

## Peninsula Clean Energy Board of Directors Meeting

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- Call to Order / Roll Call
- Public Comment (for items not on the Agenda)
- Action to set the Agenda and Approve Consent Items 1-2
  - Consent Public Comment
- Regular Agenda
- Adjournment



# Chair Report (Discussion)

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# **CEO** Report (Discussion)

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## 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:
  - Wednesday, October 12 at 8:30 a.m. (Zoom)
- Executive Committee:
  - Wednesday, October 12 at 10:00 a.m. (Zoom)
- Citizens Advisory Committee:

   October 13 at 6:30 p.m. (Zoom)
- Board of Directors:
  - October 27 at 6:30 p.m. (Zoom)





# CAC Report (Discussion)

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## 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

Project	Developer	Technology	Location	Expected Start Date	Board Approval Date
Arica	Clearway Energy Group	100 MW solar + 50 MW storage (4hr)	Riverside County	Apr 1, 2024	Oct 26, 2021



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
  - $_{\odot}$  COVID still has some impacts
  - 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 <u>Advice Letter-6658</u> 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 Midterm 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

# **DEAI Policy Origins**

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



## 2020-2025 Strategic Plan Progress Annual Update for FY and CY 2022

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## Introduction

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 prepandemic levels

### **Building Electrification**

- Climbing utility costs
- Low awareness and motivation

#### Copper Prices for the Last 5 Years





## **Organizational Priorities**

#### Key Performance Indicators (Measured on CY)

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

\*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.



## **Power Resources Overview**

#### **Key Performance Indicators** (Measured on CY)

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

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
  - $_{\odot}\,$  Chaparral & Arica solar + storage
  - $_{\circ}~$  Gonzaga Ridge Wind
  - Geysers Geothermal
  - Second Imperial Geothermal (Heber 2)
  - $_{\odot}\,$  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)

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

- 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
  - o 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

- $_{\odot}$  16 communities have adopted reach codes
- $_{\odot}$  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

 $_{\odot}\,$  Execution on program ramp-up moving EV ports in the pipeline to installations

### 2. Buildings

 $_{\odot}\,$  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

 $_{\odot}\,$  Existing building reach codes

### 3. Distributed Resources

- Installing and expanding local solar + storage projects (Local Government Solar)
- Deploying first "virtual power plant" programs (FLEXmarket, EV Managed Charging)

## Marketing & Community Relations Overview

#### Key Performance Indicators (Measured on FY)

	2020 Baseline	2021	2022	2025 Target
Participation Rate (as of FY end) <sup>1</sup>	97%	97%	97%	97%
PCE Aided Awareness	34%	31% <sup>2</sup>	39% <sup>4</sup>	60%
PCE Favorability <sup>3</sup>	63%	61% <sup>2</sup>	57% <sup>4</sup>	80%
Residential & SMB Engagement <sup>1</sup>	Med/Low	Med/Low	Med/Low	High

- 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


#### 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)

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

- 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



#### 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)

	2020 Baseline	2021	2022	2025 Target
PCIA Containment	Low	Low	Challenges	See Below
Legislative Impact	Medium	Medium	Challenges	See Below
Regulatory Impact	High	High	On Target	See Below
Coalition Building	Low	Medium	On Target	See Below
Fostering CCA Growth	Medium	Medium	On Target/Challenges	See Below

#### **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.

Peninsula Clean Energy

## 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)
- $_{\odot}$  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
  - $_{\odot}$  Continued reform of valuation and pursuit of other reductions of costs
- 2. Regulatory
  - Programs Pursue State/Federal/Ratepayer funding and other opportunities
  - Procurement Increase regulatory certainty in RA & IRP for 24/7 objectives
- 3. Legislative/Expansion
  - $_{\odot}$  Nurture new and continuing relationships with legislators and key stakeholders
  - $_{\odot}$  Furtherance of CCA growth and influence in Merced County

## **Financial Stewardship Overview**

#### Key Performance Indicators (Measured on FY)

	2020 Baseline	2021	2022 <sup>1</sup>	2025 Target
Days Cash On Hand (Unrestricted)	238	257	201	231
Credit Rating (Fitch/Moody)	BBB+/Baa2	same	BBB+/Baa2 POS	single "A" level
Change in Net Position (\$000s)	\$48,900	-\$8,216	-\$12,976	positive
Investment Performance (FRB/PFM)		2%	-4.4%/-4.7% <sup>2</sup>	TBD
Average Cost of Energy (\$/MWh)	\$61.92	\$59.04	\$62.75	\$62.73

1. Key Performance Indicator results for FY 2021-2022 are based on unaudited 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



## 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
- 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

- 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)

	2020 Baseline	2021	2022	2025 Target
Staff Satisfaction	High	High	On Target	See Below
Innovation Impact	High	High	On Target	See Below
Technology & Systems	High	Med-High	On Target	See Below
Organizational Policies*	High	High	On Target	See Below
Governance	High	High	Challenges	See Below

\*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 <sup>48</sup> 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

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September 22, 2022

#### **Presentation Outline**

- Introduction and Recommendation
- Background
- Modeling Approach
- Results
  - Portfolios for 24/7 Renewable Energy
  - Cost of 24/7 Renewable Energy
  - 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
  - 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
  - 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



#### 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 <u>in the</u> <u>same year</u>
- 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



## 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

<ul> <li>Reflects our use of California grid energy</li> <li>Does not credit</li> </ul>		2021 24/7 Emissions Footprint	2021 Annu Emissions Footprint
<ul> <li>oversupply</li> <li>Reflective of recently adopted SB</li> </ul>	Averag e	210 Ibs/MWh	5 lbs/MWh
1158 (Becker)	Minimu m	0 Ibs/MWh	N/A
Peninsula Clean Energy	Maxim	987 lbs/MW	N/A

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Current reporting ٠ standard

Annual

- Gives credit for oversupply in some hours
- Reflective of • current Power **Content Label** reporting rules

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#### Phasing our time-coincident renewable goal



#### Questions?



## Modeling Approach.

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
  - Assumes a single set of assumptions, and determines a single outcome
  - o Can be fast and streamlined, and therefore good for optimization modeling
  - Doesn't provide insight into range of likely of outcomes
- Stochastic
  - Runs many simulations with varied inputs
  - Provides estimates on the range of likely outcomes can evaluate risks and probabilities
  - More computationally intensive (slower), and therefore challenging to do iterative optimization

## **Modeling Approach**



#### Resources considered for our 24/7 Goal

#### • Resources considered:

- Solar PV
- Hybrid Solar + Storage
- Energy Storage
- Onshore Wind
- 。 Geothermal
- 。 Small hydro
- <sup>o</sup> 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**

	Scenario Name	Note
	Existing Portfolio	Represents current budget. Assumes use of Index-Plus RECs to cover the difference between annual load MWhs and contracted renewable MWhs.
Time-coincident Scenarios*	100% Annual	Match annual load with an equal amount of contracted renewable energy.
	100% Hourly	Match 100% of load in all hours with contracted renewable energy
	99% Hourly	Match 99% of load in all hours with contracted renewable energy
Peninsula Clean Energy	* All Time-coincident ho	urly scenarios achieve the 100% Annual Renewable Goal Match 95% of load in all hours with contracted renewable

## Market Sensitivity Scenarios

Scenario	Notes
Optimistic Case	<ul> <li>Based on late 2021 market conditions</li> </ul>
Conservative Case	<ul> <li>Based on mid-2022 market conditions (incorporating market disruptions such as supply chain issues, the war in Ukraine, and potential solar tariffs)</li> </ul>

#### 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 timecoincident goal



## New Capacity Required to Add to our Portfolio

- New capacity required to be added to our portfolio generally increases as timecoincident 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 overprocurement. For example, in the 99% Hourly scenario, we observed 46% over-procurement.

Scenario	Annual Volumetric %*
Existing Portfolio	85%
100% Annual	102%
90% Hourly	114%
95% Hourly	126%
99% Hourly	146%
100% Hourly	180%

\*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
  - $_{\odot}$  In the short-term, we expect to be able to resell most excess RA and RECs
  - $_{\odot}\,$  In the long-term, there is uncertainty around ability to resell

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 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

#### **Variations of Model Results**

	Variation	Notes
	Cost of Energy, No Resale	Cost of Energy without reselling of any excess RA/RECs
ıla C	Cost of Energy, With Resale	Cost of Energy with full (100%) resale of all excess RA/RECs

## 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

Scenario	Difference in Expected Cost of Energy* relative to Existing Portfolio (%)
Existing Portfolio	0%
100% Annual	-1%
90% Hourly	0%
95% Hourly	1%
99% Hourly	2%
100% Hourly	12%

\*Deterministic Results

## Market Sensitivity Analysis

- Our Optimistic Case showed lower cost of time-coincident procurement
  - 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



## 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.

Cost of Energy Relative to Existing Portfolio, no Resale (Conservative Case)



## **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.

**Conservative Case** 12.0% 11.8% 10.0% 8.0% 8.2% 7.1% Risk 6.8% 6.5% 6.0% 6.0% 4.0%2.0% 0.0% Existing Portfolio 100% Annual 99% Hourly 100% Hourly 90% Hourly 95% Hourly

Risk Premium as a Percent of Average Cost of Energy

### **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 timecoincident 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.



## **Emissions Reductions: Avoided Emissions**

 Increasing our timecoincident target displaces more emissions

**Avoided Emissions:** Grid emissions displaced by our portfolio in the long run. (20)Change in Long-Run Emissions (lbs CO2/MWh of Generation) (40)(60)(80)(100)(120)(140)(160)Existing 100% 90% Hourly 95% Hourly 99% Hourly 100% Hourly Portfolio Annual

#### Results show benefits to the entire grid

## 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 .



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



- 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**



## **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 **Clean Buildings Director, NRDC** Pierre Del Forge **Cisco Devries** CEO, OhmConnect Adrienne Etherton Sustainability Manager, City of Brisbane Sustainability Policy Director, SPUR Laura Feinstein Zach Franklin Chief Strategy Officer, GRID Alternatives Matt Golden **CEO**, Recurve Ortensia Lopez **Executive Director, El Concilio** Loren McDonald EV Industry Analyst, EVAdoption.com EVP, Richard Heath and Associates Joshua Pierce 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

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## Recap

Schedule, Scope, Analysis Conclusions

## **Project Schedule**



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## PCE 2035 Plan Scope

## Primary Scope

- $_{\circ}$  Transportation
  - o private passenger, local gov & small commercial fleets,
  - $_{\odot}\,$  ride-hailing, alternative mobility
- $\circ$  Buildings
  - o "small" residential (single family & small multifamily),
  - $_{\circ}\,$  office, small commercial

## • Not in scope, or limited\* (others to lead)

- Transportation: heavy-duty vehicles, off-road
- Buildings: industrial, large commercial\*, large multifamily\*
- Non-energy: land-use, compost, stationary sources, landfills, embodied carbon
- o Adaptation, restoration



San Mateo Countywide Greenhouse Gas

Emissions.

24%

Transportation

(In-Scope)

41%

**Building Methane** 

(Not-in-Scope)

Stationarv

Sources 5%

Transportation (Not-in-Scope)

13%

7% Electricity (Non-PCE)...

Solid Waste

8%

Water

0%

Wastewater

0%

# Transportation: EV Growth for New Vehicle Sales

"Business-as-usual" EV and Gas Vehicle Sales & Gas Vehicle Retirements



Peninsula Clean Energy



## **Current EV Charging Distribution**



- Min. need to support allelectric 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


# PCE Analysis: Transportation Conclusions

- <u>Young fleet</u>: Our vehicles are younger than national average (our new vehicle segment is 2x national average) and appear to turn over faster
- <u>Vehicle age and EV adoption correlate with income</u>: EV adoption and vehicle age and are highly correlated income (areas where average car age is 10+ years old have avg. income of <\$100k, very low income)</li>

 <u>Charging at multi-family</u>: 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



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



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



# PCE Analysis: Buildings Conclusions

- <u>Older, small-residential dominant</u>: 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).
- <u>Total Capital Required</u>: Estimated ~\$3.6-4B needed to electrify single-family and small multifamily.
- <u>Economics improve</u> 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:

- Private Vehicles: ~50-60% vehicles electrified, ~70-80% EV port need (not DCFC)
- Small Residential: ~25-35% homes electrified
- Assuming stable external funds, aggressive finance, and modest PCE budget growth
- All resources must be leveraged (incentives, DR value, finance, etc.)
- 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



### **SMC Carbon Neutrality Action Plan**

Intentional coalition of three main countywide Board organizations towards carbon neutrality





OFFICE OF SUSTAINABILITY



#### **Objectives**

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

# 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

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

#### EV Charging methods

- 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
- Portable batteries (MCE)
- Residential solar + storage (SVCE, EBCE)
- Ebikes (SCP)
- Fleets (SVCE, 3CE)
- On-Bill Finance (SCP)
- New EV Dealer Incentive (SCP)
- Low Income Turnkey (EBCE)
- Heat Pump Water Heaters (CPSF, EBCE, MCE, SCP, SVCE)



### • 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:
- With what resources:
- How much we can capture:
- What is the role of policy:
- What are the limits:
- What is the gap:

GHG, # EVs, chargers, buildings

\$ from all sources

Other value streams

Local, regional, state

State/Fed funds, finance, PCE budget

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)

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

### 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.

	Electrification Cost	Gas Equipment Cost
Water Heating (includes 240V circuit)	\$6,100	\$2,000
Space Heating	\$20,700	\$6,132
Cooking	\$1,098	\$1,155
Clothes Drying	\$925	\$925
Total	\$28,823	\$9,057
Panel, if required	\$3,700	
Total non-optimized cost	\$32,523	



# **Existing Buildings: Electrification**

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



Reach Codes Drive Adoption

Electrified "Homes"

Gas Reinvested "Homes"

Increasing # cities & stringency



# **Existing Buildings: Electrification**

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





"Homes"



# **Existing Buildings: Electrification**

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





# Financial Summary, Buildings (sm resi)

Small Residential – Projected Available Resources 2024-2035

#### **Total Need**

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

#### **Projected Resources**

• Through 2035: \$1-1.3 billion





## Financial Strategy: Transportation (EV Charging)

EV Charging – Projected Available Resources 2024 - 2035

### **Total Need**

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

#### **Projected Resources**

~75-90% EV charging need

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





### Financial Strategy: Transportation (Vehicles)

### **Total Need**

- ~600k personal vehicles, 60% electrified in 2035
- Cost to electrify:
  - E-bike: \$1,000 \$2,000
  - $_{\odot}$  Used EV: \$25k \$30k

### **Projected Resources**

• Through 2035: \$715 - \$875 M

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

17% of lowincome residents getting EV or \_\_\_\_\_ bikes



EVs – Projected Available Resources 2024 - 2035

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



### • 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

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### **Decarbonization Programs**

### **1. Building Electrification**

- $\circ$  Flexible incentives
- $_{\odot}$  High touch support
- $_{\odot}$  Links to finance

# 2. Reach Codes & Other Local Policies

- $_{\odot}$  Continue new construction
- Support existing buildings
- $_{\odot}$  Ensure programs support policies

### **3. Transportation Electrification**

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

### 4. PCE as Conduit to Capital

o 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
- $_{\odot}~$  To support BAAQMD goals
- Work with state and federal agencies to leverage funding streams

### **Transportation Electrification**



#### 1. Vehicle Incentives

- $_{\odot}\,$  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
- $_{\odot}\,$  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

 $_{\odot}\,$  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



### • Do we have the right mix of programs?

### • Are there missing program features?

### Policy Needs

**Regional and State** 



## **Key Regional and State Policies**

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


## **Additional Regional and State Policies**

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

### 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

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# Adjournment

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