

COMMUNITY CHOICE AGGREGATION: TECHNICAL STUDY RESULTS



Peninsula Clean Energy

September 24, 2015

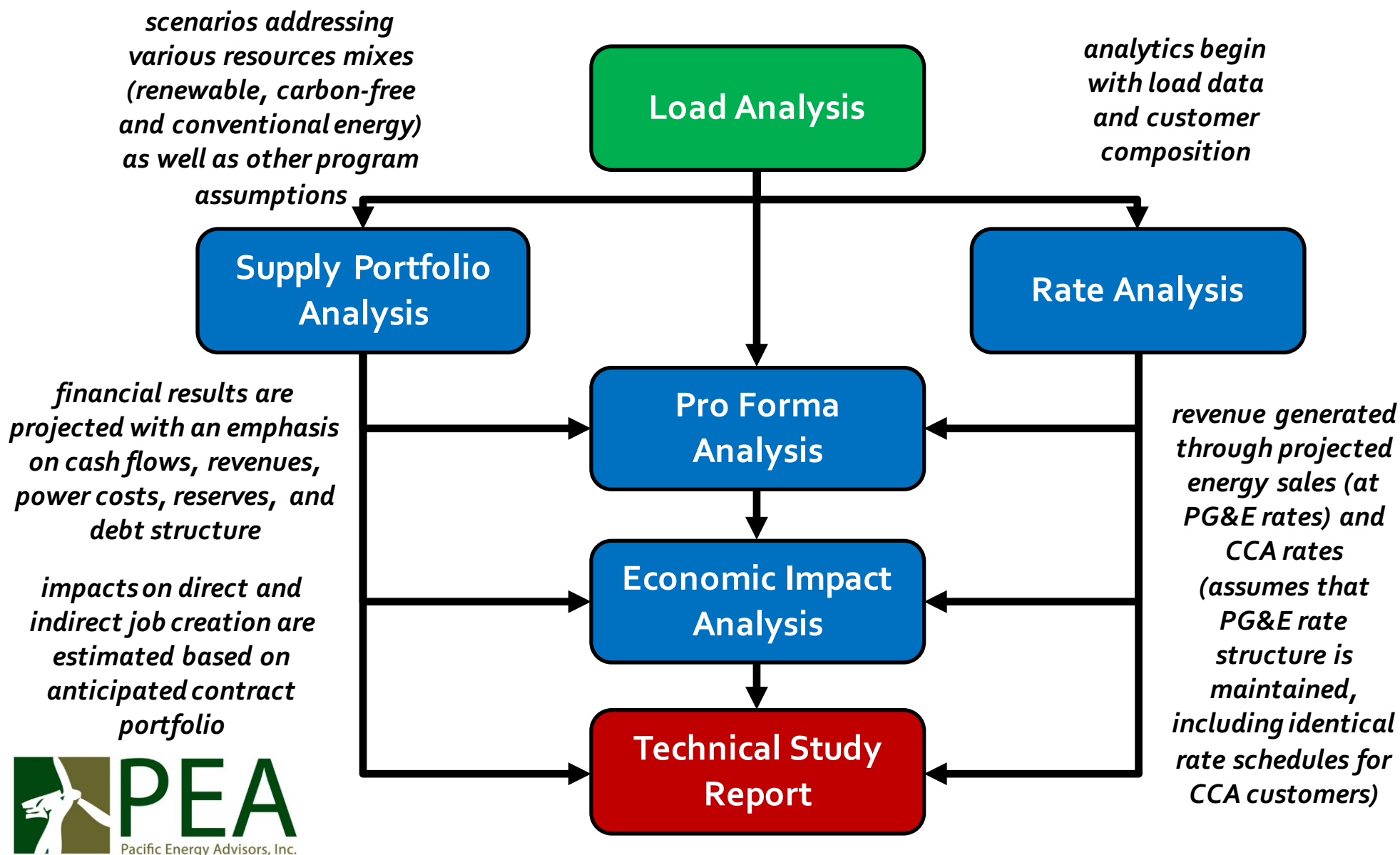


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Technical Study Methodology

Technical Study Methodology



Load Study Results

PCE Load Composition

Peninsula Clean Energy: Electric Energy Overview

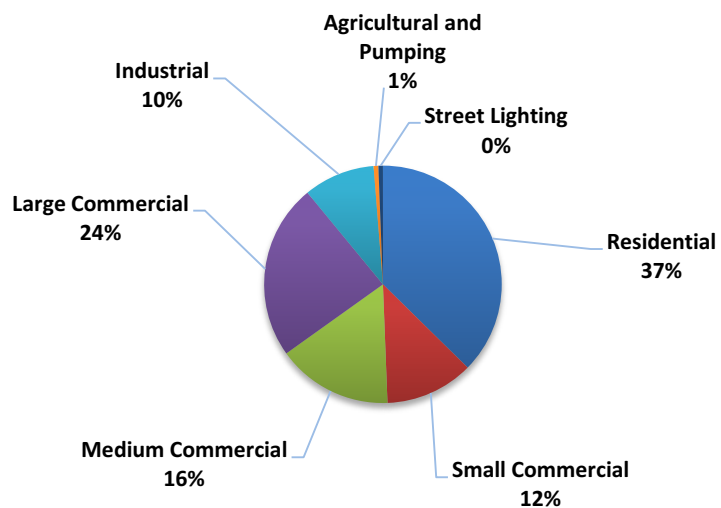
| Current Service Provider | Customer Accounts | Customer Accounts (% of Total) | Energy Use (MWh) | Energy Use (% of Total) |
|------------------------------------|-------------------|--------------------------------|------------------|-------------------------|
| PG&E ("Bundled" electric accounts) | 297,881 | 99.8% | 3,900,930 | 90.3% |
| Direct Access electric accounts | 554 | 0.2% | 417,485 | 9.7% |
| Total – CCE Study Partners | 298,435 | 100.0% | 4,318,415 | 100.0% |

Bundled Energy Use by Customer Classification

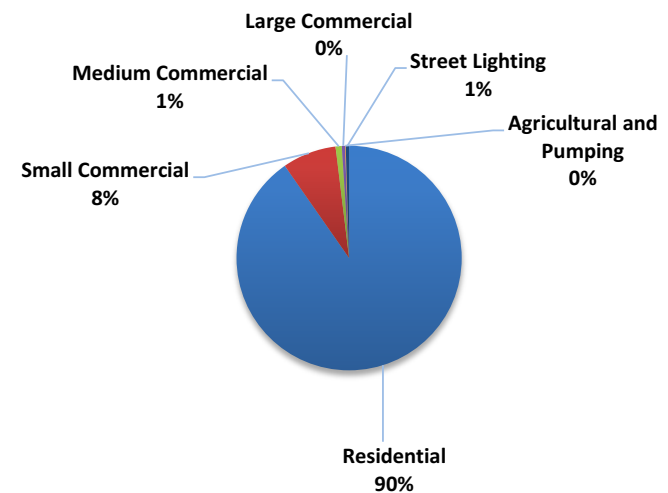
| Customer Classification | Customer Accounts | Customer Accounts (% of Total) | Energy Use (MWh) | Share of Energy Use (%) |
|-------------------------|-------------------|--------------------------------|------------------|-------------------------|
| Residential | 269,061 | 90% | 1,457,637 | 37% |
| Small Commercial | 23,072 | 8% | 469,021 | 12% |
| Medium Commercial | 2,665 | 1% | 613,398 | 16% |
| Large Commercial | 1,333 | <1% | 933,305 | 24% |
| Industrial | 43 | <1% | 378,422 | 10% |
| Ag and Pumping | 275 | <1% | 25,095 | 1% |
| Street Lighting | 1,432 | <1% | 24,052 | 1% |
| TOTAL | 297,881 | 100.0% | 3,900,930 | 100% |
| Peak Demand (MW) | 682 | | | |

Electricity Use by Customer Class

Electric Consumption by Customer Class

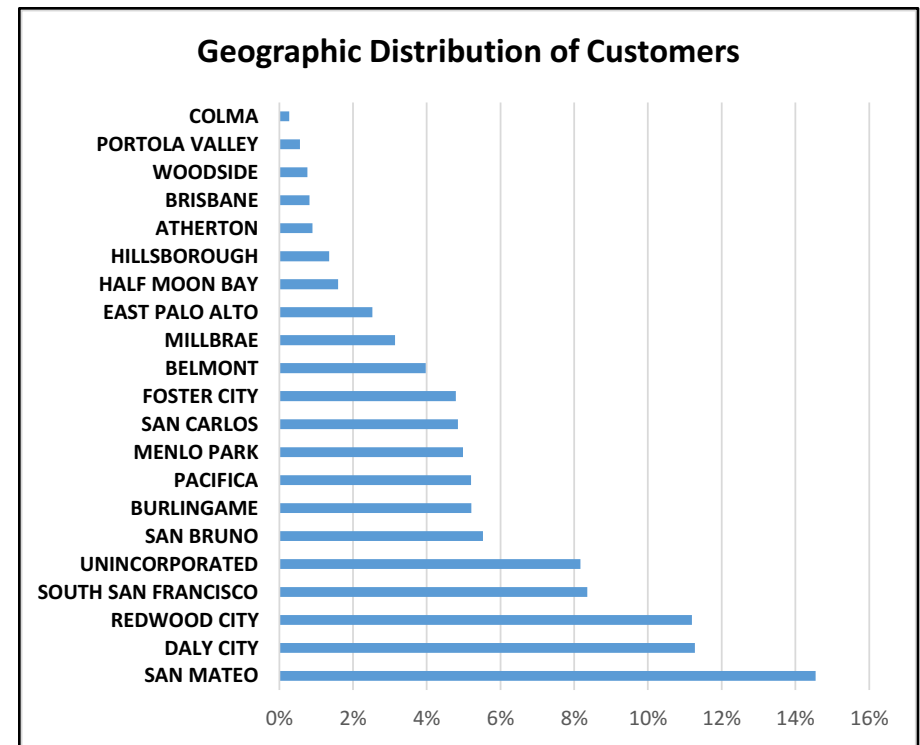
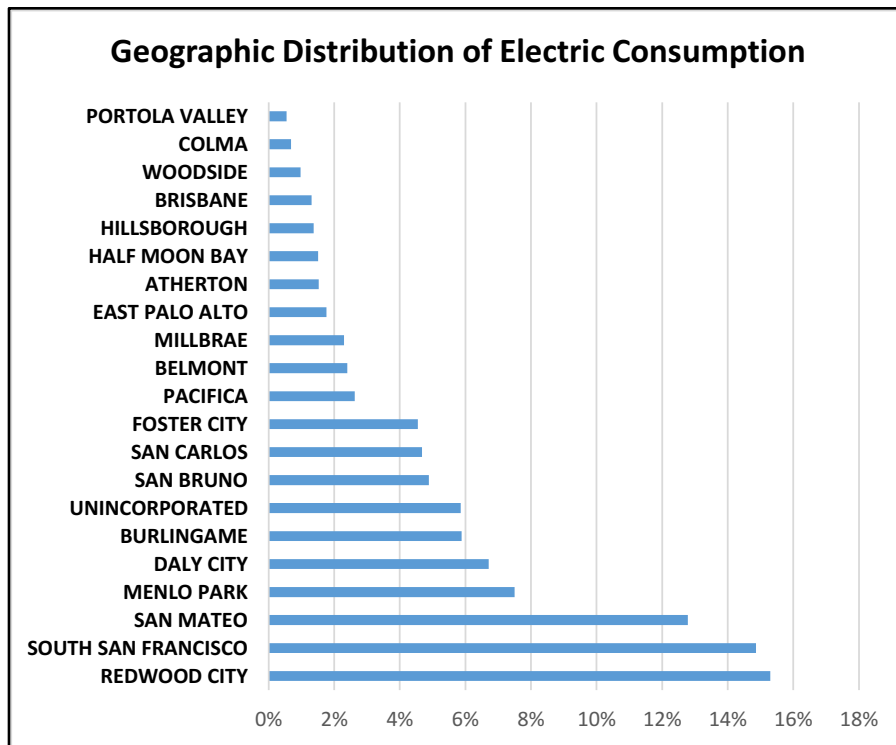


Customer Composition by Rate Class



Load Composition by Jurisdiction

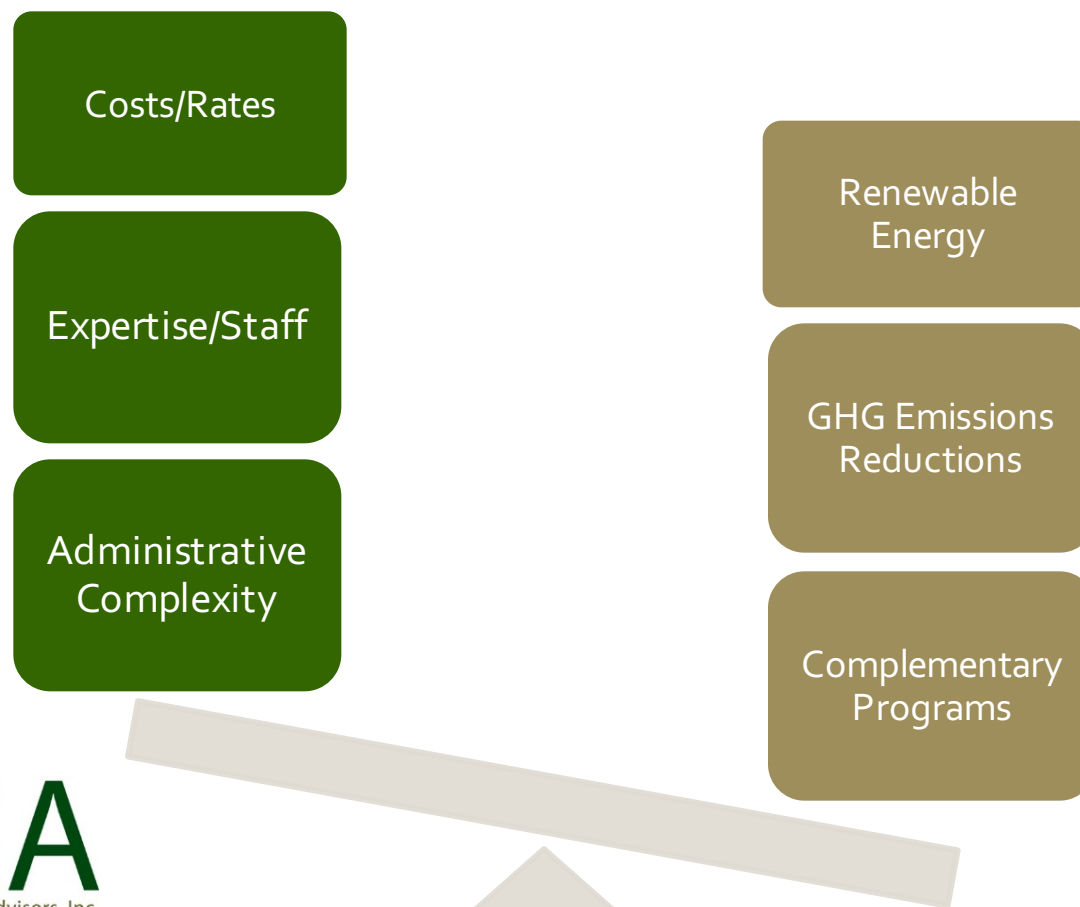
Top five cities account for almost 60% of total PCE electric consumption and 55% of total PCE customer accounts



Supply Portfolio Scenarios: Overview and Summary of Results

Identification of Planning Priorities

- Tradeoffs are inherent in CCA program development
- Generally, “program enhancements” will increase costs/rates, etc.



Current Electric Resource Mix: 2014

| Energy Resources | 2014 PG&E Power Mix ¹ | 2014 California Power Mix ² |
|------------------------------|----------------------------------|--|
| Eligible Renewable | 27% | 20% |
| --Biomass & Waste | 5% | 3% |
| --Geothermal | 5% | 4% |
| --Small Hydroelectric | 1% | 1% |
| --Solar | 9% | 4% |
| --Wind | 7% | 8% |
| Coal | 0% | 6% |
| Large Hydroelectric | 8% | 6% |
| Natural Gas | 24% | 45% |
| Nuclear | 21% | 9% |
| Unspecified Sources of Power | 21% | 14% |
| Total ³ | 100% | 100% |

¹Source: PG&E 2014 Power Source Disclosure Report; ²Source: California Energy Commission; ³Numbers may not add due to rounding

Prospective Supply Scenarios

- Unbundled renewable energy certificates excluded from all scenarios
- Nuclear- and coal-based energy also excluded from all scenarios
- **Scenario 1**: Baseline, minimum 35% renewable energy content scaling up to 50% by 2030
- **Scenario 2**: Minimum 50% renewable energy content scaling up to 75% by 2030; reduced overall GHG emissions relative to PG&E projections
 - Large hydro resources to be used for non-renewable, GHG-free supply
- **Scenario 3**: 100% renewable energy content with significant GHG emissions reductions

Summary of Scenario Results: Year 1

| Key Considerations | Scenario 1 | Scenario 2 | Scenario 3 |
|---|--|--|--|
| <u>General Environmental Benefits</u> | 35% Renewable 35% GHG-Free | 50% Renewable 63% GHG-Free | 100% Renewable 100% GHG-Free |
| <u>Rate Competitiveness</u> | Average 6% <u>savings</u> relative to PG&E rate projections | Average 4% <u>savings</u> relative to PG&E rate projections | Average 2% <u>increase</u> relative to PG&E rate projections |
| <u>Projected Residential Customer Cost Impacts</u> ¹ ¹ Average monthly usage for PCE residential customers ≈ 450 kWh | Average \$5.40 monthly cost <u>savings</u> relative to PG&E rate projections | Average \$4.05 monthly cost <u>savings</u> relative to PG&E rate projections | Average \$1.80 monthly cost <u>increase</u> relative to PG&E rate projections |
| <u>Assumed PCE Participation</u> | 85% customer participation rate assumed across all customer groups | 85% customer participation rate assumed across all customer groups | 75% customer participation rate assumed for residential and small commercial customers; 50% for all other groups |
| <u>Comparative GHG Emissions Impacts</u> | 0.278 metric tons CO ₂ /MWh emissions rate; <u>additional GHG emissions</u> of ≈136,000 metric tons in Year 1 | 0.115 metric tons CO ₂ /MWh emissions rate; ≈75,000 metric ton <u>GHG emissions reduction</u> in Year 1 | Zero emissions rate; ≈130,000 metric ton <u>GHG emissions reduction</u> in Year 1 |

Pro Forma Financial Projections

| | Scenario 1 | Scenario 2 | Scenario 3 |
|---|------------------|------------------|------------------|
| PCE Account Total (following phase-in) | ≈250,000 | ≈250,000 | ≈220,000 |
| Annual energy sales (following phase-in) | ≈3.3 million MWh | ≈3.3 million MWh | ≈2.4 million MWh |
| Annual operating costs | ≈\$225 million | ≈\$235 million | ≈\$200 million |
| Annual contribution to reserves | ≈\$7 million | ≈\$7 million | ≈\$6 million |
| Annual PCE Revenue Requirement | ≈\$230 million | ≈\$245 million | ≈\$206 million |
| Annual Change in PCE Customer Charges* | ≈\$(40) million | ≈\$(28) million | ≈\$9 million |

*Negative amounts reflect the potential for customer savings (or complementary program funding, rebate distribution, additional reserve accrual, etc.); positive amounts reflect PCE's need to impose comparatively higher generation rates.

Summary of Environmental Impacts: 10-Year Average

| GHG Impact | Scenario 1 | Scenario 2 | Scenario 3 |
|---|------------|------------|------------|
| Annual Change in GHG Emissions (Tons CO ₂ /Year) | 476,125 | -145,036 | -301,269 |
| Change in Electric Sector CO ₂ Emissions in San Mateo County (%) | +111% | -34% | -100% |
| Projected PCE Portfolio Emissions Factor (metric tons/MWh) | 0.268 | 0.086 | 0 |
| Projected PG&E Portfolio Emissions Factor (metric tons/MWh) | 0.128 | 0.128 | 0.128 |

Risks and Uncertainties

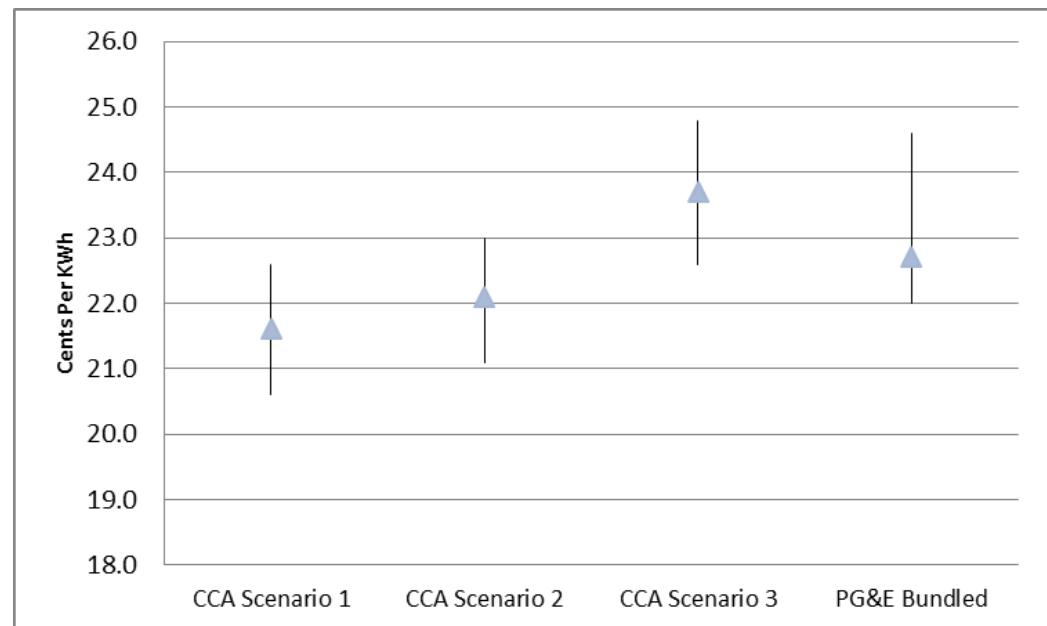
- PG&E rate uncertainty (generation rates and exit fees)
- Length of current wholesale energy price trough
- Availability of large hydro resources to meet carbon-free content goals
- Opt-out rate uncertainty
- Overall program size given participation of specific jurisdictions
- Credit structure for power supply
- Future CCA specific legislation
- Regulatory changes around renewable and capacity mandates

Sensitivity Analysis Overview

- Six sensitivities were tested (high and low cases):
 - Natural gas prices
 - Renewable energy prices*
 - Carbon Free energy prices
 - PG&E generation rates*
 - PG&E exit fees*
 - Opt-out rates

*Key comparative influences

Range of Electric Rate Impacts by Scenario



Conclusions

Key Findings and Conclusions

- Scenario 1 highlights CCA program viability on a rate competitive basis
- Scenario 2 highlights CCA program viability on renewable and carbon-free content basis (w/rate competitiveness)
- Scenario 3 highlights the CCA rate premium under a 100% renewable option as well as opt-out risk/uncertainty
- No “correct” answer, but in general terms, the technical study indicates that the Peninsula Clean Energy program could be economically viable while also achieving the County’s environmental objectives

Questions & Discussion