

**Regular Meeting of the Executive Committee of the
Peninsula Clean Energy Authority (PCEA)
AGENDA**

**Monday, April 14, 2025
10:00 am**

PLEASE NOTE: This meeting will be held in a hybrid format with both in-person and Zoom participation options for members of the public; Board members shall appear in person.

In-Person Meeting Locations:

**PCEA Lobby, 2075 Woodside Road, Redwood City, CA 94061 , and
1507 Viscaino Road, Pebble Beach, CA 94010**

**Zoom, Virtual Meeting Link: <https://pencleanenergy.zoom.us/j/83252507093>
Meeting ID: 832-5250-7093 Passcode: 2075 Phone: +1 (669) 444-9171**

This meeting of the Peninsula Clean Energy Executive Committee will be held at the Peninsula Clean Energy Lobby: 2075 Woodside Road, Redwood City, CA 94061 and by teleconference pursuant to California Assembly Bill 2449 and the Ralph M. Brown Act, CA Gov't Code. Section 54950, et seq. **Members of the Committee are expected to attend the meeting in person** and should reach out to our General Counsel for Peninsula Clean Energy, Jennifer Stalzer, with questions or accommodation information (jstalzer@smcgov.org). For information regarding how to participate in the meeting remotely, please refer to the instructions at the end of the agenda. In addition, a video broadcast of the meeting can be viewed at <https://www.peninsulacleanenergy.com/executive-committee> following the meeting.

Public Participation

The PCEA Executive Committee meeting may be accessed through Zoom online at <https://pencleanenergy.zoom.us/j/83252507093>. The meeting ID is: 832 5250 7093 and the passcode is: 2075. The meeting may also be accessed via telephone by dialing +1(669) 444-9171. Enter the webinar ID: 832 5250 7093, then press #. (Find your local number: <https://pencleanenergy.zoom.us/u/kTIH1Ocod>). Peninsula Clean Energy uses best efforts to ensure audio and visual clarity and connectivity. However, it cannot guarantee the connection quality.

Members of the public can also attend this meeting physically at the **Peninsula Clean Energy Lobby** at 2075 Woodside Road, Redwood City, CA 94061.

Written public comments may be emailed to PCEA Board Clerk, Nelly Wogberg (nwogberg@peninsulacleanenergy.com) and such written comments should indicate the specific agenda item on which the member of the public is commenting.

Spoken public comments will be accepted during the meeting in the Board Room(s) or remotely through Zoom at the option of the speaker. Please use the "Raise Your Hand" function in the Zoom platform, or press *6 if you phoned into the meeting, to indicate that you would like to provide comment.

Please note that Peninsula Clean Energy Executive Committee meetings are a limited public forum, and all public comment must relate to something that is within the subject matter jurisdiction of the Committee. If comments do not relate to the subject matter jurisdiction of the Committee, we will stop the comment and move on to the next speaker. General Counsel will assist in identifying comments that are not related to the subject matter jurisdiction of the Committee.

ADA Requests

Individuals who require special assistance or a disability related modification or accommodation to participate in this meeting, or who have a disability and wish to request an alternative format for the meeting, should contact Nelly Wogberg, Board Clerk, by 10:00 a.m. on the day before the meeting at (nwogberg@peninsulacleanenergy.com). Notification in advance of the meeting will enable PCEA to make reasonable arrangements to ensure accessibility to this meeting, the materials related to it, and your ability to comment.

Closed Captioning is available for all PCEA Board meetings. While watching the video broadcast in Zoom, please enable captioning.

CALL TO ORDER / ROLL CALL / APPROVE TELECONFERENCE PARTICIPATION UNDER AB 2449

This item is reserved to approve teleconference participation request for this meeting by Director pursuant to Brown Act revisions of AB 2449 due to an emergency circumstance to be briefly described.

PUBLIC COMMENT

This item is reserved for persons wishing to address the Committee on any PCEA-related matters that are not otherwise on this meeting agenda. Public comments on matters listed on the agenda shall be heard at the time the matter is called. Members of the public who wish to address the Committee are customarily limited to two minutes per speaker. The Committee Chair may increase or decrease the time allotted to each speaker.

ACTION TO SET AGENDA AND TO APPROVE CONSENT AGENDA ITEMS

1. [Approval of Minutes from the January 13, 2025 Executive Committee Meeting](#)

REGULAR AGENDA

2. Chair Report (Discussion)
3. CEO Report (Discussion)
4. [Discussion on Phase One of Peninsula Clean Energy's 2026-2030 Strategic Planning Process \(Discussion\)](#)
5. [Recommend to the Board of Directors Approval of the Draft Program Plan for California Public Utilities Commission \(CPUC\) FLEXmarket Program \(Action\)](#)
6. [Distributed Energy Resources Framework 2025 - 2030 \(Discussion\)](#)
7. Committee Members' Reports (Discussion)

ADJOURNMENT

Public records that relate to any item on the open session agenda are available for public inspection. The records are available at the Peninsula Clean Energy offices or on PCEA Website at: <https://www.peninsulacleanenergy.com>.

Instructions for Joining a Zoom Meeting via Computer or Phone

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- Please mute your microphone when you are not speaking to minimize audio feedback
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- If participating via videoconference, audio quality is often better if you use the dial-in option (option 2 below) rather than your computer audio

Options for Joining

- Videoconference with Computer Audio - see Option 1 below
- Videoconference with Phone Call Audio - see Option 2 below
- Calling in via Telephone/Landline - see Option 3 below

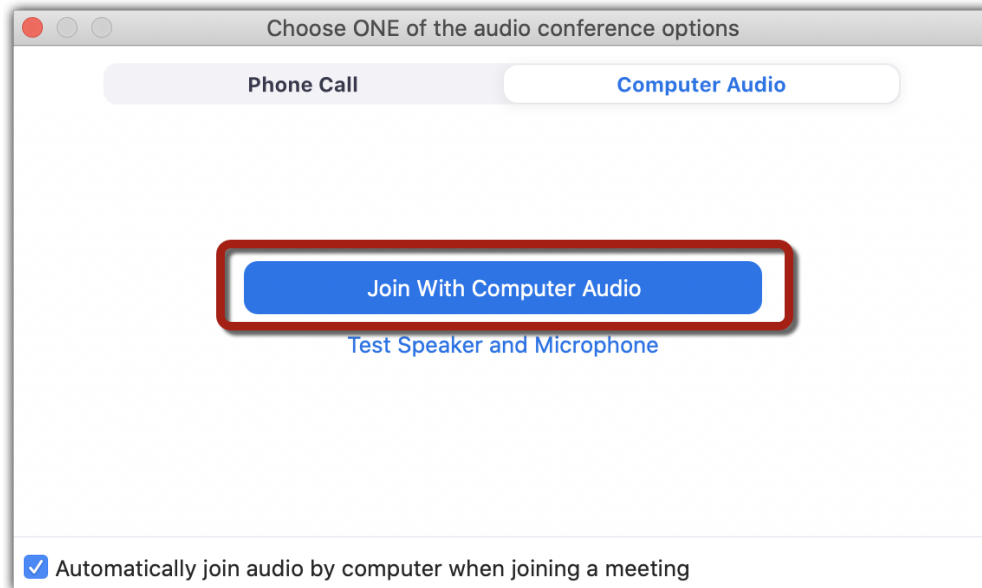
Videoconference Options:

Prior to the meeting, we recommend that you install the Zoom Meetings application on your computer by clicking here <https://zoom.us/download>.

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Option 1 Videoconference with Computer Audio:

- From your computer, click on the following link that is also included in the meeting calendar invitation: <https://pencleanenergy.zoom.us/j/83252507093>
- The Zoom application will open on its own or you will be instructed to open Zoom.
- After the application opens, the pop-up screen below will appear asking you to choose ONE of the audio conference options. Click on the Computer Audio option at the top of the pop-up screen.

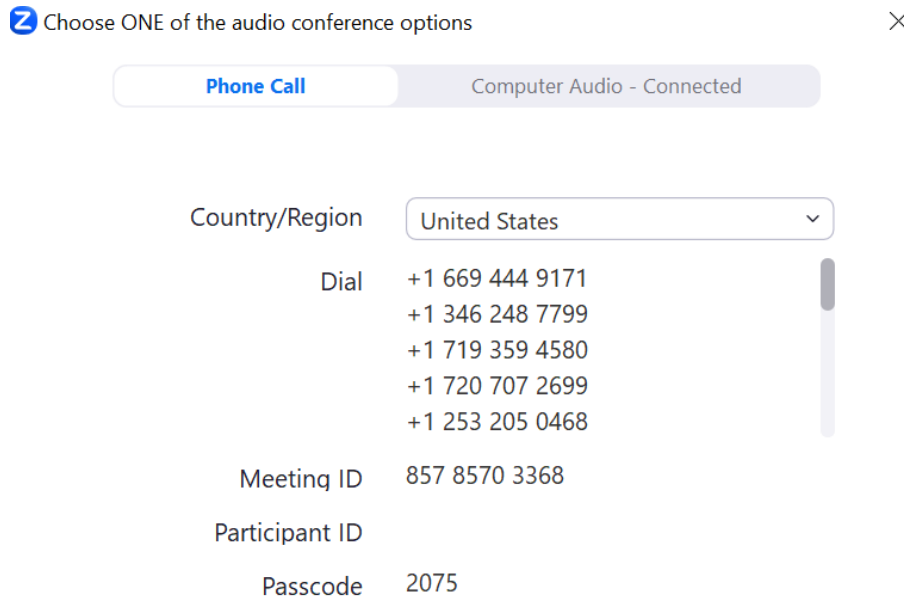


- Click the blue, "Join with Computer Audio" button.
- In order to enable video, click on "Start Video" in the bottom left-hand corner of the screen. This menu bar is also where you can mute/unmute your audio.

Option 2 Videoconference with Phone Call Audio

- From your computer, click on the following link that is also included in the meeting calendar invitation: <https://pencleanenergy.zoom.us/j/83252507093>
- The Zoom Application will open on its own or you will be instructed to Open Zoom.

- After the application opens, the pop-up screen below will appear asking you to choose ONE of the audio conference options. Click on the Phone Call option at the top of the pop-up screen.



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Participant ID

Passcode 2075

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- In order to enable video, click on "Start Video" in the bottom left-hand corner of the screen. This menu bar is also where you can mute/unmute your audio.

Audio Only Options:

Please note that if you call in/use the audio only option, you will not be able to see the speakers or any presentation materials in real time.

Option 3: Calling in via Telephone/Landline:

- Please dial +1 (669) 444-9171.
- You will be instructed to enter the meeting ID: **832-5250-7093 followed by #.**
- You will be instructed to enter your **Participant ID** followed by #. If you do not have a participant ID or do not know it, you can press # to stay on the line.
- You will be instructed to enter the meeting passcode **2075 followed by #.**



PENINSULA CLEAN ENERGY AUTHORITY
JPA Board Correspondence

DATE: April 11, 2025
MEETING DATE: April 14, 2025
VOTE REQUIRED: Majority Vote

TO: Honorable Peninsula Clean Energy Authority Executive Committee
FROM: Brianna Arroyo, Administrative Assistant
SUBJECT: Approval of Minutes from the January 13, 2025 Executive Committee Meeting

RECOMMENDATION

Approval of Minutes from the January 13, 2025 Executive Committee Meeting

BACKGROUND

Approval of Minutes from the January 13, 2025 Executive Committee Meeting

ATTACHMENTS:

[1.13.2025 Minutes.pdf](#)



Regular Meeting of the Executive Committee of the Peninsula Clean Energy Authority (PCEA) Minutes

Monday, January 13, 2025
10:00 a.m.
Zoom Video Conference and Teleconference

CALL TO ORDER

Meeting was called to order at 10:05 a.m. in virtual teleconference and in the Peninsula Clean Energy Authority lobby.

ROLL CALL



Participating:

Rick DeGolia, Atherton,
Coleen Mackin, Brisbane
Donna Colson, Burlingame, *Chair*
Betsy Nash, Menlo Park
Anders Fung, Millbrae
Marty Medina, San Bruno, *Vice Chair*

Absent:

A quorum was established.

PUBLIC COMMENT: None

ACTION TO SET AGENDA AND TO APPROVE CONSENT AGENDA ITEMS



Public Comment: None

MOTION: Vice Chair Medina moved, seconded by Director Mackin to set the Agenda and approve Agenda Item Number 1.

1. Approval of the Minutes for the November 12, 2024 Executive Committee Meeting

MOTION PASSED: 6-0 (Absent: None)

JURISDICTION	BOARD MEMBER	YES	NO	ABSTAIN	ABSENT
Atherton	Director DeGolia	X			
Brisbane	Director Mackin	X			
Burlingame	Director Colson	X			
Menlo Park	Director Nash	X			
Millbrae	Director Fung	X			
San Bruno	Director Medina	X			

	Totals	6			
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REGULAR AGENDA

2. [Chair Report](#)

Donna Colson gave a brief Chair Report to the Executive Committee where she shared upcoming changes to the Board of Directors and potential new assignments for the Executive Committee.

Public Comment: None

3. [CEO Report](#)

Shawn Marshall, Chief Executive Officer, provided a CEO report that covered the following topics: new Board Members and Alternates, updates to the Executive Committee, and updates on federal and state appointments.

Public Comment: None

4. [Discussion and Recommendation to Approve Phase One/Strategic Policies of Peninsula Clean Energy's 2026-2030 Strategic Planning Process \(Action\)](#)



Shalini Swaroop, Chief Operating Officer, and Lester Olmstead-Rose from La Piana Consulting gave a presentation on the overview of Phase One of the Strategic Policies of Peninsula Clean Energy's 2026-2030 Strategic Plan.

Public Comment: None

5. [Discussion of Rate-Setting Options and Recommendation to Adjust Peninsula Clean Energy Rates in February 2025 \(Action\)](#)

Nick Bijur, Chief Financial Officer, and Justin Kudo, Associate Director, Rates and Strategic Analysis, gave a presentation on the rate-setting options and a recommendation to adjust the Peninsula Clean Energy rates.

Public Comment: None

MOTION: Director DeGolia moved, seconded by Director Medina to move Option 2 as staff has suggested, Reducing all general rates to a 10% discount.

MOTION PASSED: 6-0 (Absent: None)

JURISDICTION	BOARD MEMBER	YES	NO	ABSTAIN	ABSENT
Atherton	Director DeGolia	X			
Brisbane	Director Mackin	X			
Burlingame	Director Colson	X			
Menlo Park	Director Nash	X			

Millbrae	Director Fung	X			
San Bruno	Director Medina	X			
	Totals	6			

6. [Committee Members' Reports](#)

Director Medina shared an update on streetlamp installations.

ADJOURNMENT

Meeting was adjourned at 12:11 p.m.



PENINSULA CLEAN ENERGY AUTHORITY
JPA Board Correspondence

DATE: April 10, 2025

MEETING DATE: April 14, 2025

VOTE REQUIRED: None

TO: Honorable Peninsula Clean Energy Authority Executive Committee

FROM: Shalini Swaroop, Chief Operating Officer

SUBJECT: Discussion on Phase One of Peninsula Clean Energy's 2026-2030 Strategic Planning Process (Discussion)

RECOMMENDATION

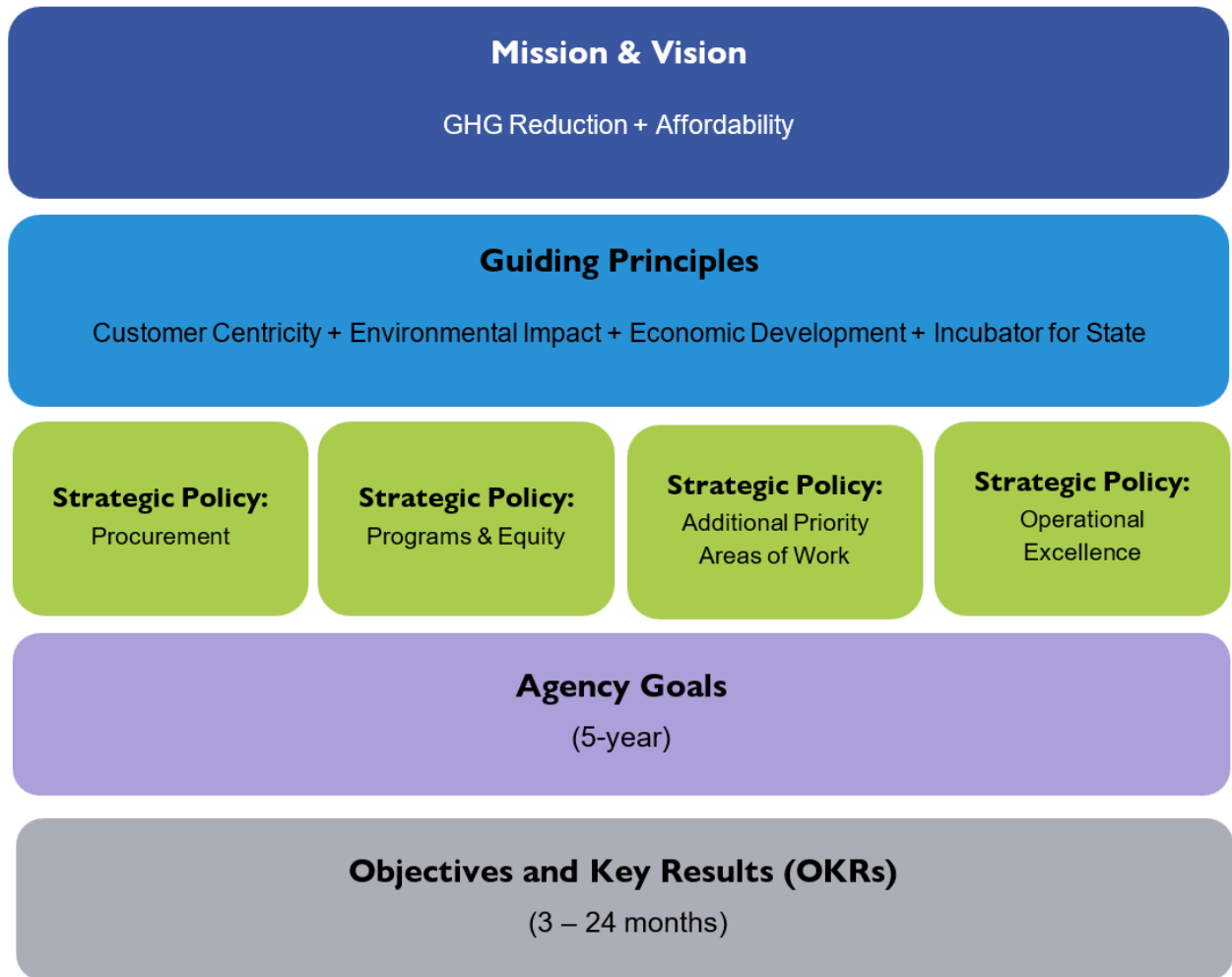
Discussion item only.

BACKGROUND

Peninsula Clean Energy (PCE) launched a strategic planning process in Summer 2024 to focus its efforts through 2030. Iterative conversations have included various community partners, the Community Advisory Committee, PCE Staff, the Board Ad Hoc Committee, and the Board of Directors. These conversations focused on identifying the critical questions PCE needed to address in its next phase of growth and operations. From there, contributing participants provided input to potential strategies in response to these questions. The Strategy Roadmap was created from extensive input and staff discussions to provide clear guidance for long-term and ongoing decisions. Included in today's presentation are:

- Options for refreshed PCE mission and vision statements
- Addition of foundational guiding principles
- Addition of a new strategic policy for a total of four that will serve as a framework for 5 year Agency goals

Following direction given at the January 23, 2025 Board of Directors meeting, the framework for the Strategic Plan was adjusted to better identify where the Strategic Policies align with PCE's work. The updated framework is below.



The updated framework will be presented to the Board Ad Hoc Strategic Planning Committee, the Board Executive Committee, and the Community Advisory Committee Strategic Planning Subcommittee for feedback and discussion. Staff will incorporate this input and present the Strategy Roadmap to the Board of Directors for discussion at its May 22, 2025 meeting. Staff will then develop five-year agency goals with specific objectives and key results (OKRs) and return to the above-mentioned groups for feedback and input before bringing to the full Board for adoption at its October 2025 Board retreat.

DISCUSSION

This Executive Committee meeting will provide an opportunity to discuss the updated mission and vision statement options, new guiding principles, and four strategic policies as part of the review process for the 2026-2030 Strategic Plan.

Mission Statement Refresh:

PCE's mission statement should clearly articulate PCE's purpose and impact, clarify who the organization serves, and how PCE delivers value and frames accountability by providing a public statement of intent. The mission is grounded in the present while the vision describes what the world will look like when PCE fulfills that mission. PCE's current mission is: "to reduce greenhouse gas emissions by expanding access to sustainable and affordable energy solutions."

Staff is presenting three potential options for Mission refinement:

Option A: "We are leading the way to a carbon-free future by delivering innovative and affordable clean energy solutions, supporting equitable community growth, and driving environmental progress."

Option B: "We unleash the potential of clean energy, transforming it into power that uplifts every neighborhood. We are committed to ensuring everyone benefits from a healthier, more sustainable, and economically vibrant future."

Option C: "We deliver affordable, clean electricity and support local solutions that lower costs, reduce pollution, and strengthen community resilience."

Vision Statement Refresh:

PCE's vision should paint the picture of a prosperous future led by our people and our community. It should inspire the PCE team, the Board and key stakeholders, and shape strategic planning by outlining what success looks like. PCE's current vision is: "a sustainable world with clean energy for everyone."

Staff is presenting three options for vision statement refinement:

Option A: "A carbon-free future where every home and business thrives — through clean energy that's accessible, affordable, and supports resilient communities."

Option B: "A future where clean energy powers prosperity and resilience in every community — so that everyone has the opportunity to thrive."

Option C: "A resilient, carbon-free future where clean, affordable energy helps every neighborhood thrive."

Strategic Plan Guiding Principles:

1. Prioritize reducing **environmental impact** by accelerating the transition from a fossil-based grid to one that runs on carbon-free and renewable resources, driven by strategic procurement efforts, commitment to environmental justice, and focus on energy resilience and reliability.
2. Design programs, products, and services to be **customer-centric**, keeping customer needs at the forefront of decision-making and program design in a way that will differentiate PCE from other energy providers by engaging customers as critical partners in the transition to a clean energy future.
3. Contribute to regional **economic development** by investing locally to reduce greenhouse gases, provide economic value through PCE programs, and maintain affordable rates in a way that supports the local economy.
4. Drive **innovation** in all areas of work, creating replicable solutions to reducing greenhouse gases, engaging in new clean energy technology and driving broad market change.

Strategic Policy - Procurement:

Maintain a 100% zero-carbon power resource portfolio while working towards delivering 100% renewable energy on an annual basis by 2030 through strategic and cost-effective procurement of resources that maximize PCE's 24/7 hourly matching of renewable energy and load.

This policy statement encompasses the following key elements:

- Continued commitment to achieving industry-leading renewable energy targets.
- Built-in flexibility on the 24/7 hourly matching goal to balance against potential cost impacts on PCE's customers.
- An emphasis on strategic procurement to minimize cost and risk exposure to PCE, minimize cost pressures for customers, and maintain PCE's financial health.
- A target of 60% minimum Renewable Portfolio Standard (RPS) of PCE's annual retail sales prior to 2030, with flexibility on the remaining portfolio composition to balance incremental gains toward the 100% renewable goal while maintaining cost competitiveness with PG&E.

Strategic Policy - Programs and Equity:

To reduce greenhouse gases (GHGs) as quickly as possible by continuing to deliver programs and services that benefit a range of PCE customers, including designing certain programs and services with equity and/or vulnerable customers' needs in mind by:

- Prioritizing rate affordability for all customers, and offering targeted discounts for equity customer segments with greatest need.
- Offering certain programs specifically designed for equity customers and, where programs have broad customer participation, providing tiered levels of support that enhance access and assistance for more vulnerable customers.
- Initiating policy initiatives and seeking third-party funding for equity programs that benefit vulnerable/equity customers and improve affordability and access to PCE services and benefits.
- Engaging equity customers and communities by working with community-based organization (CBO) partners to support equity customers, engage diverse and vulnerable communities, and solicit feedback on ways to improve PCE's equity services.

Strategic Policy - Additional Priority Areas of Work:

Over the next five years, PCE will prioritize efforts to accelerate the development of carbon-free distributed energy resources (DERs) in order to support further innovation and market transformation of distributed energy technologies, accelerate greenhouse gas (GHG) reductions, and provide customer and community resilience, including:

- Expanded DER project development support.
- Expanded customer access to capital in support of DER/electrification projects.
- Expanded technical assistance and support for local resiliency projects.
- Drive relevant policy development and advocacy.

Strategic Policy - Operational Excellence:

PCE will continuously improve and invest in its people, operational infrastructure, systems, and processes to enhance efficiency, resiliency, and adaptability. PCE's policy is to ensure that its operations are aligned with best practices in the industry; leverage technological advancements; support a high-performing workforce that is equipped to meet the evolving needs of customers and stakeholders; and achieve its diversity, equity, access, and inclusion (DEAI) commitments. Operational enhancements will be driven by the need to enhance PCE's ability to partner effectively with the customers and communities it serves and to advance the organization's mission impact. This policy includes specific guidance around:

- Scaling process optimization through effective use of technology
- Empowering an agile and diverse workforce
- Driving decisions with good data
- Ensuring cybersecurity and IT resilience
- Promoting equity and accessibility in operations
- Effectively managing risk and maintaining compliance

These elements are included in the Draft PCE Strategy Roadmap attached. Staff will return to the various reviewing groups in late Summer 2025 for discussion/feedback on five-year Agency goals and seek final approval for PCE's Strategic Plan at the October 23, 2025 Board of Directors meeting.

ATTACHMENTS:

[PCE DRAFT Strategy Roadmap 04-10-25.docx](#)



DRAFT Strategy Roadmap

v 4.8.25



www.lapiana.org



info@lapiana.org



510-601-9056

Executive Summary

Context

Peninsula Clean Energy (PCE) launched a strategic planning process in Summer 2024 to focus its efforts through 2030. This Strategy Roadmap is focused on Board-level decisions. Included are:

- Updated mission and vision statements
- New guiding principles
- Four strategic policies

Once the Board approves the framework inherent in this Strategy Roadmap, staff will develop programmatic and operational strategies with a particular focus on five-year agency goals, specific objectives, and key results to be achieved over the next 12-24 months and updated on a regular cadence throughout the term of the full 5-year strategic plan.

Process Overview

Iterative conversations with staff, the Board, and community members have been used to identify the critical questions PCE needed to resolve in order to guide it over the coming years and, then, to provide input to potential strategies in response to these questions. This Strategy Roadmap was created from extensive input and discussions to provide clear areas of work for PCE to focus on and guidance for ongoing decisions.

Updated Mission and Visions Statements

Based on the work completed in 2024, marketing staff initiated an effort to review and, as needed, update PCE's mission and vision statements to better reflect the organization's guiding principles and value proposition. The following information is provided to solicit input into possible statement updates.

Mission Statement

The mission statement should clearly articulate PCE's purpose and impact. It provides a public statement of intent that specifies who the organization serves and how it delivers value while framing accountability. The mission statement is grounded in the present, in contrast to the vision statement that describes what the world will look like if PCE fulfills its mission.

PCE's current mission statement is to reduce greenhouse gas emissions by expanding access to sustainable and affordable energy solutions.

Based on a variety of criteria, staff developed three options for a potential mission statement refinement:

Option A: "We are leading the way to a carbon-free future by delivering innovative and affordable clean energy solutions, supporting equitable community growth, and driving environmental progress."

Option B: “We unleash the potential of clean energy, transforming it into power that uplifts every neighborhood. We are committed to ensuring everyone benefits from a healthier, more sustainable, and economically vibrant future.”

Option C: “We deliver affordable, clean electricity and support local solutions that lower costs, reduce pollution, and strengthen community resilience.”

Vision Statement

The vision statement should paint the picture of a prosperous future led by PCE. It should inspire the PCE team, the Board, key stakeholders, and the community and shape strategic planning by outlining what success looks like.

PCE's current vision statement is for a sustainable world with clean energy for everyone.

Based on a variety of considerations, staff developed three options for a potential vision statement refinement:

Option A: “A carbon-free tomorrow where every home and business thrives — through clean energy that’s accessible, affordable, and supports resilient communities.”

Option B: “A future where clean energy powers prosperity and resilience in every community — so that everyone has the opportunity to thrive.”

Option C: “A resilient, carbon-free future where clean, affordable energy helps every neighborhood thrive.”

Guiding Principles

As part of the planning process, PCE also developed four guiding principles that outline the broad approach to organization-wide direction as it moves forward. PCE will:

Prioritize reducing **environmental impact** by accelerating the transition from a fossil-based grid to one that runs on carbon-free and renewable resources, driven by its procurement efforts, commitment to environmental justice, and focus on energy resilience and reliability.

Design programs, products, and services to be **customer-centric**, keeping customer needs at the forefront of decision-making and program design in a way that will differentiate PCE from other energy providers by engaging customers as critical partners in the transition to a clean energy future.

Contribute to regional **economic development** by investing locally to reduce greenhouse gases, provide economic value through PCE programs, and maintain affordable rates in a way that supports the local economy.

Drive **innovation** in all areas of work, creating replicable solutions to reducing greenhouse gases, engaging in new clean energy technology and driving broad market change.

Strategic Policies

Strategic Policy: Procurement

The question posed was *what are PCE's procurement priorities and how do affordability concerns affect those priorities?*

The proposed updated policy statement is that PCE will:

Maintain a 100% zero-carbon power resource portfolio¹ while working towards delivering 100% renewable energy on an annual basis by 2030 through strategic and cost-effective procurement of resources that maximize PCE's 24/7 hourly matching of renewable energy and load.

This policy statement encompasses the following key elements:

- Continued commitment to achieving industry-leading renewable energy targets.
- Built-in flexibility on the 24/7 hourly matching goal to balance against potential cost impacts on PCE's customers.
- An emphasis on strategic procurement to minimize cost and risk exposure to PCE, minimize cost pressures for customers, and maintain PCE's financial health.
- A target of 60% minimum Renewable Portfolio Standard (RPS) of PCE's annual retail sales prior to 2030, with flexibility on the remaining portfolio composition to balance incremental gains toward the 100% renewable goal while maintaining cost competitiveness with PG&E.

Strategic Policy: Programs & Equity

The question posed was *how can PCE continue to deliver services within an equity framework while also scaling decarbonization?*

The proposed policy position is for PCE to:

To reduce GHGs as quickly as possible by continuing to deliver programs and services that benefit a range of PCE customers, including designing certain programs and services with equity and/or vulnerable customers' needs in mind by:

- Prioritizing rate affordability for all customers, and offering targeted discounts for some equity customer segments with greatest need
- Offering certain programs specifically designed for equity customers and, where programs have broad customer participation, providing tiered levels of support that enhance access and assistance for more vulnerable customers
- Initiating policy initiatives and seeking third-party funding for equity programs that benefit vulnerable/equity customers and improve affordability and access to PCE services and benefits

¹ A "zero carbon" power resource portfolio might include *de minimus* emissions from geothermal facilities.

- Engaging equity customers and communities by working with community-based organization (CBO) partners to support equity customers, engage diverse and vulnerable communities, and solicit feedback on ways to improve PCE's equity services.

Strategic Policy: Distributed Energy Resources

The question posed was if there are there any new or enhanced areas of work that PCE should engage in to further support decarbonization and electrification in California?

The proposed policy is that:

Over the next five years, PCE will prioritize efforts to accelerate the development of carbon-free distributed energy resources (DERs) in order to support further innovation and market transformation of distributed energy technologies, accelerate greenhouse gas (GHG) reductions, and provide customer and community resilience, including:

- Expanded DER project development support.
- Expanded customer access to capital in support of DER/electrification projects.
- Expanded technical assistance and support for local resiliency projects.
- Drive relevant policy development and advocacy.

Strategic Policy: Operational Excellence

The need identified was to articulate a policy of continuous growth and excellence in PCE operations to maximize mission impact and invest in optimal teams, systems, and business practices.

The proposed policy is that:

PCE will continuously improve and invest in its people, operational infrastructure, systems, and processes to enhance efficiency, resiliency, and adaptability. PCE's policy is to ensure that its operations are aligned with best practices in the industry; leverage technological advancements; support a high-performing workforce that is equipped to meet the evolving needs of customers and stakeholders; and achieve its diversity, equity, access, and inclusion commitments. Operational enhancements will be driven by the need to enhance PCE's ability to partner effectively with the customers and communities it serves and to advance the organization's mission impact. This policy includes specific guidance around:

- Scaling process optimization through effective use of technology
- Empowering an agile and diverse workforce
- Driving decisions with good data
- Ensuring cybersecurity and IT resilience
- Promoting equity and accessibility in operations
- Effectively managing risk and maintaining compliance

Strategy Roadmap

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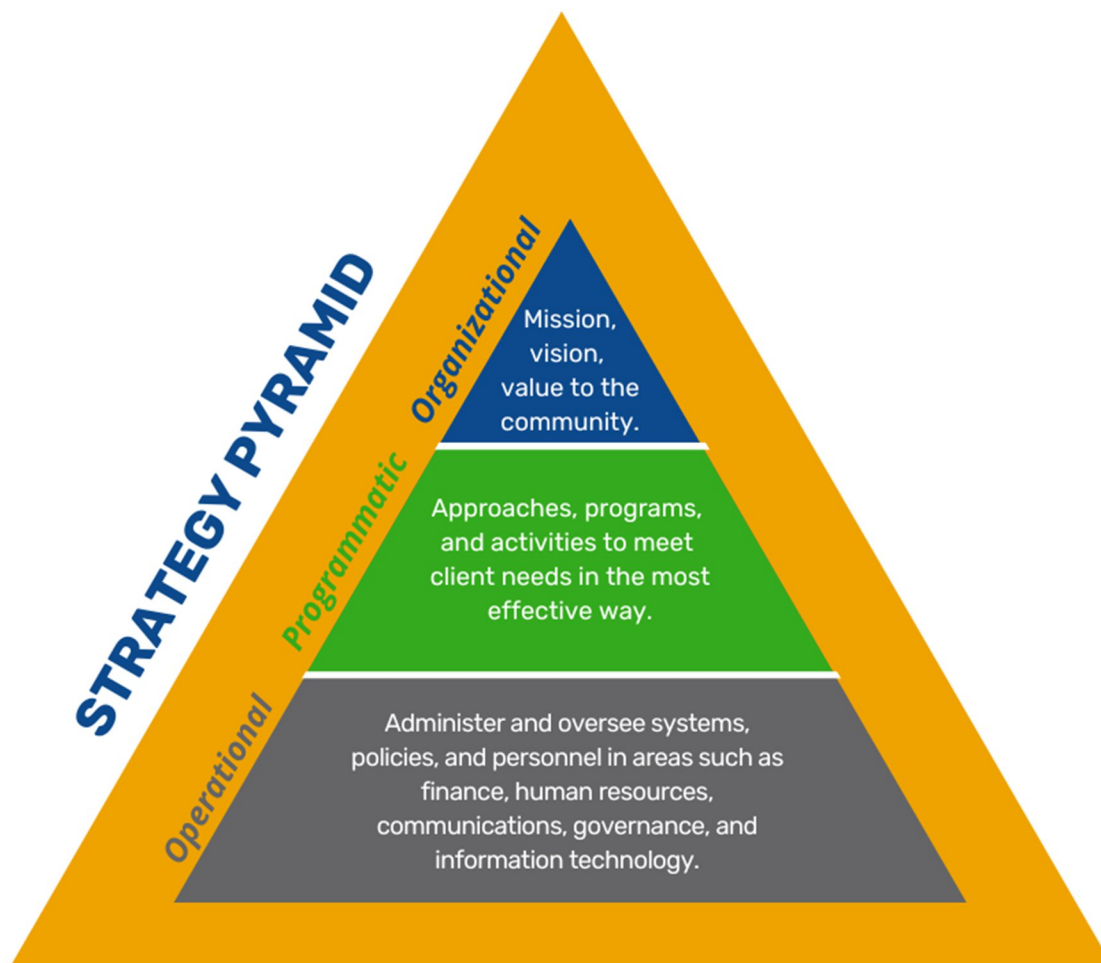
Process Summary

Process Purpose and Overview

Peninsula Clean Energy (PCE) engaged La Piana Consulting in the early Summer of 2024 to lead its strategic planning process. The primary outcomes PCE sought from the process were a strategic framework providing a clear path forward and the flexibility to anticipate and respond to a constantly changing environment.

The Strategy Pyramid and Process Outline

PCE is advancing its strategy development and planning effort through three distinctive stages. These three stages of work align with the graphic below, including Organizational Strategy, Programmatic Strategy, and Operational Strategy.

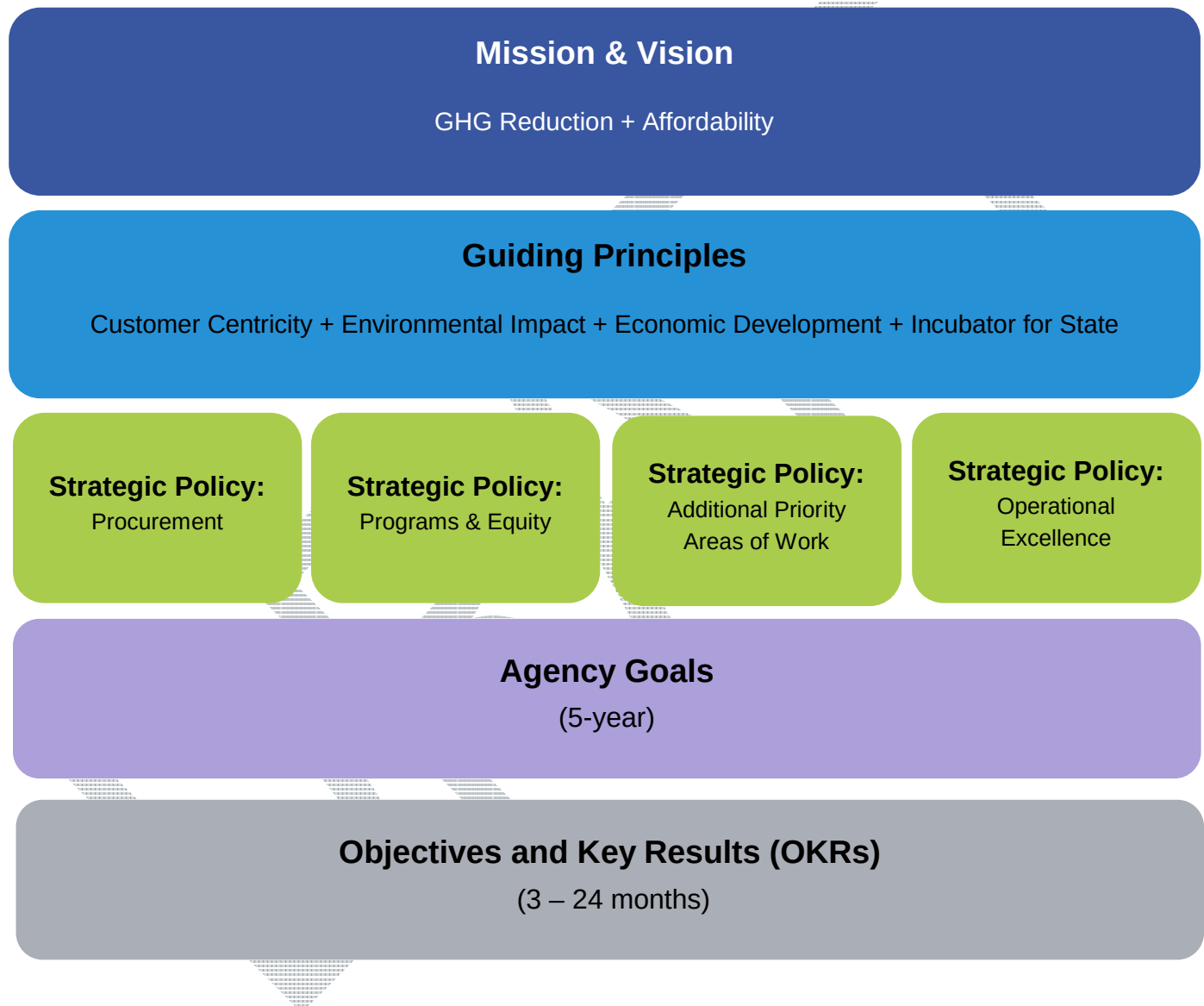


Strategy Roadmap

This Strategy Roadmap is focused on PCE's proposed Organizational Strategy, with high-level elements of Programmatic and Operational Strategy included. This Roadmap includes:

- Updated mission and vision statements
- New guiding principles
- Four strategic policies

Once the Board approves the framework inherent in this Strategy Roadmap, staff will develop programmatic and operational strategies with a particular focus on five-year agency goals, specific objectives and key results to be achieved over the next 12-24 months. This full strategic planning structure is summarized in the graphic below.



Also included in this process was the development of two foundational tools: defining PCE's future value proposition and developing a set of decision-making criteria to guide PCE's strategic choices throughout and beyond this process. These tools are included in the appendices.

Community and Staff Input

This process has been driven by the extensive engagement of staff, community members, and the Board.

Project Team

A Project Team including three staff members has guided this process as thought partners and logistical guides for La Piana. The Project Team has met approximately every other week during the process.²

Board Ad Hoc Strategic Planning Committee

The Board's *Ad Hoc* Strategic Planning Committee included five members of the Board and provided substantial input into the content of this process — including shaping the critical questions and proposed organizational strategy. The Committee has met multiple times during the process.³

Staff

All staff have been engaged both in the formative and latter stages of this process through small group conversations and several all-staff meetings.

Senior Staff

Senior staff have been actively involved by participating in all *Ad Hoc* Committee meetings and meeting independently approximately 6-8 times. Specific senior staff members with primary responsibility for implementing the organizational strategy were responsible for working with their teams to review information gathered and craft policy proposals for *Ad Hoc* Committee review.

Community

Community groups were engaged both in the formative and latter stages of this process through small group conversations. Groups consulted in the early stages of the process included the Community Advisory Committee, partner Community-based Organizations, Labor, and City and County sustainability staffs (including the primary liaison with Los Banos). The Community Advisory Committee and its Strategic Planning committee has provided input as the process progressed.

Mission and Vision

Based on the work completed in 2024, marketing staff initiated an effort to review and, as needed, update PCE's mission and vision statements to better reflect the organization's guiding principles and value proposition. The following information is provided to solicit input into possible statement updates.

Updated Mission Statement

The mission statement should clearly articulate PCE's purpose and impact. It provides a public statement of intent that specifies who the organization serves and how it delivers value while framing accountability. The

² Project Team members initially included Shalini Swaroop and Jana Kopyciok-Lande. Beginning in January 2025 the Project Team consisted of Shalini Swaroop and Nelly Wogberg.

³ *Ad Hoc* Strategic Planning Committee members included Adam Loraine, Donna Colson, Leslie Ragsdale, Marty Medina, and Rick DeGolia.

mission statement is grounded in the present, in contrast to the vision statement that describes what the world will look like if PCE fulfills its mission.

PCE's Current Mission Statement

Our mission is to reduce greenhouse gas emissions by expanding access to sustainable and affordable energy solutions.

Opportunities to evolve the Mission Statement

- Ensure the purpose is clear: To catalyze a carbon-free future and make sustainable energy a right, not a privilege
- Clarify the impact: Focus on positive outcomes including thriving communities, health, and well-being -- not just the technical process
- Capture adaptability: Connect PCE's legacy to innovation, scalability, and climate resilience
- Emphasize customer-centric focus: Reflect PCE's customer-first approach, including affordability and experiences designed with customers and equity in mind

Key questions to consider related to PCE's mission statement are:

- Does it reflect a customer-first approach, including affordability, equitable access, and services designed around customer needs?
- Does it highlight PCE's commitment to strengthening the community through economic growth and equitable outcomes?
- Does it position PCE as an adaptable leader driving clean energy innovation and shaping the future of energy?
- Is it bold in a way that inspires action and engagement from customers, stakeholders, and internal teams?
- Is the language clear, concise, straightforward, and free from jargon, making it easy for a broad audience to understand?
- Is it adaptable by defining boundaries while allowing the organization to move in key directions as circumstances change?

Staff developed three options for a potential mission statement refinement that meet these criteria:

Option A: *"We are leading the way to a carbon-free future by delivering innovative and affordable clean energy solutions, supporting equitable community growth, and driving environmental progress."*

Option B: *"We unleash the potential of clean energy, transforming it into power that uplifts every neighborhood. We are committed to ensuring everyone benefits from a healthier, more sustainable, and economically vibrant future."*

Option C: “We deliver affordable, clean electricity and support local solutions that lower costs, reduce pollution, and strengthen community resilience.”

Updated Vision Statement

The vision statement should paint the picture of a prosperous future led by our people and our community. It should inspire the PCE team, the Board, key stakeholders, and the community and shape strategic planning by outlining what success looks like.

PCE's Current Vision Statement

Our vision is a sustainable world with clean energy for everyone.

Opportunities to evolve the Vision Statement

PCE can build on the original vision statement by considering the following:

- Leadership: Reinforce PCE as a driver of change
- Innovation & Equity: Clearly articulate these as central to PCE's vision of the future
- Impact: Emphasize equitable, sustainable outcomes that result in abundance, resilience, and strong communities

Key Questions to consider related to PCE's vision statement are:

- Does it clearly communicate a sustainable and equitable future for all communities, driven by clean energy?
- Does it highlight PCE's role as a leader in the clean energy transition and climate action?
- Does it reflect PCE's commitment to innovation and adaptability in the evolving energy landscape?
- Does it underscore the importance of community impact, economic growth, and resilience in shaping PCE's future?
- Is it bold, inspirational, and aspirational, motivating internal teams, customers, and stakeholders to engage in the clean energy movement?
- Is the language clear, simple, and compelling, making it easy for a wide audience to understand and connect with?

Staff developed three options for a potential vision statement refinement that meet these criteria:

Option A: “A carbon-free tomorrow where every home and business thrives — through clean energy that's accessible, affordable, and supports resilient communities.”

Option B: “A future where clean energy powers prosperity and resilience in every community — so that everyone has the opportunity to thrive.”

Guiding Principles

As PCE progressed through this strategic planning process, it became clear that there was a need to develop guiding principles. Guiding principles outline the broad approach to enhance PCE's future value proposition and direct its decision-making towards achieving significant mission impact. PCE's guiding principles are:

Environmental Impact. PCE was founded on the vision of a sustainable world for everyone; a world in which energy choice could dramatically reduce harmful greenhouse gas emissions by accelerating the transition from a fossil-based grid to one that runs on carbon-free and renewable resources. PCE will continue to be champions for the environment in its procurement and program initiatives. PCE will expand its focus to include environmental justice in its decision-making and new clean energy technologies that leverage local renewables to support energy resilience and reliability.

Customer-Centric Approach. PCE would not exist without its customers. Keeping customer needs at the forefront of decision-making and program design is central to its continued success and will be at the core of what will differentiate PCE from other providers in the future. PCE's customers are not only the clients it serves, they are also PCE's critical partners in the transition to a clean energy future.

Economic Development. In its quest to expand renewable energy production, support electrification, and reduce greenhouse gases, PCE will also serve as an economic engine for its service area. It will do this by considering affordability in rate-setting, investing in local decarbonization and electrification efforts, supporting the development of new renewable projects (additionality), and expanding the “green economy” including local workforce development and local jobs.

Driving Innovation. PCE will continue to be an innovator and thought leader in the CCA industry — recognized locally, statewide and nationally for its leading-edge renewable procurement strategies, scalable and replicable building and transportation policies and programs, workforce DEAI initiatives, and piloted distributed energy resource and advanced energy projects that can be replicated for greatest environmental, economic, and customer impact — and that show the way towards broad market change.

Strategic Policies

Context

At the outset of this process participants identified three critical questions to focus on⁴. These questions, if resolved, provide broad guidance for ongoing decision-making by PCE:

⁴ Another question that has been raised is PCE's stance on geographic expansion. Resolving this is not central to this process and can be addressed at a later time.

1. What are PCE's procurement priorities and how do affordability concerns affect those priorities?
2. How can PCE continue to deliver services within an equity framework while also scaling decarbonization?
3. Are there any new or enhanced lines of business that PCE should engage in to further support decarbonization and electrification in California?

The resolution of each of these critical questions resulted in a strategic policy, providing more guidance for ongoing decision making. As the process continued, the need for a fourth strategic policy related to operations became clear and was added.

Strategic Policy: Procurement

Context

PCE's mission is to reduce greenhouse gas emissions by expanding access to sustainable and affordable energy solutions. PCE's vision is a sustainable world with clean energy for everyone.

PCE's power procurement strategy aims to displace fossil fuel generation on the grid and to serve customers with renewable energy each hour of the day while keeping costs low and meeting all regulatory requirements. PCE has been serving its customers with 100% clean energy on an annual basis since 2021.

Strategic Policy

In April 2024, PCE's Board of Directors approved and adopted the following Strategic Plan Priority, which serves as a general policy-level framework for future power procurement activities:

Deliver 100% renewable energy on an annual basis by 2030 through strategic and cost-effective procurement of resources that maximize PCE's 24/7 hourly matching of renewable energy and load.

While the current policy statement accurately reflects PCE's forward-looking renewable goals, in an effort to emphasize PCE's commitment to maintain a 100% zero-carbon resource portfolio at all times, the new policy statement is proposed to be:

Maintain a 100% zero-carbon power resource portfolio⁵ while working towards delivering 100% renewable energy on an annual basis by 2030 through strategic and cost-effective procurement of resources that maximize PCE's 24/7 hourly matching of renewable energy and load.

This policy statement encompasses the following key elements:

- Continued commitment to achieving industry-leading renewable energy targets.
- Built-in flexibility on the 24/7 hourly matching goal to balance against potential cost impacts on PCE's customers.

⁵ A "zero carbon" power resource portfolio might include *de minimis* emissions from geothermal facilities.

- An emphasis on strategic procurement to minimize cost and risk exposure to PCE, minimize cost pressures for customers, and maintain PCE's financial health.
- A target of 60% minimum Renewable Portfolio Standard (RPS) of PCE's annual retail sales prior to 2030, with flexibility on the remaining portfolio composition to balance incremental gains toward the 100% renewable goal while maintaining cost competitiveness with PG&E.

Measurable Expectations (What PCE is Doing)

Since the adoption of PCE's strategic procurement priority earlier in 2024, PCE released two solicitations for long-term renewable and storage resources and received numerous quality project offers. PCE's updated selection criteria focuses on:

- Portfolio fit to advance 24/7 hourly renewable matching
- Maximizing resource value
- Minimizing operational risk
- Providing benefits to communities surrounding project sites

Half a dozen projects have been shortlisted through the solicitation process. Over the next two years, PCE expects to contract an additional 1GW of new renewable and storage capacities to contribute to the renewable transition on the grid.

Rationale

Maintaining the recently updated renewable goal and clarifying procurement criteria is recommended for the following reasons:

1. Since April 2024, there have been no significant changes in resource availability or pricing. Therefore, the analysis previously performed that justified the adjustment of PCE's renewable target is still valid. Pursuing a more aggressive 24/7 goal immediately could be both costly and risky.
2. The adopted strategic policy continues to focus on the concept of additionality through the 24/7 hourly matching approach, which has been PCE's long-standing strategy to facilitate deployment of new renewable and storage capacities on the grid in order to displace fossil fuel generation and reduce emissions.
3. While the adopted strategic policy is not the lowest cost option, it retains flexibility, maintaining room for adjustment on an annual basis based on market conditions and PCE's financial well-being, which in turn provides opportunities to minimize rate impacts to customers.
4. Accelerating GHG reduction through the 24/7 hourly matching approach is important to push the boundaries for customers interested in achieving rapid carbon reductions or have sustainability goals of their own. Continuing to procure towards a 24/7 target could create opportunities for future products that might be desired by such customers.

Future Policy Considerations

While the proposed strategic policy statement above provides adequate procurement guidance for the next five years, it is imperative for PCE to continue exploring alternatives for future policy considerations as the market keeps on evolving and the political, economic, and regulatory environments change. PCE will continue to look for opportunities to accelerate GHG reduction including considering additional concepts such as:

- How to create an ecosystem that could better facilitate an industry transition from an annual renewable to a hourly renewable framework
- How to adjust PCE's renewable targets if there are major changes to the current tax credit rules and import tariffs
- Whether or not a 24/7 carbon-free approach would be more viable than 24/7 renewable
- Whether minimizing marginal grid emissions should be used as the new metric
- Whether it is feasible to pursue or prioritize carbon-free capacity procurement in addition to electricity procurement

Strategic Policy: Programs & Equity

Context

Again, PCE's mission is to reduce greenhouse gas emissions by expanding access to sustainable and affordable energy solutions. PCE's vision is a sustainable world with clean electricity for everyone.

PCE's programs and services address multiple goals to reduce climate pollution, lower electricity costs, increase resilience, support economic development and underserved communities, and ensure a sustained customer base and business.

In 2021, PCE's Board of Directors approved and adopted the following Strategic Plan Priority, which serves as a general policy-level framework for program activities:

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

PCE's core programmatic goal is to decarbonize communities by leveraging market forces and policy to drive affordability and ultimately achieve clean energy solutions without the need for market support.

In 2021, PCE's Board of Directors also adopted a strong [DEAI Policy](#), and in 2022 a [DEAI Action Plan](#) to direct staff in how to implement it. This policy requires that staff report to the Board twice yearly on progress in implementing the Action Plan.

As part of this Action Plan, PCE developed the [Diversity, Equity, Accessibility and Inclusion \(DEAI\) Decision-Making Framework](#) which establishes guidelines for how different customers should benefit from the organization's investments. It states:

While not all customers will always benefit equally from our expenditures, we should take care to ensure that we are not inadvertently exacerbating inequalities by:

- Distributing ratepayer funds from less wealthy to wealthier⁶ customers, or
- Inadvertently discriminating based on race, ethnicity, or country of origin in the distribution of PCE customer benefits (per Title VI of the Civil Rights Act)

PCE is committed to serving its equity customers with thoughtfulness and intentionality. “Equity customers” is an umbrella term that represents a range of customer groups **but is centered on customers who are vulnerable to economic, environmental, societal, or other pressures**. PCE will focus its efforts on serving three types of equity customers:

- *Low-income Customers*: Customers with household incomes at or below 80% of area median income (AMI).⁷
- *Customers with Greatest Need for Support*. PCE is striving towards supporting vulnerable customers under its self-funded programs. At this time, there is no standard definition available to identify such customers, therefore, these customers will be identified on a program-by-program basis. For example, a potential resiliency program may focus on a coastal area with frequent outages.
- *Disadvantaged Communities (DACs)*: DACs refer to the areas throughout California that suffer most from a combination of economic, health, and environmental burdens. These burdens include poverty, high unemployment, air and water pollution, the presence of hazardous wastes as well as high incidence of asthma and heart disease. California’s official definition of DAC is the top 25% of census tract per the CalEnviroScreen (CES) tool.⁸

Equity **or vulnerable** customers are disproportionately impacted by climate change and experience additional energy burdens and other unique challenges, such as language barriers, distrust, non-ownership of assets, and more. PCE’s programs provide targeted investments that deliver benefits to equity customers. That said, supporting equity populations through many customer-facing programs is generally more expensive on a per capita basis, often leaves out equity customer segments, may not take into account the difficulty in reaching equity customer segments, and/or emissions reductions can be less certain for more accessible technologies.

Strategic Policy

Equity/vulnerable communities are disproportionately impacted by the harms of climate change and frequently face barriers to receiving the benefits of market transformation. PCE’s policy is **to reduce GHGs as quickly as possible by continuing to deliver programs and services that benefit a range of PCE**

⁶ Definition: Wealth, or net worth, is the value of assets owned by a family or an individual (such as a home or a savings account) minus outstanding debt (such as a mortgage or student loan). See <https://www.pewresearch.org/social-trends/2020/01/09/trends-in-income-and-wealth-inequality/>.

⁷ Per the U.S. Department of Housing (HUD). See at https://www.huduser.gov/portal/datasets/il/il2024/select_Geography.odn. In PCE’s service territory there are approximately 56,000 customers that are at or below 80% AMI, which represents about 20% of PCE’s residential customer accounts.

⁸ See CES tool at <https://oehha.ca.gov/calenviroscreen/report/calenviroscreen-40>. Around 23,000 of PCE’s customers are located in the top 25% of DACs, which represents around 8% of PCE’s residential customer accounts.

customers, including designing certain programs and services with equity and/or vulnerable customers' needs in mind by:

- Prioritizing rate affordability for all customers, and offering targeted discounts for some equity customer segments with greatest need
- Offering certain programs specifically designed for equity customers and, where programs have broad customer participation, providing tiered levels of support that enhance access and assistance for more vulnerable customers
- Initiating policy initiatives and seeking third-party funding for equity programs that benefit vulnerable/equity customers and improve affordability and access to PCE services and benefits
- Engaging equity customers and communities by working with community-based organization (CBO) partners to support equity customers, engage diverse and vulnerable communities, and solicit feedback on ways to improve PCE's equity services.

Measurable Expectations (What PCE is Doing)

To reduce GHG emissions quickly, PCE will prioritize applying its self-funded investments in ways that:

- Can be leveraged for scaling
- Are ready to deploy rapidly
- Are cost-effective by delivering relatively high GHG reduction for the dollars provided
- Avoid engaging in PCE self-funded programs in ways that duplicate existing programs operated by community partners or supported by third-party funders

As implied in the policy description above, PCE will incorporate equity considerations into its decision-making in several specific areas:

- Rates and Discounts
 - Providing cost-competitive rates to enhance community affordability
 - Expanding the DAC-GT program
 - Considering new opportunities to provide rate assistance
- Targeted programs and tiered support
 - Continuing to maintain current levels of PCE's self-funded program revenues (approximately one-quarter of the total) to support efforts by equity customers to reduce GHG
 - Adhering to PCE's DEAI Decision-Making Framework to ensure that ratepayer funds are not inadvertently distributed from less wealthy to wealthier customers
 - Where feasible, increasing the tiers of support in its broad-based programs so that more support is offered to equity customers to enhance access
 - Identifying customers that may benefit from greater support on a program-by-program basis and identifying ways to provide tailored assistance for full program access
- Policy initiatives and third-party funding

- Advocating for policies that center equity customers' interests
- Advancing affordability policies at the California Public Utilities Commission, California Energy Commission, state legislature, and other regulatory bodies
- Continuing to offer technical support for cities considering reach codes, which benefit equity customers through new affordable housing being built EV ready and with clean appliances
- Securing state funding for equity programs such as Equitable Building Decarbonization, Self-Generation Incentive Program, and CPUC energy efficiency funding
- Identifying and pursuing additional opportunities as they arise
- Equity community engagement
 - Creating and implementing community engagement plans to inform program planning, implementation, and evaluation
 - Sustaining the Community Grant program and focus groups
 - Engaging in ongoing program review to ensure its programs are as effective as possible at reducing GHG and reducing barriers to access by equity customers
 - Identification of equity customers through CBOs

Rationale

This proposed policy retains a strategic emphasis on rapid scaling of GHG reductions while introducing key new concepts in how PCE will support equity customers. Rapid scaling of GHG reduction adheres to PCE's primary mission while also delivering longer-term benefits to all ratepayers including equity customers. Equity customers benefit both through GHG reductions and associated impacts as well as by lowering the costs of products and services needed in the transition to GHG-free electricity. This policy aligns with PCE's decision-making criteria by emphasizing GHG reductions while supporting PCE's equity commitments and value proposition.

Relevant Information

During the vetting process, the Board and community members asked for more information to support policy decisions made in this process. The information below is not complete and more will be generated when PCE moves into Programmatic and Operational Planning. However, the information here does provide further background so that Board decisions are well informed.

- *What is PCE's current program investment to support equity customers?*

Currently, PCE invests approximately a quarter of its self-funded program budget in serving low-income customers. This percentage does *not* reflect additional funding that PCE is and will seek from external public funding sources that benefit PCE's low-income customers, such as the DAC-GT program, Self-Generation Incentive Program, and Equitable Building Decarbonization program. The financial impact of these public funds targeted toward low income and/or equity programs may be approximately \$9 million in 2025-26. These numbers also do not include any electricity rate initiatives that PCE offers to low-income customers (e.g., freezing rates at previous levels or the December 2023 \$300 bill credit to CARE/FERA customers).

- *What is the level of GHG reduction for dollars invested by different programs?*

Determining the exact level of GHG reduction per dollar invested in PCE's energy programs is a complex task. PCE staff are currently working on a detailed analysis and can only provide initial conceptual trends at this time. The table below presents an overview of PCE's eight existing energy programs and initiatives that benefit residential customers, listed in order of increasing cost for GHG reduction per sector based on historic figures (still under review). The table also describes how quickly GHG reductions are expected (GHG immediacy) and if the concept is scalable (note that "demand-constrained" means the uptake does not exceed available funds (i.e., more funds do not result in more uptake)).

Table 1: Conceptual analysis of PCE's residential programs GHG benefits and costs.

Program	Market target	Scalability & market dynamic	Benefits & Costs	GHG immediacy
Buildings				
Reach codes	All	High, through replication in state policy	High GHG reduction, very low cost	Not immediate but grows rapidly as new buildings are built and existing ones are being remodeled
Appliance	Mainly owner-occupied single family	High scalability, essential for early market transformation	High GHG, moderate cost	Immediate
Home Upgrade income qualified	Owner-occupied single family	Med-high, core of market transformation	Med GHG, expensive but significant co-benefits (including non-energy home repairs)	Immediate
Distributed Energy Resources (DERs)				
Residential solar & storage (forthcoming)	Owner-occupied single family	Med-high, likely popular to lower bills	Significant financial benefit, makes electrification attractive	Indirect GHG benefits through load shaping
Community Solar	Low-income customers located in DACs	Med-low, highly dependent on state funding	Moderate; customers receiving a material, long-term bill discount	Low; higher when program evolves to include storage
Transportation				
E-Bikes	Broad low-income	Uptake is slowing but could be med-high	Theoretically high GHG at low cost but data is uncertain (self-reported subset of participants)	Depends on usage
Used EV	Broad low-income	Uptake is low such that further investment will not increase uptake (demand-constrained)	Low cost Delivers customer financial benefits	Immediate but low GHG additionality Used vehicles would likely have entered market anyway
EV Ready (EV charging)	Multifamily (& other)	Demand-constrained but essential for equity and opening up the EV market	High GHG eventually, moderate cost	Low-med, can take years for vehicles to start using chargers depending on site

- *Do we need or do we have any information about what equity customers say they want/value/need?*

Multiple workshops and focus groups with equity customers in both English and Spanish find that these customers are interested in:

- Lower rates and help enrolling in discount programs
- More program offerings that are accessible for renters
- Improving indoor air quality in their homes
- Resilience, including access to air conditioning during heat emergencies
- Increased access to EVs

Strategic Policy: Distributed Energy Resources

Context

The California energy landscape is in a constant state of transition as it advances towards meeting the State's aggressive decarbonization goals.⁹ PCE must continue to be an innovator and thought leader in California's clean energy transition while focusing on its core strengths. Currently, PCE focuses on providing electrical services to its customers while PG&E provides delivery (i.e., transmission and distribution (T&D)) services. PCE's core competencies include (1) the procurement of centralized, large-scale front-of-the-meter (FTM) generation and storage projects (supply-side) and (2) offering beneficial energy programs to its customers for a variety of behind-the-meter (BTM) solutions (demand side). PCE must consider if there are other lines of business that it should engage in, or if its existing lines of business should be modified, to adjust to new and emerging realities during California's transition to a decarbonized and decentralized energy economy.

Through this Strategic Planning process, a variety of possible new or enhanced lines of business were identified and considered for prioritization. Incorporated in these options — as vetted with PCE staff, the Board of Directors, and community members — was the concept of focusing on further fostering the development of distributed energy resources (DERs). DERs are defined as:

"Distributed Energy Resources (DERs) are assets on the distribution grid, either at the consumer's side of the energy meter (behind-the-meter DERs) or in front of the customer meter connected to the distribution grid (front-of-the-meter DERs). They can be used individually or in aggregate to provide value to the grid and individual customers."

Strategic Policy

Over the next five years, PCE will prioritize efforts to accelerate the development of carbon-free distributed energy resources (DERs) in order to support further innovation and market transformation of distributed energy technologies, accelerate greenhouse gas (GHG) reductions, and provide customer and community resilience.

⁹ SB 100 (2018) requires that all retail electricity resources must be renewable or zero carbon by 2045.

Measurable Expectations (What PCE is Doing)

The initiative to foster DERs will include an array of activities to support the diverse needs of different customers (not in order of priority):

- *DER Project Development:* Expanded and new means to support the installation of both BTM and FTM DERs in PCE's service area, such as:
 - Growing PCE's Virtual Power Plant (VPP) by leveraging customer-sited assets for grid flexibility and reliability
 - Developing front-of-meter (FTM), distribution-connected projects such as microgrids or local community solar+storage projects in collaboration with local communities
- *Financial Services:* Expanded and new means of increasing customer access to capital in support of DER/electrification projects to install BTM DER projects, such as:
 - Offering power purchase agreements (PPAs) for BTM solar+storage projects to an expanded customer group by accessing third-party financing
 - Offering on-bill financing to customers for carbon-free energy investments with varying interest rates based on financial need
 - Exploring the ownership and operation of a spectrum of dispatchable energy assets, including generation, electricity storage, electric vehicle (EV) charging infrastructure, building loads, and other tools to meet PCE's emission reduction and equity goals.
- *Consulting & Technical Assistance:* Expanded and new ways to support customers with technical information and direct support to facilitate their installation of local DERs, such as:
 - Providing direct technical assistance and consulting services — both free and fee-based — to aid commercial and residential customers
 - Increasing distribution of educational materials providing “how-to” information for customers seeking to add DERs
- *Advocacy:* Drive policy development and advocacy to foster the development of DERs, such as:
 - Enacting policies to reduce or eliminate regulatory and/or investor-owned utilities (IOU) hurdles to expand DERs
 - Addressing limitations to the benefits of DERs because of transmission and distribution (T&D) systems' weaknesses

This list reflects many examples of what PCE might do to create a comprehensive DER initiative. The actual activities will be developed as part of phases 2 and 3 (Programmatic and Operational Strategy development) of this process.

Rationale

This proposal was developed by weighing each identified option against PCE's decision-making criteria. Key considerations from that conversation and from input received from staff, Board, and community include:

- The high mission benefit of accelerating GHG reduction that can be achieved through improved customer economics that DER can provide

- Reduced power resource costs by improving PCE's load shape, matching demand to clean supply, and lowering commodity costs
- The opportunity to build on PCE's future value proposition by becoming a trusted partner with its customers and the community with a range of relevant services
- The local investment that DERs represent, providing economic and environmental benefits within PCE's service area
- The potential for DER support to provide new funding streams to PCE, either through partnerships with for-profit providers, direct fee-for-service activities, or new sources of public support
- Response to customer demand that ensures PCE's position is not eroded by competitors

Strategic Policy: Operational Excellence

Context

As in every organization, PCE must operate effectively in order to deliver high mission impact through its programming. As the mission-focused work proceeded during this process, the parallel need for an operational strategy became clear in order to improve upon PCE's "start-up" systems and processes that no longer matched the size and maturity of the organization.

Strategic Policy

Over the next five years, PCE will advance operational infrastructure, systems, and processes to deliver outstanding customer service, empower staff, and enable efficiencies that will increase its mission impact.

More specifically, PCE will continuously improve and invest in its operational infrastructure, systems, and processes to enhance efficiency, resiliency, and adaptability. PCE's policy is to ensure that its operations are aligned with best practices in the industry, leverage technological advancements, and support a high-performing workforce that is equipped to meet the evolving needs of stakeholders. Operational enhancements must always be driven by the need to enhance PCE's ability to partner effectively with the communities it serves, carry out its commitment to serving equity customers, and to advance the organization's mission impact. This policy encompasses the following key elements:

Scalable Process Optimization. Continuously refine operational processes to improve workflow efficiency and reduce administrative burdens while investing in scalable technology solutions that can grow with PCE's expanding programs and services to improve customer experience.

Empowered and Agile Workforce. Provide its diverse workforce with the necessary training and resources to drive innovation, enhance collaboration, and maintain operational excellence in a rapidly evolving energy landscape.

Data-Driven Decision-Making. Leverage data analytics and automation to drive informed decisions, streamline operations, reduce costs, maintain a strong financial position, and continuously improve overall efficiency across the organization to better serve all of its customers,

Cybersecurity and IT Resilience. Establish and maintain comprehensive cybersecurity measures and continuously strengthen IT infrastructure to protect customer data and sensitive information, ensure system reliability, and safeguard against emerging threats.

Equity and Accessibility in Operations. Maintain efficient operations that also ensure the needs of all stakeholder segments are met. In particular, consider how operations can enhance access for equity customers by addressing language, ability, financial, and other needs.

Effectively Managing Risk and Maintaining Compliance. Maintain PCE's operational policies, conduct regular audits, and ensure adherence to legal and industry standards while navigating policy and market challenges and maintaining autonomy and financial stability.

Measurable Expectations (What PCE is Doing)

PCE is undergoing a number of initiatives in order to achieve "PCE 2.0" or an evolutionary expansion of its operational capacity. As part of this strategy, PCE has:

- Hired its first Energy Risk Manager, approved a new risk management policy, and created a Risk Oversight Committee
- Approved a cost-of-service ratemaking model, limiting PCE's dependence on being tied to the rates of the incumbent utility
- Launched PCE's call center with dedicated customer service representatives who speak the major languages of PCE's service area: English, Spanish, and Mandarin
- Began using technology tools to better segment PCE's customers and provide them with bespoke communications
- Hired a new People and Culture Director to lead workforce training and human resources processes such as instituting a common date staff review system and creating new standard operating procedures for routine human resources tasks, hiring, and performance management
- Adjusted its time commitment for its contracted General Counsel and initiated an assessment to determine whether those services should be brought in-house to better manage legal risk and operations
- Diversified PCE's revenue streams beyond its ratepayer base including applying for state funds through numerous programs administered by the California Energy Commission and California Public Utilities Commission

Rationale

NOTE: More to be added. Following is just a starting point.

The requirement for PCE staff embedded in this Strategy Roadmap is for staff to:

- Increase the organization's mission impact by increasing deliveries of GHG-free energy while maintaining customer affordability

- Build PCE's future value proposition by enhancing its partnerships with its customers and with the communities it serves
- Recognize that only by advancing its operational infrastructure, systems, and processes will PCE be able to deliver on its mission promise

DRAFT



PENINSULA CLEAN ENERGY AUTHORITY
JPA Board Correspondence

DATE: April 7, 2025
MEETING DATE: April 14, 2025
VOTE REQUIRED: Majority Vote

TO: Honorable Peninsula Clean Energy Authority Executive Committee

FROM: Shelby Bush, Energy Efficiency Programs Manager

SUBJECT: Recommend to the Board of Directors Approval of the Draft Program Plan for California Public Utilities Commission (CPUC) FLEXmarket Program (Action)

RECOMMENDATION

Recommend that the Board of Directors Approve the Draft Program Plan for the California Public Utilities Commission (CPUC) FLEXmarket Program.

BACKGROUND

Peninsula Clean Energy's mission is to reduce greenhouse gas emissions by expanding access to sustainable and affordable energy solutions. Achieving this goal requires shifting uses of methane gas and petroleum to electric power (electrification) and encouraging alignment between power demand and renewable supply.

To support these objectives, in November 2021, the Board approved a Program Plan for FLEXmarket, a novel energy efficiency initiative sponsored by the CPUC. Peninsula Clean Energy's plan was granted approval by the CPUC for full cost recovery over a three-year period, beginning in May 2022 and concluding in May 2025. Peninsula Clean Energy has been among the early adopters of this market-driven approach, aligning its program with similar efforts launched by other load-serving entities/CCAs in the state. This first three-year phase piloted the program and the lessons learned are informing PCE's next steps as discussed below.

FLEXmarket is an innovative "pay-for-performance" energy efficiency program that assigns an hourly price to measured, behind-the-meter energy load reductions. Energy companies deliver efficiency and load-shifting projects and receive payments based on verified outcomes. Unlike traditional energy efficiency programs that provide incentives for specific installed measures, FLEXmarket features a robust measurement and verification (M&V) framework that leverages smart meter data across Peninsula Clean Energy's entire service area. This approach ensures more precise and cost-effective impact measurement.

The intent of the FLEXmarket structure is to implement energy efficiency in a way that "shapes load" to benefit the grid. In addition, because the program uses a market approach that

rewards outcomes, allowing any technology or method that delivers benefits, it is highly adaptable to changing market conditions. It allows the top-level program administrator (PCE) to focus on managing to end performance, leaving the specific approach (customer segment, technology, marketing) to the implementers, referred to as “aggregators.”

Program Impacts

Through the FLEXmarket program, Peninsula Clean Energy seeks to achieve the following outcomes:

- Peak load reduction benefits
- Customer utility bill savings
- Energy savings

Through the first phase of the program, a total of 11 commercial projects were implemented, primarily at medium-sized commercial sites, including big box retailers, car dealerships, and discount variety store chains. The most significant savings were achieved through lighting retrofits and refrigeration controls. In addition, the program supported 13 residential customers who installed heat pumps. While these projects contributed to decarbonization goals, including residential projects made it more challenging for the program to meet overall cost-effectiveness standards as required by the CPUC. The program works well for larger, commercial sized projects so that component will continue. However, PCE will continue to explore targeted strategies to support residential participation in future phases of the program.

Overall, the first phase of the program achieved the following outcomes:

- **Peak Load Reduction Benefits:** The program has contributed to a 10% reduction in summer peak energy usage across the implemented projects, helping to alleviate grid demand during critical periods. This reduction in peak load supports grid stability and aligns with Peninsula Clean Energy's goal of reducing system strain during high-demand times.
- **Customer Utility Bill Savings:** While the financial incentives were distributed to aggregators, participants in the program benefited from financial support for energy-efficient upgrades. The energy savings from these upgrades will lead to ongoing reductions in customer utility bills, furthering Peninsula Clean Energy's goal of providing cost savings and energy efficiency to residents and businesses.
- **Energy Savings and Project Scope:** The program has achieved a forecasted 1,239,437 kWh in energy savings, with projects exceeding initial savings projections by 30%.

Lessons Learned

- **Price Signal Design:** Early in implementation, Peninsula Clean Energy set the price signal at a relatively high level to help jumpstart market participation—a common strategy in energy efficiency programs. While this successfully drove early engagement, adjustments to the incentive level did not happen quickly enough, which negatively impacted CPUC cost-effectiveness test. Going forward, PCE has refined its approach by running more frequent market tests and calibrating price signals to optimize both participation and cost-effectiveness.

- **Regulatory Learning Curve:** PCE has gained a deeper understanding of CPUC reporting requirements, documentation standards, and overall program compliance. Navigating this regulatory landscape has informed internal processes and strengthened PCE's ability to manage future programs under CPUC oversight.
- **Program Operations and Contracts:** PCE has also improved the design and structure of contracts and incentives to better align implementer performance with program outcomes. These operational refinements position us to run the next phase of the program more efficiently and effectively.

Next Phase and Regulatory Approvals

PCE's FLEXmarket program is an example of an CPUC's "Elect to Administer" pathway for Energy Efficiency ("EE") program, or "ETA program." Under California statute, CCAs have a statutory right to administer EE programs through the ETA pathway. The ETA pathway allows CCAs to design and run energy efficiency programs serving CCA customers tailored to local community needs, rather than relying on traditional utility-administered offerings. These programs must still meet CPUC energy savings and cost-effectiveness requirements. Additionally, ETA programs are funded using dedicated energy efficiency funds collected through distribution charges (i.e., on the investor-owned utility side of the electric bill), rather than the CCA's own generation revenue.

CPUC authorization under the ETA Pathway requires CCA Program Plan approval by their Board for each cycle before the request is submitted to the CPUC. The CPUC authorizes ETA Programs in three-year budget increments.

The current FLEXmarket program will conclude on May 4, 2025. To maintain continuity, the next phase is expected to launch in September 2025, following ETA approval. This phase will run through 2028, at which point it will transition into a broader energy efficiency program portfolio that is forthcoming.

In the first funding cycle, the FLEXmarket program has been heavily weighted toward commercial customers, with strong participation from large businesses pursuing energy efficiency and load reduction projects. PCE anticipates that the second phase of the program will continue to focus on commercial customers while also exploring opportunities to potentially extend participation to targeted residential customer segments in the 2025-2028 funding cycle.

DISCUSSION

PCE plans to submit a request for to renew its ETA FLEXmarket program from 2025 through 2028 after the PCE Board of Directors approves the Program Plan. The attached draft Program Plan is substantively the same as the original version approved by the PCE Board in November 2021.

The current CPUC-funded budget period will close this May, and the program will be paused until the new budget period is authorized by the CPUC. PCE anticipates that approval from the CPUC will occur sometime in **Q3 2025**, at which point the program will be relaunched.

PCE is requesting approval of the attached Draft Program Plan to submit to the CPUC. The Draft Program Plan is largely the same as the PCE's current FLEXmarket Program Plan. The

major features are:

- An open market that service providers can participate in across all solutions including energy efficiency, smart controls of all kinds, and batteries.
- Inclusion of commercial customer segments with opportunity to explore residential offerings where there is potential and overlap with existing programs is limited.
- Setting price points based on the state-wide “Avoided Cost Calculator” which provides a formal methodology for valuation of avoided costs such as generation, transmission, distribution, greenhouse gas mitigation and other factors.
- PCE providing payments to service providers according to those price points and recouping those funds from the CPUC.
- Partnering with implementation firms to deliver the FLEXmarket.
- Providing formal measurement and verification, as well as auditing, to the CPUC consistent with CPUC requirements.
- Coordinating with PG&E and other providers on program details to ensure resources provided are not double-counted in local and state programs.
- Delivering demand reduction benefits during periods of grid stress during the summer period.

Of note, PCE’s billing data provider Calpine Energy Solutions is providing program admin services through an M&V technology firm called Recurve, and PCE will onboard additional support services for reporting and other administration as needed. Specific contracts that may be considered under this program would come to the Board at a future date.

PCE’s ETA FLEXmarket program is part of a longer-term Agency strategy to expand the energy efficiency programs PCE can offer without relying on its generation revenue. In addition to the ETA pathway, CCAs also have a statutory right to administer EE programs through what is referred to as the Apply to Administer (“ATA”) pathway. In February 2026, PCE plans to submit an application to the CPUC under the ATA pathway to launch an expanded portfolio of EE programs in January 2028. PCE is pursuing a new three-year ETA in order to maintain its FLEXmarket program until it can be rolled into the larger ATA portfolio beginning in 2028.

The Apply to Administer (“ATA”) pathway provides an alternative to the Elect to Administer (“ETA”) approach, offering CCAs the opportunity to pursue larger budgets for energy efficiency programs. Unlike ETA, which features a streamlined, automatic approval process but comes with a limited budget, ATA requires CCAs to submit a detailed application to the CPUC. This application must demonstrate how the proposed programs will meet the same standards investor-owned utilities must follow, including energy savings goals, cost-effectiveness requirements, and other regulatory benchmarks. While ATA offers significantly greater funding potential, it involves a more rigorous approval process and ongoing reporting and compliance obligations, making it a more resource-intensive pathway for CCAs. PCE’s Board will receive additional details on the ATA plan later this year as the plans advance.

FISCAL IMPACT

Approval of the Draft Program Plan has no immediate fiscal impact. If the plan is approved by the CPUC and implemented by PCE it will result in expenditures that will be fully recovered from Public Purpose funds. Specific contracts that will be considered under this program will

come to the Board for approval at a future date.

ATTACHMENTS:

[2025.04.14 EC Programs FLEXMarket_Program Plan DRAFT.docx](#)



PENINSULA CLEAN ENERGY

Peninsula Clean Energy (PCE)
Demand FLEXmarket Program
Implementation Plan
Program Manual
Measurement & Verification Plan
PCE01

March 27, 2025

Version 3

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1. Program Overview

The PCE Demand FLEXmarket program offers aggregators a performance-based pathway to deliver energy efficiency and demand flexibility solutions. Using a price-driven NMEC model, aggregators are compensated based on verified energy savings and Total System Benefits (TSB) achieved. This approach reduces transaction costs, prioritizes high-value customers, and maximizes energy savings and grid benefits while ensuring sector-specific evaluation and reporting.

Program Budget and Savings

Table 1: Program Budget and Savings		
1	Program Name	FLEXMarket
2	Program ID number	PCE01
3	Program Implementer	TBD
4	Portfolio Administrator	Peninsula Clean Energy
5	Program Implementer Type (IOU Core, Third-Party Solicited, REN/CCA)	REN/CCA
6	Portfolio Segment (Resource Acquisition, Equity, Market Support, or Codes and Standards) ¹	Resource Acquisition
7	Total Program Budget	\$2,974,493.93
8	Program Budget by Year	\$991,497.98
9	Program Duration (Start Date - End Date)	August 1, 2025 – July 31, 2028
10	Total System Benefit (TSB) (Total Program TSB and TSB by Program Year)	Total: \$4,607,511.22 2025: \$0.00 2026: \$1,978,834.52 2027: \$2,544,725.50 2028: \$83,951.21

¹ D.21-05-031 Ordering Paragraph 2

Table 1: Program Budget and Savings		
11	CO ₂ (Lifecycle, First Year, Net, Gross)	Lifecycle Gross CO ₂ : 22,527 Lifecycle Net CO ₂ : 21,401 First Year Gross CO ₂ : 2,311 First Year Net CO ₂ : 2,195
12	KW (First Year, Net, Gross)	First Year Net kW: 1,938 First Year Gross kW: 2,040
12	KWh (Lifecycle, First Year, Net, Gross)	Lifecycle Gross KWh: 86,928,000 Lifecycle Net KWh: 82,581,600 First Year Gross KWh: 7,074,000 First Year Net KWh: 6,720,300
13	Therms (Lifecycle, First Year, Net, Gross)	Lifecycle Gross Therms: 0 Lifecycle Net Therms: 0 First Year Gross Therms: 0 First Year Net Therms: 0
14	Program Cost Effectiveness: Total Resource Cost (TRC): (Total TRC and TRC by Year)	Total TRC: 1.13 2025: N/A 2026: 1.15 2027: 1.11 2028: 1.19

Table 1: Program Budget and Savings		
15	Program Cost Effectiveness: Program Administrator Cost (PAC): (Total PAC and PAC by Year)	Total PAC: 1.76 2025: N/A 2026: 1.87 2027: 1.84 2028: 1.92
16	Market Sector(s) (i.e., residential, commercial, industrial, agricultural, public or cross-cutting) If multi-sector, provide estimated % of the total budget for each sector)	Commercial 90%, Residential 10%
17	Program Type (i.e., Non-resource, Resource)	Resource
18	Delivery Type(s) (i.e., Upstream-Manufactured, Midstream-Distributor, Midstream-Retail, Downstream, Downstream - Direct Install, ² Codes & Standards) ³	Downstream
19	Intervention Strategies (e.g., Strategic Energy Management (SEM), Market Access Program (MAP), Direct Install, Incentive, Finance, Audit, Technical Assistance, Advocacy, Training, Marketing and Outreach, etc.)	Incentive
20	M&V Methods (e.g., Deemed, Custom, NMEC – Population, NMEC – Site, SEM M&V, Randomized Controlled Trial (RCT), Other (if applicable, describe Other M&V method))	NMEC – Population

2. Implementation Plan Narrative

Program Description:

The PCE Demand FLEXmarket program will offer a flexible path for aggregators⁴ of commercial & residential customers to bridge the gap of customer needs, PCE's energy efficiency (EE) resource needs, and grid reliability. A price-based population Normalized Metered Energy Consumption (NMEC) program design

² <https://cedars.sound-data.com/deer-resources/deemed-measure-packages/guidance/>

³ Database for Energy Efficiency Resources (DEER) 2026 Delivery Types

⁴ Aggregators are participating vendors or program partners who generate energy efficiency and/or demand savings for an aggregated group of customers.

will support the delivery of cost-effective savings (and potential decarbonization) to help meet PCE's goals and optimize energy usage for commercial & residential customers. Performance incentives and payment structures will push aggregators to deliver maximum savings and optimized load shapes that maximize system benefits.

PCE will leverage Recurve as an M&V partner. Recurve is tasked with providing software for project processing, determining customer eligibility, analytics, determining payments to aggregators and more.

PCE will contract with a firm or potentially bring in house, aggregator relationship management, Project processing and other tasks.

Under the program, all aggregator payments are tied to the delivery of savings. Aggregators will leverage capital upfront to deliver the savings and will be compensated for the total program value delivered (Total System Benefit after programmatic adjustments described in the M&V plan), net of the marketplace management fees and non-energy private investment for their projects.

Marketplace management costs include general and administrative (G&A) overhead, direct implementation non-incentive (DINI), M&V, and marketing, education and outreach. These management costs are forecasted at 25% of the total program budget.

The relationship management team will recruit and contract with multiple qualified aggregators and will support them directly with eligibility and prioritization analytics to identify and engage the highest value customers based on the aggregators' business model. Aggregators recruit customers and install projects. Recurve will then track the NMEC verified impacts in the Recurve Platform. PCE will pay aggregators quarterly, based on the impacts achieved and the auditable record of performance for each aggregator's portfolio. Portfolios are categorized by market sector and by the Program years, meaning an aggregator will only have a Commercial Portfolio if they submit projects to the Commercial FLEXmarket and a Residential Portfolio if they submit projects to the Residential FLEXmarket. This separation ensures sector-specific evaluation and reporting. The core objectives of this program are as follows:

- Pay aggregators on measured savings performance and total program value delivered (Total System Benefits (TSB) after adjustments detailed in the accompanied M&V plan), incentivizing aggregators to pursue projects and measures that produce the most savings.
- Reducing transaction costs for aggregators, PCE, and end customers.

- Improving diversity in the vendor pool that provides demand flexibility services.
- Customer prioritization to drive outsized savings impacts.

See flow diagram in Supporting Documents Section, Process Flow for more detail.

Pricing, payments and incentives are included in Supporting Documents, Program Plan.

Performance Tracking:

The core strategy of this program is to enable a market-driven, performance-based approach to energy efficiency. As a FLEXmarket program, it is designed to be measure-agnostic, allowing aggregators to develop and implement the most effective solutions based on real-world performance rather than predetermined project types. Rather than dictating specific technologies or energy savings thresholds, the program relies on Total System Benefit (TSB) and adherence to the NMEC Rulebook⁵ as the primary indicators of success.

	Metric	Target
1	Total System Benefit (TSB)	\$4,607,511.22
4	Fraction of Completed Customer Survey	70%

By focusing on TSB and NMEC Rulebook adherence, this program ensures that energy savings are measurable, verifiable, and aligned with cost-effectiveness and grid benefit goals. Given that savings during summer peak hours provide the greatest value, aggregators will naturally be drawn to projects that optimize reductions during these periods. This approach maximizes benefits while maintaining the flexibility needed to encourage innovative and high-impact energy efficiency solutions. We will consider including additional metrics in future contracting opportunities.

Program Delivery and Customer Services:

The core strategy of this program is simplification and flexibility. Qualified aggregators will have the flexibility to meet commercial & residential customers

⁵ Rulebook for Programs and Projects Based on Normalized Metered Energy Consumption, January 7, 2020
<https://www.cpuc.ca.gov/-/media/cpuc-website/files/legacyfiles/n/6442463694-nmec-rulebook2-0.pdf>

in terms of energy needs, technology fit, and project cost. Rather than a prescriptive set of program offerings, aggregators will develop their offerings around a core set of targeted solutions (e.g., HVAC, Lighting, Heat Pumps, Water Heaters, Building Shell, Refrigeration, and controls) and optimize the meter-based performance to maximize benefits to PCE, the grid and the customer.

The range of services, products and tools that are provided by the aggregators to customers is diverse. They will have full flexibility to propose services, tools, or interventions (as defined in the “Eligibility” and “Qualifying Measures” section in the attached M&V plan) to customers to encourage adoption, effectuate consumption changes, and manage energy. Recurve will provide core services and tools to PCE and aggregators in the form of an operational platform to identify, enroll, track, and settle the energy efficiency resources delivered through this program.

This program is not specifically designed to address hard-to-reach customer segments, but it is flexible and is a viable program concept for doing so. If aggregators have a business model that can serve hard-to-reach customers effectively, they will be highly valuable participants in the Marketplace.

This program cannot be combined with other PA programs or incentives, as all M&V tracking and incentive payments are measured at the meter. Allowing multiple incentives would result in double payments, as there is no way to exclude those savings from FLEXmarket calculations.

Program Design and Best Practices:

The key program strategies and tactics to reduce barriers for program participation for targeted customers are:

Reduce technical and administrative barriers associated with traditional deemed, custom, and site-specific NMEC project development pathways. These delivery pathways are not only burdensome for aggregators and contractors, but also for customers.

Matching customers with aggregators who are best-equipped to meet their needs and tying those needs to grid-optimized solutions (as valued in the avoided cost calculator (ACC) adopted by the Commission).

Leveraging a key benefit of population-level NMEC programs - the inclusion of to-code savings opportunities and thereby reducing so-called “stranded” savings opportunities, while simultaneously removing the administrative challenges of excluding to-code impacts.

The program anticipates that a specific set of technologies will be best suited to maximizing the avoided costs, but their adoption (and appropriate incentive levels) will be a function of the customer needs, financing requirements, and other funding mechanisms available to the aggregator to promote adoption through financing options or shared costs.

The Demand FLEXmarket is adopting three key best practices. The first is focusing on market design rather than program or project design to draw in the maximum number of solutions from aggregators. The second is setting the price for energy savings based on the total program value delivered net of marketplace management cost. And third, managing risk by only paying aggregators for the value delivered. Program value is defined as TSB after any programmatic adjustments defined in the M&V plan. This strategy protects the rate-payer risk of investing in programs that may not deliver value and creates the proper incentives for aggregators to mobilize and deliver the maximum benefit possible.

The Recurve platform is critical to the strategy, administration and implementation of the Demand FLEXmarket program. It provides the necessary analytic tools to bridge the flow of information between PCE, aggregators, and evaluators. The primary elements of Recurve's platform to be leveraged are outlined below.

The Resource Planner module will help identify end customers with the highest potential for savings. Using Resource Planner, Recurve computes a suite of customer usage characteristics or "features", based exclusively on pre-program consumption data. These features are calculated for every customer and range from simple summations (e.g. total annual MWh usage) to normalized metrics (e.g. the percentage of usage from cooling) to more complex load characteristics (e.g. baseload, evening ramp).

Targeted Top 15%

2.5x Energy Savings

4.5x Peak Reductions

3x Grid Value

2.5x GHG Savings

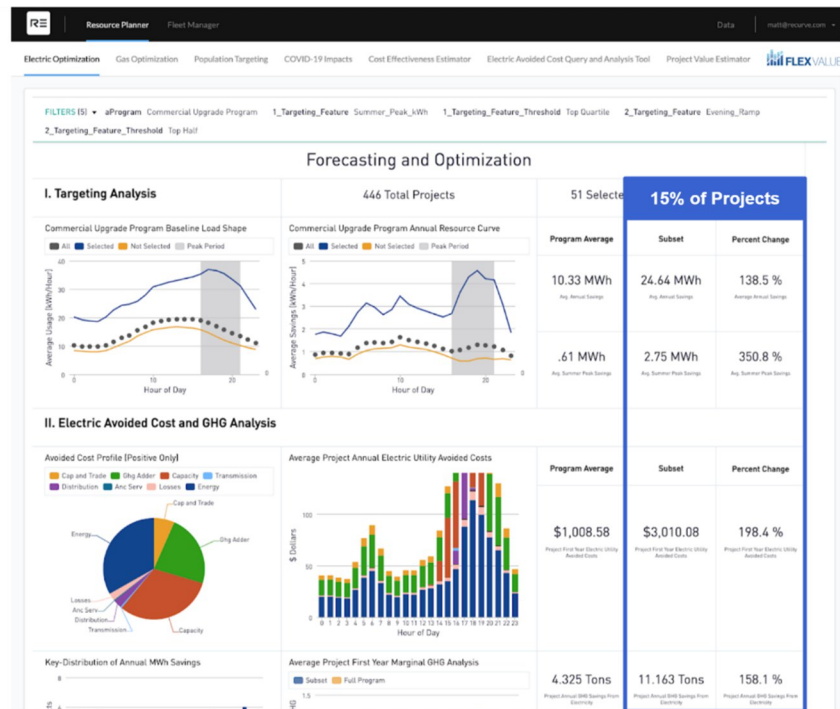


Figure 1: Resource Planner Module - Prioritization Analysis

Recurve will segment the PCE service area by load shape and develop a customer and usage analysis. Some customers may have little potential for savings from a particular measure, while others present a significant opportunity. The relationship management team will work with aggregators to identify high priority customers within the segments they serve and the solutions they are capable of providing.

The program team may also provide an analysis to qualified aggregators of projects they implemented within PCE's service area in previous program years. This analysis would generate the information required for aggregators to know which of their interventions at specific customer types deliver maximum grid benefits.

The Fleet Manager module provides ongoing tracking of building-level energy savings and is the foundation of automated M&V. Each demand-side asset (e.g., energy efficiency participant) is tracked for savings using open-source, replicable methods. Savings will be updated on a monthly basis as new data is ingested.

Fleet Manager provides some key features including:

- CalTRACK savings tracking for the duration of the program term
- Continually updated savings values for kWh and therm values

- Tracking and access to all of the data and savings results at an individual meter/project level
- The ability to define and assess relevant cohorts⁶ for which data are available
- The ability to view savings performance at a portfolio, cohort, and individual project level
- API functionality to allow for accessing data for any desired additional analysis

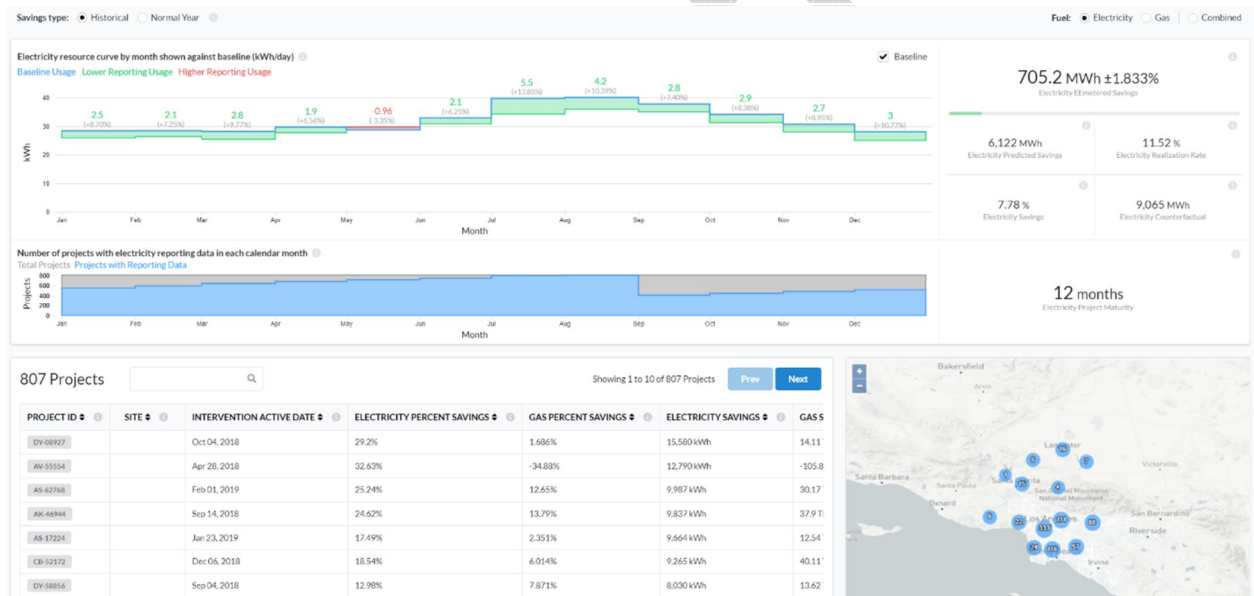


Figure 2: Program and Portfolio Savings Tracking in Fleet Manager

The Ledger module turns metered savings into transactions. With the savings calculations serving as a basis of payment for aggregators, a system of record is needed to record savings and payments to third parties in an auditable, transparent fashion. The Ledger supports payment invoicing and regulatory filings backed by a full audit trail of all historical transactions as visualized in Figure 3 below.

The Flex Ledger provides for:

- Custom Portfolio Valuation Functions
- Custom Eligibility Rules
- Custom Configurations

⁶ Cohorts are defined as portfolios of projects grouped by various metadata (such as aggregator, measure type, installation month, etc.)

- Non-Routine Event Tracking
- Full Auditability of Transaction Records
- Regulatory Reporting

Account - Demo P4P					March 21st, 2020		Create New Payment		
99 Projects	164 Meter Assets	\$8,234.55 Base Value	\$0.00 Kicker Value	\$64.10 Assigned Value	\$8,298.65 Total Value	\$4,220.00 Upfront Credit	\$12,518.65 Total Value + Upfront Credit	\$6,265.74 Previous Payments	\$6,252.91 Balance
164 Meter Assets									
Showing 1 to 10 of 164 Meter Assets									
METER ID	METER TYPE	PROJECT ID	PROJECT MATURITY	STATUS	DISQUALIFICATION REASON	BASE VALUE	KICKER VALUE	ASSIGNED VALUE	TOTAL VALUE
M127-gas	gas	PROJ123127	13 months	ACTIVE		\$389.82	\$0.00		\$389.82
M190-gas	gas	PROJ123190	13 months	ACTIVE		-\$212.69	\$0.00		-\$212.69
M208-gas	gas	PROJ123208	13 months	ACTIVE		\$228.30	\$0.00		\$228.30
M255-gas	gas	PROJ123255	13 months	ACTIVE		\$1.20	\$0.00		\$1.20
M333-gas	gas	PROJ123333	13 months	ACTIVE		-\$226.00	\$0.00		-\$226.00
M76-gas	gas	PROJ12376	13 months	ACTIVE		\$3.03	\$0.00		\$3.03
M87-gas	gas	PROJ12387	13 months	ACTIVE		-\$647.43	\$0.00		-\$647.43

Figure 3: Flex Ledger Module Tracking Incentive Payments Owed and Due

Innovation:

The primary objective of this program is to simplify the path for PCE to translate allocated budgets for energy efficiency into actual results in the most streamlined and scalable manner possible. FLEXmarket does so by:

1. Combining pay-for-performance with an aggregator marketplace designed to deliver savings impacts with an upfront price signal;
2. Consistent, transparent meter-based quantification of impacts, and;
3. An auditable performance payment structure.

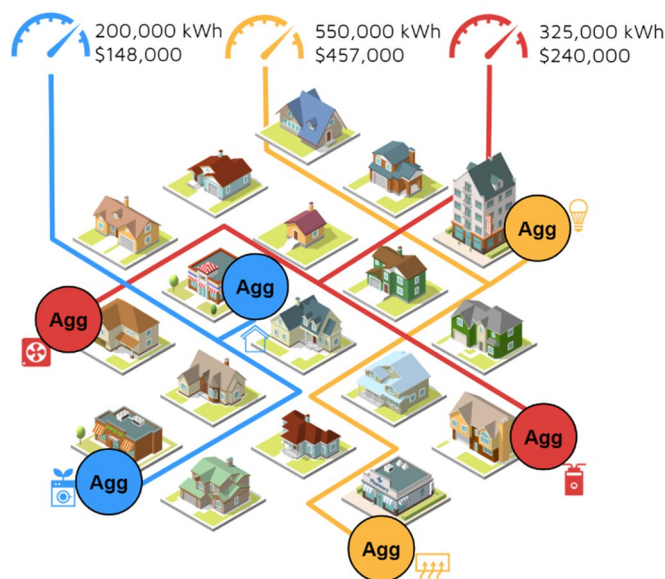


Figure 4: Demand FLEXmarket Concept

The innovation in this model involves overcoming the barriers of entry for qualified aggregators, ensuring that the program pays only for grid benefits delivered, and validating the impacts for both customers and the grid. This will enable a tighter connection of energy efficiency program investments with the grid impacts that drive significant value in increasing reliability, meeting climate goals, and improving the lives and livelihoods in the communities they serve.

The core innovation principles of the Demand FLEXmarket program are simplification, flexibility and scale and have been designed specifically to deploy resources in this grid reliability emergency rapidly.

The program brings simplification by reducing or eliminating common technical and administrative barriers associated with traditional prescriptive EE programs. These delivery pathways are not only burdensome for aggregators, but also for end customers. With the Demand FLEXmarket delivery model, project and customer enrollment are streamlined while still retaining the necessary quality assurance/ quality control (QA/QC) checks on paperwork. The program reduces transaction costs and administrative burden by measuring savings at the meter after project installation and paying only for delivered value, rather than burdening aggregators with administrative bottlenecks and extensive reviews up front to receive a rebate.

Market Access

Aggregator / Trade Ally

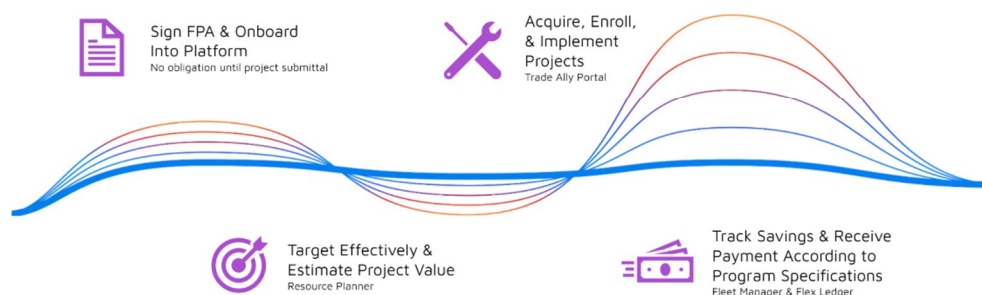


Figure 5: General Aggregator Process for Demand FLEXmarket

The Demand FLEXmarket program brings flexibility by allowing qualified aggregators to meet the individual needs of end customers in terms of energy savings, comfort, technology fit, and project cost. Rather than a prescriptive set of program offerings, aggregators will deliver solutions oriented around peak savings and TSB delivered. By leaving the solution set open-ended but fixing the price to savings delivered and providing consistency in tracking impacts, the range of possible solutions is determined by optimizing between cost and benefits, rather than prescribing a fixed program solution to a customer.

The program achieves scale by leveraging the growing number of aggregators participating in the Marketplace. Qualified aggregators can join any Marketplace after signing a Flexibility Purchase Agreement and agreeing to program rules. This increases competition and vendor diversity that will create scale in the marketplace to ensure the program addresses stranded opportunities and realizes efficiency potential.

The other key innovation is that payments to aggregators will be based on the TSB (after adjustments described in the M&V plan) of the portfolio of projects they deliver, net of the marketplace management costs and non-energy private investment. Marketplace management costs include general and administrative (G&A) overhead, direct implementation non-incentive (DINI), M&V, and marketing, education and outreach. These management costs are forecasted at 25% of the total program budget. Aggregators will target customers and optimize their budget by increasing savings impacts and finding the right shared cost point for customers to "say yes" to a project. It is in the hands of the aggregator to maximize their performance payments across their portfolio by achieving the greatest benefits (savings and demand impacts).

By focusing on the total program value delivered (both as presented through analytics and motivated through price), aggregators will have the tools and resources to improve their portfolio over time, manage risk, and be paid for the actual value delivered to PCE. Underperformance by an aggregator will likewise signal either modifications to their delivery model or exit from the Marketplace with no additional risk to ratepayers.

Pilots:

This section is not applicable to this program.

Workforce Education and Training:⁷

The Demand FLEXmarket program does not have a direct component for workforce education and training.

Workforce Standards:⁸

Aggregators that join the Demand FLEXmarket program will adhere to all requirements for workforce standards established by the Commission.⁹ As part of the intake and review process, aggregators will provide all necessary qualifications and licensure to perform the proposed work.

Disadvantaged Worker Plan:¹⁰

The Demand FLEXmarket program does not have a direct component for targeting disadvantaged workers

Market Access Programs:

This section is not applicable.

Additional information:

This section is not applicable.

⁷ D.18-05-041, pages 20-21 and Ordering Paragraph 7

⁸ D.18-10-008, Ordering Paragraph 1-2 and Attachment B, Section A-B, page B-1

⁹ D.18-10-008

¹⁰ D.18-10-008, Attachment B, Section D, page B-9

Supporting Documents

Program Manuals and Program Rules

A program manual containing rules for participation is provided with this implementation plan and is also integrated into the Demand FLEXmarket web page, found at www.demandflexmarket.com.

Program Theory and Program Logic Model

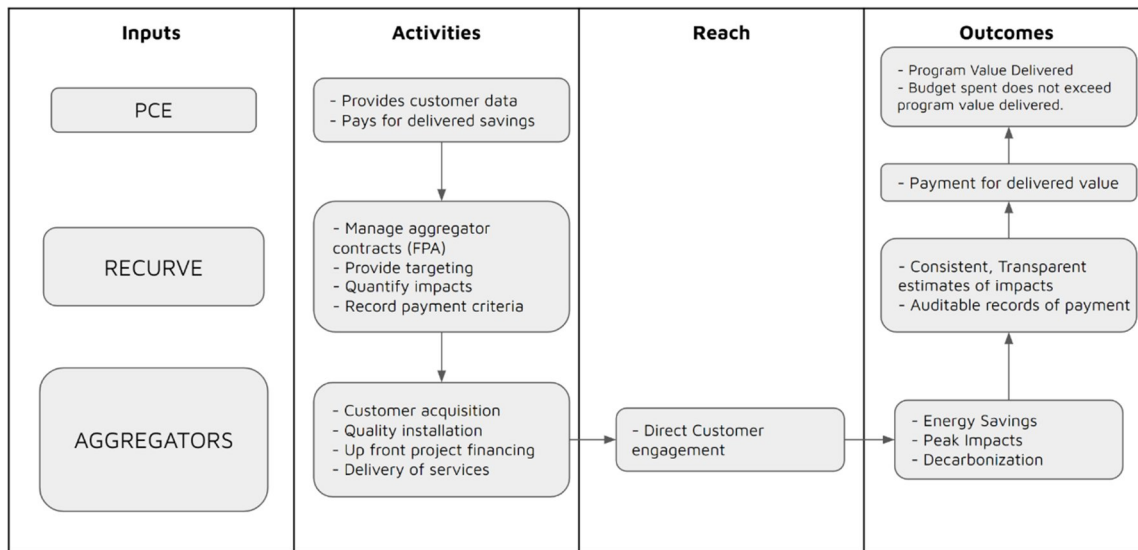
The essence of the program theory for the Demand FLEXmarket program is price signaling. The program establishes a flexible structure (i.e., a market design) by which aggregators can offer direct value from energy efficiency investments, and PCE can then purchase that value directly.

Unlike a traditional program, PCE is not buying the service, but the commodity - a stream of net benefits - from the aggregator. Historic barriers to program implementation have included rigid program designs with fixed technology incentives and pre-payment for program services which risked program savings delivered. In the Marketplace model, the program theory holds that the aggregators will act to optimize the value they can deliver, based on the price offered.

Aggregators are typically already familiar with the barriers for their targeted customer groups and have the flexibility to devise solutions to address those barriers for the customer groups that are likely to adopt similar technologies offered by the aggregators.

PCE gets the benefit of the value delivered at a price aligned with the Commission's Avoided Costs Calculator and with a protection against exceeding spending thresholds by only paying for value delivered above and beyond the Marketplace management costs.

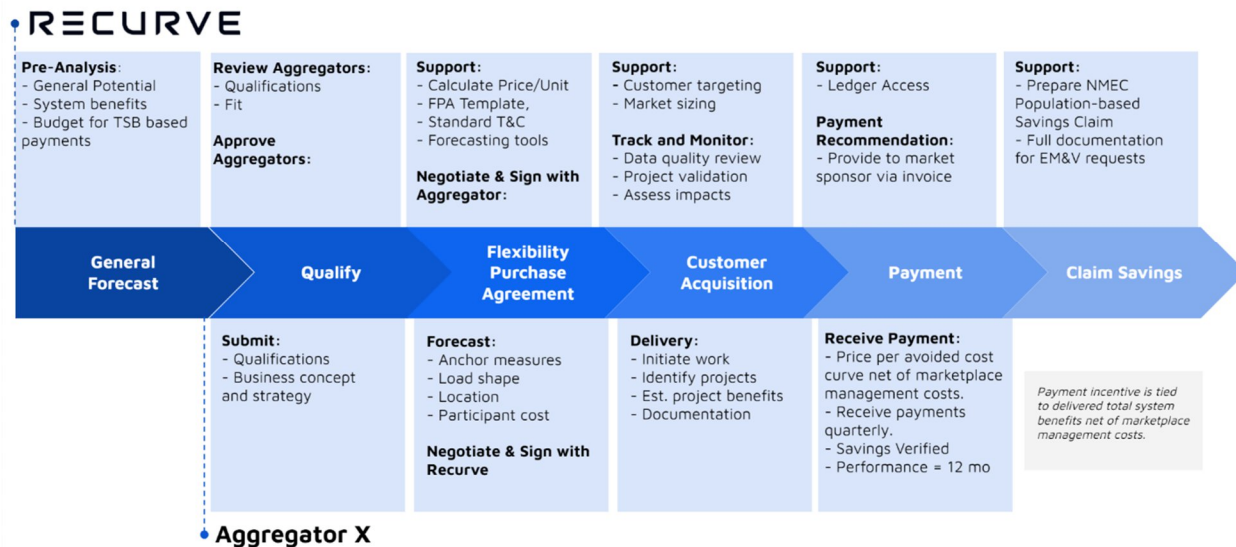
Marketplace Logic Model



Process Flow Chart

The following graphic illustrates the process flow for Demand FLEXmarket projects and portfolios.

General Aggregator / Project Flow



Incentive Tables, Workpapers, Software Tools

The Demand FLEXmarket program is a population-level NMEC program and does not have fixed measures or incentives. Workpapers or deemed savings values are not part of the program plan, but may be used for initial forecasts. The program's M&V plan describes the approach and associated software tools for calculating actual payable and claimable savings.

Savings estimates from aggregators will be reviewed by program staff. Since savings forecasts are not foundational to the Aggregator payments, reviews are focused on ensuring customers are getting reasonable estimates of savings potential, aggregators are appropriately applying EULs as agreed upon in the M&V plan, and that PCE can have confidence in forecasted impacts and manage performance payment budgets.

For payable savings, the value per unit of energy is grounded in the climate zone of the project, the metered load shape, ACC adjustments such as capacity smoothing, program multipliers applied to incent specific interventions or customer groups, and the Effective Useful Life appropriate for the primary measure (based on historic savings claims).

Incentives and costs presented to the customer are at the discretion of the aggregator. For program claims, the participant contribution will be net of non-energy private investment. Past approved program portfolios illustrate that measure costs can account for a large portion of the total resource costs. Programs that leverage incentives to encourage a high degree of private investment are often best able to achieve savings goals and policy objectives at the lowest ratepayer cost.

Based on the suite of best available evaluation research, net non-energy private investment will be utilized for claimed impacts.^{11, 12, 13, 14, 15, 16}

Quantitative Program Targets

During program years 2025-2028, PCE anticipates this program will deliver a total savings of 7,074,000 in gross kWh. The estimated incentives for the program are \$2,230,300.42, and PCE projects that over 10 aggregators will be active by the end of 2028. The program has a goal of 2,040 kW in cumulative peak impact (gross) by the end of 2028.

¹¹ The Commission has recognized this model as being low risk to rate payers. "... this type of program is very low risk to ratepayers regardless of cost-effectiveness score, because actual energy savings are measures based on NMEC methods, payments to aggregators are made based on performance, and spending is limited by the TSB actually achieved." D.21-12-011 at p.26

¹² [PG&E Advice Letter 2019 - Advice Letter 4011-G/5375-E - 2019](#)

¹³ [PY2013-2014 California Statewide Residential and Nonresidential Spillover Study](#), Opinion Dynamics and Itron, Inc., 2017. CALMAC ID: CPU0186.01; see figure 3, noting that "internal motivators" drive participant action to "do more".

¹⁴ [Energy Upgrade California – Home Upgrade Program Process Evaluation 2014-2015](#), EMI Consulting, 2015. CALMAC ID: PGE0389.01; Figure 4-10 shows equal weight (between 4-5 on a 5 point scale) of the importance given to energy savings among other considerations. AND SBW Consulting. (2013). and [2010-2012 PG&E Whole House Retrofit Program Phase II Process Evaluation Study - Methods and Findings](#) - PGE0302.06. Bellevue, WA. Table 2, shows that the top motivations for participants are comfort, saving money, the incentives available and reducing their environmental impact.

¹⁵ [PG&E Whole House Program: Marketing and Targeting Analysis](#). Opinion Dynamics Corporation, 2014. CALMAC ID: PGE0302.05 20 Energy Upgrade California – Home Upgrade Pro; see figure 3; reasons for participation. and:

¹⁶ [Cost-Effectiveness of Energy Efficiency Financing Programs - Methodology & Strategic Issues, December 2016](#) documents the influence of other value drivers for participating in the financing programs.

Diagram of Program

Program Lifecycle Flow

	Eligibility	Qualification	Enrollment		Performance Tracking	Quality Assurance
			Pre-Intervention	Post-Intervention		
Program Implementer	Identify eligible customers for program. Engage customers to participate in the program.	Review baseline analysis for eligible customers to determine appropriate measures. Make notes on project. Group projects by contractor cohort	Review recently scheduled projects	Review recently completed projects	Monitor ongoing portfolio performance after update to ensure on track to meet savings goals. Download KPIs for reporting.	Periodically examine disqualified projects and look for outliers which may negatively effect portfolio performance.
Recurve Platform	Pull authorized customer, site and historical meter data into platform. Verify eligibility w/meta data.	Create placeholder-project for each eligible customer. Batch customers and ETL to complete baseline analysis for each.	Update project intervention date and status to scheduled. Remove customer from eligibility table.	Update project intervention date and status to completed.	Batch completed projects/new data to ETL and run meters at set frequency e.g. monthly.	Use portfolio settings to detect NRE's and identify outliers.
Program Channel		View cohort of eligible projects to see suggested measures and info for each customer. Use list for customer outreach.	Sell intervention to customer. Use enrollment form to update project with scheduled intervention date and set status to scheduled. Upload required contracts & info.	Complete intervention. Use enrollment form to update project with actual intervention date and set status to completed.	Examine program performance to see if projects performed as expected.	Identify outliers and examine their meta data to understand how to improve performance.

Evaluation, Measurement & Verification (EM&V)

At this time, there are no plans for implementing a process evaluation or other evaluation effort for this program. This program employs a robust embedded M&V strategy (as described in the M&V plan below).

Normalized Metered Energy Consumption (NMEC)

The Demand FLEXmarket Population NMEC M&V Plan is provided with this implementation plan.

PCE Demand FLEXmarket Program Manual

1. How the PCE Demand FLEXmarket Works

Any aggregator¹⁷ who has agreed to the Terms and Conditions as detailed in the Flexibility Purchase Agreement (FPA) and signed Peninsula Clean Energy's Terms and

¹⁷ Aggregators are participating vendors or program partners who generate energy efficiency and/or demand savings for an aggregated group of customers.

Conditions, both provided by Program Staff, is allowed to participate in PCE's Demand FLEXmarket.

Commercial Enrollment

The PCE Commercial Demand FLEXmarket enrolls projects in a two-stage process (Initial Enrollment and Project Completion). Through the FLEXmarket portal, project information is collected from aggregators along with an estimated incentive value, as well as various permissions and acknowledgments to complete a formal project enrollment. A "Reservation Letter" will be issued to the aggregator, providing details of the proposed incentive reservation and serve as a reservation confirmation to the aggregator for the project's installation. Upon installation, if there have been changes to the scope of work that affect the forecasted value of the project, values from the project reservation letter will change upon final project review and reflected in the issue of the "Project Completion Confirmation" letter. Submissions are checked for eligibility and completion prior to official enrollment into the Commercial Market and can be subject to additional documentation and review (as per the terms in the "Engineering Review Trigger" section). Unless otherwise agreed upon, a project's official "Start Tracking Date" will correspond with the date of project installation completion, noted on the final Project Completion Paperwork submitted by aggregator.

Commercial Efficiency Market incentive payments are paid based on performance of an aggregator's portfolio of projects and occur on a quarterly basis. Each project within a portfolio has its performance calculated quarterly, for the previous quarter, and an aggregator's collective portfolio performance for that quarter will be paid out. To prevent under- or over-performance due to seasonality, 10% is withheld from each quarterly portfolio payment and will be returned if performance holds. If a project performs as expected, 100% of its estimated incentive value will be paid out. The reservation of 120% of the forecasted project value ensures that incentive funding will be available for overperforming aggregator portfolios. Value that accrues in excess of this amount will be paid based on program funds availability; this availability will be assessed in order of project maturity following the end of the Commercial Program Portfolio¹⁸ performance periods.

Projects can increase their value by increasing savings volume and delivering load shape impacts that are more valuable than the CPUC's deemed average resource cost curve (greater \$/kWh saved), especially during summer peak and net peak hours. The Commercial Efficiency Market is agnostic to measures and business models, however,

¹⁸ PCE Commercial Program Portfolio is defined as a single portfolio across all Commercial Program 2025-2028 years, inclusive of all participating aggregator portfolios.

the expected useful life of the measures being implemented affects the magnitude of the incentive.

Recurve tracks savings for every project in an aggregator's portfolio and provide aggregators M&V for all projects through the Fleet Manager portal. Recurve also tracks payment recommendations through the Flex Ledger. Both of these tools are available to aggregators that have successfully enrolled a project in the Commercial Efficiency Market to monitor their portfolios.

Residential Enrollment

The PCE Demand FLEXmarket enrolls projects in a single-stage process; bypassing the "Initial Enrollment" and moving directly to the "Project Completion" stage. Through the FLEXmarket portal,¹⁹ project information is collected from aggregators, as well as various permissions and acknowledgments to complete a formal project enrollment. Submissions will be checked for eligibility and completion prior to official enrollment into the Demand FLEXmarket and can be subject to additional documentation and review (as per the terms in the "Engineering Review Trigger" section).

Once projects are officially approved and enrolled into the Demand FLEXmarket, a "Project Completion Confirmation Letter" will be issued for the project. The letter represents PCEs commitment to paying the aggregator for the grid value to be delivered by a project. Unless otherwise agreed upon, a project's official "Start Tracking Date" will correspond with the date of project installation completion, noted on the final Project Completion Paperwork submitted by aggregator. The Project Reservation is calculated at 120% of the estimated incentive value (submitted through the enrollment process) from the program budget to account for the possibility of the project overperforming, exceeding its savings forecast.

Demand FLEXmarket incentive payments are paid based on performance of an aggregator's portfolio of projects and occur on a quarterly basis. As soon as a project's value generated exceeds the upfront incentives paid and the initial associated Marketplace management costs, portfolios become "active for payment". Accurate forecasting is inherent to the program design: over forecasting may lead to unnecessarily high marketplace management costs attributed to the project, while under forecasting may result in an insufficient budget reservation. Each project within a portfolio will have its performance calculated quarterly, for the previous quarter, and an aggregator's collective portfolio performance for that quarter will be paid out. To prevent under- or

¹⁹ The FLEXmarket portal can be found at <https://www.demandflexmarket.com>

over-performance due to seasonality, a Safety Factor will be withheld from each portfolio quarterly payment and will be returned if performance holds. If a project performs as expected, 100% of its estimated incentive value will be paid out. The reservation of 120% of the forecasted project value ensures that incentive funding will be available for overperforming portfolios. Savings that accrue in excess of this amount will be paid based on program funds availability; this availability will be assessed in order of project maturity following the end of the Residential program portfolio²⁰ performance period.

Projects can increase their value by increasing savings volume and delivering load shape impacts that are more valuable than the CPUC's deemed average resource cost curve (greater \$/kWh saved), especially during summer peak and net peak hours. The Demand FLEXmarket is agnostic to measures and business models, however, the expected useful life of the measures being implemented will affect the magnitude of the incentive.

Recurve will track savings for every project in an aggregator's portfolio and provide aggregators M&V for all projects through the Fleet Manager portal. Recurve will also track payment recommendations through the Ledger. Both of these tools are available to aggregators that have successfully enrolled a project in the Demand FLEXmarket to monitor their portfolios.

2. Eligibility Requirements

Aggregator Eligibility

Any organization that can meet the requirements as listed in the FPA can participate in the PCE Demand FLEXmarket. Aggregators are participating vendors or program partners who generate energy efficiency and/or demand savings for an aggregated group of customers.

If an organization can meet these listed requirements, it must sign the [Flexibility Purchase Agreement](#) and [Peninsula Clean Energy's Terms and Conditions](#) to officially submit and enroll projects.

Project and Customer Eligibility

Recurve will utilize CalTRACK modeling to qualify customers based on data sufficiency and baseline model fit in addition to other usage characteristics.²¹

²⁰ Residential Program's Portfolio is defined as a single portfolio across all Residential 2023 - 2025 Program years, inclusive of all participating aggregator portfolios.

²¹ Project qualifications based on data sufficiency and model fit may only apply to the type of savings being measured (electric or gas).

General customer eligibility requirements include but are not limited to:

- Commercial site or Residential customer (single-family);
- Project site must be located in PCE's service area;²²
- Unbundled (i.e., receiving electric generation service from PCE) customer;
- Site is not currently participating, and has not participated in the past 12 months, in a CPUC ratepayer-funded energy efficiency program;
- 12 consecutive months of energy usage data is available;
- Model fit needs to be < 1.0 Coefficient of the Variation of the Root Mean Square Error (CVRMSE) and site must pass CalTRACK data sufficiency analysis (Recurve will conduct analysis at intake);
- If the customer has onsite solar system, installation of the system must have been completed at least 12 months prior to the EE intervention.
- Projects can only enroll in the Market if they were installed and completed following the Program's elect to administer date.
- Qualifying residential projects subject to cost-effectiveness requirements set forth by the Program
- Commercial and Residential projects must be installed and project completion paperwork submitted to Recurve by no later than August 30, 2028.

More requirements for eligible customers are detailed in the program M&V plan.

Qualifying Measures

The Demand FLEXmarket will promote a wide range of measures including, but is not limited to, the following interventions: lighting, HVAC, water heating, building envelope, refrigeration, and controls-based technologies. The types of measures that are installed will be documented in the course of program deployment and be included in the metadata (see Data Collection section).

Projects with a primary measure (as defined in the M&V plan) of controls or behavioral interventions will default to a 1-year EUL (with the option to re-enroll) unless otherwise supported with documentation such as CPUC approved work papers or eTRM data (see the "Effective Useful Life" section of the M&V plan for more detail). Solar PV and other electricity generation are not eligible for incentives from the Demand FLEXmarket.

²² <https://www.PCEcleanenergy.org/member-communities/>

3. Project Enrollment Process

Pre-Enrollment

Prior to enrolling a customer, the program recommends that aggregators use the “Data Sufficiency and Eligibility Tool”²³ to check if a customer is eligible for program enrollment. To operate this tool, an aggregator must receive the SAID (Service Agreement Identifier) for a customer. Please note, this is different from the Account ID and Service Point ID numbers. Once an aggregator has an SAID, they simply enter it into the Data Sufficiency and Eligibility Tool. Outputs include but are not limited to:

1. If there is sufficient baseline data (12 months consecutively)
2. CalTRACK model fit (< 1.0 CVMSE for eligibility)
3. Address
4. If the site has participated in a CPUC funded program within the past 12 months (as data provided by PCE)
5. Customer prioritization metrics

Customers with SAIDs that do not pass the data sufficiency check are not eligible to participate in the Demand FLEXmarket. Customers that have other factors contributing to ineligibility will have those listed in the Tool. For a full list of eligibility criteria, please see the [Eligibility Requirements](#) section above. Only aggregators that have signed the Flexibility Purchase Agreement are given access to the Data Sufficiency Tool.

Enrollment

Aggregators enroll projects under the Demand FLEXmarket via the FLEXMarket Portal²⁴. Aggregators submitting projects must include the following:

1. Contact information for their company;
2. Contact information for the customer being enrolled;
3. Project information (such as forecasted savings) for electric and gas (if applicable).
4. Final scope of work;
5. Final project invoice;
6. Customer signed Data Authorization form;
7. Customer signed Project Completion form.

Upon completion of the project enrollment form, Recurve will review and verify that the enrollment is complete. The review is focused on ensuring that customers are receiving reasonable estimates of savings potential, aggregators are appropriately applying EULs,

²³ The Data Sufficiency and Eligibility tool can be found at <https://www.demandflexmarket.com>

²⁴ The FLEXmarket portal can be found at <https://www.demandflexmarket.com>

and that PCE can have confidence in forecasted impacts and manage performance payment budgets. If the review is not passed, Recurve will review the results with the Aggregator to resolve any issues identified.

Projects will also be reviewed to see if a Third-Party Engineering Review is required. While the table below outlines the general parameters for a Third-Party Engineering Review, Recurve and PCE maintain the right to subject any project to additional engineering review.

Engineering Review Thresholds

Category	Threshold
New Aggregator Submission	First 3 projects in the market
% Savings (Annual Usage)	> 20%
Forecasted Aggregator Incentive	> \$200,000 ²⁵

Once installed, projects may be inspected on-site per the terms of the program's Quality Assurance Plan found in the program M&V plan. If an installed project does not pass a QA inspection, the Aggregator will be alerted by a program representative and will be expected to rectify the issue as specified in the Flexibility Purchase Agreement.

Approval

Commercial FLEXmarket Approval

Once projects are officially approved and enrolled into the Commercial Efficiency Market, a "Project Reservation" letter is issued for the project. The letter represents PCE's commitment to reserve funds required to pay the aggregator for the grid value to be delivered by a project, should the project be installed at the customer site. The Project Reservation is calculated at 120% of the forecasted incentive value (submitted through the enrollment process) from the program budget to account for the possibility of the project exceeding its forecasted value. Once projects are installed and completed, a "Project Completion Confirmation" letter is issued for the project with updated information and tracking start date, as well as the final amount of funding reserved, based on the completed scope of work, to pay the aggregator for any grid value

²⁵ If aggregators routinely underperform relative to project forecast, engineering review thresholds may be lowered.

delivered by the project. Unless otherwise agreed upon, a project's official "Start Tracking Date" will correspond with the date of project installation completion, noted on the final Project Completion Paperwork submitted by aggregator.

Residential FLEXmarket Approval

Projects approved by the program will be issued a "Project Completion Confirmation Letter". Aggregators will be alerted when projects are rejected or are subject to additional review.

Approved projects will have 120% of their estimated incentive value reserved from the program budget for aggregator payments for the delivered value. Unless otherwise agreed upon, a project's official "Start Tracking Date" will correspond with the date of project installation completion, noted on the final Project Completion Paperwork submitted by aggregator.

Approved projects will be added to the submitting aggregator's portfolio of projects within their Recurve Platform Instance, where project performance will be monitored (using the Fleet Manager tool) and incentive tracking will be calculated (using the Ledger tool).

4. Incentive Payments

Upfront Incentives

Commercial projects are eligible for an upfront payment equaling 20% of the Forecasted Aggregator Incentive, while Residential Projects are eligible for an upfront incentive payment equaling 50%²⁶ of the forecasted Total System Benefit (TSB) grid value which will be processed for payment in the month after the "Project Completion Confirmation" letter was issued. The upfront incentive will be debited against the aggregators portfolio and the aggregator must deliver value beyond this debit prior to receiving additional payments.

How Incentives are Calculated

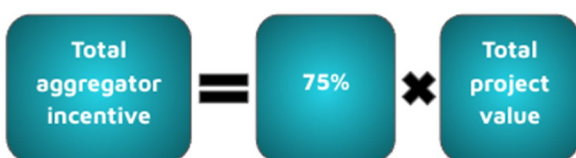
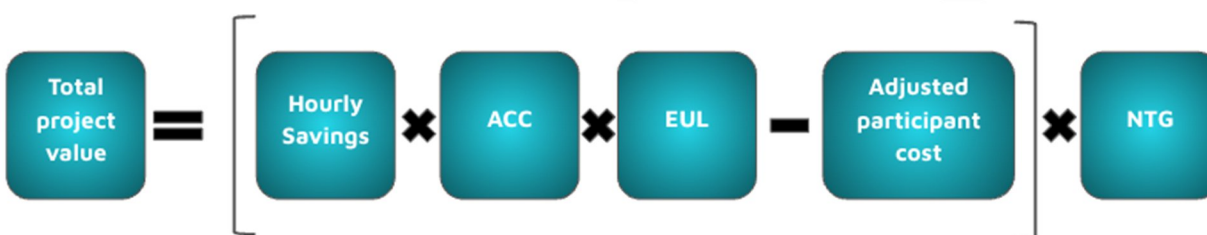
In general, incentives are calculated based on the total grid value from savings achieved in an aggregator's portfolio applied to the hourly grid value as defined by the Avoided Cost Curve, weighted EUL, adjustment factors (e.g., NTG, comparison groups) and participant costs. Individual projects are evaluated over a 12-month period but receive the full benefit of the weighted EUL of the project. 75% of the delivered grid value is allocated to the aggregator. 25% of the delivered grid value is

²⁶ Upfront incentives are capped at \$40,000. An aggregator with a project with a forecasted value of greater than \$200,000 must submit the project with ICP certification to receive an upfront incentive beyond \$40,000.

allocated to program management fees, which include administration, marketing and outreach, and direct implementation non-incentive (DINI) costs.

The total project value is calculated in three steps. First, hourly energy savings are multiplied by the hourly value dictated by the ACC for the duration of the EUL. Second, an adjusted participant cost is subtracted from the resulting value.²⁷ Finally, this total is multiplied by the net-to-gross ratio, which is pre-determined to 0.95 for all commercial projects and 0.85 for all residential projects.

The aggregators receive 75% of the total project value.



Aggregators are able to receive payments quarterly for value delivered at the portfolio level. Further detail on this process can be found in the “Payments and Incentives” section of the M&V plan. A project value estimation tool and further detail on the Avoided Cost Curve can be found at <https://www.demandflexmarket.com>.

How Payments Are Made

Aggregator incentive payments for this population-level program will be made based on payable savings determinations using NMEC methods described in the gross and net

²⁷ Only 50% of the participant costs are included in the equation to reflect that customers make efficiency investments for non-energy reasons. The incentive equation does not factor in non-energy benefits, so the costs are reduced accordingly for symmetrical accounting of costs and benefits.

sections of the M&V plan. Payments for the program will be made quarterly during the 12-month measurement period for active projects in the aggregator portfolio.

The quarterly measurement periods are:

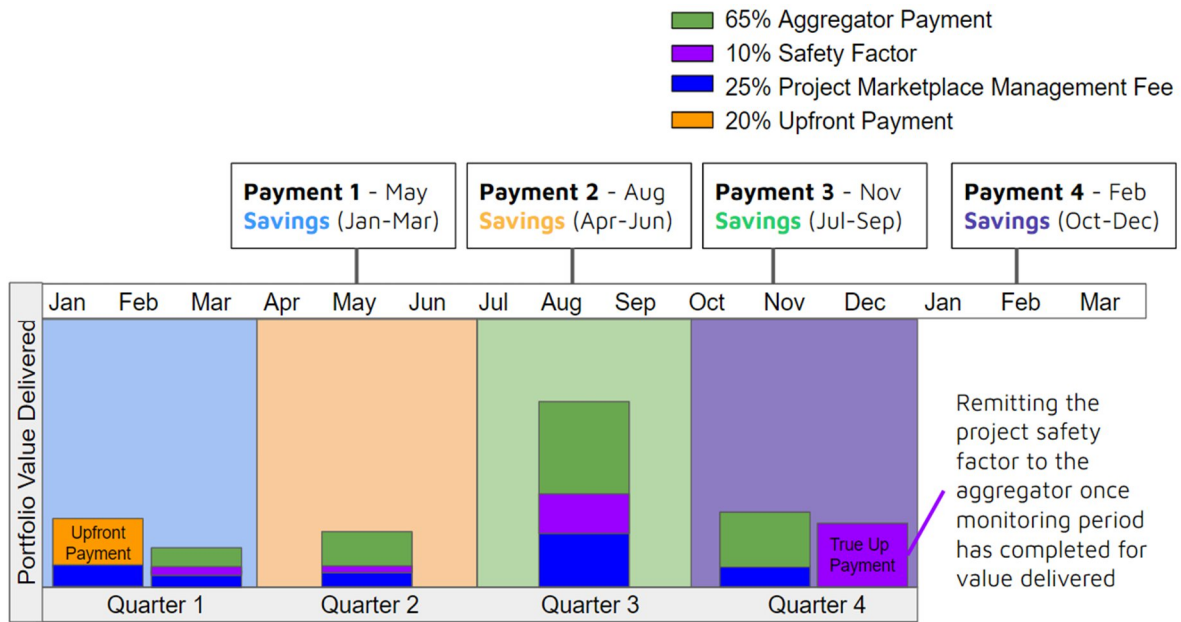
- January-March
- April-June
- July-September
- October-December

Payments are expected to be made within 60 days from the end of the previous measurement period. For example, payments for Q1 (January through March) will be made by May 30. Aggregators will be alerted if there's a deviation from this timeline.

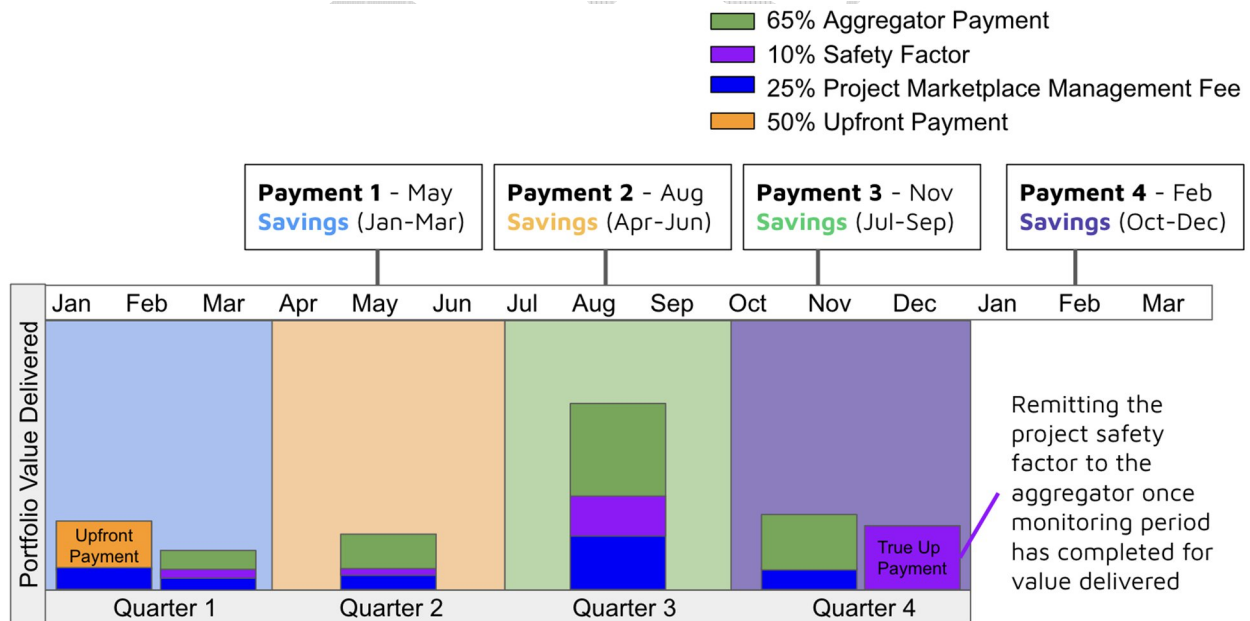
The quarterly incentive payment is based on the total program value net of program management costs of projects in the portfolio and non-energy private investment. Aggregators will be paid for their portfolio value achieved based on metered savings from active projects achieved during the most recent measurement quarter. Aggregators are not eligible for a quarterly incentive payment if the net benefits from their projects do not exceed upfront incentives and the associated initial market management costs. In other words, the portfolio becomes active for a quarterly incentive payment after the value generated exceeds the upfront incentives and applicable participant costs for the projects. Marketplace management costs include general and administrative (G&A) overhead, direct implementation non-incentive (DINI), M&V, and marketing, education, and outreach. These management costs are calculated at 25% of the total program value delivered quarterly.

In addition, a Safety Factor is withheld each quarter to provide a buffer in regards to seasonality and/or project performance. As projects complete the full 12 month measurement period, aggregators will be compensated with a "true-up" payment in the following quarterly payment cycle that will release owed funds. The safety factor percentage defaults at 10% of measured project value. At the end of the portfolio year, each aggregator's safety factor will be re-evaluated based on the performance of their portfolio relative to their forecast (realization rate). A visualization of payment cadences and safety factor evaluation is shown in the figures below.

Commercial:



Residential:



Aggregators with realization rates less than 30% will be evaluated regarding their participation in the next year of the Market. This evaluation may impact the Safety Factor applied as well as the Aggregator's eligibility for Upfront Payments.

The reservation of 120% of the forecasted project value ensures that incentive funding will be available for installed projects. Values that accrue in excess of this amount will be paid based on program funds availability and assessed once the portfolio tracking period has completed.

In the case that aggregator portfolio performance exceeds the reserved budget for the portfolio, a "scale back factor" will be calculated for the portfolio and applied uniformly to each meter, reducing the payment equally across all meters, resulting in a total portfolio payment equal to the reserved funds.

Scale back factor = $\text{Aggregator's Reserved Portfolio Incentive Funds} / \text{Aggregator's Earned Portfolio Incentive (Before Any Holdback or Scale back)}$

Recurve will document in an electronic, revenue-grade, auditable ledger the recommended payments to support aggregator invoices to PCE after each quarterly measurement period. The electronic ledger will track all stages of a project, including non-routine adjustments. Invoice payment recommendations will be based on CalTRACK payable savings results. Claimable results to the CPUC will be derived from the ledger for compliance with reporting requirements.

Invoicing and Payment

Recurve's Ledger tracks all stages of the project and converts it into value, including non-routine adjustments. Invoice payment recommendations will be provided to PCE based on CalTRACK payable savings results. PCE will issue payments based on Recurve's payment recommendation.

Please see the Measurement & Verification Plan for the details of payment calculations, timelines, and non-routine event adjustments.

5. Additional Services

Co-Branding

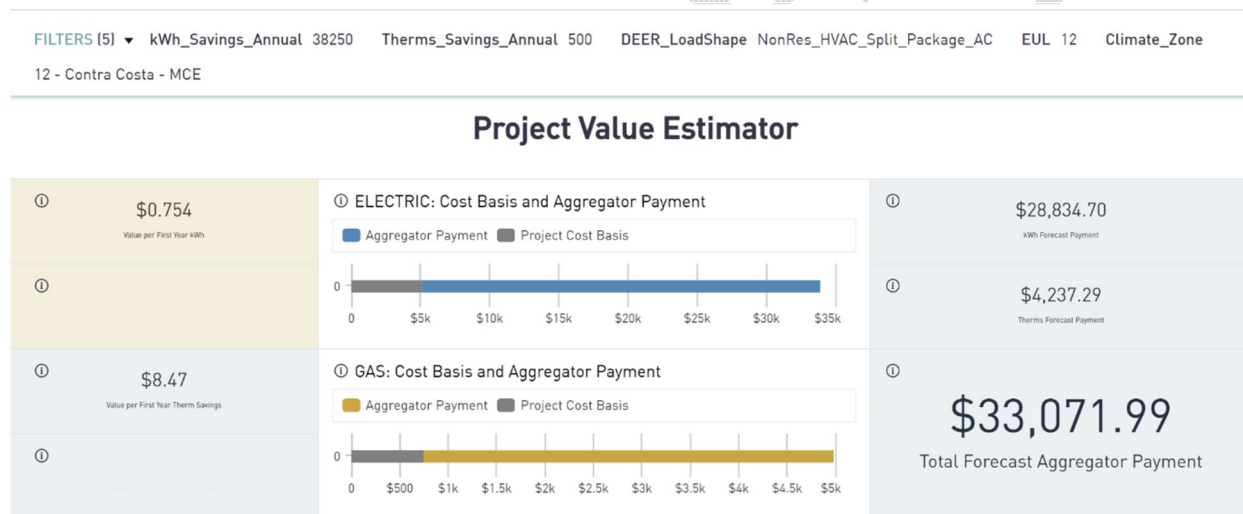
PCE offers co-branded marketing as a free service to aggregators as an opportunity to showcase their organization's offerings and benefits to their potential residential customers within PCE's service area. PCE must approve in advance any use of PCE's logo.

Exploring Project Value: How much is your project worth?

As program incentives shift from deemed rebates or fixed performance rates to meter-based incentives that pay for grid value delivered, it can be difficult to understand how to estimate how a particular project earns value. As incentives begin to value temporal benefits over sheer volume of installations, understanding how load shapes impact performance is crucial.

Estimating and Forecasting Value

Aggregators have access to a Project Value Estimator and FLEXvalue²⁸ tools via the program webpage. These tools give aggregators the ability to estimate their projects' value through the PCE Demand FLEXmarket. The Project Value Estimator dashboard requires basic project inputs to estimate the available Aggregator Incentive Payment value.



Customer Optimization to Maximize Value

Aggregators have an incentive to both increase the volume of total savings and maximize the value of the resource curve (savings load shape) to maximize project value. We encourage all aggregators to take time using the Project Value Calculator to understand these interactive effects to develop a model that maximizes grid impacts and customer offerings.

One primary tactic in the Demand FLEXmarket is the ability to work with Recurve tools to identify customers with the highest potential for savings. Aggregators are encouraged to

²⁸ <https://colab.research.google.com/github/recurve-methods/flexvalue/blob/master/notebooks/colab.ipynb#scrollTo=7da3bd62>

pursue opportunities with customers whose consumption profiles suggest greater savings potential, especially those with high usage during the summer peak and net peak hours.

Program tools can also be used to identify the buildings that offer flexibility opportunities during summer evening ramp, leading to much more valuable avoided cost savings. Recurve will work with aggregators to identify the attributes of high-potential customers. These attributes are then used to prioritize customer segments that are the most likely to have cost-effective outcomes for all parties involved.

For example, an aggregator targeting residential Air Conditioner savings would have the greatest potential impact by focusing on the customers with the greatest AC usage during the grid peak periods when savings are worth the most. These customers are most likely in need of help, and will have dramatically higher bill savings and grid benefits.

Aggregators also have the freedom to optimize their offerings toward the most beneficial mixes of technologies, develop innovative customer engagement strategies, or explore automation. Aggregators will be given maximum flexibility to determine their own business models, and customer value propositions.

Understanding Avoided Cost

The cost of energy is not static and fluctuates based on the time of use. The CPUC Avoided Cost Calculator (ACC) provides a set of 8760 marginal hourly values for the California grid, forecasting the cost of energy for each hour of the day. For the purpose of this program, the ACC has been adjusted, as outlined in the M&V plan, to provide a more stable compensation structure and adequately value summer peak hours. This data set is used to value energy savings or demand flexibility in the Marketplace. This data feeds into the Project Value Estimator, where aggregators have direct access to derive incentives in the PCE Demand FLEXmarket, estimating the avoided cost value of the project in order to forecast potential cash flows

Audits

No pre-or post-on-site audits are required. PCE may, as part of the quality assurance framework, select a random sample of projects to confirm technologies were installed. Audit of data quality and eligibility of participants will be conducted by Recurve.

6. Sub-Program Quality Assurance Provisions

Quality Assurance Plan

PCE maintains the integrity of the Demand FLEXmarket through an independent Standards and Quality Assurance Team who manages the quality assurance system for the Market.

The quality assurance (QA) system has several components, including a review of qualifications and credentials, paperwork audits, the establishment of program standards, and field and photo inspections. QA inspections involve verification of the contracted scope of work, accuracy of site analysis, comparison of installation to submitted designs. Recurve, PCE, or its representatives may make a reasonable number of visits to the customer site before, during, and/or after installation of efficiency measures to assess overall compliance.

Aggregator Roles and Responsibilities

The program relies on aggregators to provide complete turnkey services for qualified energy efficiency improvements to customers. Aggregator roles and responsibilities include:

- Aggregator and/or their subcontractors hold the agreement (contract) with the customer
- Responsible for performance, including subcontractors
- Receives incentive payments and determines customer incentives
- Agrees to terms of the Flexibility Purchase Agreement
- Agrees to PCE's terms and conditions
- Agrees to terms of the M&V agreement
- Accountable for resolution of customer complaints
- Responsible for installation, warranties, and product guarantees

Selecting Completed Projects for Inspection

The purpose of the QA inspection is to provide PCE an opportunity to evaluate the accuracy of the site analysis and design documents and verify that building components and equipment are installed according to Program requirements. The QA inspection also includes selected health and safety and performance items.

PCE reserves the right to select any project for inspection. Selections may include consideration of the following criteria:

- Low savings realization rates
- High CVRMSE or CVRMSE change

- High variance

PCE reserves the right to conduct both field and photo inspections based on the following sampling rates:

- 10% photographic
- 2-4% onsite inspection

PCE may select any completed project for inspection based upon customer complaints, warranty-related issues, or as part of the review of a contractor under status review or Program disciplinary action.

Field Inspections Process and Scope

The purpose of a field inspection is to confirm measures are installed per manufacturer instructions and as outlined by the aggregator in the customer agreement, and in the project documentation provided to Recurve. QA field inspections are scheduled at the customer's convenience. Customers are encouraged to allow the contractor to attend the inspection to answer questions. If the customer agrees, the contractor will be notified by email between 5 to 14 days before the inspection. Every effort will be made to accommodate the contractor's schedule, but the customer's convenience takes precedence.

Customers have the right to request that the contractor not attend the QA field inspection. In these situations, the contractor will not be notified of the scheduled inspection but will receive the report from the QA team within 15 business days of the inspection.

Photo Inspections

The contractor is required to take construction photos for each measure installed, which describe the existing conditions as well as the replacement product or measure. PCE expects contractors to take photos throughout the installation process to ensure that each measure completed is supported with photographic documentation. PCE may request construction photos for purposes of conducting a photo inspection at any time, and failure to provide the requested photos may result in higher onsite inspection rates. Taking multiple pictures of each installed measure will help ensure a smooth photo inspection process.

QA Inspection Report

The QA inspection report will provide a summary of all evaluated elements of the project and list any non-conformances identified during the inspection. The report will provide an overall score of the project and identify it as a pass or fail. Scoring criteria is further described below in the program M&V plan.

The report will be provided to the contractor approximately 15 days after the inspection, following an internal review and scoring by the QA Team. The report will be made available to the customer upon a direct request to PCE.

7. Other Program Metrics

N/A

DRAFT

Population-level NMEC M&V Plan

Program Name: PCE Demand FLEXmarket

Program Administrator: PCE

Market Implementer: Recurve

1. Summary

This is a Program-Level Measurement and Verification (M&V) Plan for the PCE Demand FLEXmarket. The program is eligible for, and complies with, the population-level Normalized Meter Energy Consumption (NMEC) requirements defined in the CPUC NMEC Rulebook v.2.²⁹ Based on the definitions provided by the CPUC, population-level NMEC is used when savings claims are made for a portfolio of projects using fixed, standardized, verifiable measurement methods established before the program starts and that are uniformly applied to all sites in the group.³⁰ All NMEC approaches are based on pre- and post-intervention energy usage data observed at the meter.

The program implementation plan³¹ for the Demand FLEXmarket provides the details for how the program shall be implemented. The population-level NMEC M&V approach is appropriate for this program because it meets all required program design criteria, including those related to expected savings and permissible project types related to building-type similarity.

The Demand FLEXmarket, implemented by Recurve will utilize independent, transparent measurement and continual tracking of changes in pre- and post-intervention energy usage observed at the meter. Standardized, open-source methods and tools are the foundation of this M&V plan. The remainder of this document details compliance with the CPUC NMEC Rulebook 2.0 requirements for the program-level M&V Plan for Population NMEC, which must be included in any implementation plan.

2. Analytical Methods and Calculation Software Selection

This Demand FLEXmarket is designed for the commercial & residential sector within PCE's service area. Targeted building types, including consumption trends, existing equipment, and likely impact of the interventions, will be reasonably consistent for each aggregator within the program. Qualified aggregators will mostly focus on installing a primary

²⁹ Rulebook for Programs and Projects Based on Normalized Metered Energy Consumption, January 7, 2020

<https://www.cpuc.ca.gov/General.aspx?id=6442456320>

³⁰ CPUC's full definition: "Population-level NMEC is an energy savings calculation approach in which results are based on pre- and post-intervention energy usage data observed at the meter and calculated across a group of sites, rather than a modeled engineering forecast or deemed value (or a Site-level metered savings calculation). For Population-level NMEC, measurement methods are fixed before the program starts and apply to all sites in the group in a uniform fashion, as opposed to Site-level NMEC measurement methods which may differ on a site-by-site basis." Rulebook p. 24

³¹ Templates for implementation plans can be found here: <https://www.caeec.org/implementation-plan-guidance>

technology across a similar sub-section of the market, but the implementation plan does not pre-define the measures nor the targeted sub-set of the market.

Initial savings forecasts from aggregators will be reviewed and validated by Recurve. Since aggregator payments are based on metered impacts, not calculated estimates, reviews are utilized to ensure estimates are reasonable and based on industry best practice. This review process will help ensure customers receive reliable estimates of savings potential, aggregators are appropriately applying EULs, and that PCE can have confidence in forecasted impacts and effectively manage performance payment budgets.

Approach	Project Documentation from Aggregator
Actuarial <i>Meter-based past performance</i>	Past evaluation report, third party evaluation or engineering assessment of a similar projects' past performance utilizing whole building IPMVP Option C methods; e.g. CalTRACK/OpenEEmeter or ECam
Modeled <i>Building simulation projection</i>	Results of a building simulation model like Energy Plus, EQuest, or other similar IPMVP Option D modeling tool. Models calibrated with actual usage data are preferred.
Deemed <i>Pre-approved standardized measure-specific savings</i>	Citation of a CPUC-approved or archived work paper, or other DEER value. Measure-specific savings estimates from CalTF via the eTRM may also be appropriate but should be calibrated for to and through code performance.
Bottom-Up <i>Multiple approved and standardized measure-specific savings</i>	Citation of a suite of deemed values (see above) combined to estimate the whole impacts of a project. Interactions between measures should be considered in the estimate.

Figure 1: Pre-Installation Verification of Savings Estimation Options if Engineering Review Threshold Exceeded

Payable Savings

Payable savings constitute the basis of payments between PCE and aggregator(s). The public, open-source CalTRACK 2.0 methods,³² executed via the OpenEEmeter³³ for the calculation of baseline models and counterfactuals, GRIDmeter for comparison group sampling and savings adjustment, and FLEXvalue for the calculation of grid value based on the measured hourly savings impact and the CPUC's avoided cost calculator have been chosen as the analytical method(s) and calculation software for payable savings for this program. A wide range of building types may be part of the program and a threshold baseline model fit will be a precursor for project acceptance. The open-source methods and codebase can collectively be called the **FLEXmeter**. The FLEXmeter methods and code will be used for quantifying energy efficiency and demand response impacts and can be used to disaggregate EE and DR impacts as applicable. Background on development of CalTRACK and the OpenEEmeter can be accessed through www.caltrack.org. The GRIDmeter methods and code are available publicly at gridmeter.recurve.com and FLEXmeter tools and code are found at flexvalue.recurve.com. References to technical specifics are provided throughout this M&V plan.

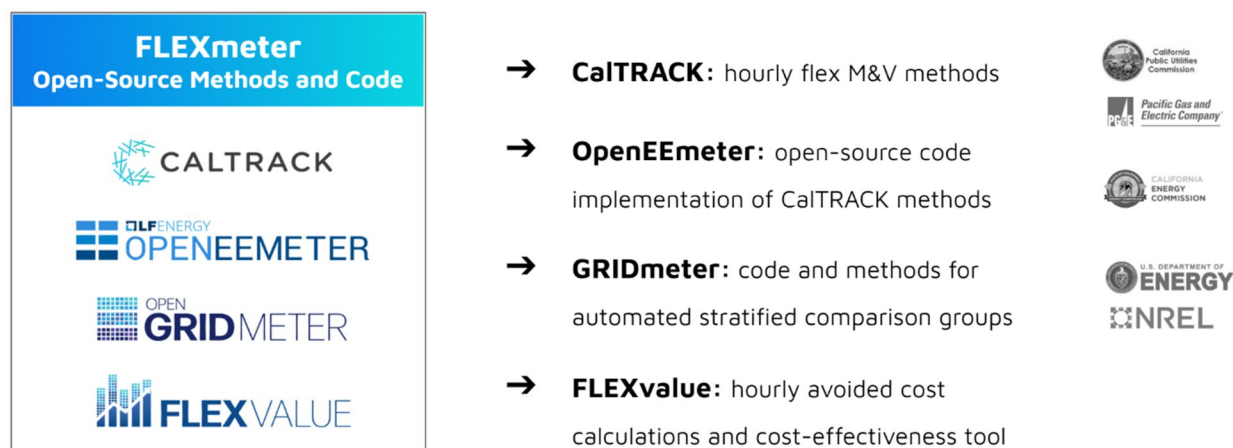


Figure 2: FLEXmeter Methods and Codebase

The CalTRACK methods are based on industry guidelines established by The American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE Guideline 14)³⁴

³² The current v. 2.0 CalTRACK methods documentation and technical appendix are available at <http://docs.caltrack.org/en/latest/methods.html>

³³ The python code base for the OpenEEmeter (eemeter and eeweather) can be downloaded from Github at: <https://github.com/openeemeter>; Code and methods to accommodate special cases like PV, EV, and batteries may be included in updates to openEEmeter.

³⁴ ASHRAE Guideline 14-2014 –Published guideline. Supersedes ASHRAE Guideline 14-2002. Measurement of Energy, Demand and Water Savings <https://www.ashrae.org/technical-resources/standards-and-guidelines/titles-purposes-and-scopes>

and the Uniform Methods Project (Chapter 8 - Whole Building Methods)³⁵ and meet all International Performance Measurement and Verification Protocol (IPMVP Option C³⁶) requirements. These methods are an appropriate match for this program given it is targeting a range of commercial & residential buildings and combination of interventions. Hourly methods have demonstrated appropriate fit based on historic applications and technical review, and discrete project baseline fit review. Additionally, tests conducted by the Efficiency Valuation Organization (EVO) demonstrate that the OpenEEmeter 2.6.0 CalTRACK hourly methods, performs on par with the LBNL Time of Week Temperature (TOWT) model, and comparably with all other models tested, including more complex machine learning models that are based on decision trees and genetic programming.³⁷

Payable savings will be adjusted for free ridership using the approved deemed net to gross ratio of 0.95 for Commercial and 0.85 for Residential Single-Family NMEC. Payable savings will also be adjusted via a comparison group adhering to the protocols and recommendations described in the report *Comparison Groups for the COVID Era and Beyond*.³⁸ The GRIDmeter methods were developed in partnership with the United States Department of Energy and in consultation with a working group of industry experts. Comparison groups are described further below.

The CPUC has specified criteria for "Tools, Methods, Analytical Approaches, and Calculation Software" in the NMEC 2.0 rulebook. FLEXmeter compliance with each of the criteria is provided in Attachment A in table format.

Claimable Savings

Demand FLEXmarket claimable savings will be based on the payable savings (calculated with CalTRACK and the OpenEEmeter), including adjustment for free ridership using the approved deemed net to gross ratio of 0.95 for Commercial NMEC and 0.85 for Single-Family Residential NMEC. The October 12, 2019 DEER Resolution allows for alternative approaches for net adjustment, but, for this program, the traditional application of the net to gross ratio will be combined with the comparison group adjustment to gross savings impacts.³⁹

³⁵ *The Uniform Methods Project: Methods for Determining Energy Efficiency Savings for Specific Measures*, National Renewable Energy Laboratory, <https://www.energy.gov/eere/about-us/ump-protocols>

³⁶ International Performance Measurement & Verification Protocol: Concepts and Options for Determining Energy and Water Savings, Volume I, Revised March 2002 DOE/GO-102002-1554, International Performance Measurement & Verification Protocol Committee <https://evo-world.org/en/products-services-mainmenu-en/protocols/ipmvp>

³⁷ EVO's testing portal <<http://mvportal.evo-world.org/>> allows users to compare Advanced M&V implementations and methods against each other using a single standardized dataset comprised of one year of hourly electricity data and outdoor temperature from 367 buildings from different regions in North America.

³⁸ Report available at: https://gridmeter.recurve.com/uploads/8/6/5/0/8650231/doe_sampling_v2.pdf

³⁹ Resolution E-4952. Approval of the Database for Energy-Efficient Resources updates for 2020 and revised version 2019 in Compliance with D.15-10-028, D.16-08-019, and Resolution E-4818. See p. A-45 for table of NMEC NTG ratios. <http://docs.cpuc.ca.gov/publisheddocs/published/g000/m232/k459/232459122.pdf>

Other fields required for claimed savings include the estimated useful life (EUL), load shape, and costs. These parameters of claimed savings will be handled in accordance with CPUC reporting requirements. Aggregator portfolios of reasonably consistent measures will utilize an EUL matching the primary measure or technology installed in accordance with the requirement outlined in accordance with the requirement outlined in the “Effective Useful Life” section. Savings will be claimed using the actual measured load shape. Actual project costs, including participant contributions and information on the key value drivers, will be collected during program implementation to support savings claims to the CPUC. Savings will be claimed based on forecasted savings and savings load shapes for each project, and after the 12 month measurement period will be revised based on actual measured savings during a “true-up” process.

3. Calculation of Gross and Net Savings

Gross Savings

The basic calculation process for gross savings is conducted in four parts using the FLEXmeter calculation methods after data collection and sufficiency checks (see Data Plan section D. for more detail). The first is establishing the baseline calculation or model fit (see CalTRACK Section 3(b): Modeling - Hourly Methods). The second is normalization of weather and occupancy (section 3.8 and 3.9). The third is computing the results of the avoided energy use (sections 3.10-3.12) and the fourth is the formation of comparison groups and adjustment to savings via the difference of differences calculation (Chapters 3 and 4 of *Comparison Groups for the COVID Era and Beyond*).

Baseline Calculation

The CalTRACK Hourly model draws from 365 days of pre-intervention data in order to deliver a fully specified baseline model for a weather-normalized savings calculation. Customer AML data for a full year prior to program enrollment, customer location (address or latitude/longitude coordinates), initial project intervention date, and blackout period that encompasses the duration of project installation are minimal requirements to fully specify the CalTRACK model and assess savings. Aggregators will report project installation and completion dates in addition to various project metadata, which will enable Recurve to assign baseline, blackout, and reporting periods and to create project cohorts that can be tracked separately.

Normalization for Weather and Other Factors

The CalTRACK Hourly methods normalize for weather and occupancy, as described in detail in section 3.8 and 3.9 of CalTRACK technical documentation.

For occupancy, the sensitivity of building energy use to temperature may vary depending on the “occupancy” status. This is handled by segmenting the hours-of-week into periods of high load and low load (also referred to as occupied/unoccupied,

although the states may not necessarily correspond to specific occupancy changes). The segmentation is accomplished using the residuals of a linear HDD-CDD model fit at an earlier stage.

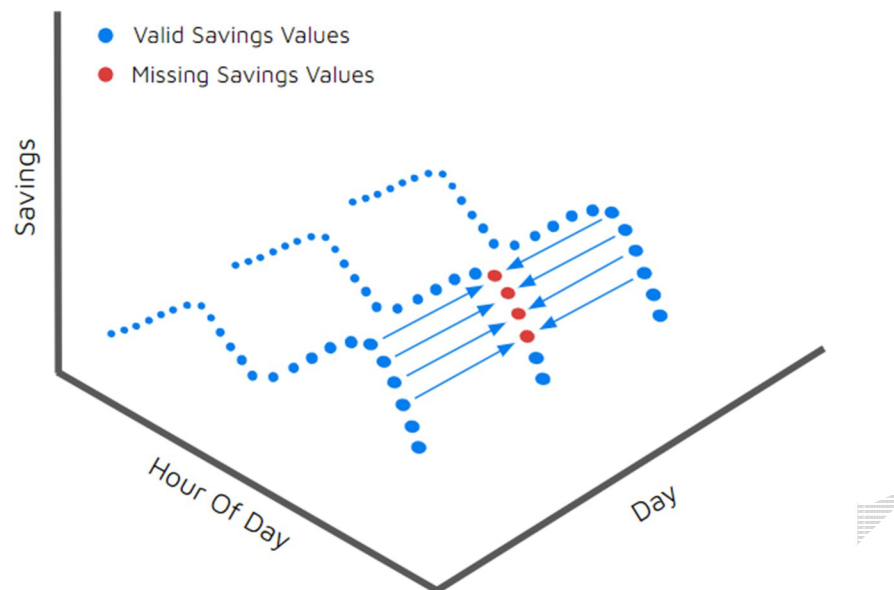
For weather normalization, for each data point (hour) in the baseline dataset, the outdoor dry bulb air temperature is used to calculate up to 7 temperature bins (<30, 30-45, 45-55, 55-65, 65-75, 75-90, >90). These bin endpoints are validated for each model by counting the number of hours with temperatures within these bins. Bins with fewer than 20 hours are combined with the next closest bin by dropping the larger bin endpoint, except for the largest bin, where the lower endpoint is dropped. The 7 valid bin endpoints are then used to develop the binned temperature features.

These methods have been tested and demonstrate that they yield an appropriate model fit for most building types in California (as measured by the coefficient of variation of the root-mean-squared error, CVRMSE).

Interpolation of Missing Savings

Using the savings calculation methods described in this M&V plan, there are still around 2-3% of values missing on average. Missing values occur if the treatment meter or all matched comparison group meters have experienced missing; weather data or observed meter reads. These dropped meter reads have the potential to substantially impact on the payments being made to aggregators.

In the case that there are missing values, Interpolation will be performed via an 8 moving average window that surrounds the missing value and fills them with the average of surrounding days for counterfactual, observed and savings values. For hourly electricity data, the missing hour will be filled with the average of surrounding days for that same hour of day.



Adjusted Gross and Net Savings

For the Demand FLEXmarket, the site-specific gross savings will be adjusted to quantify the relative grid impacts of the program interventions using a comparison group and adjusted for free ridership using a fixed net to gross value. More detail can be found in the demand response disaggregation section. All adjustments will be reflected in the payable savings to aggregators and in the claimable savings to the CPUC.

Comparison groups will be maintained for gross savings adjustments. The same savings calculation as described in the "gross savings" section including method and software will be applied to understand participant and comparison group changes in energy consumption. The calculated incremental impact of the program over the non-participant population will adjust both payable and claimable savings for the portfolio. The adjusted gross savings⁴⁰ will be the difference of differences, calculated on a percentage basis and then applied to the treatment group counterfactual.

Comparison groups used in meter-based programs have the unique challenge of needing to quantify impacts in the midst of implementation as well as address dissimilar responses to exogenous factors, unpredictable exogenous events, and limited data for assigning buildings to cohorts. As such, the comparison group selection process in meter-

⁴⁰ "Adjusted gross" is, in this context, net of other activity on the grid, whereas the final "net" adjustment is considering free ridership alone.

based programs needs to utilize a more standardized and consistent methodology than what might be found in traditional impact evaluations.

The methodological approach that will be used for establishing comparison groups in the Demand FLEXmarket was developed in an intensive, collaborative research project led by Recurve and funded by DOE in the summer of 2020. More detail on the research informing this method is described in a comprehensive working group report funded by the Department of Energy and peer-reviewed by industry leaders.⁴¹ The comparison group analytic approach comports with best practices in the Department of Energy Uniform Methods Project on Estimating Net Savings⁴², and is an evolution of standardized approaches for developing matched comparison groups documented by the Energy Trust of Oregon.⁴³ This method has been expanded to Demand Response applications and is compliant with the FERC-approved tariff for comparison group settlement used by the California Independent System Operator.⁴⁴

Comparison Group Method Synopsis

Comparison group selection can be summarized as follows:

1. Identify program-eligible participants
 - a. The eligibility rules for this program are included in the program plans. These classifications will guide the classification of comparable customers.
2. Limit comparison pool to eligible non-participating customers that meet program requirements.
 - a. Fit a CalTRACK 2.0 model on all eligible program participants prior to program launch. This model will uncover incomplete or missing data as well as erratic energy consumption patterns.
 - b. Remove customers with insufficient baseline data, defined in the CalTRACK methods to be < 328 days for the specification of annual baselines. For the measurement of demand response or seasonal savings shorter baseline periods may be utilized if needed.
 - c. Remove customers with CalTRACK Daily baseline CVRMSE values in excess of 1.0⁴⁵.

⁴¹ *Comparison Groups for the COVID Era and Beyond*, Recurve, 2020

https://gridmeter.recurve.com/uploads/8/6/5/0/8650231/doe_sampling_v2.pdf

⁴² *Chapter 21: Estimating Net Savings – Common Practices* <https://www.nrel.gov/docs/fy17osti/68578.pdf>

⁴³ *Comparison Group Identification for Impact Evaluation*, OpenEE, for Energy Trust of Oregon, 10/2018

<https://www.energytrust.org/documents/open-ee-technical-report-comparison-group-identification-for-impact-evaluation/openee-technical-report-comparison-group-identification-methods-final-wsr/>

⁴⁴ See *Demand Response Advanced Measurement Methodology: Analysis of Open-Source Baseline and Comparison Group Methods to Enable CAISO Demand Response Resource Performance Evaluation*, CAISO -Recurve, 2021

<http://www.caiso.com/Documents/DemandResponseAdvancedMeasurementMethodology.pdf>

⁴⁵ Given the focus on peak savings that can only be measured with an hourly model, there may be a recommendation to incorporate an hourly CVRMSE threshold.

- d. Remove any remaining customers failing to meet program eligibility criteria

3. Selection of Comparison Group from within Sample of Sub-Population

- a. Segment treatment customers by climate zone, solar status, and sector. For the measurement of efficiency savings in the commercial sector also segment customers by business type using NAICS Group mapping as was done in the GRIDmeter report as applicable.
- b. For a comparison pool meter to be sampled into the comparison group for a specific categorical segment of the treatment group, the customer must share all criteria listed in 3.a.
- c. With categorical segmentation completed, conduct individual meter selection on the basis of Euclidean distance (least sum of squares) matching with each treatment meter on the basis of seasonal hour-of-week baseline modeled consumption as described in Chapter 3 of the GRIDmeter report. For shorter-term baselines such as those used to gauge demand response impacts, the Euclidean distance matching may be performed on a single (non-seasonal) modeled hour-of-week basis as described in the CAISO report⁴⁶. For non-residential programs that serve a small number of customers or serve very large customers, the stratified sampling methods also described in chapter 3 of the GRIDmeter report may be more appropriate and thus utilized as applicable.

4. Creation of Comparison Group Vintages and Difference of Differences

- a. Once a comparison group has been created, the baseline period of the comparison group must be aligned temporally with the baseline period of the participating customers.
- b. Where programs enroll customers over a period of time longer than 30 days, the comparison group savings calculation must be rebaselined for each month of enrollment and a new vintage created that is assigned to a monthly cohort of enrolled participants.
- c. For each monthly cohort of participants, calculate a difference of differences of percentage savings between the treated customers and the associated vintage of the comparison group.

⁴⁶ See *Demand Response Advanced Measurement Methodology: Analysis of Open-Source Baseline and Comparison Group Methods to Enable CAISO Demand Response Resource Performance Evaluation*, CAISO -Recurve, 2021
<http://www.caiso.com/Documents/DemandResponseAdvancedMeasurementMethodology.pdf>

- d. The fractional difference of differences is then multiplied by the treatment group counterfactual on an aggregated basis for each segment established in 3a. More detail is provided in Chapter 4 of the GRIDmeter⁴⁷ report on conducting the difference of differences savings calculations as well as in the CAISO report.

For payable and claimable net savings, Recurve will apply 0.95 default net to gross ratio for Commercial and 0.85 default net to gross ratio for Single-Family Residential NMEC programs as specified in the October 12, 2019 DEER Resolution⁴⁸ to account for free ridership.

Outlier Site & Non-Routine Event Identification

This section of the M&V plan augments generic qualification criteria for participants with specific considerations regarding project eligibility criteria, screening, and handling of non-routine events to ensure that the savings from the program are reflective of the impacts of the program intervention.⁴⁹ The process includes pre-screening, event detection, and handling adjustments as described in the sections below. The following diagram illustrates the 4 step process:

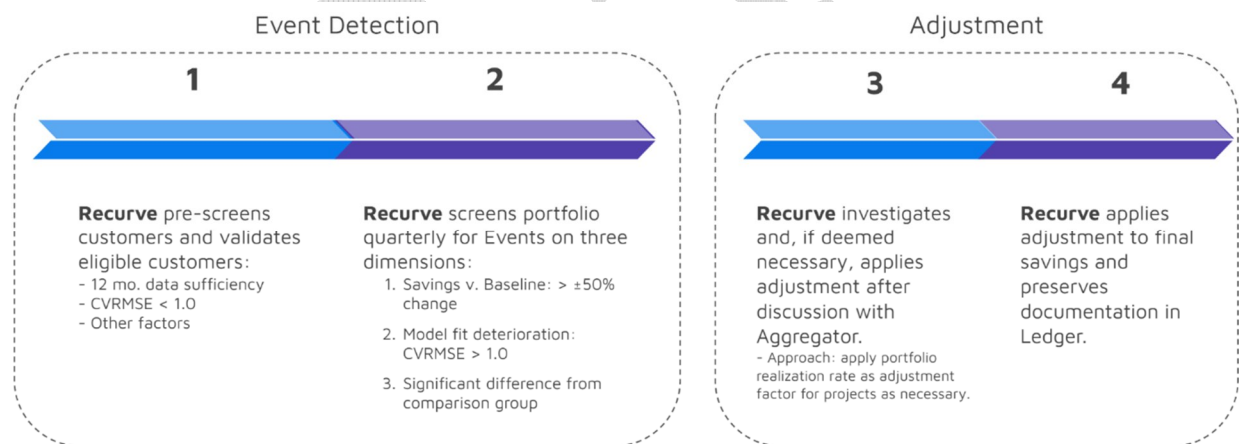


Figure 4: Eligibility Criteria and Screening

Eligibility Criteria and Screening

⁴⁷ *Comparison Groups for the COVID Era and Beyond*, Recurve, 2020

https://gridmeter.recurve.com/uploads/8/6/5/0/8650231/doe_sampling_v2.pdf

⁴⁸ Resolution E-4952. Approval of the Database for Energy-Efficient Resources updates for 2020 and revised version 2019 in Compliance with D.15-10-028, D.16-08-019, and Resolution E-4818. See p. A-45 for table of NMEC NTG ratios.

<http://docs.cpuc.ca.gov/publisheddocs/published/q000/m232/k459/232459122.pdf>

⁴⁹ This approach is preliminary and any adjustment to it will be made in consultation with the Market Sponsor (Program Administrator)

STEP 1. As described above, Recurve will utilize CalTRACK modeling to pre-screen the population to identify qualifying customers that have data sufficiency and baseline model fit, which will ensure savings are measurable in the performance period. Customers who experience a baseline non-routine event or erratic energy consumption that exceeds the prescribed threshold during the baseline period may be excluded from the program. Some scenarios in which they may remain include:

- (i) the impacted metered consumption can be excluded from the analysis without violating minimum data sufficiency standards.
- (ii) the NRE can be adequately controlled by comparing customer energy consumption to a matched nonparticipant comparison group. Aggregators will be able to check potential projects against this pre-screened list.
- (iii) the NRE is determined to not materially impact the project and portfolio savings.

In the process of customer acquisition, aggregators will verify with customers that they do not plan to install major new load additions or subtractions, solar PV, or EV charging in the reporting year (post-program implementation). In addition, aggregators will work with Recurve and PCE to ensure that customers are not participating in another energy efficiency program, have not installed an EV charging system, or solar PV or battery storage within the baseline year. PCE will be responsible for providing past energy efficiency program participation data to ensure accurate monthly program forecasting. If data is not provided in a timely fashion and sites are enrolled that have participated within the previous year, project reservations, tracking, and payments to aggregators will be maintained.

Non-Routine Events and Treatment

STEP 2. Once projects have been initiated, Recurve shall regularly conduct screening of all projects in the aggregators' portfolios for possible non-routine events in three dimensions:

- **Savings relative to comparison group-adjusted counterfactual consumption:** Recalculate savings as a percentage of comparison group-adjusted counterfactual consumption for all participating projects on a quarterly basis. Flag any projects with savings exceeding ± 50 percent annual savings.
- **Deterioration in normalization model goodness of fit:** Fit CalTRACK model to the Year 1 post-retrofit consumption data and recalculate CVRMSE, prior to a savings claim. If the Year 1 model has a CVRMSE of greater than 1.0, then the Project will be flagged as a non-routine event.

- **Significant difference from comparison group:** If a treatment site does not have a sufficient comparison group to adjust for exogenous impacts, the Project will be flagged as a non-routine event.

STEP 3 & 4. If it has been determined that metered savings results are invalid, for instance due to the project being flagged as a savings outlier, insufficient reporting period data, or poor (CVRMSE > 1) reporting period CalTRACK daily model fit, the project savings will be estimated using a consistent adjustment applied uniformly to all disqualified projects. Assigned savings values will be based on the average savings or realization rate for the other qualified projects in the aggregators' portfolio.⁵⁰ Assigned savings for disqualified projects will be applied on a monthly basis and paid out on an ongoing quarterly basis by applying the current aggregator portfolio realization rate at the time of savings calculation. Aggregators whose entire portfolios are subject to an NRE, or assigned savings, will not receive ongoing assigned savings but rather a single payment at the end of the project's 12-month performance period; at that time, the assigned savings payment will be calculated by applying the Program Portfolio's current realization rate to the projects forecasted savings.

Aggregator Self-Reported NRE Notification

The Aggregator is required to notify the Lead Implementer of any situation in which a building enrolled in the Program has a non-program related material change in energy usage, or an NRE. Examples of NREs may include material changes in the following:

- Changes to building size;
- Additions of heating and cooling loads in the building;
- Addition of load such as computers or data processing equipment;
- Longer, or shorter operating hours, or material schedule changes; and/or
- Changes in building usage such as converting lab space to office space.

The Aggregator shall notify the Lead Implementer of NREs as soon as supporting information can be assembled and submitted. For all NREs, Aggregators shall submit to the Lead Implementer a detailed narrative describing the changes that occurred and the duration of the NRE including the following:

- Describe the change and its impact on energy usage;
- Identify the date the change occurred and expected length;
- Describe the systems that are likely impacted by the change;
- If changing equipment, either adding or subtracting, note the load (kW) of the existing equipment, and the new equipment, if appropriate.

⁵⁰ If an entire aggregator's portfolio is subject to an NRE, the aggregator's portfolio will receive the program's realization rate at the time of Program Portfolio maturity and the aggregator's participation will be reviewed.

$$\text{Estimated Savings} = \text{Realization Rate} * \text{Predicted Annual Project Savings}$$

Where:

Estimated Savings = Annual non-routine-adjusted savings to calculate performance payments

Realization Rate = Aggregators total portfolio actual savings divided by total predicted portfolio savings;

$$\Sigma S / \Sigma P$$

Where:

S = Actual annual project savings in kWh or therms as calculated in Recurve platform

P = Predicted annual project savings in kWh or therms as reported by the Aggregator during Project submission to Recurve, aligned with the load shape forecasted for the purposes of determining project value.

This standard approach for the identification and treatment of non-routine events will be included as part of an aggregator's contract with Recurve. Systematic and predictable treatment of non-routine events tied to overall portfolio performance to manage risk comports with the Population-NMEC expectation of consistent calculations and treatment of projects across the portfolio. Any custom calculations for non-routine adjustments will be reviewed and approved in collaboration with the market sponsor for this program.

4. Hourly Load Shape and Peak Impact Calculations

CalTRACK V.2.0 hourly methods quantify savings for each hour in the reporting period. The GRIDmeter methods adjust these results for exogenous factors also at an hourly level. The hourly tracking of savings enables valuation of savings and marginal greenhouse gas (GHG) impacts.^{51,52} For gas savings, if applicable, the CalTRACK V.2.0 Daily methods will

⁵¹ A careful study of the CPUC's 2019 Avoided Cost Calculator reveals that over-generation and renewables curtailment is forecast for 25% of all hours in 2025 with the majority of these hours occurring during mid-day time periods and mild shoulder months.

⁵² Golden, M., A. Scheer and C. Best. 2019. "Decarbonization of Electricity Requires Market-Based Demand Flexibility". The Electricity Journal. Vol 32. Issue 7 (August-September).

be used and comparison adjustments and non-routine event tracking and adjustments will be made as described above.⁵³

At this time, actual load shape impacts cannot be reported to the CPUC via CEDARS - Cost-Effectiveness Tool.⁵⁴ Deemed load shapes or proportional deemed load shapes are used to mirror the impacts of meter-based programs. For the Demand FLEXmarket, actual load shapes will be submitted through FLEXvalue. If actual load shapes are not accepted, a proportional multi-deemed load shape that is the closest reflection of the actual load shape achieved by the program may be used.

Peak impact calculations will leverage the hourly data to estimate the peak impacts achieved by the program during the peak periods defined in the October 11, 2019, DEER Resolution.⁵⁵ Timing of peak load is 4:00 p.m. to 9:00 p.m. over a three consecutive weekday “heatwave” that occurs between June 1st and September 30th, does not include weekends or holidays, has the highest value for the sum of the average temperature over the three-day period, plus the average temperature from noon to 6 p.m. over the three day period, plus the peak temperature over the three-day period.

5. Data Collection

Data Security

Data security and customer privacy are paramount for effective, trustworthy customer programs. Recurve has implemented rigorous data security procedures and protocols at every step of data transfer, analysis, and reporting for handling AML data and customer information. Recurve data tools and systems are built on modern industry standards and have undergone the auditing process to achieve SOC 2 compliance, which ensures best in class security and data management practices that meet the required “trust service principles” as defined by the AICPA. Security agreements with PCE and aggregators are available to the CPUC upon request.

Data Collection

The availability and quality of hourly consumption data for proper baselines is fundamental to identifying and qualifying NMEC program participants. CalTRACK details necessary data and sufficiency requirements for the establishment of appropriate baselines in [Section 2. Data Management](#).

Aggregators will collect the site and meter information required for proper weather station matching project start and end dates needed for the identification of baseline,

⁵³ Gas data is generally available but hourly gas data is only available in part of the state.

⁵⁴ Recurve is hopeful functionality to submit actual load shapes will be available by the time savings can be reported for this program.

⁵⁵ <http://docs.cpuc.ca.gov/publisheddocs/published/g000/m232/k459/232459122.pdf>

blackout, and reporting periods to meet the CalTRACK with the specification. Aggregators will collect relevant project and site metadata as specified in the aggregator's Flexibility Purchase Agreement. These data will include participant, location, meter id, date of installation, technology installed, and project costs. Any or all of these data will be utilized for more granular cohort (program subgroup) tracking and management and could be used to facilitate future EM&V studies.

For developing a comparison group, a sample of non-participant customers will be identified to perform accurate matching and comprise a reliable comparison group from non-participant data.

Data must be delivered in a clean readable format. Any duplicated data will be thrown out. Any overlaps in meter datasets will resolve to the dataset with the largest time period.

6. Monitoring and Documentation QA/QC Over Reporting Period

The CalTRACK modeling process specifies quality assurance and quality control procedures. Recurve will maintain quality data management and monitoring throughout the program life to ensure the reporting period results generate an accurate representation of the savings impacts. As part of this M&V plan, Recurve will provide a fully auditable and verifiable record to track each meter that is modeled and its fate over the course of the program.

7. M&V Related Plans for Project Types, Design, Payments, Measures and Cost Effectiveness

Permissible Project Types

As noted in the implementation plan, the Demand FLEXmarket may consist of several aggregators targeting a range of measures. For any given aggregator, participating customers are reasonably expected to have similar types of equipment and drivers in energy consumption. During the aggregator qualification process, Recurve will ensure that factors that impact consumption and energy savings will be relatively similar across the population.

In addition, the Demand FLEXmarket will leverage insights from multiple recent studies^{56,57,58,59} which have shown that recruiting customers based on insights from AMI data analytics can effectively identify stranded potential and substantially enhance the metered savings and cost-effectiveness of energy efficiency programs. These analyses

⁵⁶ *Customer Targeting for Residential Energy Efficiency Programs: Enhancing Electricity Savings at the Meter*, A.M. Scheer, S. Borgeson, K. Rosendo, 2017

⁵⁷ *Energy Efficiency Program Targeting: Using AMI Data Analysis to Improve At-the-Meter Savings for Small and Medium Businesses*, S. Borgeson, A.M. Scheer, R. Kasman et. al. 2018

⁵⁸ *Customer Targeting via Usage Data Analytics to Enhance Metered Savings*, 2018 ACEEE Summer Study, A.M. Scheer, S. Borgeson, R. Kasman et al.

⁵⁹ PG&E's Energy Efficiency Business Plan 2018 – 2025, Residential Appendix D

will be conducted by Recurve in partnership with qualified aggregators to find populations that may have similar characteristics of usage prior to intervention and that will be predictive of impacts of the intervention.

8. Program Design Criteria and Fractional Savings Uncertainty (FSU)

Program Design Criteria

The Demand FLEXmarket has been designed to meet the CPUC criteria for population-level NMEC programs. Recurve is currently forecasting over 5,000 projects in PCE's service area that encompass lighting, HVAC, water heating, building envelope, controls, and refrigeration. The program will be measuring FSU for this program portfolio, and based on past program experience with this number of projects and savings depth, the program does not foresee any issue in remaining below the 25% guideline for Population NMEC.

Fractional Savings Uncertainty

Calculation of FSU used in this plan complies with industry best practice and specifically reflects Section 4.3 of the CalTRACK methods. The two key metrics for uncertainty are the Coefficient of Variation of the Root Mean Square Error (CVRMSE) and Fractional Savings Uncertainty (FSU). The FSU depends on a number of interactive factors, several of which have non-linear dependencies. In general, driving deeper savings, recruiting customers with good model fit, and serving a large number of customers will improve FSU at a given confidence interval. FSU at an individual site level is defined by the following equation:

$$FSU_i = \frac{\Delta U_{save,Qi}}{U_{save,Qi}} = \frac{t(aM^2 + bM + d)CV(RMSE) * \sqrt{\frac{P}{P'}(1 + \frac{2}{P'})\frac{1}{Q}}}{F}$$

where

t is the t-statistic and a, b, and d are empirical coefficients described further in the online CalTRACK documentation

M is the number of months in the reporting period

Q is the number of periods in the reporting period (days or billing periods for example)

F is the savings fraction defined as the savings divided by the counterfactual baseline usage

CVRMSE is the coefficient of variation of the root-mean-squared error and provides a measurement of the quality of model fit (lower CVRMSE equates to better model fit) and is defined as follows:

$$CV(RMSE) = \frac{\sqrt{\frac{\sum_{p=1}^P (U_p - \hat{U}_p)^2}{P-c}}}{\bar{U}}$$

where

U_p is the total energy use during period P

$\hat{U}_p$ is the predicted energy use during period p

$\bar{U}$ is the mean energy use during the baseline period

P is the total number of periods

c is the number of explanatory variables in the model

Fractional savings uncertainty at an aggregated (portfolio) level is calculated via the following equation:

$$FSU_{portfolio} = \frac{\sqrt{\sum_{i=1}^N (\Delta U_{save, Qi})^2}}{\sum_{i=1}^N U_{save, Qi}}$$

For the Demand FLEXmarket, the CalTRACK methods described above were applied to a sample of buildings similar to those that are likely to be targeted as part of the program. Assumptions about the forecasted average savings and savings depth as a percentage of the baseline were derived from past project experience and combinations of DEER technology savings and load shapes (lighting, HVAC, water heating, building envelope, controls, and refrigeration) that will be deployed as part of the program. Recurve has estimated the rough number of projects needed to capture savings under projected budgets; and discrete business plans from Aggregators will further refine these estimates.

The CalTRACK methods model each site individually before aggregating to the portfolio level with savings uncertainty reported as a first-class output. Savings uncertainty, as opposed to savings depth, is the ultimate parameter of concern (e.g. savings of 4+/-1% may be acceptable, but savings of 10+/-3% may be unacceptable). Aggregating results to a portfolio mitigates issues related to model noise and increases confidence in savings estimates. An extensive discussion of model uncertainty is included in CalTRACK documentation and was leveraged for this analysis.⁶⁰

⁶⁰ See CalTRACK issue: <https://github.com/energy-market-methods/caltrack/issues/71>.

Based on assumptions, if the Demand FLEXmarket is able to achieve the forecasted installations of the planned technologies, and achieve the forecasted average savings, FSU will fall well within the bounds of the CPUC requirements. Recurve expects to achieve the CPUC's stated desired FSU of +/- 25% at the 90% confidence level by recruiting a sufficient number of projects, supporting aggregators in recruiting customers with a reasonable CVRMSE (generally less than 0.75), monitoring savings for a sufficient number of days (FSU will be calculated with the CalTRACK daily model), and delivering a reasonable savings depth measured from existing conditions baseline.

Payments and Incentives

Aggregators are eligible for an upfront incentive payment of 20% of the forecasted aggregator incentive for installed commercial projects⁶¹ and 50% of the forecasted grid value for installed residential projects. The remaining incentive depends on the performance of their portfolio. There are no predetermined customer payments or rebates set by the program- customer rebates are determined by participating aggregators, and are expected to be variable depending on business models, cost of service etc. Aggregators will be required to report any incentive payments passed on to the customer. This payment structure is designed to incentivize maximum performance around net benefits, as well as peak and net-peak impacts. The incentive payment is designed to pay directly on the value of delivered metered net savings.

In calculating the net benefits (avoided costs), Recurve will take the full measured 8,760 electric savings resource curve and multiply by the appropriate hourly avoided cost profile of the CPUC's Electric Avoided Cost Calculator (ACC) for the duration of the Effective Useful Life of the measure.

However, for the purposes of program payment, a smoothing process for generation capacity, transmission, and distribution values will be applied as follows:

- Evenly distribute the average gross peak values across gross peak hours (4-7 PM)
- Evenly distribute the average net peak values across net peak hours (7-9 PM)
- Evenly distribute the average off-peak values across the off-peak hours.

The purpose of this smoothing process is to account for sporadic capacity peaks distributed throughout the original avoided cost curve. As illustrated in the figure below, the majority of capacity value is concentrated in a small number of days throughout the year. While this may be logical to facilitate simulations, it creates enormous risk to aggregators and creates the potential for gaming. Since actual critical peak demand days are unknown ahead of time, the programmatic approach is to take the gross and net peak capacity value and distribute it evenly across gross and net peak hours. This provides a more consistent price curve and value signal for program participants to plan

⁶¹ Upfront incentives are capped at \$40,000. An aggregator with a project with a forecasted value of greater than \$200,000 must submit the project with ICP certification to receive an upfront incentive beyond \$40,000.

around while staying anchored within the original avoided cost curve. Throughout this smoothing process, the “total 8760 value” of the avoided cost curve is kept completely consistent.

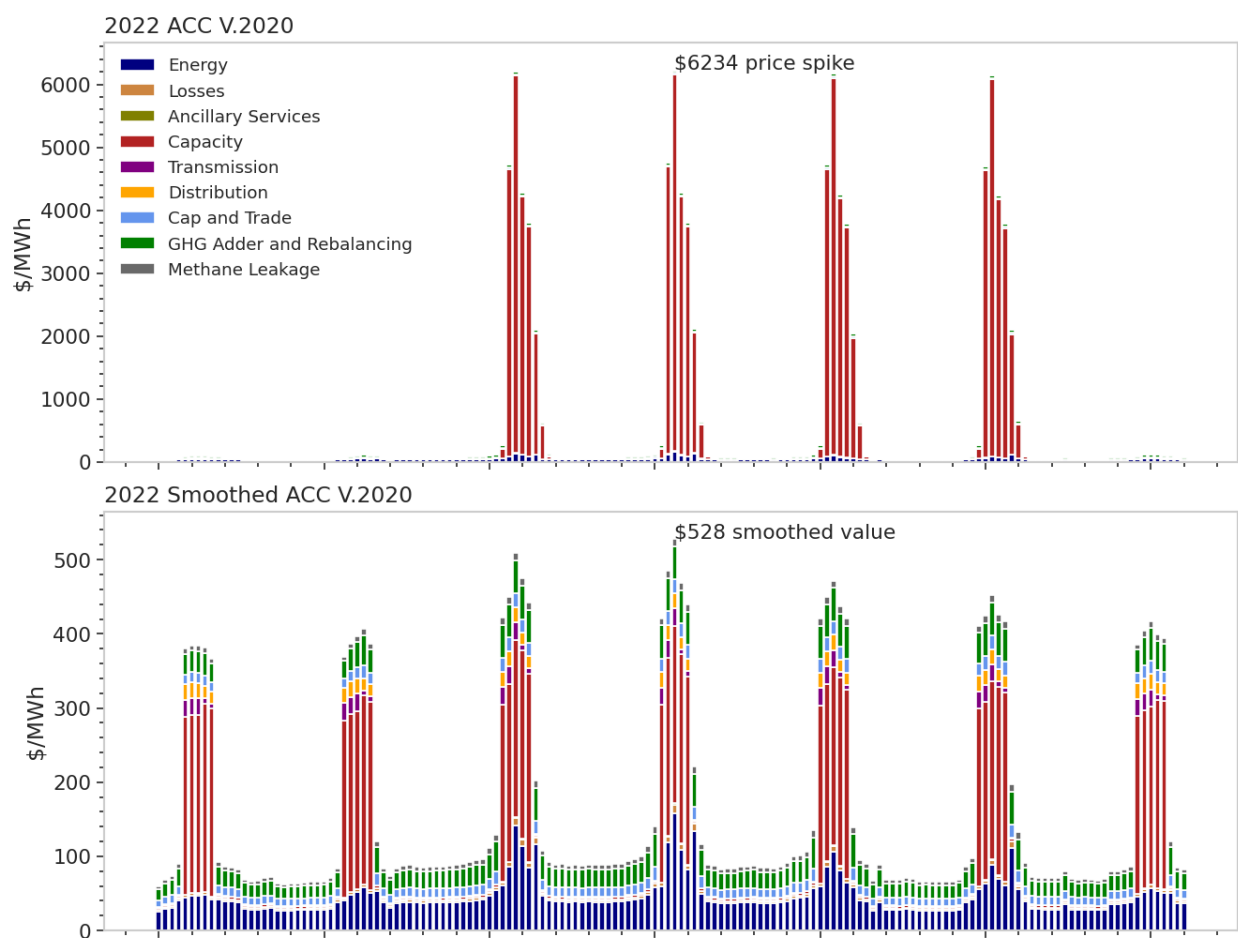


Figure 4: Smoothing Capacity Value

The gas benefits will be paid based on the lifetime therm savings based on the measured annual savings, effective useful life, and the forecasted value per therm. The forecasted therms value is derived from the CPUC's Gas Avoided Cost Calculator.

For this program, the hourly avoided cost profile is adjusted as described below to provide a more accurate TSB value where measured savings are aligned to the correct Hour of Year on the ACC.

The ACC used with FLEXValue tend to align with weekdays of all years such that the first day of each year is the same day. For example, in the 2020 California Avoided Cost Calculator, January 1, 2020 was a Wednesday. This means that all subsequent years in the ACC are all modeled as if they start on a Wednesday.

In measured savings, we have real savings that occur on a real date (for example January 1st, 2021). To properly match the days of the week of the ACC to the actual day savings occurred, the ACC is shifted to the hour of year based on the year that the savings were measured, depicted below.

First Day of Year			
Year	First Day of Year	to Align To	Hour of Year Shift
2021	Friday	Wednesday	-48

Hour of Year (Real Life)	Year (Real Life)	Hour of Year Shift	Wednesday Aligned Hour of Year
0	2021	-48	8712
1	2021	-48	8713
2	2021	-48	8714
3	2021	-48	8715
4	2021	-48	8716
5	2021	-48	8717
...	...	...	...
8754	2021	-48	8706
8755	2021	-48	8707
8756	2021	-48	8708
8757	2021	-48	8709
8758	2021	-48	8710
8759	2021	-48	8711

Savings are essentially shifted 48 hours "backwards", wrapping around at the end of the year.

Most projects in the Commercial Efficiency Market are tracked across multiple calendar years. For example, a project that completed January 1, 2021 will have measured savings spanning both 2021 and 2022, but these years have different ACC Hour of Year shift requirements.

An illustration of this is below:

First Day of Year			
Year	First Day of Year	to Align To	Hour of Year Shift
2021	Friday	Wednesday	-48
2022	Saturday	Wednesday	-72

Hour of Year (Real Life)	Year (Real Life)	Hour of Year Shift	Wednesday Aligned Hour of Year	
72	2021	-48	24	Hours 0-23 never assigned
73	2021	-48	25	
74	2021	-48	26	
...	...	...	...	
8736	2021	-48	8688	24 Hours (8688-8711) Assigned Twice
8737	2021	-48	8689	
8738	2021	-48	8690	
...	...	...	...	
0	2022	-72	8688	
1	2022	-72	8689	
2	2022	-72	8690	
...	...	...	...	

Shifting across multiple years results in:

- 24 hours that are not assigned to any “Wednesday aligned” Hour of Year.
- 24 hours that are duplicative, assigned to the same “Wednesday aligned” Hour of Year.
- The gap/duplication comes from the delta between the hour of year shifts (i.e. $72 - 48 = 24$)

Recurve's Metering+ software allows the duplicate/dropped assignments to happen, and after FLEXValue runs, it realigns the hourly value outputs back to the real life hour of years.

For duplicate hour of year assignments, we store savings for each real life hour such that we can disaggregate value back to real life hours after FLEXValue has ran.

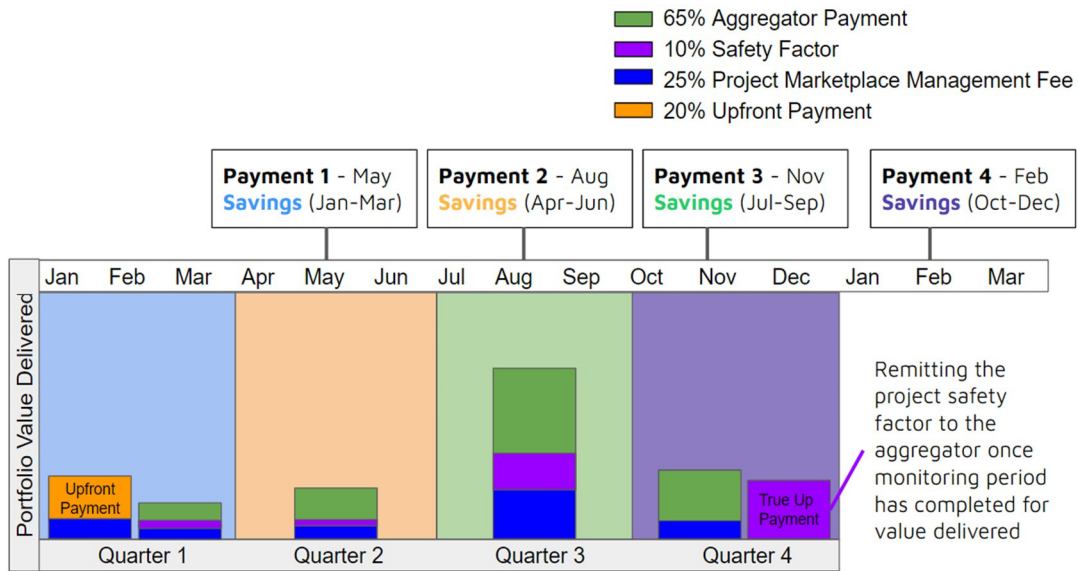
PCE payments for this population-level program will be made based on payable savings determinations using NMEC methods described in the gross and net sections of this plan.

Payments for the program will be made quarterly during the 12-month measurement period for active projects in the aggregator portfolio. The quarterly measurement periods are fixed before program start, and aggregators will be paid based on portfolio savings for active projects during the measurement period.

The quarterly incentive payment is based on the total program value (adjusted avoided cost benefits as described above) net of market management costs and non-energy private investment. Marketplace management costs include general and administrative (G&A) overhead, direct implementation non-incentive (DINI), M&V, and marketing, education and outreach. These management costs account for 25% of the total program budget. Aggregators will be paid for their portfolio value achieved based on metered savings from active projects achieved during the most recent measurement quarter. The Aggregator is not eligible for a quarterly incentive payment if the net benefits from their portfolio does not exceed the upfront payments. Portfolios become "active for payment" after the value generated exceeds the upfront incentives paid and associated marketplace management costs. Payments will be made at fixed quarterly intervals established in the program manual and are based on each aggregator's project portfolio that is "active for payment". Payments will be made based on the latest data received at the time of measurement, and payment for missing time periods of data will move to the following payment cycle. Once data is received for the end of the monitoring of the market, no further updates to measurements will occur.

In addition, a Safety Factor is withheld each quarter to provide a buffer in regard to seasonality and/or portfolio performance. As the portfolio completes the full 12 month measurement period, aggregators are compensated with a "true-up" payment in the following quarterly payment cycle that will release owed funds. The safety factor defaults at 10% of measured portfolio value. At the end of the portfolio year, each aggregators' Safety Factor will be re-evaluated based on the performance of their portfolio relative to their forecast (realization rate). A visualization of payment cadences and safety factor evaluation is shown in the figures below.

Commercial:



Residential:

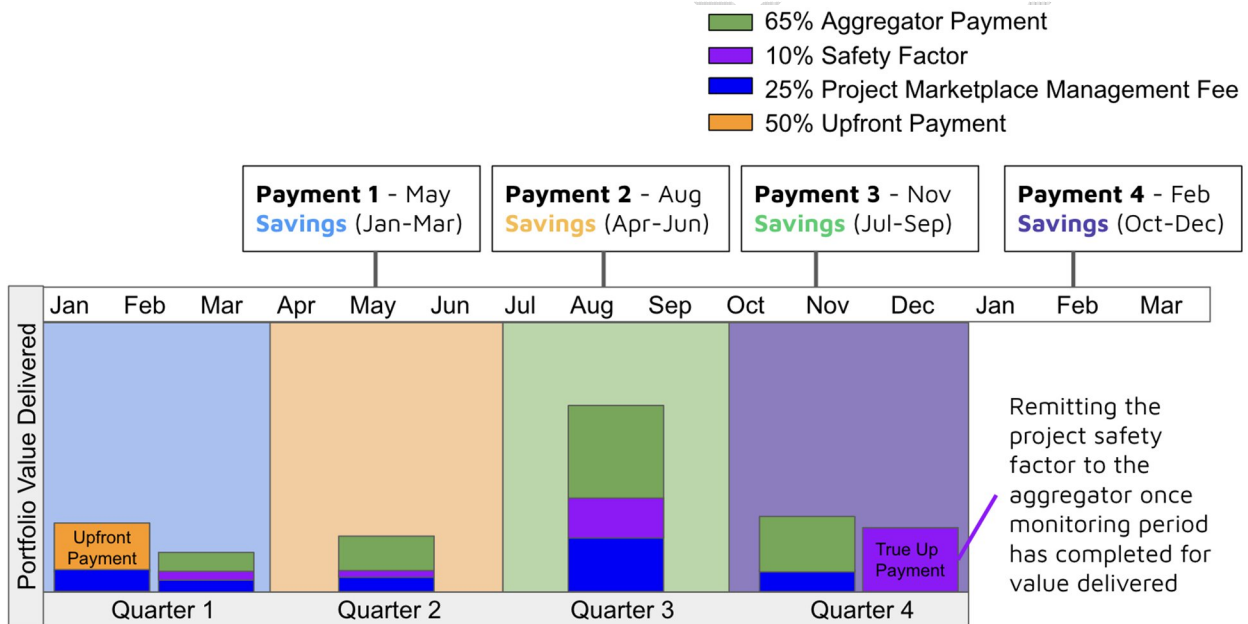


Figure 7: Aggregator Payments Based on Active Projects within the Measurement Period

Aggregators with realization rates less than 30% will be evaluated regarding their participation in the next year of the Market. This evaluation may impact the Safety Factor applied as well as the Aggregator's eligibility for Upfront Payments.

Recurve will document in an electronic, revenue-grade, auditable ledger the recommended payments to support aggregator invoices to PCE after each quarterly measurement period. The electronic ledger will track all stages of an NMEC project in a program, including non-routine adjustments. Invoice payment recommendations will be based on CalTRACK payable savings results. Claimable results to the CPUC will be derived from the ledger for compliance with reporting requirements.

Payments for eligible projects involving solar in the baseline or reporting year will only be eligible for an annual payment, further described in the eligibility section below.

Qualifying Measures

The Demand FLEXmarket will promote a wide range of measures including, but is not limited to, the following interventions: lighting, HVAC, water heating, building envelope, refrigeration, and controls-based technologies. The types of measures that are installed will be documented in the course of program deployment and be included in the metadata (see Data Collection section).

Projects with a primary anchor measure of controls or behavioral interventions will default to a 1-year EUL (with an option for re-enrollment) unless otherwise supported with documentation such as work papers or eTRM data (see the "Effective Useful Life" section of the M&V plan for more detail). Solar PV and other electricity generation are not eligible for incentives from the Demand FLEXmarket.

Cost Effectiveness

The Demand FLEXmarket was designed for compliance with all of the Commission's current cost-effectiveness rules. All data needed to calculate cost-effectiveness for this program are included in this plan.

9. Eligibility Criteria

See Section b. Calculation of Gross and Net Savings/Eligibility Criteria and Screening

Recurve will utilize CalTRACK modeling to qualify customers based on data sufficiency and baseline model fit in addition to other usage characteristics.⁶²

General customer eligibility requirements include but are not limited to:

- Commercial site or Residential customer (single-family);
- Project site must be located in PCE's service area;⁶³
- Unbundled (i.e., receiving electric generation service from PCE) customer;

⁶² Project qualifications based on data sufficiency and model fit may only apply to the type of savings being measured (electric or gas).

⁶³ <https://www.PCEcleanenergy.org/member-communities/>

- Site is not currently participating, and has not participated in the past 12 months, in a CPUC ratepayer-funded energy efficiency program;
- 12 consecutive months of energy usage data is available;
- Model fit needs to be < 1.0 Coefficient of the Variation of the Root Mean Square Error (CVRMSE) and site must pass CalTRACK data sufficiency analysis (Recurve will conduct analysis at intake);
- If the customer has an onsite solar system, installation of the system must have been completed at least 12 months prior to the EE intervention.
- Projects can only enroll in the Market if they were installed and completed following the Program's elect to administer date.
- Qualifying residential projects subject to cost-effectiveness requirements set forth by the Program
- Commercial and Residential projects must be installed and project completion paperwork submitted to Recurve by no later than April 30, 2025

Aggregators will verify with customers that they do not plan to install major new load additions or subtractions, solar PV, or EV charging in the reporting year (post-program implementation). In addition, Recurve will assess if a site has participated in another energy efficiency program, installed an EV charging system, or installed solar PV or battery storage within the baseline year. Past program participation data will be used as received to ensure that savings claims will not be duplicated for measures by cross-referencing known participants in other programs and not allowing them to participate. If data is not provided in a timely fashion and sites are enrolled that have participated within the previous year, project reservations, tracking, and payments to aggregators will be maintained.

Customer sites with existing solar installations within the baseline period are ineligible for participation in the Market due to solar generation's temperature independence. However, the Market will allow aggregators to enroll sites in the program at a future date to be announced with 30 days of notice to aggregators, and provided certain minimum criteria are met, including but not exclusive to:

1. Aggregator will take the risk of site eligibility until after the project is paid and the impacts analyzed.
2. Aggregator must provide submeter from the PV system for the baseline and reporting years in the format the Market specifies to assess impacts.
3. The Demand FLEXmarket aggregator completes the onboarding process for submeter data submittal, demonstrating ability to provide the Demand FLEXmarket program with submeter data required in the specified format. This must be completed before any sites with solar installations are enrolled.

Sites with PV generation will only be eligible for an annual payment within four months of final data receipt from both the meter data from PCE and the PV submeter data from the Aggregator in the specified format.

In addition, solar PV and other electricity generation are not eligible for incentives from the Demand FLEXmarket. If a PV system or other generation capacity is installed/activated as part of an on-site intervention, the aggregator must adhere to the conditions listed above and must include a peak load reduction component, such as battery storage or efficiency upgrades.

Tracking grid impacts from a battery-system submeter, based on the charge/discharge of the system is currently ineligible for participation in the Market. However, given the state of emergency, the Market will allow aggregators to enroll battery submeters in the program at a future date to be announced with 30 days of notice to aggregators, and provided minimum criteria are met, including but not exclusive to:

1. Storage system must have been installed after January 1st, 2018
2. Aggregator must provide submeter data from the storage in the format the Market specifies for the period required by the Market administrator.
3. Aggregator completes the onboarding process for submeter data submittal, demonstrating ability to provide the program with submeter data required in the specified format. This must be completed before any sites with storage installations are enrolled.

Sites tracking against the charge/discharge of the battery system as opposed to the whole-building analysis of CalTRACK will only eligible for an annual payment after final data receipt of both the meter data from MCE and the battery submeter data from the aggregator in the specified format.

Projects consisting solely of 1-year (or less) EUL controls or behavioral measures will be eligible to re-enroll in the program for up to 2 additional years while utilizing the counterfactual model developed upon the date of initial enrollment and has otherwise maintained eligibility and data sufficiency status. The number of years for re-enrollment while utilizing the existing counterfactual model may be expanded in future plans.

10. Effective Useful Life (EUL)

The FLEXmarket includes, but is not limited to, the following interventions: lighting, HVAC, water heating, building envelope, refrigeration, and controls-based technologies. The measures listed in the following table will be utilized to assign EUL values to primary and secondary measures for each project as applicable. The EULs listed combined with the default DEER loadshapes (based on past program claims) will be used to calculate the Forecasted Program Value for submitted interventions and for savings claims. The program is technology agnostic and a wide array of measures may be installed to meet

the savings and demand impact targets. Primary and secondary anchor measures are identified and appropriate EULs will be applied as part of the final claimable savings calculations. This table is the list of EULs and savings load shapes that are used for primary and secondary anchor measures for this program. This table is based on best available research from eTRM measure packages and 2020 program claims. Default load shapes are used for forecasting purposes only. The tables below shall be referenced for all primary and secondary measure EULs. If the proposed primary or secondary measure does not conform into one of the categories listed, then a justification for another EUL or Load Shapes may be submitted to the program for review in the form of CPUC approved work papers or eTRM data. All EULs will be reviewed and confirmed by Recurve during project enrollment.

Technology / Intervention	Sector	Effective Useful Life	Default DEER Load Shape for Forecasting
Lighting	Com	12	DEER: NonRes_Indoor_CFL_Ltg
HVAC Retrofit	Com	15	DEER: NonRes_HVAC_Split_Package_AC
Heat Pump Retrofit	Com	15	DEER: NonRes_HVAC_Split_Package_HP
HVAC Maintenance	Com	3	DEER:HVAC_Split-Package_AC
Chillers	Com	20	DEER:NonRes_HVAC_Chillers
Refrigeration	Com	12	DEER: NonRes_HVAC_Chillers
Building Envelope	Com	20	DEER:NonRes_HVAC_Split_Package_AC
Pumps/Motors/Drives	Com	15	DEER: NonRes_Indoor_CFL_Ltg
Storage Water Heater	Com	15	DEER: NonRes_Indoor_CFL_Ltg
Heat Pump Water Heater	Com	10	DEER: NonRes_Indoor_CFL_Ltg
Controls or Behavior		Default is 1-year EUL unless otherwise supported through	By default match the

Based Interventions (Including Storage)	Com	work papers or eTRM data and approved by market sponsor. (Eligible for re-enrollment)	anchor measure load shape that controls are influencing.
Lighting	Res	12	DEER:Res_Indoor_CFL_Ltg
HVAC Retrofit	Res	15	DEER:Res_HVAC_Eff_AC
Heat Pump Retrofit	Res	15	DEER:Res_HVAC_Eff_HP
HVAC Maintenance	Res	3	DEER:Res_HVAC_Eff_AC
Refrigeration	Res	12	DEER:Res_Indoor_CFL_Ltg
Building Envelope	Res	20	DEER:Res_BldgShell_Ins
Pumps/Motors/Drives	Res	10	DEER:Res_Indoor_CFL_Ltg
Smart Thermostat (New Install Only)	Res	9	DEER:Res_HVAC_Eff_AC
Heat Pump Water Heater	Res	10	DEER:Res_HVAC_Eff_HP
Controls or Behavior Based Interventions (Including Storage)	Res	Default is 1-year EUL unless otherwise supported through work papers or eTRM data and approved by market sponsor. (Eligible for re-enrollment)	N/A

In the case of an add-on equipment measure, the guidelines outlined in Resolution E-4818 will be followed. Retrofit add-on equipment measures will have an EUL that is “equal to the lower of the RUL of the modified system or equipment or the EUL of the add-on component.”⁶⁴ In such cases, the program will apply the $\frac{1}{3}$ rule for the EUL of the parent system as described in the EE policy manual.⁶⁵ The program will require aggregators to attest if their measure is an add-on to an existing system and will work to provide consistent messaging on which measures are likely to be considered add-ons: VFDs and VSDs being an example measure type.

⁶⁴ https://www.caetrm.com/media/reference-documents/CPUC_Resolution_E-4807_December_2016.PDF

⁶⁵ <https://www.cpuc.ca.gov/-/media/cpuc-website/files/legacyfiles/e/6442465683-ee-policy-manual-revised-march-20-2020-b.pdf>

In preparing savings claims, this program will develop combined measure claims in accordance with the CPUC's guidance on "Weighted Average Expected Useful Life/Net to Gross Method."⁶⁶ Since the outputs of the calculator are dependent on the savings achieved, the projected EUL for this program is not yet known.

11. Methods, Payment Terms, and Risk

Methods for Payable and Claimable Savings

See section a. *Analytical Methods and Calculation Software Selection* and section b. *Calculation of Gross and Net Savings for detail on methods and the expected difference between payable and claimable savings.*

Payment Terms

Recurve and qualified aggregators will establish the payment terms in their contract based on the net metered savings in the portfolio and corresponding project EULs, net of marketplace management costs. Value is directly related to the benefit stream in the adjusted hourly avoided cost calculator for the service area and climate zone.

These payment terms are designed in accordance with the NMEC Rulebook 2.0 guidance and all known Commission directives related to terms and conditions. Compliance on payment terms for this M&V plan is described in *Section f. Payments and Incentives.*

Risk Mitigation

The Demand FLEXmarket has a fundamentally different risk profile from the rest of the energy efficiency portfolio. The Commission noted the limited risk to ratepayers of this program model in D.21-12-011 in their justification to suspend the cost-effectiveness rules:

*" . . . this type of program is very low risk to ratepayers regardless of cost-effectiveness score, because actual energy savings are measures based on NMEC methods, payments to aggregators are made based on performance, and spending is limited by the TSB actually achieved. Therefore, it is reasonable to suspend cost-effectiveness rules for this purpose for this unforeseen emergency situation in response to the Governor's Proclamation."*⁶⁷

One-hundred percent of the payment to the aggregator is based on the annual net savings achieved at the meter. The aggregator takes on the upfront risk, and arranges financing, to deliver impacts. This risk is within their power to mitigate with successful program implementation, innovative financing, insurance, and with general support provided by the program administrator. The Demand FLEXmarket represents minimal risk

⁶⁶ Rolling Portfolio Program Guidance; Weighted Average Expected Useful Life/Net to Gross Method. Excel Spreadsheet titled "Combining_Measures_Claims-DRAFT". The spreadsheet calculator has not been updated to reflect new DEER values; so can only be used with respect to the proposed method. <https://www.cpuc.ca.gov/General.aspx?id=6442456320>

⁶⁷ See D.21-12-011 at p. 26

for PCE or ratepayers, especially when compared to deemed program models given that the program administrator will only pay for savings achieved at the meter and by design will meet minimum cost effectiveness criteria.

The Demand FLEXmarket will further mitigate risk of settlement dispute by using a consistent, transparent means of tracking the impacts for settling payable savings as described in this M&V plan. Payment to the aggregator is completely based on savings delivered at the meter and will be made on a quarterly basis.

The Demand FLEXmarket is designed to minimize risk to program administrators, moderate risk for project developers with a portfolio pricing scheme, and decouple interest in the savings from the entity calculating the savings. PCE makes incremental payments by portfolio rather than committing to full project or program costs. The majority of payments to external entities are dependent on identifying projects and the performance of those projects. In the worst-case scenario: PCE pays its administrative cost (internal and/or external staff); no projects come forward, and no savings are achieved, which would still represent a very small portion of the total allocated budget.

An easy way to visualize the risk is looking at a three point table as has been done in other papers on understanding risk in pay for performance programs:⁶⁸

(Market Sponsor) PCE / RATEPAYERS Upfront: Administrative cost If projects materialize: Portion of the forecasted benefits for monitoring and tracking If savings materialize: Payment for kWh or therms, net of marketplace management costs	
CUSTOMERS / PARTICIPANTS Upfront: Contribution to project If savings materialize: Enough savings to generate value for the customer in addition to other value provided by the project.	PROJECT DEVELOPERS / AGGREGATORS Upfront: Forecasting, business plans, customer recruitment, project development, financing, etc. If projects materialize: Payment needs to be enough to cover costs and generate margin. If savings materialize: Ineligibility risk will fall on developers (manage risk with portfolio), that installations will deliver expected savings and load shapes.

⁶⁸ [Where's the Risk with Pay for Performance? Rob Hansen. ACEEE paper 2018](#)

12. To Code Savings Compliance

The Demand FLEXmarket is targeting to-code savings as described in the implementation plan. Compliance with [D. 17-11-006 Ordering Paragraph 2](#) is met in Section 6 of the implementation plan.

The M&V plan described herein will quantify the savings achieved compared to an existing conditions baseline as authorized in AB802, SB350, and detailed in the methods sections of this M&V plan.

13. Bid M&V Plan

The Demand FLEXmarket will not conduct a bidding process for this program. It will utilize an aggregator qualification approach that reduces barriers to entry. Bid M&V plans will not exist.

DRAFT

ATTACHMENT A. Tools, Methods, Analytical Approaches and Software Criteria

In the NMEC Rulebook V. 2.0 (p. 17) the CPUC outlines specific criteria for the approaches and calculation software allowable and preferable for NMEC population-level M&V. The following table itemizes the criteria in the left hand column and how the proposed tools, methods, analytical approaches, and calculation software in this M&V plan meet these criteria.

<i>Tools, Methods, Analytical Approaches and Calculation Software - CPUC Criteria</i>	Compliance demonstrated in this M&V plan
<i>Savings Calculations: All analytical methods, including tools, algorithms and software used in savings and incentive or compensation payment calculations, must be made available to Commission staff and its consultants upon request.</i>	The proposed analytical methods (FLEXmeter) (CalTRACK) and calculation software (OpenEEmeter) are open source and publicly available. Comparison group methods (GRIDMeter) are publicly available. A certificate of compliance with the CalTRACK methods will be provided to the PA, CPUC, and Evaluators. All data will be readily accessible and made available upon request.
<i>Measurement Period: Savings determinations must be made by comparing at least 12 months of post-intervention energy consumption to at least 12 months of pre-intervention energy consumption.</i>	CalTRACK data handling (see Section 2 of the technical specification) will be followed which screens for pre-intervention baseline data criteria: "2.2.1.1. Consumption and temperature data should be sufficient to allow for a 365-day baseline period" Interim savings determinations will be

	assessed on an ongoing basis but reported annually and based on the Commission guidelines.
<i>Transparency: Data, methods and calculations must be made available to the PAs well as the Commission and its impact evaluators.</i>	The proposed analytical methods (FLEXmeter) (CalTRACK) (GRIDMeter) and calculation software (OpenEEmeter) are open source and publicly available. Certification of compliance will be provided to PAs, the CPUC and impact evaluators in addition to access to all data methods and calculations.
<i>Documentation and Replicability: The methods used to calculate savings for NMEC programs must be documented in the program-level M&V Plan sufficiently such that savings calculations are able to be replicated by the PAs as well as the Commission and its impact evaluators. Upon request, the underlying participant consumption data and other data inputs must be made available to the PAs well as the Commission and its impact evaluators such that savings calculations can be replicated to reach the same result.</i>	The methods used to calculate savings are referenced in the program-level M&V plan and the details for savings calculation, including data handling, and weather station selection are documented in the CalTRACK 2.0 Technical Specification. Comparison group methods for quantifying net impacts to the grid are documented in GRIDMeter. The OpenEEmeter is a Python code base which enables replication of the CalTRACK methods. The FLEXmeter methods and code base documents demand response savings calculations. All data will be made available. In addition, documentation of data handling, and calculations will be documented and provided to PA, CPUC

	and evaluators to quickly isolate any differences in results using the same data.
<i>Consistent, Pre-Set Method: For Population-level NMEC programs, the specific measurement method(s) and calculation software must be determined before the program begins and applied uniformly to all sites in the program.</i>	The FLEXmeter, CalTRACK, and GRIDMeter methods and OpenEEmeter code base have been pre-determined for this program; and will be applied uniformly to all sites in the program. Certification of compliance and documentation of data handling will validate uniform application to all sites in the program.



PENINSULA CLEAN ENERGY AUTHORITY
JPA Board Correspondence

DATE: April 4, 2025
MEETING DATE: April 14, 2025
VOTE REQUIRED: None

TO: Honorable Peninsula Clean Energy Authority Executive Committee

FROM: Jana Kopyciok-Lande, Associate Director of Innovation Strategy and Peter Levitt, Senior Manager of Distributed Energy Programs

SUBJECT: Distributed Energy Resources Framework 2025 - 2030 (Discussion)

RECOMMENDATION

Information and discussion only

BACKGROUND

Peninsula Clean Energy's mission is to reduce greenhouse gas emissions by expanding access to sustainable and affordable energy solutions. In 2018, PCE initiated community programs, which have been developed within three major pillars: Building decarbonization, Transportation decarbonization and Distributed Resources.

In September 2021, the Board adopted a new aspirational target supporting the region in reaching 100% decarbonization in buildings and transportation by 2035 and directed staff to analyze the feasibility of that target and return with an assessment and plan. The detailed analysis was delivered to the Board in September 2022 and assessed current market conditions, funding and financing availability, economics, and policy status. The plan also provided guidance on strategies to deliver significant emissions reductions within a scope that the agency is well positioned to affect.

The core strategy was defined as follows: To decarbonize buildings and transportation, align energy use with renewables, and deliver community benefits in segments PCE is best positioned to influence - progressively developing and adapting programs that evolve customer preference, innovation, and policy. In addition, to demonstrate scalable, sustainable business models and mobilize market forces state-wide. PCE has developed a portfolio of decarbonization programs aligned with the plan including reach codes, existing building decarbonization focused primarily on the residential sector, and transportation programs focused on private vehicles (EVs, ebikes, EV charging), with significant elements aimed at underserved communities.

However, the Decarbonization Plan also identified major barriers in scaling decarbonization and a special need to develop new business models to achieve scalability. Subsequent to the

decarbonization plan, the Board directed staff to develop a Distributed Energy Resources (DER) Plan to complement the Decarbonization Plan. As with the decarbonization programs, DER programs have been ongoing and details of the existing approach for those DER programs were presented to the Board as “Part 1” in May 2024. Staff will provide a brief recap of Part 1 during the Executive Committee meeting to set the stage for the rest of the Plan as outlined below.

The need for a more comprehensive plan on how to foster DER development in PCE’s service area was also confirmed during the recent discussions for PCE’s Strategic Plan for 2026 - 2030. As part of the new strategic planning process, PCE examined whether it should expand any existing, or develop any new, lines of business. All involved stakeholders (staff, Board and community partners) agreed that PCE should continue focusing on – and expand – its work on DERs. The following DER Strategic Policy was developed and presented to the Board in January 2025:

Over the next five years, PCE will prioritize efforts to accelerate the development of carbon-free distributed energy resources (DERs) in order to support further innovation and market transformation of distributed energy technologies, accelerate greenhouse gas (GHG) reductions, and provide customer and community resilience.

The following strategies were identified to foster the growth of DERs:

1. DER project development: For example, by growing PCE’s Virtual Power Plant (VPP) or developing community solar + storage or microgrid projects
2. Financial services: increasing customer access to capital via scalable and sustainable business models
3. Consulting & technical assistance for both residential and commercial customers
4. Advocacy: drive policy to increase the value and reduce the hurdles of DER deployment

In the following section, staff outlines specific Goals for the next 5 years to address each of these strategies in more detail.

DISCUSSION

This DER Framework for 2025 – 2030 has three core components: (1) Align around an updated definition of DERs that reflects the breadth and scale of DERs in today’s energy environment; (2) Provide context on the value, benefits, barriers and status of DERs in PCE’s service area today and; (3) Outline specific Goals, including programmatic and policy initiatives, to foster DERs over the next 5 years.

DER Definitions

Historically, PCE has largely focused on DERs as behind-the-meter (BTM) distributed generation and storage technologies such as solar + storage. Moving forwards, PCE will use a broader definition of DERs that also includes local front-of-the-meter (FTM) resources, as well as non-generation BTM technologies that can shift load, such as electric vehicles (EVs), heat pump water heaters (HPWHs), smart control thermostats (SCT) and other energy efficiency (EE) measures (defined jointly as “**Load Flexibility Technologies**”). PCE will use the following definition of DERs moving forwards:

Distributed Energy Resources (DERs) are assets on the distribution grid, either on the

consumer's side of the energy meter (behind-the-meter (BTM)) or in front of the customer meter connected to the distribution grid (front-of-the-meter (FTM)). They can be used individually or in aggregate to provide value to the grid and individual customers. Importantly, PCE will focus on "clean" DERs, which do not emit greenhouse gases (GHGs) in their operations.

PCE will aggregate BTM DERs under a so called "**Virtual Power Plant**" which is a collection of load flexibility technologies that are located at a customer site that can be aggregated together and flexibly managed to modify load in order to meet grid needs.

FTM DERs are typically 1-10 MW in size and are interconnected directly to the California Independent System Owner (CAISO) market. They do not offset customer load and are often referred to as the "missing middle" as they neither fall under the scope of work of the Power Resources team (who focuses on the procurement of large-scale, centralized FTM energy resources) nor the Energy Program team (who focus on BTM solutions at customer site). Examples of FTM DERs include community solar + storage facilities and multi-customer, community-scale microgrids.

Context: Status, Benefit and Barriers

To establish a baseline for its future work on DERs, PCE staff analyzed the **status** of DERs in its service area, as well as the associated benefits and barriers. PCE's customers have one of the highest adoption rates of BTM DERs in the United States. There are roughly 40,000 solar systems, 6,500 storage systems[1], 60,000 zero emission vehicles (ZEVs)[2], and 11,000 Google Nest smart control thermostats[3] in PCE's service area. Unfortunately, the same success has not been seen for FTM DERs to date. Over the past 20 years, only 26 MW of FTM DERs have been interconnected into PG&E's distribution system in San Mateo and Merced counties. 433 MW have been withdrawn, which reflects the large challenges facing these types of resources. 126 MW are currently in project development.[4]

DERs provide **benefits** to customers, the load serving entity (LSE) and the grid and society at large. For customers, DERs can reduce energy costs in several ways. For example, residential customers often see immediate savings between the cost for energy of the new solar + storage system versus purchasing energy from the grid. Non-residential customers can reduce demand charges with DERs. And all customers can save on electricity costs when using their load flexibility technologies to move energy consumption out of peak times (i.e., 4-9pm) into non-peak times. In addition, solar and storage systems can mitigate any increase in electricity consumption due to electrification measures, thereby supporting a customer's transition to electrifying their home. Last but not least, distributed storage systems provide backup power for customers in the event of grid outages (so called "energy resilience").

For PCE, customer-sited renewables can complement large-scale, centralized renewable deployment in meeting PCE's renewable energy goals. BTM DERs can also function as a flexible load resource that can support PCE's 24/7 renewable energy matching goal. More specifically, BTM DERs can provide quantifiable financial benefits to the LSE by reducing its need to procure energy during high-priced hours and by reducing its resource adequacy (RA) obligations. They are also a means for PCE to engage with its customers, to deepen our understanding and relationship of customers, and to retain them as PCE customers. In theory, DERs can also help reduce grid costs by deferring or avoiding the need for upgrades to the distribution grid. However, there is currently no pathway for LSEs to take advantage of this

value stream in California. Last but not least, developing DERs in PCE's service area contributes to the local economy similar to other construction projects.

Despite the many benefits of DERs, it can be challenging to develop both BTM and FTM DERs in PCE's service area. These **barriers** vary by technology and market segment but can generally be summarized into 5 categories. First, it can be challenging to engage customers in new and emerging technology areas (customer adoption barrier). Second, DERs can carry significant added costs and financing is not always readily available. Third, not all potential benefits and value streams of DERs are accessible to the customer or the LSE, largely due to regulatory constraints. Fourth, the market landscape for DERs can be fragmented and complex, making it hard for customers and stakeholders to engage. Fifth, deployment timelines for certain DERs can be extended by slow and onerous permitting and interconnection processes.

Goals for 2025 - 2030

PCE has developed the following **Goals** to foster the development of DERs in its service area under a customer-centric approach during the 2025 – 2030 timeframe:

1. Grow PCE's behind-the-meter "Local Power" Portfolio to 30 MW leveraging scalable and self-sustaining financing solutions
2. Move towards a Whole-Home Energy Approach by integrating electrification, solar + storage, and EV offerings in a streamlined manner in major PCE programs
3. Develop a Virtual Power Plant (VPP) that aggregates 15 MW of customer-sited resources in PCE's service area to the benefit of the customer, PCE and the grid
4. Explore business models to foster the development of front-of-the-meter Distribution Resources in PCE's service area
5. Investigate additional behind-the-meter DER ownership models to scale DER growth
6. Make PCE DER programs more accessible to customers through technical assistance services
7. Engage in policy advocacy on DER value maximization and value stacking

Under **Goal 1**, PCE will expand its BTM Local Power portfolio [\[5\]](#) to 30 MW via two core initiatives – (1) developing a General Market Residential Solar + Storage Program and (2) expanding PCE's Solar + Storage for Public Buildings Program. Scalable and self-sustaining financial solutions are central to this Goal.

Under **Goal 2**, PCE will initially strive towards integrating additional DERs such as solar + storage and EV readiness under PCE's existing residential electrification program, the Home Upgrade Program. In a second step, PCE will also work towards providing integrated program offerings across the breadth of DERs to local government and commercial customers.

Under **Goal 3**, PCE is already working on procuring a Distributed Energy Resource Management System (DERMS) that monitors, controls, and optimizes BTM DERs for PCE's VPP under an ongoing [request for proposal \(RFP\) for Customer Demand Flexibility Services](#). PCE staff is planning on discussing the details of the DERMS platform, as well as the contract with the selected vendor, during the May Executive Committee and May Board meeting. The DERMS RFP was also discussed with the Programs subcommittee on January 7, 2025.

Under **Goal 4**, PCE will undertake both programmatic and policy initiatives to explore new business models for FTM distribution resources such as community solar + storage projects

and microgrids. As mentioned above, these resources face several challenges in their deployment, mostly related to cost and uncertain value streams. PCE will pursue public funding opportunities and engage in policy advocacy to identify business models that can foster the deployment of FTM distribution resources.

As described under Goal 1, PCE is already engaged in developing scalable financing models for BTM DERs, including where PCE is the owner of the resource. Over the next 5 years, PCE will investigate if similar ownership models should also be expanded to other BTM DERs such as EV charging equipment and electrification measures under **Goal 5**. In doing so, PCE can potentially unlock more equitable access to DERs (e.g., via reduced charging rates for EVs) and/or significantly scale the deployment of DERs (e.g. of electrification measures for local government customers).

Under **Goal 6**, PCE will expand its existing, in-house technical assistance currently offered for building electrification to other DERs such as solar + storage and transportation electrification. For residential customers, technical assistance will be offered free of charge through the existing call line and engineering support, called the “Concierge Service.” For commercial customers, an enhanced service will be developed with an equitable fee structure that is low or no-cost for small businesses and a reasonable fee for large commercial customers.

Under **Goal 7**, PCE will engage in policy advocacy to reduce barriers to DER deployment and unlock DER value stacking. Potential initiatives will include, but are not limited to, accessing RA value and distribution upgrade deferral value for DERs, reducing interconnection timelines, and enabling vehicle-to-grid (V2G) integration.

[1] Per California Distributed Generation Statistics at <https://www.californiadgstats.ca.gov/downloads/>

[2] Per the California Energy Commission’s light duty vehicle count at <https://www.energy.ca.gov/data-reports/energy-almanac/zero-emission-vehicle-and-infrastructure-statistics-collection/light>

[3] Per RenewHome proposal submitted to PCE in response to the Demand Flexibility RFP.

[4] Per PG&E’s Wholesale Distribution Access Tariff (WDAT) interconnection queue. See here: <https://www.pge.com/assets/pge/docs/about/doing-business-with-pge/PublicQueueInterconnection.xlsx>

[5] “Local Power” refers to any DER – both BTM and FTM - located in PCE’s service area