PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

Item No# 3 (Rev.1)
Agenda ID:19193
ENERGY DIVISION **RESOLUTION E-5116**
~~Mar~~April 15, 2021

R E S O L U T I O N

Resolution E-5116. Approves the Implementation Plan submitted by the California Energy Commission on September 29, 2020 for the Building Initiative for Low Emissions Development Program, as required by Decision 20-03-027.

PROPOSED OUTCOME:

- Approves the Implementation Plan submitted by the California Energy Commission on September 29, 2020 for the Building Initiative for Low Emissions Development Program, as required by Ordering Paragraph 23 of Decision 20-03-027 (Building Decarbonization Pilots); Rulemaking 19-01-011.
- Establishes the process by which the California Energy Commission should submit Building Initiative for Low Emissions Development Program guidelines to the California Public Utilities Commission for approval.

SAFETY CONSIDERATIONS:

- There are no safety considerations associated with this Resolution.

ESTIMATED COST:

- None. Decision 20-03-027 previously authorized an $80 million budget for the Building Initiative for Low Emissions Development Program.

By the California Energy Commission's submission on September 29, 2020, in compliance with Ordering Paragraph 23 of Decision 20-03-027.

SUMMARY

This Resolution approves the Implementation Plan for the Building Initiative for Low Emissions Development (BUILD) Program submitted by the California Energy Commission (CEC) on September 29, 2020, as required by, and in compliance with, Ordering Paragraph (OP) 23 of Decision (D.) 20-03-027.

The Resolution also provides a list of issues for the CEC to consider at its discretion or for further public input in the development of BUILD Program guidelines.

Finally, the Resolution requires the CEC to submit BUILD Program guidelines to the California Public Utilities Commission (CPUC) for final approval before commencing the program. The procedures established herein provide guidance to the CEC for approval of the initial BUILD Program guidelines and for approval of any subsequent changes to the BUILD Program guidelines.

BACKGROUND

On March 26, 2020, the CPUC adopted D.20-03-027, which established the framework for two building decarbonization pilot programs: the BUILD Program and the Technology and Equipment for Clean Heating (TECH) Initiative, both authorized by Senate Bill (SB) 1477 (Stern, 2018). Pertaining to the BUILD Program, D.20-03-027 established the CEC as the BUILD Program administrator, established the program budget, and laid out a set of rules and guidance for developing the program.

This Resolution originates from the CEC's submission of the Implementation Plan to the CPUC's Deputy Executive Director for Energy and Climate Policy for approval via the CPUC resolution process, consistent with OP 23 of D.20-03-027.

OP 23 states:

> *The CEC shall submit an implementation plan to the Commission's Deputy Executive Director for Energy and Climate Policy for approval via the*

> *Commission resolution process within one-hundred and twenty days of the adoption of this decision and every two years thereafter. Following the approval of the implementation plan by the Commission, and after having completed the statutory and regulatory requirements necessary to begin implementation, CEC shall publicly notice the commencement of the BUILD program to signal that applications for the program are being accepted. Implementation shall be considered to have begun from the date the notice is published. The notice shall also be sent to the relevant listservs at both the CEC and the Commission.*

On June 15, 2020, CEC staff led a joint agency workshop presenting an initial set of ideas for BUILD Program implementation. As required by OP 23, on the 120th day from the adoption of D.20-03-027 (*i.e.,* July 24, 2020), the CEC submitted the first iteration of the implementation plan to the CPUC and also published that plan on the CEC's BUILD Program docket to seek further public input.[1]

On September 29, 2020, the CEC submitted an amended BUILD implementation plan (the Implementation Plan 1) to the CPUC incorporating public input received, for adoption through a CPUC resolution. The Implementation Plan was again published on the CEC's BUILD Program docket[2] and is included in this Resolution as Appendix 1.

The Implementation Plan provides information on the anticipated requirements for program participation, including program eligibility, incentive structure, application process, eligible equipment, evaluation of new technology, bill savings calculation methodology, technical assistance and outreach, and the metrics to evaluate program performance.

This Resolution adopts the Implementation Plan and identifies additional

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[1] CEC BUILD Program draft implementation plan. July 24, 2020. https://efiling.energy.ca.gov/GetDocument.aspx?tn=234014&DocumentContentId=66836.

[2] CEC BUILD Program Implementation Plan submitted September 29, 2020. https://efiling.energy.ca.gov/GetDocument.aspx?tn=234936&DocumentContentId=67802.

matters for the CEC to consider at its discretion or for seeking further public input as it develops the program guidelines.

NOTICE

Energy Division served Draft Resolution E-5116 to the service list for Rulemaking (R.) 19-01-011 on February 12, 2021.

DISCUSSION

Sixteen written comments were received on the CEC's docket for the BUILD Program in response to the July 24, 2020 implementation plan publication. Comments were received from the following parties:

1. Alaska Applied Sciences, Inc
2. Bradford White
3. Bruce Naegel
4. California Housing Partnership and California Environmental Justice Alliance (CHP and CEJA)
5. California Solar and Storage Association (CALSSA)
6. Environmental Defense Fund (EDF)
7. Harvest Thermal
8. Leona Gonsalves
9. Natural Resources Defense Council, and Sierra Club (Joint Environmentals)
10. North American Passive House Network (NAPHN)
11. Public Advocates Office (Cal Advocates)
12. San Diego Gas and Electric Company (SDG&E)
13. Sean Denniston
14. Southern California Edison Company (SCE)
15. Southern California Gas Company (SoCalGas)
16. Steve Uhler

The Implementation Plan addressed several stakeholder comments and/or identified issues for further consideration in the development of BUILD Program guidelines.

This Resolution approves the CEC's proposed Implementation Plan and identifies additional matters for the CEC to consider at its discretion or to seek further public input to develop the program guidelines.

I. Program Eligibility Criteria

The Implementation Plan addresses several stakeholder comments and expands the eligible project types, such as SCE's recommendation to include farmworker housing and mixed use all-electric developments. We note the following issues raised in comments on the initial implementation plan:

1. *Manufactured Homes*

Energy efficiency standards for manufactured homes[3] are federally regulated by the United States Department of Housing and Urban Development (HUD) and enforced at the state level by the California Department of Housing and Community Development (HCD) through Title 25, and not Title 24 of the California Building Code. Therefore, manufactured homes are not readily modeled under the CEC's California building energy code compliance (CBECC) software. As the CEC launches the initial pilot, it may want to consider whether and how the program could potentially expand beyond buildings subject to Title 24 in future iterations.

2. *Transient housing*

The CEC could consider transient housing, such as homeless shelters and boarding houses, to be included as eligible for the BUILD Program, even if they are not government-owned, since this type of housing generally serves the lowest income and most vulnerable populations.[4]

3. *Housing in tribal communities*

The CEC could include tribal housing (both within and outside Indian country) as eligible for BUILD Program incentives. Some of these communities in

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[3] Manufactured homes are built in the controlled environment of a manufacturing plant and are transported in one or more sections on a permanent chassis. Mobile homes are not fixed to a chassis, and include manufactured homes that were built before 1976, the year when the HUD code was adopted.

[4] The CEC Implementation Plan notes that government-owned low-income housing would be eligible (p.9).

California are geographically isolated and have limited resources. Outreach and education regarding CPUC programs can be challenging. Even though building to Title 24 is not required on tribal lands, many tribes do build to current code, and program participation could require the same criteria to meet/exceed Title 24 for participation. The CEC could also seek further public input to determine whether and how tribal communities can benefit from the BUILD Program and consider tailored outreach and education for tribal communities.

II. Required and Eligible Technologies

Chapter 4 of the Implementation Plan provides a few technologies that may be considered for base and kicker[5] incentives. While we understand that the list is not exhaustive and is under consideration following stakeholder comments, the CEC could consider certain technologies that may achieve greater bill savings depending on the climate zone (*i.e.,* additional solar beyond code, solar thermal water heating, heating recovery ventilation, advanced air leakage measures, and geothermal heat pumps).

III. Process for Evaluating New Technologies

Public Utilities Code Section 921.1(d)(4)(A) requires that the program guidelines include a process for evaluating new technologies. The Implementation Plan states that if a technology is not currently evaluated in the CBECC software, the product will not be initially eligible under the base incentive structure of the BUILD Program, while certain pre-determined technologies may be eligible for kicker incentives. The guidelines could outline how new technologies – that is, beyond the ones that are already identified and that are not yet on the horizon- may be considered or evaluated for future iterations of the program.

If the CEC's Building Energy Efficiency Standards rulemaking has a process for considering new technologies for incorporation into the CBECC software, the CEC could clarify whether and how this process may be leveraged for the BUILD Program. Alternatively, the CEC may choose to develop a new technology

[5] As used in this resolution, 'kicker' incentives are incentives offered by the program administrator in addition to the 'base' or minimum incentives, when the participant deploys certain additional measures or technologies beyond the minimum required.

evaluation process under the BUILD Program and use it to inform code development.

IV. Bill Savings Methodology

1. *Rates*

CHP and CEJA comments recommend that both California Alternate Rates for Energy Program (CARE) and non-CARE rates should be considered, as not all low-income customers are aware of, or take advantage of, CARE rates. We note that the CARE program provides a percentage discount to the customer's bill, and on whichever rate the customer may be on, it is not a rate schedule in and of itself. We recommend that the CEC consider the data released in response to CPUC data resolution E-5105[6] to determine which rates are most suitable for developing the bill savings methodology.

In its comments, Southern California Gas Company ("SoCalGas") cites a recent study[7] by the University of California Los Angeles ("UCLA study"),[8] which concludes, among other findings, that there is a potential for bill increases resulting from electrification of residential end use appliances.[9] The study cites numerous past studies conducted by the CPUC that express uncertainty regarding the effect of Time of Use (TOU) rates on household energy expenditures.[10]

The study further states that low-income households in under-resourced and environmentally disadvantaged communities are likely to have very little

[6] https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M348/K071/348071702.PDF

[7] SoCalGas comments. p.2.

[8] Eric Daniel Fournier, et al. "Implications of the timing of residential natural gas use for appliance electrification efforts." Environmental Research Letters 15, no. 12 (2020): 124008. Available at: https://iopscience.iop.org/article/10.1088/1748-9326/aba1c0/pdf.

[9] Ibid. p.6.

[10] Ibid. p.9.

flexibility in terms of the timing of their end-use energy consumption and are therefore unlikely to see bill savings as a result of TOU rate adoption. It recommends that a well-designed electrification program should not only provide incentives to help under-resourced community members overcome the initial, up-front costs of purchasing new electric appliances but also with rebates or other mechanisms for reducing the ongoing marginal cost of consuming electricity, which is a more expensive source of energy.[11]

SoCalGas recommends that the CEC's calculations and baselines for bill savings[12] and costs per avoided greenhouse gas (GHG) emissions follow the UCLA study's methods to ensure affordability for low-income communities and cost-effective GHG emissions reductions.

We note the concerns raised by SoCalGas regarding the potential for customer bill increases. However, we are disinclined to prescribe a specific study method for the CEC to adopt for its bill savings analysis. Instead, we encourage the CEC to consider stakeholder comments that it will receive on its bill analysis methods as well as other available analyses, as the CEC proceeds to develop program guidelines. We also note that some of the recommendations made by the UCLA study, such as prioritizing electric appliances that have the capability of thermal energy storage to reduce grid impacts, are already under consideration in the CEC's Implementation Plan.

In response to SoCalGas's comment, the CEC may wish to consider both non-TOU and TOU rate structures in developing its bill savings analysis. Based on the CEC's analysis, the CPUC may explore whether it would be appropriate to adopt a special (new) or specific (existing) tariff to ensure that BUILD-incented properties achieve maximal bill savings.

[11] Ibid. p.7

[12] The UCLA study uses the phrase "household expenditures on energy."

2. *Defining 'building occupant'*

The Implementation Plan correctly recognizes the limitations for ensuring energy bill savings required by the authorizing statute, such as uncertainties in how occupants will use a building, varying weather conditions, etc. (pg. 32).

In addition to these, we note that while SB 1477 requires bill savings for the building occupants, it does not define what constitutes a building occupant (*i.e.*, whether it is the occupants of the individual dwelling units only and therefore the bills associated with them, or if it also includes ~~the~~ occupants who are responsible for the separately metered ~~building owner/ property manager who may pay bills for the~~ common areas and utility rooms, that is, ~~paid by~~ the building owner and/or the property manager~~)~~. Thus, as the CEC undertakes the bill analysis, ~~additional~~ a clear ~~arity and~~ definition of 'building occupant' may be helpful.

SoCalGas's comments note the importance of a methodology that results in realized bill savings for low-income households.[13] If the CEC chooses to define building occupant as the utility customer who occupies individual unit, and not include the building owner or the property manager who pays for the common area electricity usage, the CEC may want to consider whether the bill baseline could be based on some estimate of a representative low-income household occupant's prior bills.[14]

3. *Program Performance Evaluation*

SoCalGas recommends adding a new Ordering Paragraph regarding the process and metrics used to evaluate program performance:

> "The Process and Metrics to Evaluate Program Performance shall include the temporal usage of decarbonizing building technologies and the energy

[13] SoCalGas comment to the draft Resolution, p.2, 3, 4.

[14] The Implementation Plan proposes comparing anticipated bills for BUILD-incented homes against a reference mixed fuel new building conforming to the prescriptive standards of 2019 Building Energy Code (Title 24, Part 6) (CEC Implementation Plan, p.35).

profile of the local community not just the climate zone when determining any utility bill savings and greenhouse gas reductions."

We decline to add this Ordering Paragraph because it is the future program evaluator's role, not the CEC's role, to evaluate the program. The purpose of this resolution is to adopt the CEC's proposed Implementation Plan. Nevertheless, we agree with the general sentiment that temporal usage of installed technologies should be evaluated (by the evaluator) and compared against community-specific energy profiles and bills, as low-income households have unique energy use patterns and needs.

V. Submission Process for BUILD Program Guidelines

Section 921.1(a)(1) of the Public Utilities Code directs the CPUC, in consultation with the CEC, to develop and supervise the administration of the BUILD Program. As permitted by Section 921.1(a)(2) of the Public Utilities Code, D.20-03-027 designated the CEC as the third-party administrator of the BUILD Program. Following adoption of the Implementation Plan described in this Resolution, the CEC may obtain CPUC approval of program guidelines by filing a Tier 2 Business Letter following the procedures set forth in General Order 96-B.[15]

Generally, only public utilities submit Advice Letters to the Commission. (See General Order 96-B, General Rule 1.1). However, because the advice letter process is well-established at the CPUC, submission of a Business Letter that follows the same process as an Advice Letter will facilitate efficient review of the CEC's program guidelines in a just and speedy manner while distinguishing between requirements for public utilities as opposed to state agencies serving as third party administrators. (See General Order (GO) 96-~~B~~(b), General Rule 1.3).

[15] The process for submitting a Tier 2 Business Letter is the same as a Tier 2 Advice Letter set forth in General Order 96-B. The distinction between the Business Letter and the Advice Letter is to highlight that the submission is from a state agency acting as program administrator rather than a regulated public utility.

Pursuant to CEC's own practices and procedures, the proposed guidelines would first be subject to a CEC-led public notice and comment process following publishing of the guidelines to the CEC's BUILD Program docket. This process would include a public workshop where the draft guidelines would be presented and discussed. Public comment would be accepted in writing and during the workshop consistent with the direction set out in the notice for the proceeding and the workshop. The CEC would approve the guidelines for submission to the CPUC at a duly noticed business meeting prior to submitting the guidelines to the CPUC. The CEC's process provides stakeholders and the public with an opportunity to review and comment on the guidelines prior to the CPUC's review process.

Given that the proposed guidelines will be based on the Implementation Plan previously authorized by a CPUC resolution, and given that the CEC's own practices will have provided the public with an opportunity for comment, a Tier 2 Business Letter is appropriate. This approach will allow Energy Division the flexibility to more expeditiously approve the guidelines. Thus, the CPUC finds it appropriate for the CEC to submit program guidelines as a Tier 2 Business Letter prior to program commencement.

The Energy Division Director is authorized to order the Business Letter to go into effect on a date different from that otherwise provided by GO 96(b). If the protest and reply period is shortened in accordance with Rule 1.3, then the Energy Division Director may also order the Business Letter to go into effect on a date different from that otherwise provided by GO 96(b).

Any subsequent changes to the CPUC-approved program guidelines shall be approved through a Tier 1 Business Letter, which shall be the same process as a Tier 1 Advice Letter set forth in General Order 96-B.

COMMENTS

Public Utilities Code section 311(g)(1) provides that this Resolution must be served on all parties and subject to at least 30 days public review. Please note that comments are due 20 days from the mailing date of this Resolution. Section

311(g)(2) provides that this 30-day review period and 20-day comment period may be reduced or waived upon the stipulation of all parties in the proceeding.

The 30-day review and 20-day comment period for the draft of this Resolution was neither waived nor reduced. Accordingly, this draft Resolution was mailed to parties for comments and will be placed on the Commission's ~~March 18~~ April 15, 2021 meeting agenda ~~no earlier than 30 days from today~~.

One written comment was received from SoCalGas. The comment has been explained and addressed in the final resolution in the appropriate Discussion sections.

FINDINGS

1. D.20-03-027 directed CEC staff to submit an implementation plan for the Building Initiative for Low Emissions Development Program within 120 days of the adoption of the decision. The CEC timely submitted and published the first iteration of the implementation plan on July 24, 2020.
2. The CEC incorporated stakeholder feedback and submitted a second iteration- the Implementation Plan- on September 29, 2020.
3. The Implementation Plan meets the statutory requirements of SB 1477 and the regulatory requirements of D.20-03-027.
4. The CEC may continue to develop the BUILD program guidelines using the Implementation Plan as a framework.
5. Prior to program commencement, the CEC will submit the BUILD program guidelines to the CPUC for review via a Tier 2 Business Letter.
6. Any future changes to the BUILD program guidelines, including changes based on the two-year implementation plan review cycle, may be approved using the Tier 1 Business Letter procedure.

THEREFORE IT IS ORDERED THAT:

1) The California Energy Commission’s Implementation Plan for the Building Initiative for Low Emissions Development Program, as submitted on September 29, 2020 is hereby approved and adopted.

2) The California Energy Commission shall develop program guidelines and submit them to the California Public Utilities Commission using the Tier 2 Business Letter procedure set forth in General Order 96(b) prior to commencing implementation of the Building Initiative for Low Emissions Development Program.
3) The Tier 1 Business Letter procedure will apply to any future changes to program guidelines, including changes based on the two-year implementation plan review cycle.

This Resolution is effective today.

I certify that the foregoing resolution was duly introduced, passed, and adopted at a conference of the Public Utilities Commission of the State of California held on ~~March 18~~ April 15, 2021; the following Commissioners voting favorably thereon:

RACHEL PETERSON
Executive Director

APPENDIX 1

CEC BUILD Program Implementation Plan, published September 27, 2020

CALIFORNIA
ENERGY COMMISSION

California Energy Commission

STAFF REPORT

Building Initiative for Low-Emissions Development (BUILD) Program

- **Implementation Plan (Revised September 2020)**

Gavin Newsom, Governor

September 2020 | CEC-300-2020-010-REV

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ABSTRACT

Senate Bill 1477 (Stern, Chapter 378, Statutes 2018) authorized the Building Initiative for Low-Emissions Development Program. The program will provide incentives to builders to encourage the design of innovative and low-emission buildings. The bill requires the California Public Utilities Commission (CPUC), in consultation with the California Energy Commission (CEC), to develop and administer the program.

The California Public Utilities Commission initiated Rulemaking R.19-01-011 for building decarbonization. Under this proceeding, the CPUC adopted Decision D-20-03-027 to establish the framework and requirements of the program. The CEC is to coordinate with CPUC to develop an implementation plan. Furthermore, an implementation plan is to be submitted to the CPUC for approval every two years. This report is the first implementation plan for the program.

The *Building Initiative for Low-Emissions Development Program Implementation Plan (Revised September 2020)* presents California Energy Commission staff's proposed approach to administering the Building Initiative for Low-Emissions Development Program. The Build Implementation Plan provides information on the anticipated requirements for program participation including: program eligibility, incentive structure, application process, eligible equipment, evaluation of new technology, bill savings calculation methodology, technical assistance and outreach, and the metrics to evaluate program performance.

Keywords: SB 1477, Decarbonization, BUILD Program, Heat Pump, Low-Income

Please use the following citation for this report:

Chac, Erica, Geoffrey Dodson, and Tiffany Mateo. September 2020. *Building Initiative for Low-Emissions Development Program Implementation Plan (Revised September 2020)*. California Energy Commission. Publication Number: *CEC-300-2020-010-REV.*

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EXECUTIVE SUMMARY

In 2018, Senate Bill 1477 (Stern, Chapter 378, Statutes 2018) authorized two building decarbonization programs: (1) Building Initiative for Low-Emissions Development Program, and (2) Technology and Equipment for Clean Heating Initiative. These two programs encourage the development and installation of near-zero-emission building technologies to reduce the emissions of greenhouse gases (GHG) from buildings, as buildings contribute to a quarter of California's GHG emissions. Among other things, SB 1477 requires the California Public Utilities Commission (CPUC), in consultation with the California Energy Commission (CEC) to develop and supervise the administration of the Building Initiative for Low-Emissions Development Program. The Building Initiative for Low-Emissions Development Program aims to encourage the design and construction of low-emission, energy efficient buildings, with co-benefits that include reduced energy utility bills for low-income occupants and improved comfort, safety, and indoor air quality.

In January 2019, the CPUC instituted a new rulemaking on building decarbonization (Rulemaking [R.] 19-01-011). The proposed scope of the rulemaking includes implementing SB 1477. Under this proceeding, the CPUC adopted Decision (D.) 20-03-027, on March 26, 2020, to establish a framework and requirements for both programs authorized by SB 1477. D. 20-03-027 further designated the CEC as program administrator for the Building Initiative for Low-Emissions Development Program. The decision also directed the CEC, as program administrator, to develop and submit an implementation plan for approval by the CPUC, through the CPUC's resolution process. The BUILD Implementation Plan is subject to update and approval by the CPUC every two years. The BUILD Implementation Plan must address all requirements of SB 1477 and CPUC D. 20-03-027.

The BUILD Implementation Plan presents CEC staff's proposed approach to administering the Building Initiative for Low-Emissions Development Program and is subject to further revision following review by the CPUC and additional public input. The BUILD Implementation Plan provides information on the anticipated requirements for program participation including: program eligibility, incentive structure, application process, eligible equipment, evaluation of new technology, bill savings calculation methodology, technical assistance and outreach, and the metrics to evaluate program performance.

The BUILD Implementation Plan outlines a simplified program structure to encourage participation while still meeting requirements in the statute and D. 20-03-027. CEC staff has proposed flexible paths for the program while encouraging energy efficiencies, a streamlined application process and an incentive structure option that will not require additional project modeling, and advance technical assistance for builders and developers.

The BUILD Implementation Plan serves as framing document for developing proposed program guidelines, which the CEC will develop and submit to the CPUC for review and approval in early 2021. Specific provisions within the BUILD Implementation Plan may change as proposed program guidelines are developed, and CEC staff furthers program development analysis, solicits additional stakeholder input, and consults with the CPUC.

CHAPTER 1: Introduction and Background

In 2018, Senate Bill 1477 (Stern, Chapter 378, Statutes 2018; SB 1477) authorized two building decarbonization programs: (1) Building Initiative for Low-Emissions Development Program (BUILD), and (2) Technology and Equipment for Clean Heating Initiative (TECH). These two programs encourage the development and deployment of near-zero-emission building technologies to reduce GHG emissions from buildings, as buildings contribute to a quarter of California's GHG emissions while also causing indoor and outdoor pollution. SB 1477 requires the CPUC, in consultation with the CEC to develop and supervise the administration of the Building Initiative for Low-Emissions Development Program. SB 1477 makes available $50 million annually for four years, for a total of $200 million, derived from the revenue generated from the GHG emission allowances directly allocated to gas corporations and consigned to auction as part of the California Air Resources Board's (CARB's) Cap-and-Trade program for the implementation of both pilot programs, BUILD and TECH.

In January 2019, the CPUC instituted a new rulemaking on building decarbonization (R.19-01-011). The proposed scope of the rulemaking includes implementing SB 1477. Under this proceeding, the CPUC adopted D. 20-03-027, on March 26, 2020, to establish a framework and requirements for both programs authorized by Senate Bill 1477.

The BUILD Program, codified under Public Utilities Code sections 921 and 921.1, will provide incentives for the installation of near-zero emission building technologies in new residential buildings that reduce GHG emissions significantly beyond what otherwise would be expected to result from implementing the prescriptive standards described in Part 6 of Title 24 of the California Code of Regulations (California Energy Code). SB 1477 places specific programmatic emphasis on "new, low-income residential housing" by requiring no less than 30 percent of the total funding be reserved for such projects. SB 1477 also requires that new low-income, residential building projects must be offered technical assistance, and that efforts to electrify these homes not result in higher utility bills for the occupants. SB 1477 additionally authorizes the development of proposed program guidelines to include program eligibility and evaluation requirements and enumerates certain project requirements and minimum metrics to be included in program evaluation.

The BUILD Implementation Plan is intended to serve as an outline of the CEC's proposed design for the BUILD Program. The CEC, consistent with SB 1477, anticipates continued collaboration with CPUC to develop opportunities for additional public input and release detailed proposed program guidelines prior to accepting new applications.

CEC recognizes that in developing the BUILD program, staff must understand and collaborate with existing organizations and programs supporting low income housing development and programs encouraging the adoption of building decarbonization efforts. The Low-Income Housing Tax Credit (LIHTC) Program of the Tax Credit Allocation Committee (TCAC) is particularly relevant for implementation of the BUILD Program. The scoring criteria used by

TCAC are a significant motivating force for owners and developers, and it directly influences their design decisions. CEC has developed a working relationship with TCAC and will continue to collaborate with the TCAC to ensure mutual benefit between the BUILD Program and the LIHTC Program as proposed program guidelines are developed.

Staff hosted a joint CEC/CPUC public workshop on June 15, 2020, to present implementation options and solicit stakeholder feedback. Public comments on that workshop can be found in Docket 20-DECARB-01.

• Initial Budget

Program funding is authorized pursuant to SB 1477 with an overall budget of $200 million dollars. Funding accrues over a four-year period, from Fiscal Year (FY) 2019-2020 to FY 2022-2023. D. 20-03-027 provided specific allocations and more details budget allocations for each of the two programs. D. 20-03-027 appropriates 40 percent of the $200 million budget for the BUILD Program equal to $80 million.

The overall program budget may be spent over the duration of the program; however, to meet requirements of the funding source each year's accrual must be expended within 10 years of allocation. There is no specific restriction on annual spending, provided it is within the overall budget and funds are available. The BUILD budget detail is shown in Table 1.1.

Table 1.1 BUILD Program Budget

Budget Item	Amount
Program Costs (direct incentives for low-income housing developments)	$60,000,000 (no less than)
BUILD Program Costs (Other, including mixed-market developments and 3rd party technical assistance provider for low-income housing developments)	$10,000,000 (no less than)
Administrative Costs	$8,000,000 (no more than)
Joint Evaluation Cost Share	$2,000,000 (no more than)
Total	$80,000,000

Source: CPUC D. 20-03-027[16]

The $10 million allocated for other BUILD Program costs will be prioritized for the third-party technical assistance provider. The exact budget for the technical assistance has not yet been established, as the request for proposal is currently in development (see Chapter 7 for more

[16] CPUC D. 20-03-027, http://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M331/K772/331772660.PDF

detail). The CEC will identify other programmatic uses for potential leftover funds in proposed program guidelines.

To comply with CARB regulations regarding Cap-and-Trade funds and allocation requirements laid out in D. 20-03-027, regional spending for the BUILD Program must be proportionally directed to the gas corporation service territories where the funds are derived. The percentage allocation for pilot program spending in each gas corporation service territory shall be consistent with each gas corporation's allocation of Cap-and-Trade allowances, as shown in Table 1.2.

Table 1.2 BUILD Program Budget Allocation by Natural Gas Territory

Natural Gas Utility Territory	Allocated Percent of Budget
Southern California Gas Company	49.26%
Pacific Gas and Electric Company	42.34%
San Diego Gas & Electric Company	6.77%
Southwest Gas Corporation	1.63%

As noted in D. 20-03-027:

> "Any spending for the BUILD Program…with statewide or cross-territory benefits, including but not limited to administrative and evaluation spending, shall be attributed to the gas corporation service territories in proportion to their original funding contributions. To the extent that there are unspent funds allocated for an individual gas corporation's service territory, and no remaining applicants within that service territory, the remaining funds may be spent outside of that gas corporation's service territory, starting two years after initial implementation. Any unspent funds remaining as of July 1, 2033, must be returned to the ratepayers of the respective gas corporations."[17]

• Implementation Plan Contents

D. 20-03-027 specifies requirements for the BUILD Implementation Plan, which must, at a minimum, address the following topics (chapter references are indicated):

- Program eligibility criteria (Chapter 2)
- Incentive structure (Chapter 3)
- Criteria for scoring and selecting projects (Chapter 4)
- List of eligible technologies (Chapter 5)
- Process for evaluating new technologies (Chapter 6)

[17] CPUC D. 20-03-027, pg 3, http://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M331/K772/331772660.PDF

- Bill savings methodology (Chapter 7)
- Technical assistance (Chapter 8)
- Outreach Plan (Chapter 9)
- Process and set of metrics by which to evaluate program performance (Chapter 10)

CHAPTER 2: Program Eligibility Criteria

BUILD applicants may either be building owners or builders/developers only. Consultants may apply on behalf of eligible applicants. Consultants will need to provide information regarding the eligible applicants and work with the eligible applicants to submit the proper paperwork.

Projects must meet the following eligibility criteria, as further described:

- New residential housing
- All-electric
- Low-income
- Eligible service territory

To be eligible for BUILD incentives, all required and eligible technologies must be installed in conjunction with[18] the construction of a new residential building that is permanently fixed to the foundation. For eligible technologies, refer to Chapter 5 of this document.

To support broad participation in this pilot program, staff may limit BUILD applicants to three approved project applications to ensure funding is distributed across a variety of participants. The CEC would implement this limit in coordination with other program requirements and would be considered a soft cap, which means CEC staff may lift or modify the 3-project limit if program funds remain available. Staff anticipate that any cap on funds in the initial program design will include provisions that allow CEC, at its discretion, to lift the 3-project limit to respond to program participation and market conditions. Additional details about the proposed soft cap on applicants will be provided in proposed program guidelines.

Staff do not propose to limit the use of technical assistance funds provided to any single developer of low-income projects at this time. However, details of the final structure under which the technical assistance contractor will work will be further defined in proposed program guidelines and the final contract with the technical assistance provider.

CEC staff recognizes that proposed program guidelines must also address stage(s) in the development process at which a project must apply for incentives to be eligible. For instance, program staff have identified that low income project developers have specific stages in tax credit application by which all sources of funding must be identified. In addition, staff recognize that certain developers may be currently in planning or design stages and be interested in participating in the BUILD program. As such it will be necessary for CEC staff to fully address participation requirements including what stage projects must apply by and any factors that limit participation. CEC staff are continuing to evaluate this matter and will seek

[18] For an eligible technology to be considered installed "in conjunction with" the construction of a new residential building, an appliance must be installed prior to issuance of a certificate of occupancy.

additional input and will issue further guidance in proposed program guidelines approved consistent with SB 1477.

- ## New Residential Building

As noted, BUILD program eligibility requirements will be further detailed in proposed program guidelines. This Implementation Plan provides the details as identified to date, recognizing areas that will be further developed in proposed program guidelines but also noting those that are mandated by statute or directed by D. 20-03-027.

New residential building eligible for participation in BUILD is defined in D. 20-03-027 as one of the following:

1. A building that has never been used or occupied for any purpose;[19] or
2. Any work, addition to, remodel, repair, renovation, or alteration of any building(s) or structure(s) when 50 percent or more of the exterior weight bearing walls are removed or demolished;[20] or
3. An existing building repurposed for housing, whose original use was not residential.

Consistent with this requirement, staff have identified that eligible new residential building types may include:

- Single-Family homes.
- Duplexes.
- Triplexes.
- Condominiums.
- Multifamily buildings.
- Dormitories.
- Residence hotels.
- Assisted living facilities.
- Farmworker housing in agricultural zones.
- All-electric mixed-use buildings (which include residential occupancies).

Ineligible project types are anticipated to include:

- Commercial buildings.
- Government buildings (excluding government-owned low-income housing).
- Agriculture projects (excluding farmworker housing).
- Schools.
- Churches.

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[19] Section 100.1 of Part 6 of Title 24 of the California Code of Regulations (California Energy Code).

[20] Chapter 15.06.030 Section R202 of the California Residential Building Code.

- ## All-Electric Requirement

D. 20-03-027 requires projects to be limited strictly to new residential projects that are all-electric and have no hookup to the gas distribution grid. Further, staff have determined that the use of propane for building energy needs would disqualify a development for BUILD incentives. To meet the all-electric requirement, the following criteria are proposed for projects that meet the statutory definition of new residential housing:

- New buildings that have never been used or occupied may not have gas distribution lines to the building from any main gas lines on-site that preexisted construction of the project. To be eligible, new housing developments should exclude the construction of gas infrastructure entirely.
- For existing buildings that meet the new housing definition under the criteria for remodel, repair, renovation, or alteration of any building(s) or structure(s) when 50 percent or more of the exterior weight bearing walls are removed or demolished, or an existing building repurposed for housing that has existing gas lines prior to renovation or repurposing must remove or cap the gas lines leading to the structure(s). Existing building projects would need to take certain steps to show their commitment to going all-electric, prior to receiving technical assistance or applying for BUILD incentives. Final building designs for projects of this nature must demonstrate that all gas infrastructure is permanently disabled or removed consistent with the requirements for no gas service for new buildings. CEC staff intend to further define these requirements in the proposed program guidelines.

CEC staff note that D. 20-03-27 ordered that, "projects and installations in local government territories that have 'reach' codes which surpass the California Energy Code – or any other state requirement – are not prohibited from participating in the BUILD Program or the TECH Initiative." CEC staff propose to include projects in municipalities with requirements or preferences for all-electric new construction as eligible projects for BUILD incentives.

- ## Low-Income Residential Housing Requirement

Under SB 1477 and D. 20-03-027, at least $60,000,000 of BUILD funding over four years must be reserved for new low-income residential housing unless the CEC and CPUC expand incentives for market-rate housing. Consistent with this goal, CEC proposes to offer BUILD funds exclusively for low-income residential housing during the initial offering of funds. If allocated funds are not spent on low-income residential housing developments within two years of the implementation start date, expanding the applicant pool to include market-rate projects may be considered and proposed through the biennial recurring BUILD Implementation Plan update required by D. 20-03-027. Thus, to qualify for BUILD funding within the first two years of the program, a project must meet the definition of low-income residential housing provided in SB 1477:

1. A multifamily residential building of at least two rental housing units that is operated to provide deed-restricted low-income residential housing[21] and that meets one or both of the following conditions:

    a. The property is in a disadvantaged community[22] or low-income community;[23] or

    b. At least 80 percent of the households living in the building have incomes at or below 60 percent of the area median income[24]

2. An individual low-income residence[25] as described in subparagraph (C) of paragraph (3) of subdivision (a) of Section 2852 of the Public Utilities Code.

    NOTE: Public Utilities Code section 2852 (a)(3)(C) defines low-income residential housing to include: "An individual residence sold at an affordable housing cost to a lower income household that is subject to a resale restriction or equity sharing agreement, for which the homeowner does not receive a greater share of equity than described in paragraph (2) of subdivision (c) of Section 65915 of the Government Code,[26] with a public entity or nonprofit housing provider organized under Section 501(c)(3) of the Internal Revenue Code[27] that has as its stated purpose in its articles of incorporation on file with the office of the Secretary of State to provide affordable housing to lower income households."

Proof of meeting the required criteria must be provided at the time of application. CEC staff anticipate that applicants can document that a project meets this requirement by providing documentation of participation in federal, state or local programs that ensure minimum low-income participation rates. Specific details will be provided in proposed program guidelines.

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[21] The low-income housing must be provided as described in clause (i) of subparagraph (A) of paragraph (3) of subdivision (a) of Section 2852 of the Public Utilities Code.

[22] A community identified as a disadvantaged community pursuant to Section 39711 of the Health and Safety Code.

[23] A census tract or equivalent geographic area defined by the United States Census Bureau in which at least 50 percent of households have an income less than 60 percent of the area median gross income.

[24] As defined in subdivision (f) of Section 50052.5 of the Health and Safety Code.

[25] As described in subparagraph (C) of paragraph (3) of subdivision (a) of Section 2852 of the Public Utilities Code.

[26] Public Utilities Code Section 2852 (a)(3)(C) further references Government Code Section 65915 (c)(2) in defining the share of equity.

[27] Public Utilities Code Section 2852 (a)(3)(C) further references Internal Revenue Code Section 501(c)(3) in defining exemption requirements for an organization organized or operated exclusively for exempt purposes.

a. Mixed-Market Buildings (Partial Low-Income Developments)

Staff propose allowing BUILD incentives for mixed-market multifamily residential buildings, meaning only a portion of residential units are restricted to qualifying low-income tenants. Exact eligibility specifications will be addressed in proposed program guidelines and would be contingent upon the previously stated low-income requirements being met for such projects. Staff do not propose providing incentive funding market-rate units for the first two years of the BUILD program except in the case of a mixed-market multifamily residential building.

• Eligible Service Territories Requirement

To comply with rules regarding the use of Cap-and-Trade funds realized from consignment of allowances to auction, spending for the BUILD Program shall be proportionally directed to the gas corporation service territories where the funds are derived. To receive incentives through the BUILD Program, the project must be located in California in one of the identified gas corporation territories. Figure 2.1 provides a general view of service territories for reference, however, is not provided as a precise representation of these territories and will not be used to inform program decisions. Staff note that completed BUILD projects may be served by any electricity supplier, including investor owned or publicly owned utilities, community choice aggregators or other retail suppliers.

Figure 2.1: Eligible Natural Gas Utility Service Area (California, 2020)

Source: California Energy Commission

Additionally, and to the extent feasible, funds must be allocated in proportion to the percentage consistent with each gas corporations' allocation of Cap-and-Trade allowances as listed in Table 2.1.

Table 2.1: Incentive Allocations for each Gas Corporation Territory

NG IOU Territory	Allocation Percentage	Statewide Expense Amount	Incentives Amount	Total Amount
Southern California Gas Company	49.26%	$9,852,000	$29,556,000	$39,408,000
Pacific Gas and Electric Company	42.34%	$8,468,000	$25,404,000	$33,872,000
San Diego Gas & Electric Company	6.77%	$1,354,000	$4,062,000	$5,416,000
Southwest Gas Corporation	1.63%	$326,000	$978,000	$1,304,000
Total	100%	$20,000,000 (no less than)	$60,000,000	$80,000,000

Any spending for the BUILD Program with statewide or cross-territory benefits, including but not limited to administrative and evaluation spending, shall be attributed to the gas corporation service territories in proportion to their original funding contribution. To the extent that there are unspent GHG allowance proceeds allocated for an individual gas corporation's service territory, and no remaining eligible projects within that service territory, the remaining GHG allowance proceeds may be spent outside of that gas corporation's service territory, starting two years after implementation.

Any unspent funds remaining as of July 1, 2033, shall be returned to the ratepayers of the respective gas corporations.

D. 20-03-027 further notes that it is also appropriate to prioritize BUILD Program incentives toward the regions in the state with the highest potential for achieving program goals, including reducing GHG emissions and serving low-income customers. Incentive disbursement is also directed to include focus on specific climate zones of the state where there is a high cooling and high heating load, low-income residential housing, or specific building ages or types. The manner in which priority areas, populations or projects are prioritized will be addressed in proposed program guidelines. Methods available to CEC to ensure prioritization consistent with the stated goals of SB 1477 and the direction provided in D. 20-03-027 include increasing incentive values for priority projects and areas, prioritizing technical assistance to priority projects and areas, and other tools that will be further explored with public input.

- ## Energy Efficiency Requirements

Each building receiving incentives for installed technologies must comply with the applicable energy efficiency requirements pursuant to the California Energy Code[28] (Energy Code). As the BUILD Program will fund new construction projects only, buildings will be subject to the Energy Code. An apartment building with three or fewer habitable stories falls under the low-rise residential standards, while an apartment building that has more than three habitable stories falls under the nonresidential standards. Applications for existing buildings that otherwise meet the requirements to be considered "new residential", as discussed above, must submit energy modeling demonstrating that the entire building is code compliant to the current applicable energy standards. For projects that are repurposed existing buildings whose original use was not residential, different energy efficiency requirements likely apply and must be met. As noted elsewhere, energy efficiency requirements under BUILD are anticipated change to reflect updates to the Energy Code.

Energy efficiency compliance shall be demonstrated for a building as a whole and cannot combine unrelated or detached buildings[29] consistent with the 2019 Energy Code or later applicable updates. Meeting the energy efficiency requirements by using the "addition only" compliance approach or the "addition and alterations" compliance approach will not be accepted. For more information, refer to Chapter 9 of the *2019 Title 24, Part 6, Residential Compliance Manual.*[30]

Questions concerning energy efficiency requirements should be directed to the Energy Code Hotline at title24@energy.ca.gov or 1-800-772-3300. Additional information can be found on the Building Energy Efficiency Standards Web page at https://www.energy.ca.gov/programs-and-topics/programs/building-energy-efficiency-standards.

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[28] 2019 Building Energy Efficiency Standards webpage, https://www.energy.ca.gov/programs-and-topics/programs/building-energy-efficiency-standards/2019-building-energy-efficiency

29 The whole-building approach is defined in Section 8.6.1 of the *2019 Building Energy Efficiency Standards Residential Compliance Manual*, https://ww2.energy.ca.gov/2018publications/CEC-400-2018-017/chapters/08-Performance_Method.pdf

30 Energy Efficiency 2019 Residential Compliance Manual Chapter 9: https://ww2.energy.ca.gov/2018publications/CEC-400-2018-017/chapters/09-Additions_Alterations_and%20Repairs.pdf

The BUILD energy efficiency requirements are determined by the Energy Code under which the project was permitted by the building department or local authority having jurisdiction. No additional energy efficiency requirements are proposed. Applicants may also verify which Energy Code a project is subject to using the following dates:

- *2019 California Energy Code*: Building permit application(s) submitted to the building department on or after January 1, 2020.
- *2022 California Energy Code*: Building permit application(s) submitted to the building department on or after January 1, 2023.

CHAPTER 3: Incentive Structure

• Incentive Structure

D. 20-03-027 declined to dictate a specific incentive level, but, rather, provided the CEC the flexibility to establish and adjust incentive levels based on participation rates, market activity, costs, complementary programs, location, GHG savings, grid impacts, and program data. The CEC, when administering the BUILD Program incentives, will act consistently and tie incentives to the cost of equipment, incremental cost difference for builders, and estimated GHG emission reduction level with prioritization given to projects in low-income and disadvantaged communities, consistent with the requirements of D. 20-03-027.

Many stakeholders have presented compelling cases regarding the need for a simple participation model. In response, CEC staff recommend a simple incentive design that encourages participation and leverages the design, modeling and program participation efforts project developers already undertake. In addition, the first few years of this program are being implemented concurrently with development of the next update to the Energy Code. CEC staff will reflect the need for the BUILD program to address current versions of the Building Code over time in proposed program guidelines. CEC staff will also monitor the updates to the Building Code and, if necessary, appropriately reflect any new considerations and compliance requirements for all-electric residential construction in the required, recurring updates to the Implementation Plan. CEC staff seek to develop an incentive design applicable in the initial years that can both support new standards and respond to changes without a major investment of resources in re-design that would divert funds from their best use.

CEC staff proposes a pre-determined rate of funding specific to each climate zone and building type and based on modeled annual avoided GHG emissions. The incentive rate will be set to a dollar amount that offsets the cost of equipment and incremental cost difference for builders to employ all-electric housing designs and adjusts to reflect the level of GHG reductions. This approach is consistent with the requirements of D. 20-03-027, that incentives shall be based on whole building GHG performance modeled using the CEC's California Energy Code Compliance (CBECC) software against a reference case.

• Description of the Template-Based Incentive Structure

While incentive levels will be based on GHG emission reduction levels and incremental cost to builders, there are other BUILD Program requirements that will determine and shape the incentive structure. BUILD is a GHG emission reduction program and incentives shall be based on whole building GHG performance. In addition, incentives set aside for low-income housing, representing most of the BUILD Program budget, must not result in higher utility bills for building occupants. There must also be a list of eligible technologies in the proposed program guidelines.

Instead of setting up multiple checkpoints for BUILD Program applicants, which might include performing and submitting building energy modeling results, CEC staff will complete upfront analysis to make sure these statutory and regulatory requirements are met and embedded within the BUILD Program incentive structure.

The incentive structure and list of eligible technologies will be presented as a prescriptive template, tailored to each climate zone and specific to each building type. This template will list the building design criteria required to receive incentives through the BUILD Program and will be a list of requirements that will ensure energy bill savings. In order for a project to receive BUILD Program funds, it will need to meet or exceed the design criteria of the template (which in turn will likely exceed prescriptive Energy Code criteria).

The templates will list the required technologies an applicant must include in their building design, such as a minimum heat pump efficiency and minimum R-value insulation and offer a dollar incentive amount on the unit or bedroom level for multifamily buildings and conditioned floor area (CFA) for single family homes. The template presents the list of eligible technologies, bases incentives on whole building GHG performance, and ensures bill savings for building occupants without requiring any extra analysis or building modeling of the BUILD Program applicant. There may be a differing template and incentive level for each building type and each climate zone or region. Table 3.1 provides an example of the BUILD Program incentive structure.

Table 3.1 Sample BUILD Program Incentive Structure

Climate Region	1-story Single Family	Low-Rise Multifamily	High-Rise Multifamily	Mixed Use
North & Central Coast (Climate Zones 1-5)	$/CFA	$/bedroom	$/bedroom	$/bedroom
South Coast (Climate Zones 6-10)	$/CFA	$/bedroom	$/bedroom	$/bedroom
Central Valley (Climate Zones 11-14)	$/CFA	$/bedroom	$/bedroom	$/bedroom
Southern Desert (Climate Zone 15)	$/CFA	$/bedroom	$/bedroom	$/bedroom
Mountains (Climate Zone 16)	$/CFA	$/bedroom	$/bedroom	$/bedroom

In public comments to the BUILD Program workshop, many stakeholders emphasized the need for program simplicity, especially from the perspective of the applicant. A prescriptive template is intended to promote a streamlined and simple program participation experience by developing scalable templates to use as a basis for calculating GHG emissions reductions and incentives. The intent is to develop a standardized incentive in a dollar-per-bedroom or dollar-per-dwelling-unit rate that is based on avoided GHG performance and generated from standardized modeling and analysis. In either approach, studio apartments will be included as eligible residential units for BUILD incentives and details on incentive structure for these units will be addressed in proposed program guidelines. This approach will tailor the template of prescriptive efficiency measures by climate zone and utility jurisdiction. Using the prescriptive template approach, a program participant would not be required to model their building design specifically for BUILD participation. The program participant would simply need to meet basic minimum requirements then likely select the suite of applicable inputs into a BUILD Program calculator or other tool to identify the potential incentive amount of a project. At this time CEC staff does not propose limiting or capping total incentive funding for a given project, nor does staff propose limiting total funding to a given developer or developing entity submitting multiple applications for BUILD incentives. As discussed above, staff may impose a 3-project cap on any single developer or owner, but must further assess any effects this cap would impose on meeting the program goals, reaching priority populations, or ensuring the required proportional distribution of funds by service territory. Staff are interested in additional public input as proposed program guidelines are developed and may consider funding caps for individual projects based on stakeholder input.

The standardized, up-front calculation of incentive rates by CEC staff will meet statutory program requirements, without complicating participation. Also, this incentive structures allows potential BUILD Program applicants to quickly calculate the estimated incentive amount they can receive, before doing any costly modeling. This is especially important for low-income developers, as they need to secure project funding in the predevelopment phase of the project, before applying for tax credits through TCAC, and before building design is final. This timing is important, as BUILD Program incentives are meant to influence building design decisions. With this structure, projects in specific climate zones or those in disadvantaged or low-income communities can be prioritized through a predefined incentive structure rather than application scoring criteria. As discussed, this is one potential method for prioritizing target areas, projects and populations that staff will explore through development of the proposed program guidelines.

• Developing the Incentive Templates

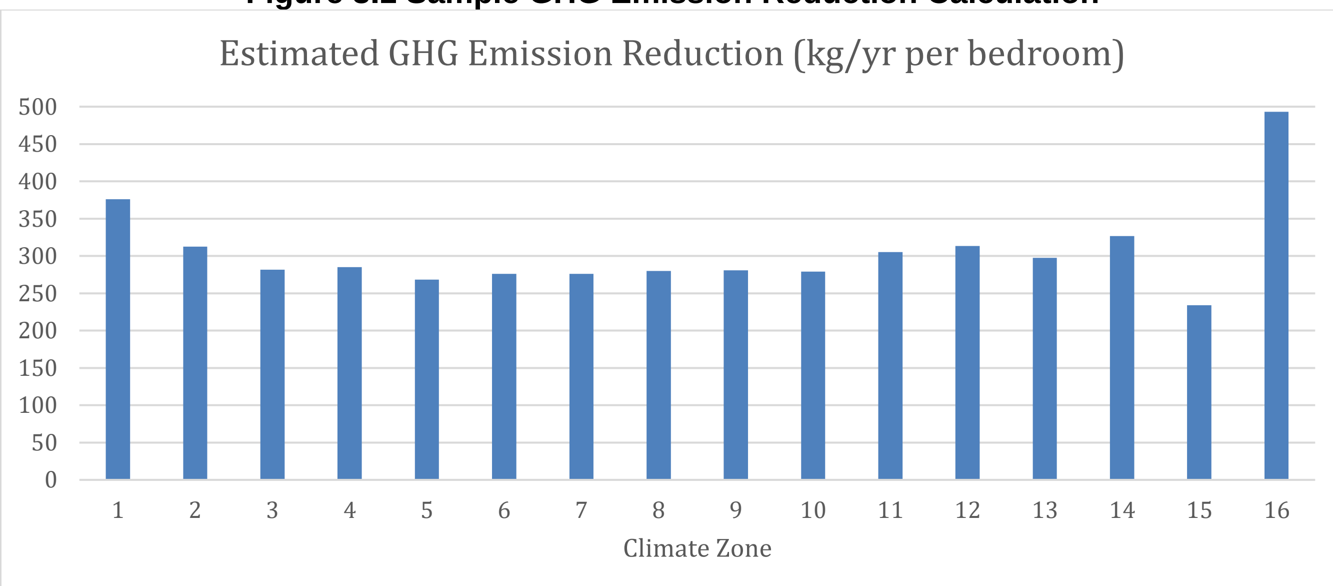
CEC staff will use CBECC software to set the BUILD Program incentive structure template. All project applications will be compared to a 2019 Energy Code prescriptive mixed fuel building to calculate the baseline energy use and GHG emissions for each building type and in each climate zone. As the Energy Code is updated for the 2022 code cycle, the incentive structure template for the BUILD Program will be updated as needed, both for the GHG emission calculation and the bill savings analysis.

b. GHG Emission Calculation

The GHG emission reduction calculation for projects funded with BUILD Program incentives will be based on whole building performance. CBECC software estimates GHG emissions of modeled buildings in carbon dioxide (CO_2) equivalent emissions per year. The CBECC emissions calculation includes site fuel emissions, mainly the combustion of natural gas from space and water heating, and emissions associated with the generation of electricity. To calculate emission reductions, the all-electric modeled building emissions are compared to 2019 mixed-fuel prescriptive building emissions baseline. This baseline will be updated as appropriate based on 2022 updates to Title 24 and CBECC software and potentially future updates as needed.

Staff will model the all-electric building template and compare the annual GHG emissions to the mixed-fuel baseline. The GHG emission reductions of each template will inform the incentive level for that building type and climate zone. Heating and cooling loads vary by climate zone, which leads to varied energy use, and varied GHG emission reductions. Figure 3.1 below is a sample of the varied GHG emission reductions based on a sample all-electric low-rise multifamily building compared to a mixed-fuel low-rise multifamily building. Once the template of eligible technologies is determined, a GHG emission analysis will be done for each building type and climate zone.

Figure 3.1 Sample GHG Emission Reduction Calculation



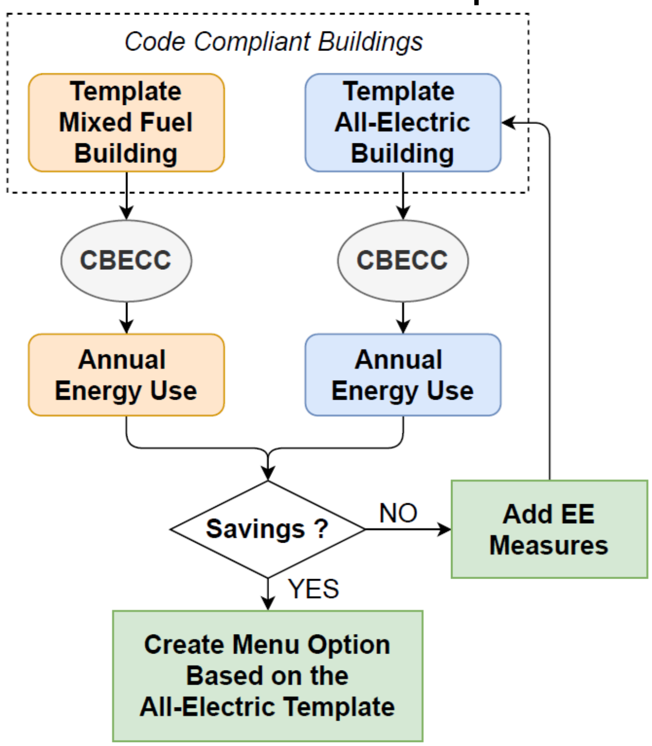
The GHG emission reduction calculation will be used as a basis for the incentive structure and a factor in incentive levels and will be reported as part of program evaluation. Regulatory and statutory requirements include reporting of total avoided GHG emissions and cost per metric ton of avoided GHG emissions. (See Chapter 10 for more information on BUILD Program metrics.)

CEC staff may perform further analysis to determine lifetime GHG emission reductions of BUILD projects. This analysis would include incorporating projected GHG emissions attributed to the generation of electricity. Because of California's increasing adoption of renewable energy, the GHG emissions attributed to electricity provided by the grid will reduce over time. The lifetime GHG emission reductions will be analyzed on a 30-year term, which is consistent with the lifecycle analysis of a residential building under codes and standards. Lifetime GHG emissions may also be analyzed under a 15-year term to compare emissions reductions to bill savings using the same time basis. (See Chapter 6 for more information on the bill savings methodology.)

c. Energy Bill Savings Calculation

As the BUILD Program has mutual goals of GHG emission reduction and bill savings, staff anticipate that project developers will need to evaluate which combination of technologies provides sufficient to meet these goals. The bill savings of a project are significantly affected by local utility rates and may be specific to certain service territories. As such, staff may iterate additional templates for added bill savings measures in some areas. In such cases, the baseline energy use will be applied to natural gas and electricity rates to calculate a baseline estimate of an energy bill. These baseline building templates will be set and constant for each building type and climate zone. CEC staff will then model templates for all-electric buildings, for each building type and in each climate zone, to determine which template of energy-efficient and low-emission building technologies are anticipated to result in energy bill savings. There will likely be multiple templates of different combinations of building technologies in each climate zone before the templates are optimized and completed. Figure 3.2 is a flow chart of this process. By doing this analysis, CEC staff eliminates the need for BUILD Program applicants to perform their own analysis. See Chapter 7 for additional information on the bill savings methodology.

Figure 3.2 Incentive Structure Development Flow Chart



CEC staff proposes that a project must meet the template minimum requirements to receive BUILD incentives. The template may differ by building type and climate zone and, consequently, may result in different levels of GHG emissions reductions and incentive levels. Table 3.2 is a sample of the eligible technologies that would serve as the basis of a BUILD Program template.

Table 3.2 Sample Template

Building Type: Low-Rise Multifamily
Climate Zone(s): 6, 8, 9
Heat Pump HVAC, HSPF ≥ 9.0
Unitary Heat Pump Water Heater, NEEA Tier 3 OR On-site Central Heat Pump Water Heater, approved in CBECC Software
Minimum 2019 Energy Code prescriptive envelope measures

CEC staff further propose that a project applying for incentives calculated under the prescriptive incentive approach would still be eligible to receive kicker incentives as described next.

d. Kicker Incentives

For building design features that are additional to those considered in the pre-determined modeled base incentive rate values and represent additional GHG emission reductions, staff propose a small suite of ‘kicker’ incentives, offered at a flat rate for specific design features on top of prescriptive or modeled incentive levels. At minimum, a project eligible for BUILD Program kicker incentives must include all mandatory base level eligible technologies. If a project includes all the base level eligible technologies, it may qualify for additional BUILD incentives by including technologies eligible for BUILD kicker incentives. CEC staff currently propose that if a project uses a technology for compliance credit under the Energy Code, the technology will not be eligible for BUILD kicker incentives. However, staff also recognize that in some cases limiting eligibility could be contrary to other policies supporting adoption of beneficial technologies. CEC staff will continue to explore these considerations and will provide final guidance on eligibility in the proposed program guidelines.

Table 3.3 shows examples of kicker incentive levels for the BUILD kicker incentive technologies. The rates shown are for example purposes only. Final and applicable incentive amounts will be made available in proposed program guidelines.

Table 3.3: Sample BUILD Kicker Incentive Levels (example values only, final values may change)

Performance "Kicker"	Incentive Level
Grid Flexibility	$500/grid flexible capable system
Low-GWP Refrigerants	$1,000/unitary or split heat pump $XX/compressor for central heat pump system
Induction Cooktop	$300/induction cooktop unit
Heat Pump Clothes Dryer	$150/heat pump clothes dryer
On-Site Energy Storage	$50/ton annual avoided GHG emissions OR $X/kWh storage capacity

e. Funding for Mixed-Market Buildings

As noted in the eligibility section, staff propose allowing BUILD incentives for mixed-market multifamily residential buildings, meaning only a portion of residential units are restricted to qualifying low-income tenants. Staff anticipates that a mixed-income project would receive a reduced incentive for market-rate residential units that are within a mixed-income multifamily building. Exact eligibility specifications and incentive rate details will be addressed in proposed program guidelines. Staff do not propose providing incentive funding for market-rate units for the first two years of the BUILD Program except in the case of a mixed-market multifamily residential building.

CHAPTER 4: Required and Eligible Technologies

The BUILD Program aims to encourage the design and construction of low-emission, energy efficient buildings, with co-benefits that include reduced energy utility bills for the occupants and improved comfort, safety, and indoor air quality. As stated in D. 20-03-027, there is no restriction for the BUILD Program to incent a specific technology or measure. Instead, incentives should be provided for any combination of technologies, including but not limited to energy efficiency and demand response measures, electric battery storage, and other measures and technologies. CEC staff currently propose that incentives support the installation of technologies beyond what is required for compliance with the Energy Code but seek additional input on this proposed approach. The CEC may consider additional technologies for incentives, such as solar water heaters, electric vehicle charging equipment, or building envelope measures, under proposed program guidelines pending additional analysis and stakeholder input.

All-electric building design with no gas hookup is a required minimum under D. 20-03-027 requirements for the BUILD Program. As such, technologies that use renewable natural gas or hydrogen will not be included in the BUILD Program. Please see Appendix A for the equipment lists the CEC plans to use for each technology type under the BUILD Program.

• BUILD Base Incentives

The CEC will calculate base incentives using CBECC software, based on design factors and technologies used to determine energy consumption and GHG emission levels. Consistent with the authorizing statute, the BUILD Program will incent a combination of technologies and measures, addressing but not limited to energy efficiency, space conditioning, water heating, cooking and laundry needs. The CEC is still considering other technologies and requirements for base incentives, including those recommended by stakeholders through public comments. Final guidance on the technologies and requirements for base incentives will be provided in the proposed program guidelines.

Table 4.1: Technologies for BUILD Base Incentives

Energy End Use	Core Technologies	Minimum Requirements
Space Conditioning	Heat Pump HVAC	HSPF ≥ 10 (non-ducted) HSPF ≥ 9 (ducted)
Water Heating	Unitary Heat Pump Water Heater	NEEA Tier 3
	Central On-site Heat Pump Water Heater	Approval in CBECC software

f. Heat Pump Space Conditioning

During the heating season, heat pumps move heat from outside into the home; during the cooling season, heat pumps run in reverse, moving heat from the home to the outdoors. Electric heat pumps substitute gas furnaces, and are a low-emission technology, eliminating the need for on-site combustion of natural gas for space heating, and therefore reducing GHG emissions. For space conditioning, heat pumps must have a heating seasonal performance factor (HSPF) of 10 or higher for non-ducted systems and 9 or higher for ducted systems to be eligible for BUILD incentives. Air source Heat pumps will be included as eligible for incentives under the BUILD program. Staff is considering including combined space and water heating systems for incentives under the BUILD Program. As noted above, technologies and requirements for base incentives will be finalized in program guidelines.

g. Heat Pump Water Heating

Heat pump water heaters use electricity to move heat from one source (typically ambient air) to water instead of using an electric resistance element. Because of this, they can be more than three times as energy efficient than conventional electric resistance water heaters. They are also low-emission compared to gas water heaters by avoiding on-site combustion of natural gas. In order to meet the cost-savings and carbon reduction goals, unitary heat pump water heaters used to develop templates under the BUILD Program include those meeting the Northwest Energy Efficiency Alliance (NEEA) Tier 3 criteria for residential electric advanced water heating specifications.[31] A NEEA Tier 4 or higher heat pump water heater may be required in certain climate zones to ensure the BUILD requirement for bill savings is met. To be eligible for BUILD incentives, central heat pump water heaters will need to be approved in the CBECC software. NEEA is currently developing a Central Heat Pump Water Specification that the CEC will take into consideration when made available. Central water heating serving an eligible project must be located on-site.

• BUILD Kicker Incentives

Kicker incentives under the BUILD Program are additional incentives available to offset the costs of additional or more advanced technology and costs borne by the developer to support electrification that are not captured in the base incentive calculation. The additions to projects must contribute to additional GHG emissions reductions beyond the level used to calculate the BUILD base incentive technologies.

While CEC does not propose providing incentives for technologies that are incorporated in a project to meet code compliance requirements, in some cases kicker incentives may be provided for technologies that are used to exceed Energy Code compliance. Staff anticipate that in certain climate zones, projects will need to exceed current building code requirements

[31] NEEA Advanced Water Heating Specification, https://neea.org/img/documents/Advanced-Water-Heating-Specification.pdf

to ensure bill savings, and that these additional energy efficiency measures should be eligible for kicker incentives.

For technology-based kicker incentives, the technologies currently proposed as eligible for the kicker incentives, listed in Table 4.2, offer advanced energy efficiency or other GHG emissions reductions, grid flexible capability, additional renewable energy generation, or storage. The kicker incentives will be offered at a different level or unit compared to base incentives. The CEC is still considering other technologies and requirements for kicker incentives, including those recommended by stakeholders. Final guidance on the technologies and requirements for kicker incentives will be provided in the proposed program guidelines.

Table 4.2: Eligible Technologies for BUILD Kicker Incentives

Eligible Technologies	Minimum Requirement
Refrigerant	GWP < 750
Induction Cooktop	No prescriptive performance standard
Clothes Dryer	Heat pump clothes dryer
Battery Storage System	Listed on the Solar Equipment Lists and JA 12 Compliant

h. Demand Response/Load Flexibility

Heat pump water heaters have the capability to provide load flexibility; the electricity consumption of heat pump water heaters can be scheduled or adjusted to match times of high supply of renewable energy. In this way, heat pump water heaters can act as a battery, loading and storing thermal energy when it is beneficial to the electric grid. Heat pump water heaters with grid flexibility capabilities may be eligible for kicker incentives. These heat pump water heaters comply with 2019 Title 24 Part 6 Joint Appendix JA13[32] on Water Heater Demand Management. They must also comply with CTA-2045 or other open source compliance standards. As noted above and consistent with other technologies, CEC staff propose that if a project uses heat pump water heaters for compliance credit under the Energy Code, the technology will not be eligible for BUILD kicker incentives. CEC staff will continue to explore these considerations with public input and will provide final guidance on eligibility in the proposed program guidelines.

On July 8, 2020, the CEC adopted JA13. The JA13 specifications for water heater demand management includes system components, safety requirements, minimum energy efficiency performance, and control requirements. The control requirements, or demand management functionality, must have the ability for: basic load up, advanced load up, return to standard operation, light shed, deep shed, and full shed. These functionalities allow the heat pump

[32] Joint Appendix 13, https://efiling.energy.ca.gov/GetDocument.aspx?tn=227876&DocumentContentId=59256

water heater to communicate and react to real-time price signals and other grid metrics, to optimize operation for demand management while ensuring sufficient hot water supply.

"CTA-2045" refers to a specification published by the Consumer Technology Association (CTA) and dual-listed by the American National Standards Institute (ANSI). From 2008 through 2012, this national standard was created through a collaborative effort by the Electric Power Research Institute (EPRI), the Smart Grid Interoperability Panel (SGIP), manufacturers, utilities, and several standards experts from the high-tech industry. The CTA-2045 communications port is analogous in concept to a USB socket on a camera, television, or computer, but this socket is specifically designed for appliances. The most important purpose of the standard is to define how to pass information from a universal communication module to the smart grid device (SGD) or appliance. The socket enables external communication and puts the customer in charge of how communication links to their appliances will occur.

Additional grid flexibility technologies may be considered for kicker incentives in the proposed program guidelines.

i. Low-GWP Refrigerants

Heat pump systems transfer heat using a refrigerant. Systems using a refrigerant have associated GHG emissions either through annual leakage, or end-of-life leakage. Conventional refrigerants typically have high global warming potential (GWP) values, around 1,500-2,000, which contributes to GHG emissions. Encouraging the use of low-GWP refrigerants in heat pump systems is part of the State's overall decarbonization goal.

Reducing refrigerant-based GHG emissions has some of the greatest potential to reduce overall GHG emissions in California and lower GWP refrigerants will further the objectives of SB 1477 to promote emerging building decarbonization technologies and strategies. As stated in D. 20-03-027, in determining kicker incentives relating to refrigerant usage, the CEC may provide for tiered incentives that differentiate between space and water heating equipment that use low-GWP refrigerants and space and water heating equipment that use mid-range GWP refrigerants.[33] CPUC defines "high-GWP" refrigerants as refrigerants with a GWP above 750, consistent with CARB's recent regulatory proposal for new stationary air conditioning systems starting January 1, 2023.

CEC staff proposes that heat pump systems using refrigerants with a global warming potential below 750 qualify for kicker incentives. As stated in D. 20-03-027, "Refrigerants used in the space and water heating appliances of building projects funded by the BUILD Program...shall not exceed the 750 GWP threshold by January 1, 2023."[34] These criteria may change in revisions to the BUILD Implementation Plan, as rulemaking through the California Air Resources Board may require low GWP refrigerants in heat pump air conditioning systems.

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[33] D. 20-03-027, pg 68, https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M331/K772/331772660.PDF

[34] D. 20-03-027, p. 48.

j. Cooking and Laundry Needs

If the builder/developer provides cooking and laundry appliances, which is common in low-income multifamily housing, ultra-efficient appliances will be eligible for BUILD kicker incentives. Only the highest performing appliances will be considered for kickers. CEC staff will determine the appropriate performance threshold or ENERGY STAR®[35] rating in proposed program guidelines. Staff is considering induction cooking and heat pump clothes dryers for BUILD kicker incentives.

Induction cooking is one of the most efficient cooking technologies. With this technology, up to 90 percent of the energy consumed is transferred to the food, compared to about 74 percent for traditional electric systems, and 40 percent for gas.[36] Induction cooktops use an electromagnetic field below a glass surface to transfers current directly to magnetic cookware, causing it to heat up. Induction also cooks faster and offers superior temperature control.

Heat pump clothes dryers are a type of condensing dryer. The moisture from the damp clothes condense on the cold coil of the heat pump, and the condensed water is discharged into a drainpipe. Because they utilize heat pump technology, these clothes dryers are among the most energy efficient on the market. Many clothes dryers on the ENERGY STAR Most Efficient[37] list are heat pump dryers. Products that make the ENERGY STAR Most Efficient list deliver cutting edge energy efficiency along with the latest technology innovation. They represent the year's best for energy savings and environmental protection.

k. On-Site Energy Storage

The benefits of onsite solar photovoltaic (PV) generation can be maximized by pairing the system with battery storage. Furthermore, storing energy can further reduce grid dependence and GHG-emissions by load shifting and providing grid harmonization.

CEC staff proposes that battery storage be eligible for kicker incentives if paired with PV generation. CEC staff currently propose that if a project uses a technology or a portion of installed technology for compliance credit under the Energy Code, the technology will not be eligible for BUILD kicker incentives. However, staff also recognizes that in some cases, such as energy storage, limiting eligibility could be contrary to the other policies supporting adoption of beneficial technologies. CEC staff will continue to explore these considerations and will provide final guidance on eligibility in the proposed program guidelines.

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[35] Energy Star, https://www.energystar.gov/

[36] Induction Cooking Technology Design and Assessment, https://www.aceee.org/files/proceedings/2014/data/papers/9-702.pdf

[37] Energy Star Most Efficient Clothes Dryers, https://www.energystar.gov/most-efficient/me-certified-clothes-dryers/

Battery storage technologies, batteries or energy storage systems, must also be listed on the CEC's Solar Equipment Lists. The system must comply with the 2019 Title 24 Part 6 Joint Appendix 12 (JA12,)[38] Qualification Requirements for Battery Storage System.

I. Alignment with other Incentives

The CEC recognizes that several programs are being implemented or developed by agencies and utilities to address building decarbonization. The CPUC conducted a workshop in June 2020, to consider the need for layering incentives to achieve complementary programs and ensure funds support identified needs most appropriately. As the CEC collaborates with the CPUC and the public to develop proposed program requirements, the CEC will seek to address the layering of incentives and identify specific areas of the BUILD program that may need to be updated including additional kicker incentives or alterations to the existing incentive structure. Following initial program implementation, the CEC will also continue to monitor overlap between BUILD base and kicker incentives and other incentive programs in the state and propose changes to the CPUC when appropriate. CEC staff will also collaborate closely with the TECH Initiative and efforts to update the Building Code.

Some investor-owned utility (IOU) programs are particularly relevant and will require close coordination to develop complementary strategies and avoid duplication. Incentive programs that CEC will consider and coordinate with include those identified in Appendix A to D. 20-03-027.

[38] Joint Appendix 12, https://ww2.energy.ca.gov/2018publications/CEC-400-2018-021/CEC-400-2018-021-CMF.pdf#page=209&zoom=100,0,0

CHAPTER 5: Process for Evaluating New Technologies

SB 1477 requires the BUILD Program to develop a process for evaluating new technologies.

Technologies considered in the base incentive modeling and calculations under BUILD must be incorporated into the CBECC software. There are two existing processes for manufacturers to add their equipment to the CBECC software, during the standard three-year iterative Energy Code update process or the compliance process. The compliance process begins by working with CEC staff, and then eventually proceeding to a business meeting. This process will require a verification process that can take significant time and can be costly for manufacturers but will provide assurance that the new technology is performing as expected.

If a technology cannot be incorporated into the CBECC software, the product will not be eligible under the base incentive structure of the BUILD Program.

Certain new technologies that fit in the categories for kicker incentives will need to meet the minimum requirements and be listed on the technology specific lists as referenced in the kicker incentives section of the Build Implementation Plan and the appendix.

CEC staff anticipates the need for a new process to be developed for technologies that have not been verified or may not be able to be included in the CBECC model. Following enough program experience and information to identify the specific need for a new process, staff will consider evaluating technologies on a case-by-case basis and will need to understand the GHG reduction potentials, performance, and safety of the new technology. CEC staff may be able to rely on established industry processes and safety and performance certifications to evaluate new technology. However, staff must coordinate the integration of new technologies into the BUILD Program in alignment with the requirements and established processes of the Energy Code.

CEC staff will also identify additional opportunities to accomplish the goals of SB 1477 by coordinating efforts with the TECH Initiative program administrator as this program also has a requirement to develop a process for evaluating new technologies in space and water heating.

CHAPTER 6: Bill Savings Methodology

• Energy Bill Savings Methodology

SB 1477 directs the CPUC, in supervising the administration of the BUILD Program, to ensure that projects funded in new low-income residential buildings located in disadvantaged or low-income communities do not result in higher utility bills for building occupants.

D. 20-03-027 directs CEC to develop or adopt a tool or a methodology to measure bill savings as a result of the BUILD Program and to make changes to the tool based on the SB 1477 Program Evaluator’s recommendations. Staff believes that existing available tools should meet the needs of the bill savings methodology, rather than necessitating the development of a new calculation tool.

This section describes the methodology CEC staff proposes to use to calculate bill savings for projects receiving incentives through the BUILD Program. The main goal of the Bill Savings Methodology is to accurately estimate expected utility bills for building occupants and will therefore need to be project-specific. The CEC staff methodology relies on the modeled estimate of the energy use of the designed building combined with the applicable utility rates to determine the expected energy bill.

To assist with design considerations, in cases where the expected combination of energy efficiency measures and new electric technologies does not indicate bill savings will also be accomplished, CEC staff can perform up front analysis using CBECC to determine what building performance criteria must be met to show utility bill savings. This analysis can include performance efficiencies of mechanical systems, additional PV generation beyond what is required in code, and building envelope performance. These performance criteria may differ in different climate zones.

m. Building Energy Modeling

CBECC is a free computer program developed by the CEC for demonstrating compliance with the Energy Code. CBECC takes inputs on building envelope and mechanical system design and calculates energy usage of the building. One output of CBECC consists of hourly energy use profiles, which are the estimated therms and kilowatt-hours used by the designed building each hour of a calendar year. By applying the therms to hourly natural gas utility rates, the natural gas bill can be calculated. Likewise, by applying the kilowatt-hours to hourly electric utility rates, the electric bill can be calculated. The combination of these bills totals the energy bill that can be compared to evaluate bill savings.

n. Establishing the Baseline

The focus of the BUILD Program will be on new low-income housing, primarily in newly constructed buildings. Newly constructed buildings have no historical data for utility costs. To calculate bill savings, a baseline must be set for these projects. In the proposed methodology, energy bills of a mixed-fuel building meeting the 2019 Energy Code prescriptive standards will be the baseline. This is consistent with the requirements for setting a GHG emissions baseline under the BUILD Program.

o. Defining Bill Savings

Under the BUILD Bill Savings Methodology, "bill savings" shall be defined as no energy utility (natural gas and electricity) bill increase. While savings can be assessed monthly, seasonally, or annually, staff proposes that an annual basis is reasonable.

Utility costs will be projected for a 15-year period, which is the general expected useful life of the building appliances. This would also align with TCAC's 15-year compliance period, as well as correspond with the general time frame in which deed-restricted affordable housing projects consider tax credit resyndication.

Rates

The California Alternative Rates for Energy (CARE)[39] program offers qualifying low-income IOU customers a 30-35 percent discount on their electric rate and a 20 percent discount on their natural gas rate. Many POUs offer similar discounts to their qualifying low-income customers. It is reasonable to assume that most tenants in low-income affordable housing buildings qualify for discounted energy utility rates. However, it is possible that some low-income residents are not on CARE rates, either because they have not yet enrolled or potentially due to ineligibility. Standard utilities rates will also be included in this methodology, mainly standard residential rates, and default time-of-use (TOU) rates. Therefore, the rates used in this bill saving methodology as proposed are CARE rates and TOU rates. The rates used to calculate the baseline must be supported by the characteristics of the housing proposed for development and must match the rates used to calculate projected bill savings. The Load Management Standards Proceeding includes a requirement for utilities to report their hourly rates to a rate repository maintained by CEC. When these rates are available, CEC staff may use these rates in any updates to the BUILD bill savings methodology. CEC staff will consider other approaches for rates that may be used in the bill savings methodology and finalize the methodology in the proposed program guidelines.[40]

Because the value of the utility rates is essential in the bill savings methodology, it is important that they be accurate. Utility rates can change, so there will need to be a process and schedule for updating the rates. For the bill savings methodology, CEC staff propose that the rates be updated every two years.

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[39] California Alternative Rates for Energy (CARE), https://www.cpuc.ca.gov/lowincomerates/

[40] The Load Management Standards Proceeding includes a requirement for utilities to report their hourly rates to a rate repository maintained by CEC. When these rates are available, CEC staff may use these rates in any updates to the BUILD bill savings methodology. For more, see https://www.energy.ca.gov/proceedings/energy-commission-proceedings/2020-load-management-rulemaking.

Rate Projections

To ensure bill savings out to 15 years, the analysis will need to include rate projections. CEC staff is researching published rate projections to determine which rate projections would be appropriate to use under the BUILD Program:

- The *Integrated Energy Policy Report* (IEPR)[41] report contains an integrated assessment of major energy trends and issues facing California's electricity, natural gas, and transportation fuel sectors. CEC uses rate projections in the demand forecast as part of the IEPR process. The rate projections for the demand forecast uses natural gas and carbon price scenarios, forecasts of retail sales, and scenarios on transmission and distribution revenue requirements. An updated rate forecast for the *2020 IEPR Update* demand forecast update will be available later this year.
- The Energy and Environmental Economics (E3) report, *Residential Building Electrification in California: Consumer Economics, Greenhouse Gases and Grid Impacts*,[42] includes a study of consumer energy bills evaluated in six climate zones. This analysis includes utility rate projections based on currently filed General Rate Cases and historical rate increases.
- *The Challenge of Retail Gas in California's Low-Carbon Future*[43] is the final report for the future of natural gas project conducted by Energy and Environmental Economics and the University of California, Irvine. The information from this project contributes to the Energy Research and Development Division's Natural Gas Research and Development Program. The research team developed estimates of gas and electric rates and bills for low-carbon scenarios through 2050.

p. Treatment of Excess PV Generation

The 2019 Energy Code require PV systems on residential buildings. PV generation offsets electricity demand from the grid, and therefore can offset the electricity bill for the building occupant. During certain times of day throughout the year, there may be an excess of PV generation compared to estimated building electricity load.

CEC staff will continue to evaluate how best to address excess PV generation under net metering agreements in the assessment of bill savings. The CEC will issue full guidance on this matter in proposed program guidelines.

q. Limitations

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[41] 2019 Integrated Energy Policy Report, https://efiling.energy.ca.gov/getdocument.aspx?tn=232922

[42] Residential Building Electrification in California, April 2019, https://www.ethree.com/wp-content/uploads/2019/04/E3_Residential_Building_Electrification_in_California_April_2019.pdf

[43] The Challenge of Retail Gas in California's Low-Carbon Future Report, https://ww2.energy.ca.gov/2019publications/CEC-500-2019-055/index.html

Ensuring no increase in energy bills is challenging, due to uncertainties in how occupants will use a building, varying weather conditions, and other factors. CEC staff have proposed using a conservative method for the Bill Savings Methodology that incorporates an additional 5 percent cushion in the calculation of realized cost as compared to baseline cost to ensure the resulting project complies with the bill savings requirement.

One limitation of this methodology is that it takes an average per bedroom energy utility cost for all building occupants, including common areas. The typical utility bill structure for multifamily buildings separates in-unit utility costs, paid by occupant, and energy use in common areas, paid by building owner via rents. Common areas may include computer rooms, on site offices for social/tenant services, conference rooms, social rooms, common kitchens, and central laundry rooms. Utility bills for theses common areas are paid by the building owner, through collected rent, which also pays bills such as landscaping and maintenance.

This methodology includes only CARE rates and default TOU rates. However, there are many rate structures/schedules and tiers within each rate depending on energy usage, and each rate can vary on a month-to-month basis. This methodology assumes a single tier within each rate for the annual period analyzed. Staff will seek additional stakeholder input on this matter as it develops program guidelines.

CHAPTER 7: Technical Assistance

SB 1477 requires that low-income projects funded with BUILD incentives are offered technical assistance to encourage use of the program.[44] Further, D. 20-03-027 requires the CEC to ensure that technical assistance is available to all prospective applicants for new low-income residential building projects before implementation to encourage greater participation in the BUILD Program. D. 20-03-027 allows the CEC to solicit a third-party contractor to provide technical assistance.

CEC staff proposes to hire a third-party technical assistance provider through a competitive bidding process or other contracting process. Primarily, the technical assistance provider will provide design assistance to project owners and developers to explore project designs and overcome any technical challenges encountered in developing an all-electric residential project. The guidance provided is anticipated to include project design options and recommendations, permitting assistance, and assisting the developer and energy consultants in demonstrating code compliance for the project. As the program is intended to offer incentives to low-income residential housing projects, the technical assistance provider will be required to have experience with and expertise in working with low-income housing developers and in disadvantaged communities, as well as the specific design considerations unique to low-income housing development. The technical assistance provider must also be well versed in the requirements specific to renovations and rebuilds as well as projects in which buildings are repurposed for residential use.

The technical assistance provider must develop a thorough understanding of all currently available technologies identified as eligible for BUILD program incentive funding, including the installation and maintenance needs for these technologies. Since this knowledge is also valuable to other parties, CEC staff anticipate that the technical assistance provider will further support staff outreach efforts as described later in this document.

Staff proposes that the technical assistance provider be allocated a maximum number of hours or budget or a combination for any project; however, CEC staff does not propose that any developer be limited in the number of projects for which they receive assistance, even if a cap is implemented for the number of projects receiving incentive funding. The specific level of funding will be determined with further input from the public and program stakeholders and detailed in the proposed program guidelines.

[44] Public Utilities Code section 921.1(d)(1).

- ## Technical Assistance for Market-Rate Housing Developers

A core principle of the BUILD Program is contributing to market transformation. Although the initial program offering will restrict BUILD incentives to low-income housing developments, CEC staff proposes that the BUILD technical assistance provider should, in coordination with the TECH implementer, develop educational and reference materials that address the available technologies for all-electric buildings and any technical issues pertaining to the installation, maintenance and performance of this equipment. Materials will be made available to building developers, including those working in the market-rate housing segment. All materials will be designed to complement technical assistance and educational activities under development by the TECH program.

CEC staff does not propose to offer technical assistance to market-rate developers at program launch. Rather, CEC staff proposes to monitor the performance of technical assistance offered by the TECH program and identify potential training gaps as BUILD and TECH work to transform the housing sector. In coordination with the CPUC, the BUILD Program may be modified to offer technical assistance to market-rate developers after the first two years of program operations.

Chapter 8: Outreach Plan

SB 1477 requires implementation of an outreach plan to encourage applications for participation in the BUILD incentive program.[45] Sections 921.1(d)(5) requires the CPUC to implement a BUILD Program outreach plan to encourage applications for projects funded with moneys reserved for low-income housing developments. Section 921.1(d)(1) requires the CPUC to ensure that new low-income residential housing building projects are offered technical assistance to encourage applications eligible for BUILD Program incentives. Moreover, D. 20-03-027 provided analysis and guidance on the implementation of the outreach program supporting BUILD and the complementary efforts supporting the TECH initiative and delegated the development of an outreach plan to the CEC as the BUILD Program Administrator. Consistent with the guidance provided by D. 20-03-027, the CEC shall ensure that program outreach has begun and technical assistance is available to all prospective applicants for new low-income residential housing prior to the start of implementation in order to encourage greater participation in the BUILD Program.

The BUILD Program education and outreach campaign will be designed to increase awareness and understanding of the availability of and benefits of building all-electric housing and the technologies that enable these buildings. Audiences will include builders, developers, state and local agencies involved in low income housing development, and state and local leaders that can influence and lead the intended transformation in policy and direct implementation. Further, the public outreach will boost awareness and adoption of building decarbonization technologies into Californian homes and businesses, including customers that are low-income, disadvantaged, and hard to reach. Efforts will advance the degree to which Californians are not only aware of, but also engaged in building decarbonization adoption to advance the markets for technologies, create demand and supply benefits, and ensure that customers are able to adopt building decarbonization technologies.

Messages and delivery methods will be tailored for the specific identified audiences and strategies developed to complement related existing and planned programs and activities. Staff will assess the needs of specific regions and populations in developing messages, materials, and communication approaches. Specific audiences are referenced within the implementation plan, but additional needs and opportunities will evolve as the program is developed and launched. Staff will monitor and assess the effectiveness of outreach and work with the joint program evaluator to refine techniques as the program matures.

[45] Public Utilities Code section 921.1(d)(5).

The BUILD program will be situated within a complex landscape of programs supporting low-income housing development. Staff recognizes that promoting market transformation in the low-income housing development community will require that the program limit the additionality of new, separate messages and rather offer information in a manner that can be more easily accessed by the intended parties. In recognition of this, the CEC aims to partner with and leverage other communications efforts. Staff will coordinate with related CEC outreach activities pertaining to transportation electrification, building electrification, energy efficiency, and onsite renewables to ensure stakeholders can be provided information about the broader suite of energy related program opportunities available through utility, local government, state, and federal programs.

To ensure participation and partnership with customers across a variety of demographic groups, CEC staff intends to partner with organizations that serve primarily low-income, disadvantaged, and hard-to-reach customers, such as community-based organizations, local housing authorities, CEC staff will also coordinate with the Disadvantaged Communities Advisory Group (DACAG) to ensure programs and policies are informed by and create real benefit for disadvantaged communities.

To ensure BUILD outreach also reaches the development community serving low-income residents and disadvantaged communities, the CEC will consult with and explore partnership opportunities with key organizations, associations, and agencies that have experience and insight into these industry sectors. As mentioned, coordination with TCAC is particularly relevant for outreach and implementation of the BUILD Program.

CEC staff also anticipates close coordination with some IOU programs that are particularly relevant to program design and outreach. These IOU programs include programs identified in Appendix A to D. 20-03-027.

CEC staff has a great deal of experience providing program outreach supporting incentive programs, including work specific to low-income housing developers. As such, CEC staff will implement most of the program outreach. Staff will develop a multiyear outreach plan and coordinate with the parties referenced previously, the BUILD technical assistance provider, utilities, and others to amplify outreach. To respond to interested party inquiries and support participation, CEC will also develop a call center to support BUILD Program participation and related inquiries from the public.

While CEC staff is confident in its ability to design, lead, and implement outreach, staff will consider contracting for additional outreach support if staff identifies the need during program implementation.

CHAPTER 9: Participation Process

Participation in BUILD shall be simplified and streamlined while ensuring that all legal requirements are met and CPUC direction followed. With a statutory focus on low-income residential development, it is critical that program participants are not unnecessarily burdened beyond what is necessary to ensure funding is used as intended. Staff aims to minimize documentation requirements and application processes to avoid duplication of information submission and encumbrances that could otherwise decrease the likelihood of participation in the program.

CEC anticipates developing an online application and reporting tool to simplify program participation. Further CEC staff proposes that information developed for other regulatory and funding programs may be used to document necessary requirements to the greatest degree possible.

CEC staff anticipates the following general steps in the program participation process:

1. CEC implements a robust outreach plan to encourage participation. Through CEC outreach, staff will identify project developers planning projects that may be eligible for BUILD incentives.
2. Prospective applicant indicates interest. CEC staff determines program appropriateness for technical assistance and level of technical assistance appropriate based on the characteristics of the prospective project.
3. Technical assistance provider supports design considerations. CEC staff will determine an appropriate deliverable to result from support. Maximum levels of technical assistance support and structure will be determined in collaboration with technical assistance contractor and detailed in the proposed program guidelines.
4. Project owner or developer submits BUILD Program application.

   Initial considerations for application requirements include:

   - Project description
   - Proof of eligibility
   - Location details and documentation as needed
   - Technology design description (elements that connect to funding)
   - Incentive calculations
   - Project budget and timeline with anticipated payments
   - Potential risks
5. CEC completes review of application, reserves funds and notifies applicant of participation process and steps to receive interim payments - The specific milestones

and percentage of funding will be provided in progress steps to be defined in proposed program guidelines.

6. Applicant Provides required progress reports and applicant submits payment invoices - All required monitoring and evaluation metrics as required by statute, D. 20-03-027, and the program evaluator will be addressed in progress reports as appropriate. Project updates and revisions will be considered and approved as necessary depending on information submitted in progress reports or as identified by project developer.
7. The final payment is made.
8. CEC provides additional outreach support for recruiting tenants and community.
9. Applicant continues to submit evaluation per requirements.

- **Reservation Application**

With the assistance of the technical assistance provider, prospective program participants will submit a program application and supporting documentation during the design stage before construction, signaling a commitment to build all-electric housing consistent with the goals and requirements of the BUILD Program. CEC expects applications and incentive calculations to be at the subdivision or whole-building level to bundle and streamline documentation requirements. When an application is approved, the CEC will reserve funding for the project for a specified period, allowing the applicant to complete construction and submit claims for payment.

- **Payment Claim Application**

CEC staff is attempting to design BUILD to provide for progress payments before project completion but has not yet determined a viable process that meets all state funding requirements and ensures the completion of projects supported by BUILD funds. CEC staff anticipates that program participants with approved reservations will submit progress payment claims during the construction phase and a final payment claim upon completion of the project. In similar programs, CEC has required the issuance of a certificate of occupancy or final building department approval before issuing payment; however, stakeholders have indicated that these steps may take an excessive amount of time to complete. CEC staff will continue to work with interested parties to identify appropriate documentation that indicates project completion to support payment.

r. Incentive Payment Model

This section outlines a possible incentive dispersal model and process that provides a portion of incentives in advance as stakeholders have expressed the value of providing upfront funding for low-income building developers. Provisions may by attached to these funds, such as the repayment of funds if builders do not meet the agreement requirements. A final proposed incentive structure will be included in the proposed program guidelines.

25-50-25 Model
CEC staff is considering a model in which incentive funds would be paid to the builder at three project milestones in increments of 25 percent, 50 percent, and 25 percent of the total incentive amount. The final model and percentages may change.

- Milestone 1 – First payment (25 percent): Eligible applicants may apply for the BUILD Program. Upon approval of the application, incentives would be officially reserved and the initial payment of 25 percent of the estimated total incentive amount can be dispersed to the builder. Applicants may need to submit development permits, proof of California Environmental Quality Act (CEQA) compliance, general project info, and TCAC documentation or other regulatory paperwork for restricted income units along with their application.

- Milestone 2 – Second payment (50 percent): BUILD incentive recipients would receive their second payment when cost is incurred, or paid, for primary space and water heating equipment (HVAC and water heating) and any kicker incentive technologies. Recipients can then invoice the CEC to receive payment and may need to show proof of commitment or payment such as an invoice, bill, or receipt. Alternatively, this payment can be based on a project completing a stage of development consistent with a level of expenditure and documented by a regulatory process or local building department action. The goal here will be to create a basis for payment that is appropriate to the expenses incurred, protects the use of the incentive for intended purposes but also provides a streamlined alternative for the project developer that reduces administrative burden.

- Milestone 3 – Third payment (25percent): Final payment would be received at the completion of the project. Recipients can notify the CEC of the completion of their project and may need to submit proof of completion such as a certificate of occupancy (if provided by the local building official), HERS verification and interconnection approval documentation (if PV/battery systems are installed).

CEC staff recognize that projects often change during development and the original design and intended technologies may be updated and that these changes may affect the final incentive amounts. As such, and if a milestone system for payment is adopted, staff will require that any project design changes are reflected and calculations updated prior to issuing payments and that all final payments are consistent with the final project details.

• Program Participation Dates and Deadlines

The Legislature provides that funding for the BUILD Program is available from a pool of $200 million, collected over four years in increments totaling $50 million annually starting in Fiscal Year (FY) 2019–20 and ending in FY 2022–23. Funding allocations must be disbursed within 10 years of allocation to the CEC. Any unspent funds remaining as of July 1, 2033, shall be returned to the ratepayers of the respective gas corporations.

Specific dates and deadlines for prospective applicants are not defined in this implementation plan. Proposed program guidelines will address specific application requirements.

- ## Application Selection Criteria

For the first two years of program implementation when participants are limited to qualifying low-income housing projects, funding will be allocated on a first-come, first-served basis for applications that meet all program and eligibility requirements. Staff do not intend to apply scoring criteria to applications; rather, the BUILD program will accept all qualifying applications as funding allows. However, as previously noted CEC is exploring the implementation of a cap on the number of applications one developer may submit. CEC staff will monitor disbursements by gas corporation territory and over time to ensure that funding meets allocation percentages as required based on the source of the funds. If no projects are available to support the allocation as required, CEC staff will work with CPUC staff to determine appropriate actions during the recurring process to update the implementation plan.

Any changes to program eligibility or selection criteria will be addressed in updates to the implementation plan and, if approved by the CPUC, corresponding updates will be made to the proposed program guidelines.

D. 20-03-27 found that it is *appropriate to prioritize BUILD Program incentives toward the regions in the state with the highest potential for achieving program goals, including reducing GHG emissions and serving low-income customers*. CEC staff intends that through the program design and outreach, as well as program monitoring, these goals can be supported over the life of the program.

CHAPTER 10: Process and Metrics to Evaluate Program Performance

• BUILD Program Metrics

BUILD is a pilot program intended to test a programmatic approach towards building decarbonization. As a pilot, information and data collected from this program will inform future policy decisions. It is important to collect information and data that will be most valuable for these decisions.

Some basic information is required by legislation. SB 1477 requires BUILD Program metrics to include, at a minimum:

s. the number of low-emission systems installed in each building type.
t. projected utility bill savings.
u. cost per metric ton of avoided GHG emissions.

Moreover, statutory language requires incentives to be set to encourage building designs that reduce GHG emissions beyond industry practices and to offer greater incentives for larger projected GHG reductions. Therefore, metrics involving GHG emissions will be an essential part of data collection. The CEC may identify additional program metrics while developing proposed program guidelines, such as total avoided GHG emissions, number of new technologies funded, and number of all-electric low-income projects funded.

v. Data Reporting

As the BUILD Program administrator, the CEC will be expected to collect program data and deliver the data to the program evaluator in a timely fashion. The program evaluator will work with the CEC, the TECH Initiative Implementer, and the Energy Division of CPUC to determine which metrics to use to measure program success.

• Program Evaluation

Per D. 20-03-027, the BUILD Program and TECH Initiative will have a single evaluator covering both programs. A single evaluator covering both programs will simplify engagement during program design to ensure the pilot programs are set up with evaluation needs in mind. Per D. 20-03-027, the CEC and CPUC will coordinate to solicit, hire and manage a program evaluator using $5 million in allocated funding for the evaluation budget. Using the metrics identified in SB 1477 as well as final BUILD guidelines, the program evaluator will measure the effect of program activities, as well as qualitatively assess the success and scalability of the strategies of the programs and analyze bill savings under BUILD. The program evaluator shall be continuously engaged throughout the initiation and administration of the SB 1477 pilot programs.

The program evaluator shall work with CPUC Energy Division staff, the BUILD Program administrator, and the TECH Initiative implementer to determine which of the following additional metrics should be required, as part of pilot program evaluation: (1) market share data (*i.e.,* demographic factors) that track both the overall share of various low-emissions technologies and the share of new installations; (2) customer outreach and customer satisfaction; (3) number of workers trained to install each type of technology and size of available skilled workforce; (4) contractor performance; (5) full life cycle of replaced and replacement appliances; (6) success in degree of training provided to market actors necessary to facilitate market transformation; and (7) types of refrigerants used, and their associated global warming potential (GWP), in space and water heating equipment promoted through the BUILD Program and TECH Initiative.

The program evaluator shall ensure that the BUILD Program administrator and TECH Initiative implementer include the following data annually so that gas corporations can comply with their reporting obligations under the Cap-and-Trade program: (1) total avoided GHG emissions expected from that year's expenditures (estimated); (2) total expenditures; (3) itemization of administration and outreach expenditures; and (4) description of the nature and purpose of the program, including aspects such as eligibility requirements.

CHAPTER 11: Next Steps

CEC staff will continue to collaborate with CPUC staff and program stakeholders to further develop the BUILD Program. CEC staff also anticipate additional public engagement through workshops and meetings as the agency seeks to develop proposed program guidelines that will be submitted to the CPUC for approval prior to accepting applications for funding. Proposed program guidelines and program materials will address all requirements of SB 1477 and D.20-03-027 that are not fully addressed by this Implementation Plan, provide complete instructions for program participation, and discuss the terms and conditions for receipt and use of funds.

To participate and receive updated information on the BUILD Program, all interested parties are encouraged to subscribe to the BUILD email list.

- ## Program Development Stages
  - Q4 2020: Issue RFP for technical assistance provider.
  - Q1 2021: Issue draft proposed program guidelines.
    Host public workshop to solicit stakeholder input on proposed guidelines.
    Award technical assistance contract.
    Issue outreach plan.
    Submit final program guidelines to CPUC for approval.
  - Q2 2021: Upon approval of program guidelines, initiate outreach program.
    Provide public notice of BUILD program launch.
    Begin accepting applications to the BUILD program.

APPENDIX A: Eligible Equipment Lists

• Eligible Equipment Lists

As administrator of the BUILD Program, the CEC aims to develop proposed program guidelines that not only achieve program GHG emissions reductions and bill savings goals but simplify participation. CEC acknowledges that there are existing processes for evaluating the safety and performance of the range of technologies employed in meeting BUILD's GHG emissions reduction goals. Rather than create a new evaluation process, the CEC intends to use existing evaluation processes and sources of information. This will simplify participation and support the efforts of organizations that have similar goals to promote the design, manufacturing, and installation of high quality, energy efficient products. Table A.1 provides the eligible equipment list sources for each technology type.

Table A.1: Eligible Equipment Lists

Technology	Eligible Equipment Lists
Heat Pump HVAC	NEEP's cold climate Air-Source Heat Pump Products List
Heat Pump Water Heater	NEEA's Advanced Water Heater Specification Qualified Products List for Heat Pump Water Heaters
Central Heat Pump Water Heater	CEC's Central HPWH Performance Map Certification List
Heat Pump Clothes Dryer	Energy Star's Product Finder
Battery Storage System (Battery or Energy Storage System)	CEC's Solar Equipment Lists

w. Cold Climate Air Source Heat Pump List

The Northeast Energy Efficiency Partnership (NEEP) is a non-profit organization that supports state efficiency policies and programs by fostering collaboration and innovation, developing tools, and disseminating knowledge. Its mission is to accelerate regional collaboration to promote advanced energy efficiency and related solutions in homes, buildings, and communities.

NEEP leads the High-Performance Air Source Heat Pump Initiative, whose participants include energy efficiency program administrators, heat pump installers, state energy office staff, and technology experts. The Initiative developed the specification to better characterize heat pump performance with the Cold Climate Air Source Heat Pump (ccASHP) Specification.[46] The specification was designed to identify air source heat pumps that are best suited to heat efficiently in cold climates. It is intended as a model equipment specification to be used broadly by clean energy and energy efficiency program qualification. It is also intended for engineers and contractors who need assurance that the equipment they select will have the require heating capacity and design temperature without unnecessary oversizing and will serve the load efficiently throughout the ambient temperature range.

The ccASHP specifications require that units be part of an Air Conditioner, Heating, and Refrigeration Institute (AHRI) matched system, defined by federal regulation 10 C.F.R. § 430.2 as a central air conditioning heat pump. Performance requirements also includes a minimum HSPF, minimum coefficient of performance (COP), and minimum seasonal energy efficiency ratio (SEER). The ccASHP specifications are updated on an as needed basis and is on Version 3.0. NEEP keeps a list of products[47] that meet the ccASHP specifications and lab testing results or engineering data for each system must be reported. This product list is used by programs in the Northeast, Midwest, Northwest, and Canada. Because these products work well in cold climates, they should also work well in all of California's climates, which usually experience milder temperatures.

x. Advanced Water Heating Specification Qualified Products List for Heat Pump Water Heaters

The Northwest Energy Efficiency Alliance (NEEA) is an alliance of more than 140 Northwest utilities and energy efficiency organizations working to cost-effectively deliver energy efficiency through market transformation. One of NEEA's area of work is advancing the market for heat pump water heaters. Utilities, energy efficiency organizations, and market partners developed the Advanced Water Heating Specification[48] to advance higher performing water heaters. While the specification aims to ensuring performance in cooler northern climates, the applicability and benefits extends beyond the Northwest.

Since the BUILD Program is a residential building decarbonization program, the specification to evaluate technologies eligible under the BUILD Program will be the Electric Advanced Water Heating Specification[49] for residential water heaters. This specification provides guidance to manufacturers and market actors interested in developing products that not only meet ENERGY STAR criteria but are able to provide high levels of consumer satisfaction and energy

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[46] NEEP's ASHP Specification, https://neep.org/ASHP-Specification

[47] NEEP's Heat Pump List, https://ashp.neep.org/#!/

[48] NEEA's Advanced Water Heating Specification, https://neea.org/our-work/advanced-water-heating-specification

[49] NEEA's Advanced Water Heating Specification for Residential Water Heaters, https://neea.org/img/documents/Advanced-Water-Heating-Specification.pdf

performance in a range of climates. The specification includes requirements for energy efficiency, noise, condensate management, minimum warranty, and testing guidelines. Manufacturers who wish to include their products on the qualified products list[50] must submit an assessment that shows the product meeting all the requirements. A third-party lab also independently tests the products to verify performance results. NEEA updates the product list about every six to eight months.

Products meeting the specification are in the 40 to 80-gallon range. Most commonly, systems of this size are used in single family residential buildings or small multifamily buildings, such as duplexes. There is an effort to set design criteria, performance specifications, and installation guidelines for heat pump water heaters with larger capacity.

The goal of the Advanced Water Heating Initiative (AWHI) is to advance the development and adoption of heat pump water heating technologies, including central heat pump water heating systems. The AWHI aims to encourage low-GWP refrigerants, plug-and-play packed systems, ability for load shifting, reliability, and cost-effectiveness. This effort will lead to better guidelines for central heat pump water systems used in larger multifamily buildings.

A Central Heat Pump Water Specification is under development with NEEA, and the CEC will consider adopting these specifications when they are available.

y. Central HPWH Performance Map Certification List

Central heat pump water heaters that are approved in CBECC will be eligible for the BUILD Program. The Central Heat Pump Water Heater (HPWH) Performance Map Certification List[51] can be referenced for approved equipment. To be listed, manufacturers will be required to submit performance data from a third-party test lab, bench tests by third party consultants, test carried out in the factory, or data collected from working field demonstrations.

z. ENERGY STAR

ENERGY STAR is the trusted, government-backed labeling program for energy efficiency. The U.S. Environmental Protection Agency (EPA) established the ENERGY STAR label to reduce GHG emissions and other pollutants caused by the inefficient use of energy and make it easy for consumers to identify and purchase energy efficient products that offer savings on energy bills without sacrificing performance, features, and comfort.

[50] NEEA's Qualified Products List, https://neea.org/img/documents/qualified-products-list.pdf

[51] CEC's Central HPWH Performance Map Certification List, https://www.energy.ca.gov/media/4026

The EPA established ENERGY STAR specification[52] based on the following set of key guiding principles:

- Product categories must contribute significant energy savings nationwide.
- Certified products must deliver the features and performance demanded by consumers, in addition to increased energy efficiency.
- If the certified product costs more than a conventional, less-efficient counterpart, purchasers will recover their investment in increased energy efficiency through utility bill savings, within a reasonable period.
- Energy efficiency can be achieved through broadly available, non-proprietary technologies offered by more than one manufacturer.
- Product energy consumption and performance can be measured and verified with testing.
- Labeling would effectively differentiate products and be visible for purchasers.

The EPA will consider ENERGY STAR specification revision based on these factors:

- A change in the Federal minimum efficiency standards.
- Technological changes with advances in energy efficiency that allow a revised ENERGY STAR specification to capture additional savings.
- Product availability.
- Significant issues with consumers realizing expected energy savings.
- Performance or quality issues.
- Issues with test procedures.

There are established Energy Star specifications clothes dryers. For the BUILD Program, the Energy Star rating will be used as the process for evaluating new clothes drying technologies. Home appliance products that earn the Energy Star label are independently certified to save energy and save money to the consumer.

aa. CEC Solar Equipment Lists

The CEC maintains lists of solar and storage equipment that includes photovoltaic (PV) modules, inverters, batteries, energy storage systems, meters, performance monitoring and reporting systems, and other solar energy-generating systems. The CEC's Solar Equipment Lists[53] were developed under Senate Bill 1, establishing criteria and standards for solar projects

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52 How Product Earns Energy Star Label, https://www.energystar.gov/products/how-product-earns-energy-star-label

53 Solar Equipment Lists, www.energy.ca.gov/programs-and-topics/topics/renewable-energy/solar-equipment-lists

applying for ratepayer-funded incentive programs under the California Solar Initiative. The purpose and use of these lists have expanded over time and provide information that supports solar incentive programs, utility grid connection services, consumers, and many other state and local programs.

Manufacturers who wish to include their equipment on the Solar Equipment Lists must submit all required documentation showing their equipment meets all safety and performance standards outlined in the Guidelines for California's Solar Electric Incentive Programs (Senate Bill 1).[54]

For energy storage systems, the safety certification must be from an NRTL and performance characteristics are provided from manufacturers. The Energy Storage System List reflects equipment certified to UL 9540, advanced inverter functions, and the approval status of the equipment for JA 12 requirements.

[54] Guidelines for California's Solar Electric Incentive Programs (Senate Bill 1), Seventh Edition, https://efiling.energy.ca.gov/GetDocument.aspx?tn=226057&DocumentContentId=56796