Agenda

• Call to Order / Roll Call

• Public Comment (for items not on the Agenda)

• Action to set the Agenda and Approve Consent Items 1-2
  o Consent - Public Comment

• Regular Agenda

• Adjournment
Chair Report (Discussion)
September 22, 2022
Welcome!

Welcome -
- Jeffrey Wright, our new Power Contracts Manager who started on August 31st
- Moya Enright, our new Senior Renewable Energy Analyst who started on September 1st
- Zsuzsanna Klara, our new Regulatory Compliance Analyst who started on September 12th
Open Positions

- Director of Power Resources
- Strategic Accounts Manager
Tonight’s Schedule

5:30 Consent: 5 minutes
5:35 Chair report: 5 minutes
5:40 CEO report: 5 minutes
5:45 CAC update: 5 minutes
5:50 Arica Solar: 10 - 15 minutes
6:05 DEAI update: 5 minutes
6:10 Strategic Plan Update: 25 minutes
6:35 Break: 5 minutes
6:40 24/7 Renewables by 2025: 75 minutes
7:55 Break: 5 minutes
8:00 2035 Decarb Plan: 75 minutes
9:15 Board Member Reports: 5 minutes
9:20 Adjourn
Upcoming Meetings

• Audit and Finance Committee:
  o **Wednesday**, October 12 at 8:30 a.m. (Zoom)

• Executive Committee:
  o **Wednesday**, October 12 at 10:00 a.m. (Zoom)

• Citizens Advisory Committee:
  o October 13 at 6:30 p.m. (Zoom)

• Board of Directors:
  o October 27 at 6:30 p.m. (Zoom)
Authorize Amended and Restated Power Purchase Agreement for Arica Solar + Storage

Chelsea Keys
Interim Director, Power Resources
September 22, 2022
Recommendation

Approve Resolution Delegating Authority to the Chief Executive Officer to Execute an Amended and Restated Power Purchase and Sale Agreement (A&R PPA) with Arica Solar, LLC, and any necessary ancillary documents.
Background of Arica Solar + Storage project

<table>
<thead>
<tr>
<th>Project</th>
<th>Developer</th>
<th>Technology</th>
<th>Location</th>
<th>Expected Start Date</th>
<th>Board Approval Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arica</td>
<td>Clearway Energy Group</td>
<td>100 MW solar + 50 MW storage (4hr)</td>
<td>Riverside County</td>
<td>Apr 1, 2024</td>
<td>Oct 26, 2021</td>
</tr>
</tbody>
</table>

Photos courtesy of Clearway Energy
Challenges & Disruptions in the Energy Market

• Inflation – High commodity prices (steel, copper, aluminum, fuel etc)
• Lithium supply scarcity – EV market driving up demand
• Changes in interest rates
• Supply Chain disruptions –
  o COVID still has some impacts
  o The precedent was that the costs for materials become fixed when developers sign contracts, but now some suppliers require that the material costs float up until a certain point in the contract
• Uncertainly around future solar tariffs which have potential to increase
Impacts to Buyers in Market

• Many developers are having to revisit their executed PPAs with the buyers for renewable projects that are in development
• PG&E issued an Advice Letter-6658 requesting approval of two contract amendments to PPAs from CPUC
• These amendments are examples of the types of changes developers are seeking with buyers to ensure projects remain economical and on track in their development stage
• While the Inflation Reduction Act signed by President Biden in August has provided some cost relief, challenges still exist, and costs remain high for developers
CPUC Mid-Term Reliability Decision

• D21-06-035, the CPUC procurement order adopted June 24, 2021, requiring 11,500 MW of new generation between the years 2023 – 2026 to ensure grid reliability

• Created competition in the market – Load serving entities must procure to their set requirements for each year (2023 – 2026)

• Arica contributes toward Peninsula Clean Energy’s MTR requirements
Impacts on Arica

• Arica has been impacted by a combination of challenges - primarily supply chain disruptions creating a supply scarcity and driving up commodity prices for materials to construct renewable projects

• The developer, Clearway Energy Group, has come back to Peninsula Clean Energy requesting changes to particular PPA terms to reduce the possibility of termination

• While this PPA was executed nearly a year ago, the market has changed considerably since then and the projects’ economics are at risk
Procurement Subcommittee

• Staff met with the Board Procurement Committee on July 21, 2022, to relay the impacts on our projects and the status of our negotiations

• Each member of the subcommittee supported staff’s efforts to negotiate an amendment to alleviate the risk of the Arica contract terminating
Impacts to PCE

• Staff conducted extensive analysis on the impacts of this A&R PPA to our power supply portfolio and has determined that these changes are acceptable

• We believe it would be difficult to contract for other resources at a competitive price and be able to achieve commercial operations under the same timeline

• The amendment does not impact Peninsula Clean Energy’s Mid-term Reliability requirements, Arica will meet our requirements as originally planned
Recommendation

Approve Resolution Delegating Authority to the Chief Executive Officer to Execute an Amended and Restated Power Purchase and Sale Agreement (A&R PPA) with Arica Solar, LLC, and any necessary ancillary documents.
Diversity, Equity, Accessibility and Inclusion Policy Update

Shayna Barnes
Operations Specialist
September 22, 2022
Peninsula Clean Energy CAC Draft Statement on Equity and Inclusion

1. Peninsula Clean Energy commits to making anti-racism top of mind during decision making

2. Develop a means of tracking revenue and formulating a mechanism (qualitative and quantitative) that ensures accountability

3. Pursue equity in energy generation and programs
Policy Development and Stakeholder Review

- CAC Equity Statement as foundation for DEAI policy
- Includes themes from needs assessment phase
- Incorporates industry best practices
- Facilitated workshops to receive feedback:
  - August 16: Staff
  - August 19: Board DEAI Subcommittee
  - September 8: CAC, CBOs, broader community
Policy Approval- Moved to October

• Policy originally scheduled for approval at September Board retreat

• Moving to October allows more time for consultant and internal project team to incorporate feedback from workshops into final policy
Living our DEAI Values

DEAI is of strategic importance to Peninsula Clean Energy

“Peninsula Clean Energy commits to making diversity, equity, accessibility, and inclusion a priority during decision making.”

Excerpt from draft DEAI policy
PCE's Strategic Plan was adopted in April 2020; this is our third annual update.

More detail in the Board memo; tonight's presentation is focused on functional dashboards, highlight of a few 2022 key accomplishments and 2023 priorities.

Updated dashboard color-coding for "quick view"
Introduction

A few material changes since last September’s annual update:

1. Moved 100% GHG-free decarbonization target from 2045 to 2035 and narrowed the focus to personal vehicle transportation and small residential/building electrification

2. Addition of a separate dashboard and discussion section for Account Services, which had previously been embedded within Marketing and Community Relations

3. Updated 2025 targets for Community Energy Programs to reflect current and more realistic market conditions going forward

4. Reorganization of Power Resources objectives
Market / Industry Context

Costs Still High

- Costs still higher than pre-pandemic
- Some material costs have eased
- Vehicle costs remain at peak

Worker shortages

- Construction employment exceeds pre-pandemic levels

Building Electrification

- Climbing utility costs
- Low awareness and motivation
## Organizational Priorities

### Key Performance Indicators (Measured on CY)

<table>
<thead>
<tr>
<th></th>
<th>2019 Baseline</th>
<th>2020</th>
<th>2021</th>
<th>2022*</th>
<th>2025 Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>100% Renewable Energy 24/7</td>
<td>47.0%</td>
<td>47.0%</td>
<td>49.2%</td>
<td>53.6%</td>
<td>100%</td>
</tr>
<tr>
<td>2035 Decarbonization (MT GHG reduced)</td>
<td>3,800</td>
<td>14,300</td>
<td>23,100</td>
<td>26,600</td>
<td>See Below**</td>
</tr>
</tbody>
</table>

*Estimated for 2022

**Peninsula Clean Energy has a 2035 decarbonization target only. Total San Mateo County emissions inventoried in 2019 were 4.1 million MT GHG of which 3.2 million MT GHG are in buildings and transportation. Decarbonization figures for each year are the estimated reductions resulting from PCE programs on a cumulative basis through that year.

- **On target**
- **Challenges exist**
- **At risk**
## Key Performance Indicators (Measured on CY)

<table>
<thead>
<tr>
<th></th>
<th>2019 Baseline</th>
<th>2020</th>
<th>2021</th>
<th>2022 YTD</th>
<th>2025 Target</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>EcoPlus</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Annual Renewable Content (%)</td>
<td>52%</td>
<td>51.7%</td>
<td>49.2%</td>
<td>53.4%</td>
<td>100%</td>
</tr>
<tr>
<td>Emissions Factor (lbs. / MWh)</td>
<td>102</td>
<td>13</td>
<td>5</td>
<td>9</td>
<td>16</td>
</tr>
<tr>
<td><strong>Eco100</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Annual Renewable Content (%)</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>Emissions Factor (lbs. / MWh)</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>New Peninsula Clean Energy Capacity Statewide</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(% of load served by new resources)</td>
<td>0</td>
<td>16%</td>
<td>24%</td>
<td>25%</td>
<td>50%</td>
</tr>
</tbody>
</table>

- **On target**
- **Challenges exist**
- **At risk**
Power Resources: FY 2022 Key Accomplishments

1. Published 24/7 White Paper – Part 1
2. Progressing our 24/7 strategy and finalized model
3. Executed PPAs
   - Chaparral & Arica solar + storage
   - Gonzaga Ridge Wind
   - Geysers Geothermal
   - Second Imperial Geothermal (Heber 2)
   - Participation in CC Power PPAs
     - Tumbleweed long-duration storage
     - Fish-lake Geothermal
     - Ormat Geothermal Portfolio
Power Resources: FY 2023 Key Priorities

1. Publish 24/7 White Paper – Part 2

2. Issue multiple requests for proposals for renewable energy and storage resources

3. Negotiate and execute contracts for 24/7 goal and to meet CPUC Mid-Term Reliability obligation
Community Energy Programs Overview

### Key Performance Indicators (Measured on CY)

<table>
<thead>
<tr>
<th></th>
<th>2019 Baseline</th>
<th>2020</th>
<th>2021</th>
<th>2022 (6mo)</th>
<th>2025 Target (revised)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transportation: GHG</td>
<td>2,000</td>
<td>8,200</td>
<td>14,800</td>
<td>17,800</td>
<td>83,000 (was 120,000)</td>
</tr>
<tr>
<td>Reductions (MT)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Buildings: GHG</td>
<td>1,800</td>
<td>6,100</td>
<td>8,300</td>
<td>8,800</td>
<td>9,800 (was 12,100)</td>
</tr>
<tr>
<td>Reductions (MT)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EV charging ports</td>
<td>0</td>
<td>13</td>
<td>146</td>
<td>241</td>
<td>3,500 (was 6,200)</td>
</tr>
<tr>
<td>installed (#)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Electric appliances</td>
<td>0</td>
<td>0</td>
<td>187</td>
<td>297</td>
<td>1,800 (was 2,800)</td>
</tr>
<tr>
<td>installed (#)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Local Resources</td>
<td>0</td>
<td>1.47</td>
<td>4.26</td>
<td>5.54</td>
<td>20</td>
</tr>
<tr>
<td>(MW)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Funds for Low Income</td>
<td>11%</td>
<td>47%</td>
<td>19%</td>
<td>24%</td>
<td>20%</td>
</tr>
</tbody>
</table>

1. All figures cumulative except Funds for Low Income
2. Overall County GHGs when last inventoried in 2019 were 4,100,000 MT
3. GHG measures reflect projected future average annual reductions of actions taken that year (ex: adopted reach codes, charging installed, EVs acquired, etc.)
4. 2019, 2020, 2021 years updated to reflect additional EV reach code impacts for commercial sites
5. Charging and appliance outpace peer agencies but lower than desired
6. Revised 2025 targets reflect actual trajectory

**EV Charging ports in pipeline: over 3,000**
Programs: CY 2022 Key Accomplishments

1. EV Charging
   - Over 3,000 ports in pipeline, subject to some attrition and addition going forward
   - Major program updates with increased incentives, increased flexibility for contractor selection, and funds shifted away from non-performing partner

2. Reach Codes
   - 16 communities have adopted reach codes
   - New model codes for 2022 adoption cycle, including existing building options

3. Local Government Solar
   - Completed solicitation, moving into contracting for 2 MW across 15 sites
Programs: CY 2023 Key Priorities

1. EV Charging
   o Execution on program ramp-up moving EV ports in the pipeline to installations

2. Buildings
   o Major updates to program in two phases:
     a) increasing incentives and flexibility, adding appliances and Zero Percent Finance (on-bill finance)
     b) expanding overall program including "one-stop shop" and turnkey options
   o Existing building reach codes

3. Distributed Resources
   o Installing and expanding local solar + storage projects (Local Government Solar)
   o Deploying first “virtual power plant” programs (FLEXmarket, EV Managed Charging)
## Marketing & Community Relations Overview

### Key Performance Indicators (Measured on FY)

<table>
<thead>
<tr>
<th>Indicator</th>
<th>2020 Baseline</th>
<th>2021</th>
<th>2022</th>
<th>2025 Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participation Rate (as of FY end)(^1)</td>
<td>97%</td>
<td>97%</td>
<td>97%</td>
<td>97%</td>
</tr>
<tr>
<td>PCE Aided Awareness</td>
<td>34%</td>
<td>31%(^2)</td>
<td>39%(^4)</td>
<td>60%</td>
</tr>
<tr>
<td>PCE Favorability(^3)</td>
<td>63%</td>
<td>61%(^2)</td>
<td>57%(^4)</td>
<td>80%</td>
</tr>
<tr>
<td>Residential &amp; SMB Engagement(^1)</td>
<td>Med/Low</td>
<td>Med/Low</td>
<td>Med/Low</td>
<td>High</td>
</tr>
</tbody>
</table>

1. Shared responsibility with Account Services team
2. Given sample size in 2021, this is statistically equivalent to the 2020 baseline
3. Of those who are aware of Peninsula Clean Energy
4. Statistically different from 2020 baseline

---

**On target**

**Challenges exist**

**At risk**
Marketing/Outreach: FY 2022 Key Accomplishments

1. Los Banos enrollment – strong participation rate and positive perceptions

2. Electrification awareness program – All-Electric awards, new original content, well-attended webinars, new message development

3. Outreach Grantee program – strong execution against work scopes
Marketing/Outreach: FY 2023 Key Priorities

1. Launch of Zero Percent Financing program coupled with expanded electrification rebates

2. Increasing Peninsula Clean Energy aided awareness

3. Electrification campaign

4. Outreach grant program
Account Services Overview

### Key Performance Indicators (Measured on FY)

<table>
<thead>
<tr>
<th></th>
<th>2020 Baseline</th>
<th>2021</th>
<th>2022</th>
<th>2025 Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participation Rate (as of FY end)(^1)</td>
<td>97%</td>
<td>97%</td>
<td>97%</td>
<td>97%</td>
</tr>
<tr>
<td>Customer Data Access &amp; Analytics(^2)</td>
<td>Low</td>
<td>N/A</td>
<td>Low/Med</td>
<td>High</td>
</tr>
<tr>
<td>External Partner Relations</td>
<td>Med/High</td>
<td>High</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>Key Account Engagement(^3)</td>
<td>Low</td>
<td>Low</td>
<td>Med/Low</td>
<td>High</td>
</tr>
<tr>
<td>Residential &amp; SMB Engagement(^1)</td>
<td>Med/Low</td>
<td>Med/Low</td>
<td>Med/Low</td>
<td>High</td>
</tr>
</tbody>
</table>

1. Shared responsibility with Marketing and Community Relations
2. Launched DataConnect platform for Key Accounts in early 2022
3. Key Account Engagement growth was impacted significantly due to COVID restrictions and uncertainty

---

**On target**

**Challenges exist**

**At risk**
Account Services: FY 2022 Key Accomplishments

1. Launched Data Connect platform for Strategic Accounts and PCE program partners to streamline access to customer energy data

2. Successful TOU-C transition in September 2021 with over 70% of eligible customers moving to TOU rates

3. CAPP 1.0 application recovering over $1.8M from State COVID relief funds to help offset residential utility debt accrued during COVID shutdowns
Account Services: FY 2023 Key Priorities

1. Re-engaging with Strategic Accounts to promote new PCE program opportunities and PCE broader decarbonization goals

2. Expand Data Connect functionality and customer access beyond Strategic Accounts

3. Prepare for eventual NEM 3.0 decision from CPUC and determine how PCE can best support customers under new NEM rules
## Public Policy Overview

### Key Performance Indicators (Measured on FY)

<table>
<thead>
<tr>
<th></th>
<th>2020 Baseline</th>
<th>2021</th>
<th>2022</th>
<th>2025 Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCIA Containment</td>
<td>Low</td>
<td>Low</td>
<td>Challenges</td>
<td>See Below</td>
</tr>
<tr>
<td>Legislative Impact</td>
<td>Medium</td>
<td>Medium</td>
<td>Challenges</td>
<td>See Below</td>
</tr>
<tr>
<td>Regulatory Impact</td>
<td>High</td>
<td>High</td>
<td>On Target</td>
<td>See Below</td>
</tr>
<tr>
<td>Coalition Building</td>
<td>Low</td>
<td>Medium</td>
<td>On Target</td>
<td>See Below</td>
</tr>
<tr>
<td>Fostering CCA Growth</td>
<td>Medium</td>
<td>Medium</td>
<td>On Target/Challenges</td>
<td>See Below</td>
</tr>
</tbody>
</table>

### Regarding 2025 Targets

1) **PCIA Containment**: PCE staff interprets this goal as an objective to minimize PCIA-related costs applicable to PCE customers by 2025. With that said, PCIA costs applicable to PCE’s customers will remain long past 2025 and are expected to persist into the 2040s.

2) **Legislative Impact**: PCE staff interprets this goal as having a high level of influence with our local representatives and CalCCA’s legislative efforts, such that our efforts result in overall positive legislative outcomes in Sacramento.

3) **Regulatory Impact**: PCE staff interprets this goal as taking the steps necessary to enable the organizations programmatic and procurement objectives by 2025.

4) **Coalition Building**: PCE staff interprets this goal as having strong local, state and regional relationships to leverage our knowledge and influence towards positive outcomes.

5) **Fostering CCA Growth**: PCE staff recognizes that CCA growth has slowed in recent years. We believe this goal should be revisited.
Public Policy: FY 2022 Key Accomplishments

1. PCIA
   - Present PCIA costs are low due to high gas prices
   - Continued benchmark reform (e.g. valuation of renewable and greenhouse gas-free)
   - Diablo Canyon costs to leave PCIA in 2024/25

2. Regulatory
   - Continued leadership on Resource Adequacy (RA), Integrated Resources Plan (IRP), and programmatic interests including Transportation and Building electrification.

3. Legislative/Expansion
   - Continued impact on legislation of significance (e.g., AB 1814, AB 1944, SB 1158, SB 1203, SB 1287, SB 1393, Budget Priorities)
   - Successful enrollment of Los Banos customers and building strong relationships with elected officials and key stakeholders
Public Policy: FY 2023 Key Priorities

1. PCIA
   o Continued reform of valuation and pursuit of other reductions of costs

2. Regulatory
   o Programs – Pursue State/Federal/Ratepayer funding and other opportunities
   o Procurement – Increase regulatory certainty in RA & IRP for 24/7 objectives

3. Legislative/Expansion
   o Nurture new and continuing relationships with legislators and key stakeholders
   o Furtherance of CCA growth and influence in Merced County
## Financial Stewardship Overview

### Key Performance Indicators (Measured on FY)

<table>
<thead>
<tr>
<th></th>
<th>2020 Baseline</th>
<th>2021</th>
<th>2022¹</th>
<th>2025 Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>Days Cash On Hand (Unrestricted)</td>
<td>238</td>
<td>257</td>
<td>201</td>
<td>231</td>
</tr>
<tr>
<td>Credit Rating (Fitch/Moody)</td>
<td>BBB+/Baa2</td>
<td>same</td>
<td>BBB+/Baa2 POS</td>
<td>single “A” level</td>
</tr>
<tr>
<td>Change in Net Position ($000s)</td>
<td>$48,900</td>
<td>-$8,216</td>
<td>-$12,976</td>
<td>positive</td>
</tr>
<tr>
<td>Investment Performance (FRB/PFM)</td>
<td>2%</td>
<td>-4.4%/-4.7%²</td>
<td>TBD</td>
<td></td>
</tr>
<tr>
<td>Average Cost of Energy ($/MWh)</td>
<td>$61.92</td>
<td>$59.04</td>
<td>$62.75</td>
<td>$62.73</td>
</tr>
</tbody>
</table>

1. Key Performance Indicator results for FY 2021-2022 are based on un-audited financial results – final results may change slightly with publication of final audited financials.
2. Investment Performance results reported for each portfolio manager's holdings in FY 2021-22 where previous results

---

On target

Challenges exist

At risk
Finance: FY 2022 Key Accomplishments

1. Positive credit rating action with the assignment of a Positive Outlook on PCE’s credit rating with Moody’s Investors Service.

2. Change in Net Position at fiscal year end reflect better than budget performance through prudent financial management despite significant power market volatility.

3. The actual average cost of energy in FY 2020-21, based on final audited results, show a better than previously projected performance on average cost of energy.
Finance: FY 2023 Key Priorities

1. Continue the push to obtain PCE rating upgrades with credit rating agencies

2. Continue prudent and close financial tracking and management of expenditures to ensure the maintenance of a healthy and strong liquidity position
## Organizational Excellence Overview

### Key Performance Indicators (Measured on FY)

<table>
<thead>
<tr>
<th></th>
<th>2020 Baseline</th>
<th>2021</th>
<th>2022</th>
<th>2025 Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>Staff Satisfaction</td>
<td>High</td>
<td>High</td>
<td>On Target</td>
<td>See Below</td>
</tr>
<tr>
<td>Innovation Impact</td>
<td>High</td>
<td>High</td>
<td>On Target</td>
<td>See Below</td>
</tr>
<tr>
<td>Technology &amp; Systems</td>
<td>High</td>
<td>Med-High</td>
<td>On Target</td>
<td>See Below</td>
</tr>
<tr>
<td>Organizational Policies*</td>
<td>High</td>
<td>High</td>
<td>On Target</td>
<td>See Below</td>
</tr>
<tr>
<td>Governance</td>
<td>High</td>
<td>High</td>
<td>Challenges</td>
<td>See Below</td>
</tr>
</tbody>
</table>

*For external vendors and partners

### Regarding 2025 Targets

1) **Staff Satisfaction**: PCE staff interprets this goal based on yearly surveys, assessment of employee satisfaction; evaluation of professional development and training efforts; evaluation of competitive benefits.

2) **Innovation Impact**: PCE staff interprets this goal as the assessment of the quality of technology, program design, and policy innovation developed by the organization and its impact towards the organization’s goals and the clean energy industry.

3) **Technology & Systems**: PCE staff interprets this goal as the assessment of quality and completeness of systems to support the organization’s work including for business processes, energy-related analysis, program impact evaluation and customer insights; evaluation of systems and practices that ensure data accuracy/privacy and security.

4) **Organizational Policies**: PCE staff interprets this goal as the assessment of progress toward implementation of key policies such as the Sustainable Workforce and Ethical Vendor Standards policies.

5) **Governance**: PCE staff interprets this goal as facilitating the succession process, providing high quality orientation materials, and eliciting broad support of the organization by new Board Members, Alternates, and Citizen Advisory Committee Members; incorporating DEAI policy when completed.
Org Excellence: FY 2022 Key Accomplishments

1. Hired COO, CFO, Board Clerk and Director of HR

2. Conducted DEAI Survey with internal and external stakeholders, started development of DEAI policy and action plan

3. Enhanced the Data Warehouse with analysis models and automations

4. Successfully conducted Board, Committee and CAC meetings virtually, with high attendance
Org Excellence: FY 2023 Key Priorities

1. Implement DEAI Policy and Action Plan

2. Strengthen training and professional development opportunities for all staff

3. Strengthen communication and onboarding support for Board Members and Alternates
Update and Discussion on 100% Renewable on 24/7 Basis by 2025

September 22, 2022
Presentation Outline

• Introduction and Recommendation
• Background
• Modeling Approach
• Results
  o Portfolios for 24/7 Renewable Energy
  o Cost of 24/7 Renewable Energy
  o Emission and Grid Impacts of 24/7 Renewable Energy
• Challenges and Risks
• Summary and Recommendation
Introduction and Recommendation
Strategic Plan

ORGANIZATIONAL PRIORITIES:

By 2025, deliver 100% renewable energy each and every hour of day.

Contribute to our community reaching a goal of 100% greenhouse gas-free in buildings and transportation by 2035.
Terminology

• Throughout this presentation, we will use the terms "24x7", "Time-coincident", and "Hourly" interchangeably to refer to our goal.
Why do we have this goal?

• Peninsula Clean Energy currently delivers to all of our customers electricity that is 100% from GHG-free or renewable resources on an annual basis
  o We have built a financially strong organization at the same time as providing cleaner energy at a 5% savings compared to PG&E

• Our goal is to match our electricity supply to consumer load on an hourly basis
  o We will not be relying on system power (methane gas plants) and can maximally reduce GHG emissions from our electricity supply

• Peninsula Clean Energy wants to take the lead to show it’s possible to provide hourly renewable energy in a cost-effective way
Progress to Date

- Peninsula Clean Energy sets 100% renewable goal
- Procure resources and conduct preliminary analysis
- Publish White Paper, Part I
  - Finalize model development and analyze results
  - Board Retreat and Subcommittee Updates
  - Convene external advisory group
- Begin development of 24/7 planning model
  - Get preliminary modeling results → refine model
- Meet with 24x7 Subcommittee
  - Finalize modeling work
  - Developing Part II of the White Paper
Recommendation

• Target **99% time-coincident** renewable energy on a planning forecast basis
  - 100% time-coincident target will be less cost-effective
  - 99% target will maximize benefits to our customers in a cost-effective way
Background
Peninsula Clean Energy currently supplies energy from 100% Carbon Free or Renewable resources on a total annual basis

- We currently purchase enough renewable and carbon-free supplies to meet customer demand in the same year

- This annual framework:
  - Is the current industry standard
  - Does not show whether supply and demand matched on an hourly basis
# 2021 Peninsula Clean Energy 24/7 Emissions Footprint due to use of California grid energy

<table>
<thead>
<tr>
<th>Hour of Day</th>
<th>Jan 1</th>
<th>Apr 1</th>
<th>Jun 1</th>
<th>Oct 1</th>
<th>Dec 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>12am</td>
<td></td>
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</tr>
<tr>
<td>6am</td>
<td></td>
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</tr>
<tr>
<td>12pm</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>6pm</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11:59pm</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Color Scale: lbs CO2 / MWh of Carbon Emissions

| 0 | 100 | 200 | 300 | 400 | 500 | 600 | 700 | 800 |
### Annual accounting vs 24/7 accounting

- The two frameworks result in different calculated emissions footprints
- The 24/7 accounting approach is needed to understand how to reduce emissions from the California grid during every hour of the year

<table>
<thead>
<tr>
<th></th>
<th>2021 24/7 Emissions Footprint</th>
<th>2021 Annual Emissions Footprint</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average</td>
<td>210 lbs/MWh</td>
<td>5 lbs/MWh</td>
</tr>
<tr>
<td>Minimum</td>
<td>0 lbs/MWh</td>
<td>N/A</td>
</tr>
<tr>
<td>Maximum</td>
<td>987 lbs/MWh</td>
<td>N/A</td>
</tr>
</tbody>
</table>

- Reflects our use of California grid energy
- Does not credit oversupply
- Reflective of recently adopted SB 1158 (Becker)

- Current reporting standard
- Gives credit for oversupply in some hours
- Reflective of current Power Content Label reporting rules
Phasing our time-coincident renewable goal

Phase 1 (by 2025)
- Use Planning Forecasts
  - Target time-coincident renewable energy using planning forecasts

Phase 2 (beyond 2025)
- Use Real-Time Data
  - Continue to evaluate the cost/benefit of delivering time-coincident renewable energy in real-time
Questions?
Modeling Approach
24/7 Objective

Used the "MATCH Model" to identify the least-cost portfolio of renewable generation and storage resources that can meet our load in every hour, considering factors such as available resources and associated costs.
Types of Modeling

• Deterministic
  o Assumes a single set of assumptions, and determines a single outcome
  o Can be fast and streamlined, and therefore good for optimization modeling
  o Doesn’t provide insight into range of likely of outcomes

• Stochastic
  o Runs many simulations with varied inputs
  o Provides estimates on the range of likely outcomes – can evaluate risks and probabilities
  o More computationally intensive (slower), and therefore challenging to do iterative optimization
Modeling Approach

- Scenario Design
- MATCH model (Deterministic Portfolio Planning)
- Analyze results
- PowerSimm model (Stochastic Portfolio Analysis)
- Analyze results
- Final Recommendation
Resources considered for our 24/7 Goal

- **Resources considered:**
  - Solar PV
  - Hybrid Solar + Storage
  - Energy Storage
  - Onshore Wind
  - Geothermal
  - Small hydro
  - *Emerging technologies (Offshore Wind, Solar Thermal, Ocean Wave)*

- **Not considered: Large Hydro and Nuclear**
  - Not considered renewable under California RPS
  - No new (additional) capacity available
  - We cannot schedule these resources
# Renewable Goal Scenarios

<table>
<thead>
<tr>
<th>Scenario Name</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>Existing Portfolio</td>
<td>Represents current budget. Assumes use of Index-Plus RECs to cover the difference between annual load MWhs and contracted renewable MWhs.</td>
</tr>
<tr>
<td>100% Annual</td>
<td>Match annual load with an equal amount of contracted renewable energy.</td>
</tr>
<tr>
<td>100% Hourly</td>
<td>Match 100% of load in all hours with contracted renewable energy.</td>
</tr>
<tr>
<td>99% Hourly</td>
<td>Match 99% of load in all hours with contracted renewable energy.</td>
</tr>
</tbody>
</table>

* Time-coincident Scenarios*  

* All Time-coincident hourly scenarios achieve the 100% Annual Renewable Goal.
## Market Sensitivity Scenarios

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Optimistic Case</td>
<td>• Based on late 2021 market conditions</td>
</tr>
<tr>
<td>Conservative Case</td>
<td>• Based on mid-2022 market conditions (incorporating market disruptions such as supply chain issues, the war in Ukraine, and potential solar tariffs)</td>
</tr>
</tbody>
</table>
Questions?
Results: Portfolios for 24/7 Renewable Energy
Current Portfolio

• All model scenarios assumed our base existing portfolio of executed contracts

• In the results that follow, we show the incremental capacity that we need to add to meet our time-coincident goal
New Capacity Required to Add to our Portfolio

• New capacity required to be added to our portfolio generally increases as time-coincident target increases.

• More firm resources are needed at higher time-coincident targets.
Excess Generation

- Time-coincident matching results in procuring more energy than load on an annual basis.

- Values above 100% show over-procurement. For example, in the 99% Hourly scenario, we observed 46% over-procurement.

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Annual Volumetric %*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Existing Portfolio</td>
<td>85%</td>
</tr>
<tr>
<td>100% Annual</td>
<td>102%</td>
</tr>
<tr>
<td>90% Hourly</td>
<td>114%</td>
</tr>
<tr>
<td>95% Hourly</td>
<td>126%</td>
</tr>
<tr>
<td>99% Hourly</td>
<td>146%</td>
</tr>
<tr>
<td>100% Hourly</td>
<td>180%</td>
</tr>
</tbody>
</table>

*Annual Volumetric % = Total Annual Renewable Generation divided by Total Annual Load
Questions?
Results: Cost of 24/7 Renewable Energy
Assumptions around Cost of Energy

• Our cost of energy results are dependent on whether we can resell excess RA and/or RECs
  o In the short-term, we expect to be able to resell most excess RA and RECs
  o In the long-term, there is uncertainty around ability to resell
  o We will continually procure resources as renewable energy contracts expire and our load grows, and we will be able to re-assess our portfolio with each year's procurement

<table>
<thead>
<tr>
<th>Variation</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost of Energy, No Resale</td>
<td>Cost of Energy without reselling of any excess RA/RECs</td>
</tr>
<tr>
<td>Cost of Energy, With Resale</td>
<td>Cost of Energy with full (100%) resale of all excess RA/RECs</td>
</tr>
<tr>
<td>Expected Cost of Variations of Model Results</td>
<td>Notes</td>
</tr>
</tbody>
</table>
Cost of Time-Coincident Procurement

• Based on the Conservative Case results, time-coincident renewable energy procurement up to 99% can be achieved with only 2% cost increase

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Difference in Expected Cost of Energy* relative to Existing Portfolio (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Existing Portfolio</td>
<td>0%</td>
</tr>
<tr>
<td>100% Annual</td>
<td>-1%</td>
</tr>
<tr>
<td>90% Hourly</td>
<td>0%</td>
</tr>
<tr>
<td>95% Hourly</td>
<td>1%</td>
</tr>
<tr>
<td>99% Hourly</td>
<td>2%</td>
</tr>
<tr>
<td>100% Hourly</td>
<td>12%</td>
</tr>
</tbody>
</table>

*Deterministic Results
Market Sensitivity Analysis

• Our Optimistic Case showed lower cost of time-coincident procurement
  o 99% time-coincident goal can be achieved at a 1% cost decrease compared to our existing portfolio

• The recent passage of the Inflation Reduction Act may allow the market to return to late 2021 conditions, which would decrease the cost

Cost of Energy Relative to Existing Portfolio, Conservative Case

*Deterministic Results
Interpreting Stochastic Results with a Box-Plot

• Our stochastic analysis includes 50 simulations.

• We often use box-plots to show results of our stochastic analysis.

[Image: A box-plot diagram showing the upper extreme, upper quartile, median, lower quartile, lower extreme, and whiskers. The text on the diagram indicates the 25th and 75th percentiles.]
Cost of Energy: Range of Likely Outcomes

• While we have a forecast for our expected cost of energy, there’s a range of likely outcomes.

• Range of likely outcomes can be attributed to the risk around market prices and ability to resell excess RA/RECs.
Risk Premium

• Risk Premium* is a measure of the potential for cost increase in the worst-case scenario

• The 99% scenario has the lowest risk premium.

*Risk Premium is defined as the cost difference between the median (50th percentile) simulation cost and the 95th percentile simulation cost. Here, we express it as a percentage of average simulation cost.
Questions?

- How does the Board view the potential for a 2% cost increase in the Conservative Case if we pursue the 99% Hourly goal?
Results: Emission and Grid Impacts of 24/7 Renewable Energy
Emissions Reductions: Hourly Carbon Footprint

• Increasing our time-coincident target will reduce our hourly carbon footprint

* The hourly carbon footprint accounts for our use of grid energy in some hours, and does not give us "credit" for supplying excess energy in other hours

** This method is anticipated to be similar to the method adopted in SB 1158 (Becker)

Hourly Carbon Footprint: Our share of grid emissions on an hourly basis.

Results are specific to Peninsula Clean Energy
Emissions Reductions: Avoided Emissions

• Increasing our time-coincident target displaces more emissions
Effects on Grid: System Net Peak

- Our portfolios reduce the net peak, which improves the entire grid system operations.
Real-Time Operations: Time-coincident performance

• In real-time operations, the portfolios fall short of the time-coincident target by 1% to 3%, due to variability in load and generation.
Questions?

• Is 96% to 98% an acceptable real-time performance of our time-coincident portfolio?
Challenges and Risks
Challenges and Risks

- Uncertainty surrounding the ability to resell RECs and RA
- Sensitivity to market conditions
- Ability to contract for resources
  - Will we be able to find cost-effective resources according to our planning?
  - Will we need to accept unfavorable contract terms in order to secure the contracts in the current Seller's market?
- Regulatory uncertainty
  - Will new Resource Adequacy or Integrated Resource Planning requirements inhibit our ability to build the optimal portfolio?
- There's no official tracking system or accounting framework to communicate the value of a 24/7 approach
  - SB 1158 (Becker) will help to develop such accounting frameworks and could incentivize tracking systems to develop
Summary and Recommendation
Summary

• Time-coincident renewable procurement can be cost-effective under a variety of market conditions
  o Based on the Optimistic Case, 99% time-coincident can decrease our cost by 1% (on average) compared to our existing portfolio
  o Based on the Conservative Case, 99% time-coincident would increase our cost by 2% (on average) compared to our existing portfolio

• Procuring time-coincident renewable energy results in benefits to society by reducing emissions and improving grid impacts
Recommendation

• Target **99% time-coincident** renewable energy on a planning forecast basis
  - 100% time-coincident target will be less cost-effective
  - 99% target will maximize benefits to our customers in a cost-effective way
Next Steps

• Continue working on the White Paper Part 2

• Continue to evaluate and procure short-, medium-, and long-term resources

• Continue to evaluate cost-effectiveness based on market conditions
Thank you!

A sustainable world with clean energy for everyone.
2035 Decarbonization Feasibility & Plan

September 22, 2022
Agenda

1. Recap: Schedule, Scope, Analysis
2. Scaling & Partnerships
3. Financial Strategy
4. Program Concepts
5. Policy Needs
6. Next Steps
Strategic Plan

ORGANIZATIONAL PRIORITIES:

By 2025, deliver 100% renewable energy each and every hour of day.

Contribute to our community reaching a goal of 100% greenhouse gas-free in buildings and transportation by 2035.
Board and Advisory Committees

**Board Sub-committee**
- Rick DeGolia
- Jeff Aalfs
- Dave Pine
- Laura Parmer-Lohan

**Advisory Committee**
- Jeff Aalfs: Board of Directors, Peninsula Clean Energy
- Diane Bailey: Executive Director, Menlo Spark
- Jeff Byron: Former CEC Commissioner
- Andrea Chow: Sustainability Analyst, City of San Mateo
- Pierre Del Forge: Clean Buildings Director, NRDC
- Cisco Devries: CEO, OhmConnect
- Adrienne Etherton: Sustainability Manager, City of Brisbane
- Laura Feinstein: Sustainability Policy Director, SPUR
- Zach Franklin: Chief Strategy Officer, GRID Alternatives
- Matt Golden: CEO, Recurve
- Ortensia Lopez: Executive Director, El Concilio
- Loren McDonald: EV Industry Analyst, EVAdoption.com
- Joshua Pierce: EVP, Richard Heath and Associates
- Mary Anne Piette: Division Director, Lawrence Berkeley National Lab
- James Russell: Energy Transition Director, CLEAResult
- Nancy Ryan: Former CPUC Commissioner
- Justin Zuganis: Director of Decarbonization, SVCE
Board and Advisory Comments

Over 120 comments and questions received. Key comments include:

1. Pursue **rate design** to create economic value in building electrification
2. Develop a “**one-stop-shop**” support for customers
3. Partner with providers for **point-of-sale finance**
4. Leverage **load shaping** across all appliances
5. Facilitate **energy efficiency** to create electric panel “headroom”
6. Promote **resiliency** to help with confidence in grid/electrification
7. Explore financing or **leases for used cars**
Recap

Schedule, Scope, Analysis Conclusions
Project Schedule

- Dec. ‘21: Scheduling and Scope
- Q1/Q2: Market Conditions
- Q2: Segments, Costs and Financing Options
- Q3: Financial Strategy, Policy, Programs, Scaling
- Q4: Final refinements (and Marketing, Metrics, Roadmap)

PCE Plan
- How much capital is needed?
- What funds are available?
- What policies are needed?
- How much can be done?

Board Retreat
PCE 2035 Plan Scope

• Primary Scope
  o Transportation
    o private passenger, local gov & small commercial fleets,
    o ride-hailing, alternative mobility
  o Buildings
    o "small" residential (single family & small multifamily),
    o office, small commercial

• Not in scope, or limited* (others to lead)
  o Transportation: heavy-duty vehicles, off-road
  o Buildings: industrial, large commercial*, large multifamily*
  o Non-energy: land-use, compost, stationary sources, landfills, embodied carbon
  o Adaptation, restoration

San Mateo Countywide Greenhouse Gas Emissions,

- Transportation (In-Scope) 41%
- Building Methane (In-Scope) 24%
- Electricity (Non-PCE)...
- Water 0%
- Wastewater 0%
- Solid Waste 8%
- Stationary Sources 5%
- Transportation (Not-in-Scope) 13%
- Building Methane (Not-in-Scope) 7%

Note: Current analysis is based on SMC data; Los Banos data to be included as it becomes available.
Transportation: EV Growth for New Vehicle Sales

“Business-as-usual” EV and Gas Vehicle Sales & Gas Vehicle Retirements

Annual Sales, Columns

- Annual EV Sales, New
- Annual Gas Sales, New
- Total Personal Gas Cars Population at Year End

Gas Cars at Year Start

Net New EVs from New Sales

Annual EV Sales, New

Annual Gas Sales, New

Gas Cars at Year Start
Current EV Charging Distribution

- Min. need to support all-electric fleet, ~70k chargers (CEC**)
- Major need in multi-family housing
- 80% of EV charging happens at home

*data quality is poor for workplace charging and multifamily so counts may be higher
**California Energy Commission adapted estimate

~4600 charging stations currently in San Mateo County*

EV Chargers by Type and Site

- Workplace 36%
- Retail 16%
- Hotels 11%
- Parking Garages 9%
- Hospital 5%
- School 3%
- All Others 10%
- Multi-family 2%
- Fast Charging 6%

*Peninsula Clean Energy
PCE Analysis: Transportation Conclusions

• **Young fleet**: Our vehicles are younger than national average (our new vehicle segment is 2x national average) and appear to turn over faster.

• **Vehicle age and EV adoption correlate with income**: EV adoption and vehicle age are highly correlated with income (areas where average car age is 10+ years old have avg. income of <$100k, very low income).

• **Charging at multi-family**: Virtually none exist currently, reach codes help but substantial gap remains affecting ~28% of population, mostly renters, many low income. Overall cost gap for all EV charging ~$400M.

• **Limited supply and slow turnover**: New gas car sales will likely end before 2035 but used cars will electrify slowly; likely supply constrained.
Peninsula Clean Energy

Impact of Utility Rates

- Residential rates in PG&E territory are very high
- Effectively eliminates economic benefit of electrification
- PCIA is ~$11/year
- Load shape 3% reduction
- Unless rate structures shift
Overarching income distribution – SM County

Low Income
Under 80% AMI*
49%

Moderate Income
80% - 200% AMI
36%

Upper Income
200% - 300% AMI
8%

Very High Income
Over 300% AMI
7%

Source: US Census – American Community Survey
Note: Low-income categories likely include homeowners with significant assets that are not normally considered “low-income”
Small residential income distribution – SM County

Note: Low-income categories likely include homeowners with significant assets that are not normally considered “low-income”
Special Challenge: Very Low-Income – SM County

Under 50% AMI

- 23% of small residential are owner-occupied, very low-income homes
- 15% of all residential are owner-occupied, very low-income homes

Note: Low-income categories likely include homeowners with significant assets that are not normally considered "low-income"
PCE Analysis: Buildings Conclusions

- **Older, small-residential dominant**: Small residential represents most of the building stock (>70%), and methane gas equipment predominates for space and water heating. Space heating is most expensive (~$20k).

- **Total Capital Required**: Estimated ~$3.6-4B needed to electrify single-family and small multifamily.

- **Economics improve** with increasing gas rates, forthcoming technologies, manufacturing scale but not enough to drive market.

  - **High electric rates are major obstacle** producing poor economics for electrification.

  - **Potential CARB and AQMD policies** implemented in 2027-2031 would have enormous impact.

  - **Low-income segment challenge**: High percentage of small residential units (~20%) owned by very low-income residents creates a challenge to self-fund electrification.
2035 PCE Decarb Plan - Feasibility Conclusions

• In Sept 2021, PCE Board asked that staff study the feasibility of 100% GHG reduction by 2035 for transportation and buildings in PCE's service territory

• Given current market conditions, funding and financing availability, current rate structures and policy status, achieving 100% GHG reduction by 2035 in PCE's service territory is infeasible.

• What PCE can achieve:
  o Private Vehicles: ~50-60% vehicles electrified, ~70-80% EV port need (not DCFC)
  o Small Residential: ~25-35% homes electrified
  o Assuming stable external funds, aggressive finance, and modest PCE budget growth
  o All resources must be leveraged (incentives, DR value, finance, etc.)
  o Assuming no rate reform (identified as a major policy need)
Scaling & Partnerships

We're Not In This Alone
Market Transformation: Generating Scale
Acting with Others

- Best Practices & Partnerships
- CCAs
- Local codes & policies
- Local Governments
- State & AQMD
- Policies & Incentives
- Financial Tools
- Capital Providers
- Products & Services

Next Up: Capital Providers
SMC Carbon Neutrality Action Plan

Objectives
- Policy advocacy
- State and Federal funding
- Communications
- Standardized metrics & timelines
- Sharing analysis and equity strategy
- Coordinated implementation

Intentional coalition of three main countywide Board organizations towards carbon neutrality
Replication

• Develop Methods & Partners
  • Technology & Technical method, Financial tools, Program models
  • Policies
  • Partnerships

• Foster Early Market
  • Generate early volume to establish initial market
  • Foster manufacturer and supply chain pipeline
  • Workforce

• Replicate
  • Push policies and methods to peers, practitioners, and state
Replication: Initial Successes

• Building Codes
  o Local codes: 16 local adopters
  o State codes: Single-family electrification, multi-family EV ready with power mgmt., low-power
  o Replicated: SVCE, EBCE, Clean Power Alliance, San Luis Obispo

• EV Charging methods
  o Power Management/Level 1: Adopted by CEC, PG&E, AQMD, SVCE, MCE
  o Advance design and technical assistance: CLEAResult with SVCE, EBCE, Palo Alto

• Other Programs
  o Government Solar: EBCE, CalChoice, Prime
  o Portable batteries (MCE)
  o Residential solar + storage (SVCE, EBCE)
  o Ebikes (SCP)
  o Fleets (SVCE, 3CE)
  o On-Bill Finance (SCP)
  o New EV Dealer Incentive (SCP)
  o Low Income Turnkey (EBCE)
  o Heat Pump Water Heaters (CPSF, EBCE, MCE, SCP, SVCE)
Key Questions

• Are there particular partnerships we should explore?

• Are there other agencies that can provide assistance?
Financial Strategy
Questions Financial Strategy aims to answer

- How much does the plan do: GHG, # EVs, chargers, buildings
- With what resources: $ from all sources
- How much we can capture: Other value streams
- What is the role of policy: Local, regional, state
- What are the limits: State/Fed funds, finance, PCE budget
- What is the gap: GHG & financial gap
PCE Financial Strategy – Key Principles

1. Leverage *market forces, innovation and policy* support for cost-effective GHG reduction measures

2. Provide *higher incentives early*, better than cost parity where possible, then reduce incentives as market matures and costs decline

3. Offer *more support to those with less* capacity to bear costs

4. Mobilize traditional and innovative *finance solutions for scale*

5. Where practical, leverage other/existing programs and *fill gaps*

6. Target and fund programs to *enable key policy* adoption for required action and market transformation
## Modeling Assumptions (as of Aug. 2022)

<table>
<thead>
<tr>
<th>Assumption</th>
<th>Basis/Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model is in <strong>constant dollars</strong> (no inflation)</td>
<td></td>
</tr>
<tr>
<td>Costs are estimated on <strong>2021 costs</strong></td>
<td></td>
</tr>
<tr>
<td>Service territory: San Mateo County</td>
<td>Los Banos data will be integrated at later date</td>
</tr>
<tr>
<td>Assumed external Building electrification (BE) funding: $27-33M/year</td>
<td>Assumes TECH and CEC budgets are continually funded at initial/current levels. Assumes IRA and tax credits are renewed once and extend to 2035.</td>
</tr>
<tr>
<td>Assumed external Transportation electrification (TE) funding: $8-10M/year</td>
<td>Approved CEC budget continued, expected CPUC TEF funding, &amp; Federal for EVs &amp; multi-family (MUD)</td>
</tr>
<tr>
<td>Existing building reach codes adopted <strong>over 10 yrs</strong> with increasing efficacy over time</td>
<td>Some cities beginning to consider adoption, increasing stringency over time. Policies drive adoption.</td>
</tr>
<tr>
<td>PCE investment grows moderately: <strong>3.5 to 5% annual program budget growth</strong> beyond FY22-FY26 forecasted baseline; 80% for decarbonization</td>
<td>Current conditions for budget growth are favorable</td>
</tr>
<tr>
<td>Additional value streams to be captured, ex: demand response (DR): estimated at <strong>$4-5M/year</strong></td>
<td>Majority DR value from res. EV load shaping. Assumes 10% EV participation. Buildings provide modest load shaping potential (excl. storage, TBD)</td>
</tr>
</tbody>
</table>
Cost of home upgrade (current)

The most common single-family home in SM County has:

- Gas water heating, tank-type
- Gas space heating, without air conditioning
- Gas cooktop
- Electric drying

The cost to electrify will be $28,000, an increased cost to the homeowner of $18,600 versus typical gas replacement costs.

<table>
<thead>
<tr>
<th></th>
<th>Electrification Cost</th>
<th>Gas Equipment Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water Heating (includes 240V circuit)</td>
<td>$6,100</td>
<td>$2,000</td>
</tr>
<tr>
<td>Space Heating</td>
<td>$20,700</td>
<td>$6,132</td>
</tr>
<tr>
<td>Cooking</td>
<td>$1,098</td>
<td>$1,155</td>
</tr>
<tr>
<td>Clothes Drying</td>
<td>$925</td>
<td>$925</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$28,823</strong></td>
<td><strong>$9,057</strong></td>
</tr>
<tr>
<td>Panel, if required</td>
<td>$3,700</td>
<td></td>
</tr>
<tr>
<td><strong>Total non-optimized cost</strong></td>
<td><strong>$32,523</strong></td>
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</tr>
</tbody>
</table>
Existing Buildings: Electrification

Expected "Home-equivalent" Electrification and Gas Replacements per Year & Remaining

Annual "Home-equivalent" Replacements (columns)

Electrified "Homes"

Gas Reinvested "Homes"

Reach Codes Drive Adoption

Increasing # cities & stringency

Existing Buildings: Electrification

Expected "Home-equivalent" Electrification and Gas Replacements per Year & Remaining

Annual "Home-equivalent" Replacements (columns)

Electrified "Homes"

Gas Reinvested "Homes"

Reach Codes Drive Adoption

Increasing # cities & stringency
Expected "Home-equivalent" Electrification and Gas Replacements per Year & Remaining

- **Annual "Home-equivalent" Replacements (columns)**
  - 2024: 12.8k
  - 2025: 12.5k
  - 2026: 11.9k
  - 2027: 11.7k
  - 2028: 11.1k
  - 2029: 10.5k

- **Expected "Home-equivalent" Electrification and Gas Replacements per Year & Remaining**
  - 2030: 4.4k, Remaining: 9.0k
  - 2031: 8.9k, Remaining: 4.4k
  - 2032: 9.2k, Remaining: 4.2k
  - 2033: 10.4k, Remaining: 3.0k
  - 2034: 10.4k, Remaining: 3.0k
  - 2035: 10.4k, Remaining: 3.0k

- **Reach Codes Drive Adoption**
  - Existing Buildings: Electrification
  - 129

- **AQMD & CARB Policy Increases Adoption**
  - Gas Reinvested "Homes"
Existing Buildings: Electrification

Expected “Home-equivalent” Electrification and Gas Replacements per Year & Remaining

Existing Buildings: Electrification

- Electrified “Homes”
- Gas Reinvested "Homes"
- Remaining Gas "Homes"
Financial Summary, Buildings (sm resi)

**Total Need**
- 200,000 small residential in San Mateo County
- Est. optimized cost ~$20k/ea.

**Projected Resources**
- Through 2035: $1-1.3 billion

---

Small Residential – Projected Available Resources 2024-2035

- **PCE Incentives**: $160 – 200M
- **PCE Low-Income Project Finance**: $40 – 50M
- **State & Federal**: $300 – 400M
- **Customer Spend**: $600 – 700M

- ~25-35% electrified
- **Total Need**: $1.1-1.3B

---

Peninsula Clean Energy
**Financial Strategy: Transportation (EV Charging)**

**Total Need**
- ~67k EV chargers (not incl. single family homes or fast charging,)
- Cost per EV Charger: ~$6k

**Projected Resources**
- Through 2035: $130 - $160 M
- 75-90% EV charging need (not incl. fast charging)

<table>
<thead>
<tr>
<th>Resource Type</th>
<th>Amount</th>
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</thead>
<tbody>
<tr>
<td>Customer Spend</td>
<td>$55 – 70M</td>
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<tr>
<td>Low Carbon Fuel Standard credits (LCFS)</td>
<td>$10 - $12M</td>
</tr>
<tr>
<td>State &amp; Federal</td>
<td>$27 - $33M</td>
</tr>
<tr>
<td>Load Shaping</td>
<td>$14 - $18M</td>
</tr>
<tr>
<td>PCE Investment</td>
<td>$22 - $28M</td>
</tr>
</tbody>
</table>

~75-90% EV charging need

---

Peninsula Clean Energy
Financial Strategy: Transportation (Vehicles)

Total Need
- ~600k personal vehicles, 60% electrified in 2035
- Cost to electrify:
  - E-bike: $1,000 - $2,000
  - Used EV: $25k - $30k

Projected Resources
- Through 2035: $715 - $875 M

Program ensures low-income access to EVs, not net new EVs in market

EVs – Projected Available Resources 2024 - 2035

17% of low-income residents getting EV or bikes

PCE Investment
$22 - $28M
State & Federal
$75 - $85M
Load Shaping
$34 - $38M
Customer Spend
$650 - 700M
Risks/Uncertainties

1. State and Federal funding is not renewed or not fully accessible
2. Cities and agencies do not adopt codes/regulations
3. Programs are not able to coordinate to achieve scale
4. Programs are unsuccessful in delivering cost reductions
5. Supply chains do not scale to meet demand
6. Additional value streams are not realized (DR, LCFS)
7. Interest rates make consumer finance too expensive
8. Capital for aggregate project finance cannot be secured
Key Questions

• Are the Financial Strategy Principles the right ones?

• Are there other resources to consider?

• Is the rate of local, regional and state policy adoption plausible?
Program Concepts

Building on PCE's Strong Program Foundation
Decarbonization Programs

1. Building Electrification
   - Flexible incentives
   - High touch support
   - Links to finance

2. Reach Codes & Other Local Policies
   - Continue new construction
   - Support existing buildings
   - Ensure programs support policies

3. Transportation Electrification
   - Vehicle Incentives
   - EV Charging (esp. MUD)
   - Fleets & Alternative Mobility

4. PCE as Conduit to Capital
   - On-Bill Finance
   - Information Conduit & Credit Enhancements
   - Project Finance
Buildings Electrification

1. **Flexible Incentives**
   - All measures, incl. prewiring and panels
   - Broader building segments
   - Integrated load shaping & solar+storage options

2. **High touch support**
   - Advanced “right-sizing” design
   - One-stop shop, hotline assist, turnkey option
   - Procurement aggregation to lower costs
   - Greater contractor support

3. **Links to Finance**
   - Specific linkages by customer segment
Reach Codes and Other Local Policies

1. **Continue to Support New Construction**
   - Re-adopt and increase jurisdictions
   - Remove exemptions and expand building types
   - Progressive increase in EV charging capacity as needed

2. **Support Existing Building Policy**
   - Adopt no-cost and low-cost measures first
   - Adopt new measures as programs and funding become available
   - Increase city count over time

3. **Build Programs to Support Policy**
   - To support local reach code adoption
   - To support BAAQMD goals
   - Work with state and federal agencies to leverage funding streams
Transportation Electrification

1. Vehicle Incentives
   - Low income used EV incentives with tech. assistance
   - Integrated load shaping

2. EV Charging
   - Technical assistance and incentives for multi-family and public agency parking, “right-sizing” design
   - Incentives in other market segments taper over time
   - Integration with SFH whole-home solutions (and V2H resiliency as appropriate)
   - Contractor training for grid & load mgmt. solutions

3. Fleets & Alternative Mobility
   - Local government and small commercial fleet incentives and technical assistance
   - E-bikes and, until state EV requirements come into effect, ride-hailing
PCE as Conduit to Capital

1. **On-bill finance (OBF) from PCE**
   - Limited scale 0% interest credit for any customer
   - Could expand to include third-party capital

2. **Provide customer information on third-party finance**
   - Guidance on consumer credit, including point of sale

3. **Advocate for state credit enhancements**
   - Foster credit enhancements to lower credit cost

4. **Aggregate residential project finance (under study)**
   - Adapted from Government Solar
   - Target lowest income customers without capacity for debt or added cost
   - PCE fully funds installations using external capital, repays capital under long term plan
   - Customers assume no debt or added expense
Key Questions

• Do we have the right mix of programs?

• Are there missing program features?
Policy Needs
Regional and State
## Key Regional and State Policies

<table>
<thead>
<tr>
<th>Category</th>
<th>Objective</th>
<th>Target</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Overall</strong></td>
<td>Influence rates to improve economics</td>
<td>Lowering T&amp;D rates incl. exploring:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Marginal rates for incremental electrification load</td>
</tr>
<tr>
<td><strong>Buildings</strong></td>
<td>Phase out gas appliances</td>
<td>Local code requirements (new &amp; existing)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>State code requirements (new &amp; existing)</td>
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<tr>
<td></td>
<td></td>
<td>AQMD NG standard</td>
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<tr>
<td></td>
<td></td>
<td>CARB ban on NG appliances</td>
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<td></td>
<td>Ensure availability of scaled finance</td>
<td>Capitalization of statewide low-cost finance facility</td>
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<td></td>
<td></td>
<td>Tariff On-Bill</td>
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<tr>
<td></td>
<td>Improve economics</td>
<td>State incentive support (continue &amp; expand)</td>
</tr>
<tr>
<td><strong>Transportation</strong></td>
<td>Phase out of gas vehicles</td>
<td>New gas car ban by 2035 CARB (-done-)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Model credits - Increased EV model availability, esp. low-cost models</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Used EV incentive program (done)</td>
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<tr>
<td></td>
<td></td>
<td>Used car buybacks, early retirements</td>
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<tr>
<td></td>
<td>Improve economics</td>
<td>State incentive support (continue &amp; expand)</td>
</tr>
<tr>
<td></td>
<td>Charging access</td>
<td>State/local codes (new &amp; existing)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Increased state support (all charging)</td>
</tr>
</tbody>
</table>
### Additional Regional and State Policies

<table>
<thead>
<tr>
<th>Category</th>
<th>Objective</th>
<th>Target</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Workforce</strong></td>
<td>Increase trained workforce</td>
<td>Increase diversity and underserved community training for building and</td>
</tr>
<tr>
<td></td>
<td></td>
<td>transportation electrification</td>
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<tr>
<td></td>
<td>Transition legacy sectors</td>
<td>Support retraining programs</td>
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<tr>
<td><strong>Grid</strong></td>
<td>Grid readiness</td>
<td>Resiliency for electric-only homes, vehicle-to-building power (V2B)</td>
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<tr>
<td></td>
<td></td>
<td>Distribution interconnection timelines</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Behind-the-meter (BTM) resources compensation, load shaping, dispatchability</td>
</tr>
<tr>
<td><strong>Gas System</strong></td>
<td>Reduce investment in gas infrastructure</td>
<td>Limit expansion and minimize continued investment</td>
</tr>
<tr>
<td></td>
<td>Gas legacy cost management</td>
<td>Shift capital from gas grid to electric grid</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Oppose gas cost-shift to electric ratepayers</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Oppose enhancements &amp; requirements, esp ratepayer funding</td>
</tr>
</tbody>
</table>
Next Steps
Next Steps

1. Refine plan based on Board feedback

2. Develop final elements of plan including:
   - Program roadmap
   - Marketing plan
   - Partners
   - Metrics
   - Policy platform

3. Return to the Board in Q1 2023
Board Members’ Reports (Discussion)
September 22, 2022
Adjournment