

TECH Clean California Tariffed On-Bill Investment Pilot

Stakeholder Working Group, Workshop #4

Consumer Protections

November 18, 2021



TECH CLEAN
CALIFORNIA

The TECH Clean California initiative is funded by California gas corporation ratepayers under the auspices of the California Public Utilities Commission.



We Are Here:

Session	Date	Topic
#1	Sept. 23	Goals and metrics, workplan and timeline
#2	Oct. 7	Tariff terms, authority to adopt, ownership of assets
#3	Nov. 4	Customer economics
#4	Nov. 18	Consumer protections
#5	Dec. 2	Information system requirements
#6	Dec. 16	Supply Chain, Quality Assurance, Risk Mitigation
#7	Jan. 6	Implementation Plan, Timeline, Budget



Workshop #4 Agenda

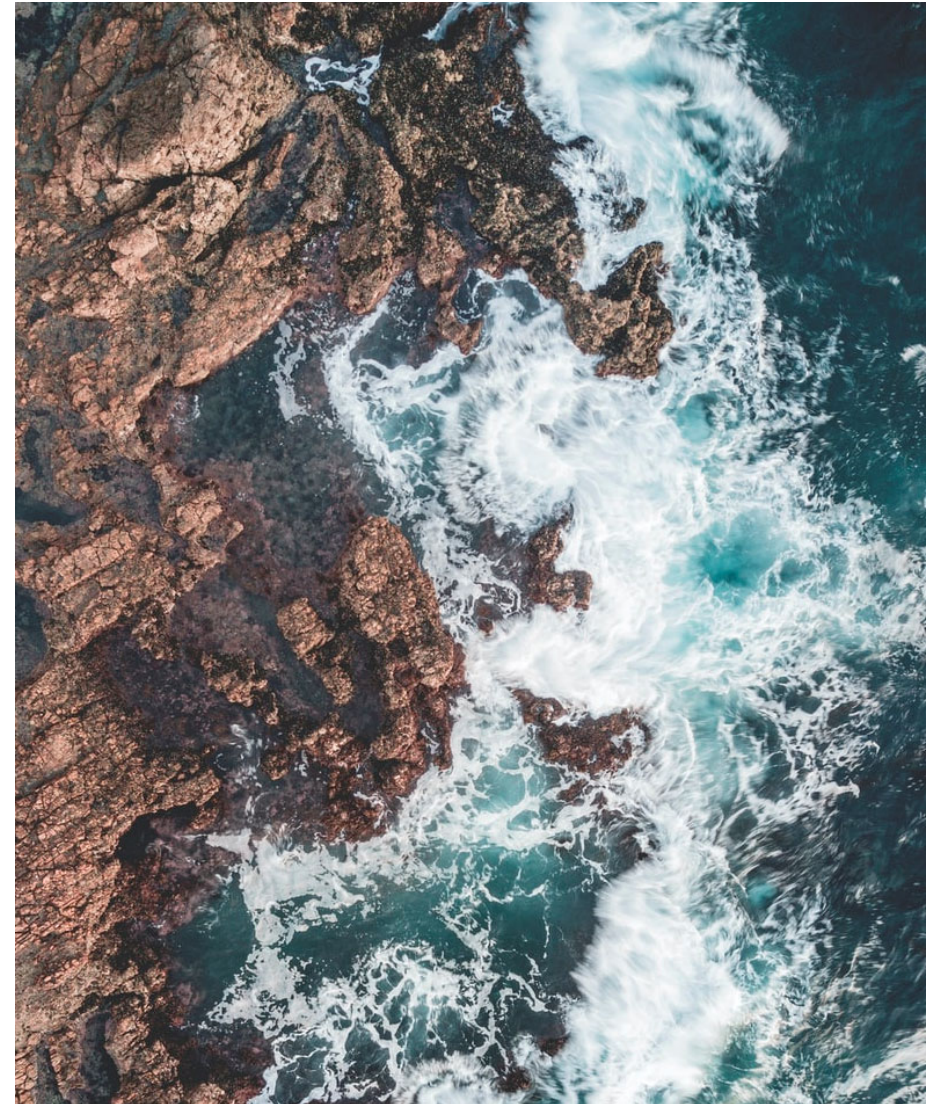
1 Introductions

2 Installation Costs

3 Equipment Performance
Degradation

4 Cost Recovery Charges

5 Energy Prices



Who's In the Room?

- Name, preferred pronoun, organization, role

Please note:

- Are there other members of your organization working/likely to work on TOB?
- What do you hope to get out of these working group meetings?
- Do you expect to have design ideas, proposals or research to share during these workshops?

Workshop Format & Ground Rules

Workshop objective: Information sharing and feedback on opportunities and challenges, pros and cons of program design alternatives from stakeholders who might implement a program.

Not a joint decision-making process.

Workshop discussions are **off the record**. Notes and recordings are for the benefit of Working Group participants only.

All meetings will be recorded and shared with workshop stakeholders

Resources: to be posted on SharePoint site for workshop attendees, recordings, presentation slides, draft documents, etc

Gathering Feedback & Information

During Workshops

- Opportunities for Q&A
- TOB team will solicit direct feedback through questions and open discussion
- Participants can share their proposals or information on different topics (ideally scheduled ahead of time)

Following each Workshop:

- A survey will be sent to each participant giving them opportunity to provide answers or feedback on key issues
- Sometimes (including today), the survey will include material mentioned but not described in detail during the presentations
- We encourage you to complete those right away, following each workshop, but no more than one week later
- Surveys are to generate feedback to TECH team; results will not be distributed

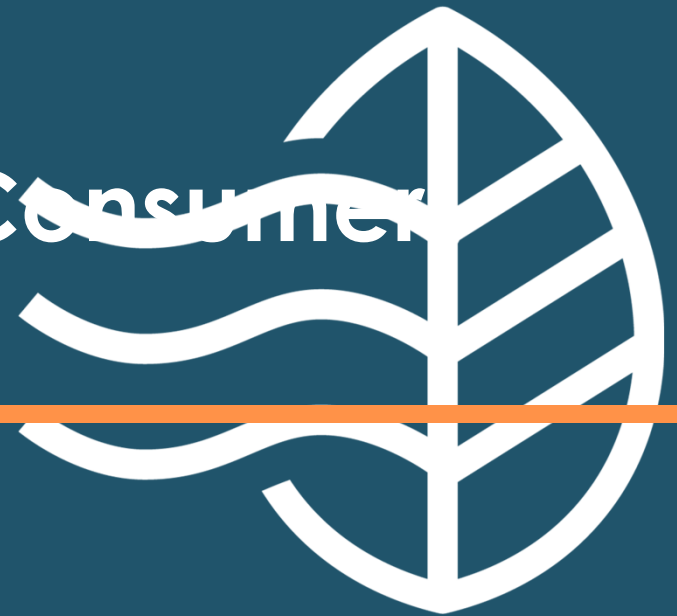
Stakeholder Working Group Mid-Point Check-In

Here we are at workshop 4 of 7! We would like to gather some feedback from you at the end of today's meeting.

- How are we doing with the level of detail in the workshops?
 - for meeting your own needs?
 - for the purpose of sharing with your internal stakeholders at your organization?
- Are there sufficient opportunities for questions and comments?
- At this point, what is the level of interest within your agency for moving forward with a TOB initiative in the next year or so?
- At this point, what is the level of interest within your agency for partnering with TECH pilot team to do so
- What can we do to improve these workshops as we continue?

1

Introduction to Consumer Protections



Introduction to Consumer Protections Under TOB Programs

- **Design principles**
 - Program ensures that improvements perform as designed
 - Property owner and occupant properly maintain and operate improvements in keeping with manufacturer's recommendations
 - Occupant responsible for unrelated energy usage changes
- **Consumer-facing risks that the TOB program should address**
 - Over-paying for upgrades (installation costs)
 - Equipment failure and performance degradation over time
 - Cost-recovery charges that exceed bill savings attributable to upgrades
 - Electricity price increases that outpace gas price increases (thus wiping out electrification bill savings)
- **Some risks that TOB programs DO NOT introduce or exacerbate:**
 - Home foreclosure
 - Repossession of installed upgrades
 - Energy service disconnection

Consumer Protections Caveat

- Virtually any risk can be mitigated to near zero, given enough money.
- Consumer protections and related risk mitigations are not free.

- Consumer protection ideas offered here are not yet cost constrained. Some recommendations may get value-engineered out.
- Part of pilot's purpose will be to ground-truth trade-offs between risks/protections and costs.

2

Installation Costs



Installation Cost Risk

- **The issue:** Participants could over-pay for upgrades
- **The challenges:** Installation contractors have an inherent incentive to charge as much as the program can pay (i.e., full TOB capital contribution, based on 80% of expected savings, plus available credits and incentives).
Utilities have an obligation to ensure that customer charges are cost-based, just, reasonable, and fair.
Bid and installation process must be tightly managed.
- **Consequences to the consumer:**
Overall project cost burden that translates to
 - Cost-recovery charges that are higher than necessary
 - Cost-recovery periods that are longer than necessary
 - Unnecessary copay requirements

Installation Cost Protections Built Into the TOB Tariff

- At the conclusion of utility cost recovery, upgrades belong to building owner.
- Upgrades do not have end-of-lease charges or transfer-of-ownership financial obligations.
- Utility subsidies and state and federal credits may only be included in cost-effectiveness analyses if they can be used to lower the upgrades' cost used in the assessment (no post-installation rebates paid to participants)

Program Design Options for Additional Protection

Option A: Closed Market Approach

- Conduct RFP for installation contractors. Hire only best qualified, most price-competitive contractors capable of handling projected project volume. Execute legally binding contracts.
- Program operator handles all functions that could otherwise create installer conflict of interest, plus functions that offer centralized economies of scale. Examples:
 - Customer acquisition
 - Project planning, including site assessment, project scope and specifications development
 - Financial analysis, including site data collection, energy modeling, determination of TOB capital contribution
 - Bulk purchase of materials
- Installation contractor's role limited to installation services, based on pre-determined project scope and specifications. Financial compensation determined by negotiated fee schedule.

Program design next step: Study utility low-income programs for best practices.

Program Design Options for Additional Protection

Option B: Open Market Approach

- Conduct RFQ for installation contractors. Enroll all contractors that meet program qualifications and price thresholds. Execute participation agreements.
- Establish measure price schedule with expected price ranges for eligible measures
- Program Operator performs QA/QC on contractor's proposed scope and bid prices
- Program Operator handles financial analysis, determines TOB capital contribution

Program design next step: Study market-rate programs with contractor delivery channels for best practices.

Some Take-Aways

- **Option A, Closed Market**

- Decisively eliminates contractor conflicts of interest
- Assigns Program Operator full responsibility for cost containment
- May pose scalability challenges

- **Option B, Open Market**

- Reduces but does not eliminate conflicts of interest
- May involve duplicative site assessments (contractor + Program Operator)
- May offer a clearer path to scale

Recommendation: Start with Option A for the pilot, investigate pros and cons of relaxed contractor participation requirements for production-scale program

Questions

3

Equipment Performance Degradation



Equipment Performance Risk

- **The issue:** Installed equipment could fail prematurely, or its performance could degrade over time
- **The challenge:** The program should be responsible for ensuring that improvements are properly installed and perform as designed, but the property owner and occupant should remain responsible for proper operations and maintenance in keeping with manufacturer's recommendations
- **Consequences to the consumer:** loss of expected bill savings, unanticipated repair costs

Equipment Performance Protections Built Into the TOB Tariff

- Requirement for independent certification that products are appropriate, and savings estimates exceed payments in both the near and long terms
- Charges stop if upgrades stop working until they are repaired and working again. Charges are also suspended for vacancy if meter is shut off. CB0
- Repairs or vacancy may extend the duration of charges but not increase the monthly payment amount.
- Cost recovery is calculated based on the amount of savings expected at the end of cost recovery for upgrades whose savings degrade over time

Slide 20

CBO Is it important to add the other part of the 80% rule here re: EUL?

Chris Bradt, 2021-11-16T17:37:45.428

BMO 0 I view that aspect as a utility risk reduction measure, not a consumer risk reducer.

Bruce Mast, 2021-11-17T19:42:14.708

Additional Consumer Protections Against Equipment Failure and Performance Degradation

- Program-sponsored quality-control inspections and acceptance testing of equipment installations on at least a sampled basis
- Requirements for extended manufacturer warranties (e.g., 10-12 years) on installed equipment
- Requirement for the installing contractor to provide a one-year warranty on labor
- “Big data” analytics of metered energy consumption data, smart thermostat data (HVAC), and hot water controls to detect possible instances of equipment performing outside of design parameters

Participant Responsibility to Minimize Equipment Risks

- Enumerate terms in the customer participation agreement for regular maintenance and care, including:
 - Assignment to customer of financial liability for damaging or removing installed improvements
 - Requirements to notify the TOB program administrator of non-functioning products
 - Requirements for ongoing annual service agreements

Slide 22

CB0 We need to price out this concept of annual maintenance fees being worked into the annual cost recovery charge.

I've gotta imagine we're talking minimum of \$200-300/yr of the agreement, which will add a couple of grand to our capital stack. I've requested some quotes through Angi's list. I'm also looking at this here:

<https://www.homeadvisor.com/cost/heating-and-cooling/service-maintain-ac-unit/#:~:text=If%20you%E2%80%9C>
Chris Bradt, 2021-11-16T17:46:29.301

BM0 0 AAA House Manager "Classic" package is \$550 regular price, \$340 with discount.
Bruce Mast, 2021-11-17T19:49:41.609

BM0 1 <https://housemanager.calstate.aaa.com/pricing/?reload=true>
Bruce Mast, 2021-11-17T19:50:01.594

Some Take-Aways

- Consumer protections required to mitigate equipment performance risks mirror the protections that utilities and their program operators should take to mitigate their own business risks relating to ownership of the investment asset

Questions

4

Cost Recovery Charges



Cost Recovery Charge Risk

- **The issue:** Actual bill savings attributable to the upgrades could fall short of estimates, leading to cost-recovery charges that exceed bill savings
- **Challenges:** CBO
 - There are multiple potential causes of mispredictions:
 - Erratic baseline consumption
 - Site data collection errors
 - Model mis-specification, including over-reliance on model default values
 - Model not properly calibrated to baseline consumption, including calibration to disaggregated weather-sensitive loads
 - Even when savings are predicted properly, there is inherent variability in customer energy consumption patterns
 - Rebound effect: customers may increase usage to improve comfort
 - Successor customers may have very different usage habits than current customers and thus experience different performance outcomes
- **Consequences to the consumer:** Cost recovery charge could add to customer's total energy burden, function like a non-recourse debt, and increase risk of disconnection for non-payment

Slide 26

CB0 Do we talk about this as "could" for individual projects or "will" for some projects in our portfolio?

alt text: "... to the upgrades will fall short of estimates for SOME projects, leading to cost-recovery...."

Chris Bradt, 2021-11-16T17:25:32.973

BM0 0 I'd prefer to stick to "could"

Bruce Mast, 2021-11-17T19:29:39.988

Consumer Protections Against Model Mispredictions

- Screen candidates for baseline model stability ($CV(RMSE) < 1.0$)
- Assign responsibility for savings estimation to Program Operator's professional energy modeler(s)
- Adopt best practices for site data collection, model specification, calibration to baseline energy consumption
- Investigate causes of mispredictions in pilot projects and incorporate lessons learned into revised program protocols
- After 1 year of program operation, calculate portfolio realization rate ($= \text{metered savings} / \text{predicted savings}$). If realization rate is less than 1.0, then true up all participant cost recovery charges

CBO

Slide 27

CBO leaving savings estimation to "professional energy modelers" put our savings in the hands of professionals that aren't necessarily bought in on our recommended approach for site visits, project scopes, etc.

Recommending that we start something here allowing the program to craft/define the modeling approach

Chris Bradt, 2021-11-16T17:29:30.244

BM0 0 I don't understand the concern. My intent was to require that the Program Operator would assign the task to someone who actually knows what they are doing (a staff person or subcontractor), as opposed to the installation contractor, who's core competency is all about installing stuff. Energy modeler would need to play a central role in developing best practices for site data collection, etc.

Bruce Mast, 2021-11-17T19:33:57.400

More Consumer Protections for Cost Recovery Charge Risks

- Protections against variable energy usage patterns
 - Customer-specific performance guarantee for pilot based on end-use submetered results (to distinguish performance issues from confounding changes in customer behavior and lifestyle)
- Protections against rebound effect
 - Incorporate expected usage increases into ex ante savings estimates and cost recovery calculations and/or
 - Incorporate PV system that is sized cover new cooling loads and other expected increase in electricity consumption
- Protections for successor customer with less usage and savings than current customer's
 - Model savings on both (1) the current occupant's usage patterns; and (2) a typical occupant's usage patterns. Base cost recovery on the most conservative estimate

Slide 28

BMO I think we need a general statement, perhaps as a 2nd intro slide, that spells out the major caveat that consumer protections and risk mitigations come at a cost. Current recommendations do not yet reflect any cost-benefit analysis. Part of pilot's purpose will be to ground-truth trade-offs between risks/protections and costs.

Bruce Mast, 2021-11-17T19:37:15.514

Some Take-Aways

- TECH has earmarked \$3 million for pilot risk mitigations, including consumer protections
- Field investigations are needed to understand trade-offs between cost of providing protections and risks / benefits to participants.
- 5 performance guarantee options to analyze:
 - **Option 1. Site-specific guarantee of end use consumption based on end use submetered results**
 - Option 2. Site-specific guarantee of end use consumption based on end use disaggregation of whole building consumption, combined with performance data from smart thermostats and other Internet-enabled sensors.
 - Option 3. Site-specific guarantee of whole house consumption
 - Option 4. Population-level guarantee. If population realization rate after one year of performance is less than one, then discount everyone's cost recovery charge by (1-realization rate) percent.
 - Option 5. No guarantee.

Questions

5 Energy Prices



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Energy Price Risk

- **The issue:** Electricity price increases that outpace gas price increases.
- **The challenge:**
 - Electrification economics are sensitive to the ratio of electricity to gas prices.
 - Both electricity and gas are subject to upward price pressures. Which will go up faster?
- **Consequences to the consumer:** Electricity price increases that exceed gas price increases erode electrification bill savings

Energy Price Protections Built Into the TOB Tariff

- Cost recovery charge is a fixed amount that may not be increased mid-payment-term.
- Cost recovery charge is tied to a savings analysis that is onsite and building specific, and it includes no energy inflation or adders.

Slide 33

CB0 "Program Services Charge" vs. "Cost recovery charge" could be read as two different on-bill charges. is that what we're intending or are these the same thing? If the same thing, let's use the same term

Chris Bradt, 2021-11-16T17:34:24.830

BM0 0 Good catch.

Bruce Mast, 2021-11-17T19:40:32.768

Consumer Protections Against Price Volatility

- Equip all appliances with smart controls and size them to meet full load requirements during off-peak hours.
- Install batteries to shift household loads to off-peak hours if economically justified
- Consider an electrification rate with a “rate lock” assurance that the electricity price will not escalate faster than a designated percentage (e.g., the rate of inflation of the Consumer Price Index)
- If a rate lock assurance is not possible, then establish a rate monitoring protocol with mitigations to consider if electricity prices climb too high relative to gas prices

Some Take-Aways

- Electrification poses a new price risk to participants that is not present in energy efficient investments that do not involve fuel switching
- Future energy prices are uncertain and largely outside of program control
- How far should the program go in shielding participants from those risks?

Questions

Mid-Point Feedback (Poll)

Five poll questions and one open question to respond to in the chat:

- How are we doing with the level of detail in the workshops?
 1. for meeting your own needs?
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- 3. Are there sufficient opportunities for questions and comments?
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Thank You

For more information, contact:

Bruce Mast

510.435.1371

bruce@ardenna-energy.com



Tre'Laine



www.energy-solution.com/tech

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