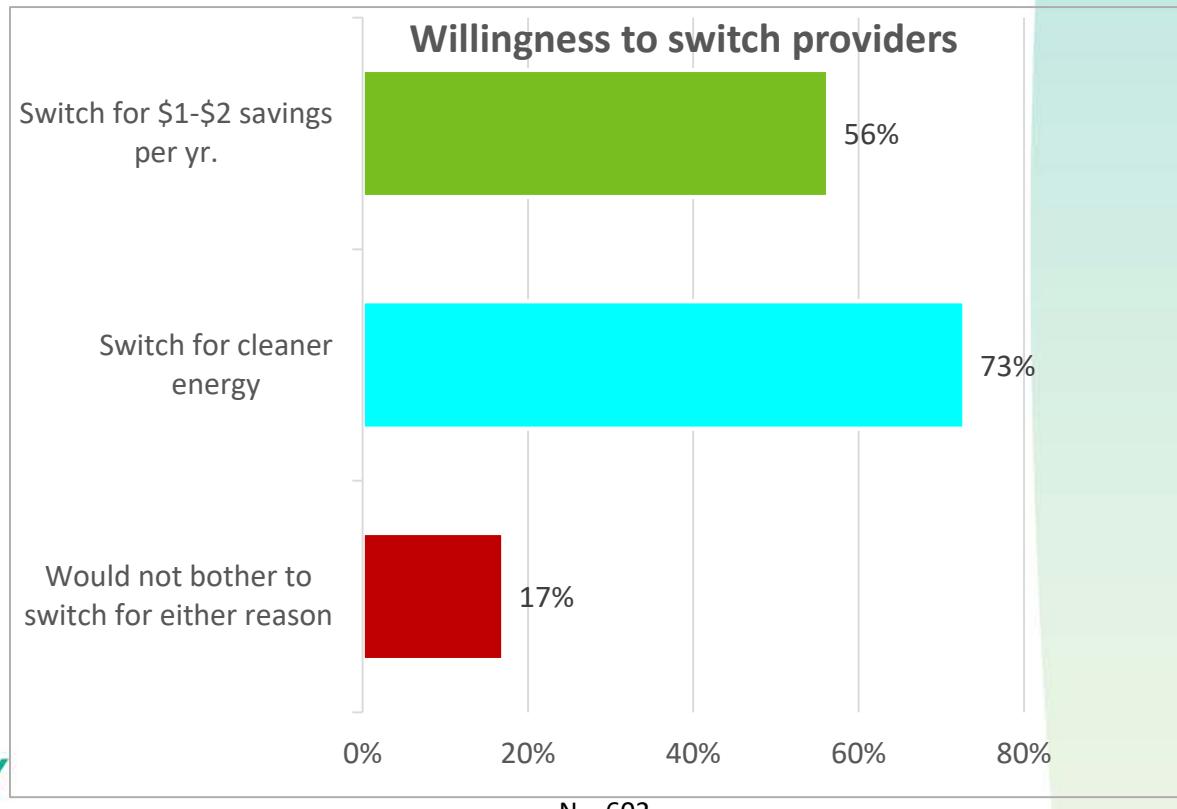


Increase renewable vs. decrease greenhouse gas emissions

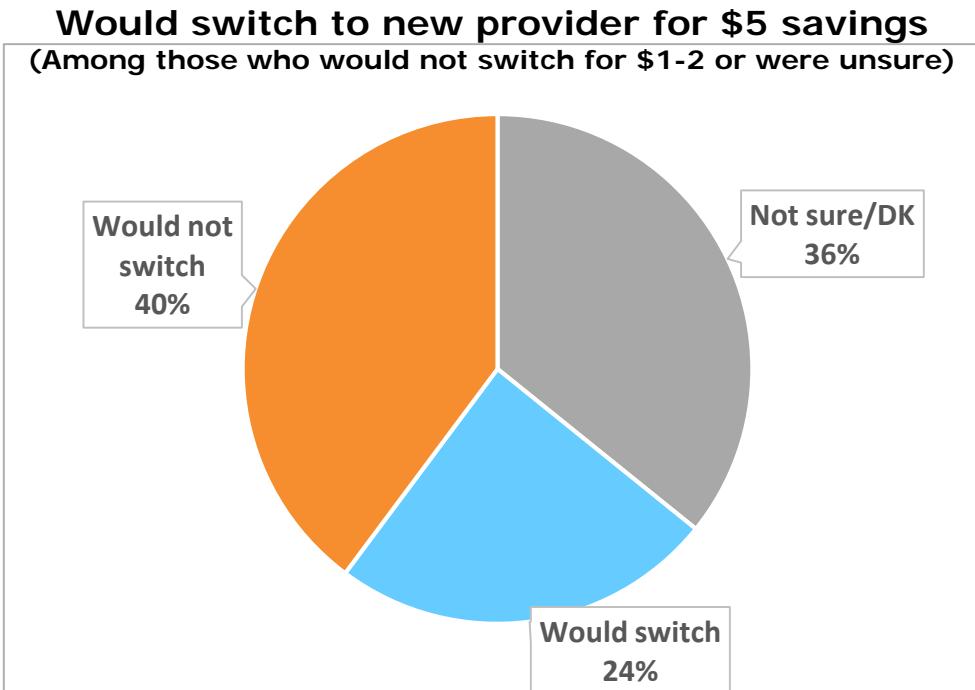




Small \$1-\$2 savings attracts approx. 1/2
Almost ¾ would switch electricity providers if
new provider offered clean energy at same cost



Increasing savings to \$5 not very effective in motivating non-switchers for \$1 to \$2 savings – Only 24% would switch for \$5



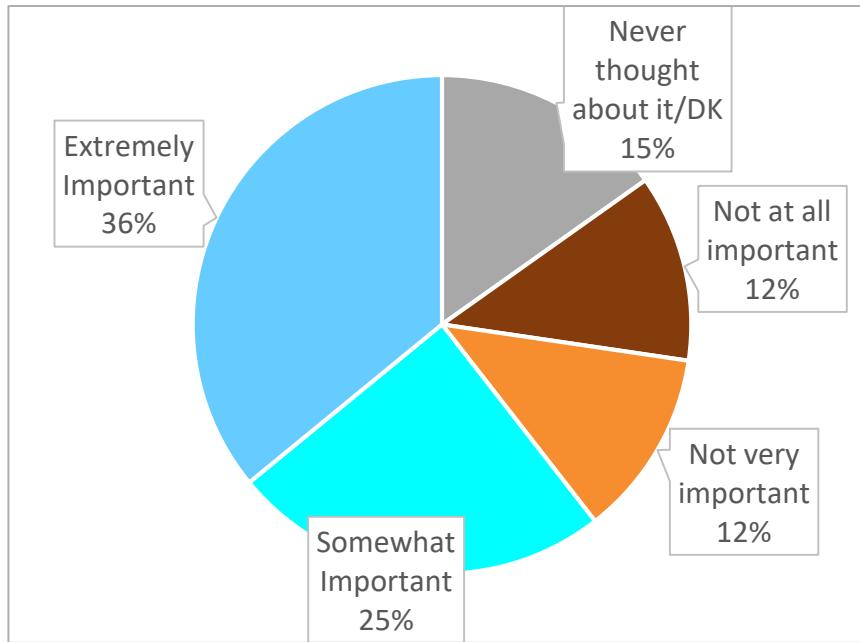
- No significant differences by demographic characteristics or by geographic location.
- Those who view SVCE unfavorably were significantly less likely to switch for any money savings. **(Not going to win over the residential opt-outs with price.)**

Base = 263 – those who would not switch for \$1 to \$2 savings or were not sure.



No consensus on California-sourced clean energy

Importance of California Clean Energy





Fun Fact



Key Takeaways

1. Customers feel it is important to address climate change in Santa Clara County.
2. Customers are more familiar with the term “renewable energy” than “carbon-free energy”.
 - Though carbon reduction is the slightly more valued objective
3. Cost savings is not a significant motivation to switch; customers are more motivated to switch to cleaner energy than to switch for cost savings.
 - From last year’s survey we know that people are willing to pay more for cleaner energy.
4. Not a large consensus on the importance of CA-sourced energy.
 - There is high PR value in investing in some nominal local project.



Power Supply Mix Options for 2019-2023

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5 Year Budget Impact

\$0

Option Description

Purchase RPS quantities that meets or exceeds 50% of SVCE load.

Purchase 50% PCC1 and 50% PCC2 renewable energy to meet this mandatory plus voluntary requirement.

Fill the remaining supply with carbon free power.

Pros/Cons

Stay the course.

No impact to budget.

Risk with PCC2.





Option Description

Purchase RPS quantities that meet the state mandated percentages. (i.e. 33% in 2020, 35% in 2021, etc.) instead of 50% of SVCE load.

Purchase only PCC1 renewable energy to meet this requirement.

Fill the remaining supply with carbon free power.

Pros/Cons

Positive impact to budget.

Can invest surplus in programs.

Less "renewable"





5 Year Budget Impact

-\$32,507

Option Description

Purchase RPS quantities that meets or exceeds 50% of SVCE load.

Purchase only PCC1 renewable energy to meet this mandatory plus voluntary requirement.

Fill the remaining supply with carbon free power.

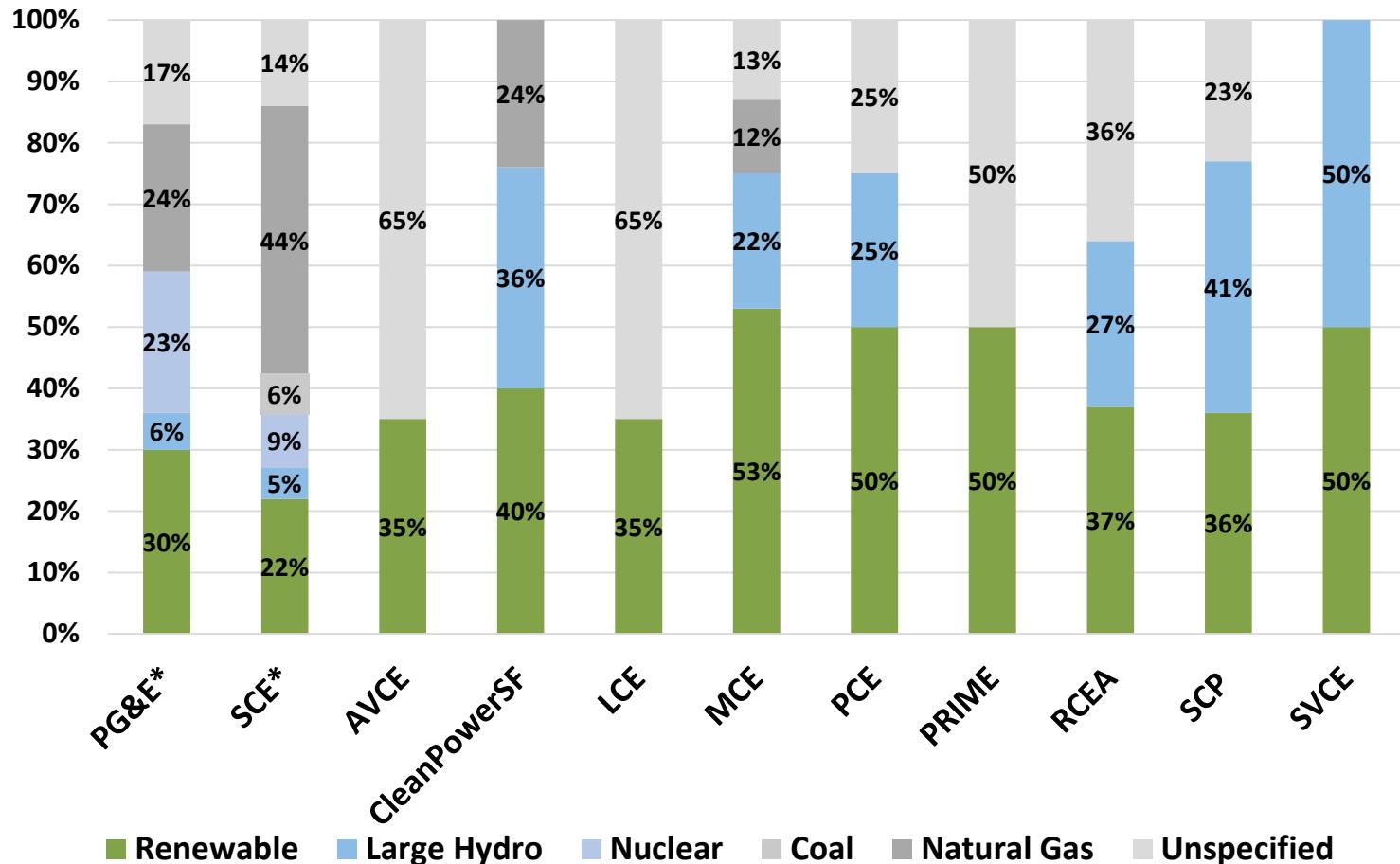
Pros/Cons

Negative impact on budget.

Less regulatory and supply risk.



CCA Portfolios in 2016/2017



*PG&E and SCE included for comparison.

■ Renewable ■ Large Hydro ■ Nuclear ■ Coal ■ Natural Gas ■ Unspecified

| CCA | Product Name | GHG-free | Renewables | Solar | Wind | Sm. Hydro | Biomass | Geo-thermal | Price Premium |
|------|--------------|----------|------------|-------|-------|-----------|---------|-------------|-------------------------------------|
| MCE | Light Green | 68% | 55% | 9% | 34% | 7% | 5% | -- | 1-2 % > PG&E |
| | Deep Green | 100% | 100% | 25% | 50% | -- | 25% | -- | \$0.01/kWh |
| | Local Sol | 100% | 100% | 100% | -- | -- | -- | -- | Flat rate \$0.142/kWh |
| SCP | Clean Start | 91% | 42% | -- | 28% | -- | -- | 9% | 1-2% < PG&E |
| | EverGreen | 100% | 100% | -- | -- | -- | -- | 100% | \$0.025/kWh |
| PCE | EcoPlus | 75% | 50% | 3% | 28% | 13% | 3% | 3% | 5% < PG&E |
| | Eco100 | 100% | 100% | some% | some% | -- | -- | -- | \$0.01/kWh |
| CPSF | Green | 78% | 40% | -- | 40% | -- | -- | -- | 1% < PG&E |
| | SuperGreen | 100% | 100% | 1.5% | 98.5% | -- | -- | -- | \$0.02/kWh |
| RCEA | REPower | 82% | 42% | 9% | 21% | -- | 12% | -- | 1% < PG&E |
| | REPower+ | 100% | 100% | 19% | 66% | -- | 15% | -- | \$0.01/kWh |
| LCE | ClearChoice | 35% | 35% | -- | 2% | 19% | 14% | -- | 1% < SCE |
| | SmartChoice | 100% | 100% | -- | 100% | -- | -- | -- | Res: \$10/m flat Com:\$0.015/kWh |
| AVCE | CoreChoice | 35% | 35% | -- | 20% | -- | 15% | -- | 1% < SCE TOU is 4% > |
| | MoreChoice | 50% | 50% | -- | 35% | -- | 15% | -- | \$2/month flat |
| SVCE | GreenStart | 100% | 50% | 10% | 40% | -- | -- | -- | 1% < PG&E |
| | GreenPrime | 100% | 100% | 20% | 80% | -- | -- | -- | \$0.008/kWh |

A large, stylized graphic of a green leaf occupies the left side of the slide, extending from the top-left corner towards the center. The leaf is rendered in a light green color with darker green veins, creating a sense of depth and organic form.

Break to
Discuss Direction



Customer Considerations

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SVCE Differentiator

- CARBON FREE is the message (Real and Aspirational)
- DECARBONIZATION is the goal
- Wind, Solar and Water are the resources
- Self Generation, Storage and Demand Management are part of the localized solution monetized by our customers
- Renewable Portfolio Standards, Firming and Shaping Emissions, PCC1, PCC2, Resource Adequacy, Capacity, Western Grid, Cal ISO, Regionalization, Additionality, Duck Curve, Reductionality, PCIA, PAM, stranded contracts,... blah blah blah..... ALL NOISE!

C&I Customer Leadership

- Nationally, direct corporate procurement of renewables growing rapidly, through DA and new utility 'green tariffs'
- 15 of our C&I customers are among the US EPA Green Power Partnership's Top 100 largest renewables customers
- 22 of our C&I customers are signatory to the 'Corporate Renewable Energy Buyers' Principles', chartered by the Renewable Energy Buyer's Alliance (REBA):



Implications for SVCE

- Demand for retail '100% Renewable' product, e.g. GreenPrime
 - Local/regional sources
 - Green-e Certified – from 'additional' sources, e.g. less than 15 years old
 - Wind, solar, small hydro generally okay; some bio sources not qualified
- Interest among large C&I customers for development of alternative 'green tariff' models where customers make contractual commitments with SVCE for renewable energy delivered from specified facilities