DOCKETED	
Docket Number:	22-BSTD-01
Project Title:	2025 Energy Code Pre-Rulemaking
TN #:	253233
Document Title:	NRDC, Earthjustice, RMI, Rewiring et al comments on T24 Draft Express Terms
Description:	N/A
Filer:	System
Organization:	NRDC, Earthjustice, RMI, Rewiring et al
Submitter Role:	Public
Submission Date:	11/17/2023 3:30:14 PM
Docketed Date:	11/17/2023

Comment Received From: Amara Eger
Submitted On: 11/17/2023
Docket Number: 22-BSTD-01

NRDC, Earthjustice, RMI, Rewiring et al T24 Draft Express Terms Comments

Additional submitted attachment is included below.

November 17, 2023

California Energy Commission
Re: Docket No. 22-BSTD-01
715 P Street
Sacramento, CA 95814
docket@energy.ca.gov

Re: 2025 Energy Code Pre-Rulemaking – Express Terms

Dear Commissioners:

The undersigned organizations appreciate the California Energy Commission's ("CEC") work developing the 2025 Title 24 Building Energy Efficiency Standards ("2025 Building Code") Draft Express Terms. The Draft Express Terms make significant advances in moving California's buildings further away from polluting gas appliances towards clean efficient electric alternatives. In addition to expanding use of heat pumps and electrification readiness in standard building designs for new construction, the Draft Express Terms also include provisions for heat pump deployment in existing buildings upon replacement of residential central air conditioning ("A/C") and non-residential rooftop package units ("RTUs"). These important common-sense measures are critical to decarbonizing existing buildings and we applaud their inclusion in the Draft Express Terms.

Due to their similar installation requirements, replacing a central A/C unit with a heat pump is a low-cost intervention that protects against gas price volatility, reduces fossil fuel dependency, improves air quality and public health, avoids the need for future gas furnace replacement, and reduces energy bills for many households and businesses. Heat pumps are also eligible for numerous federal, state and local incentives that can save Californians money up front and enable them to purchase more efficient appliances that will reduce utility bills even more over time. With approximately 1.9 million residential A/C units currently due for replacement in California, provisions for their replacement with a heat pump will help make meaningful progress toward achieving the State's climate, air quality, and public health objectives, the Governor's goal of deploying six million heat pumps by 2030, and successful implementation of the Bay Area Air Quality Management District and California Air Resources Board zero-emission space heating requirements that will go into effect at the end of this decade. We strongly support these updates to the Building Code and propose several modifications to the proposed language to improve its effectiveness.

With regard to facilitating electrification in new construction and building additions, the Draft Express Terms make meaningful progress from the 2022 Building Code that includes the following changes which we strongly support:

- From including either heat pump space or water heating to including *both* heat pump space and water heating in the standard building design for single-family homes;[1]
- Removing options for gas space or water heating in the standard design for single-family home additions;[2]
- From including heat pump space conditioning in the standard building design for multi-family homes three stories or less in most climate zones to also including heat pump water heating for systems serving individual units;[3]
- Expanding heat pump water heater ready requirements to central water heating systems in multi-family homes;[4]
- Sizing building electric systems in multi-family homes to accommodate all-electric appliances;[5]
- Expanding the use of heat pump space heating in the standard design from school and office buildings that use single-zone systems to include the larger schools and office buildings that use multi-zone systems.[6]
- Adding electric readiness requirements for commercial kitchens.[7]
- Requiring large pools and spas to be heated by heat pump pool heaters or renewable energy.[8]
- Requiring that nonresidential heating hot water systems be designed for zone temperatures no higher than 130 degrees Fahrenheit, saving energy today and enabling future heat pump retrofits.[9]

---

[1] Draft Express Terms § 150.1(c) at PDF p.420-21, *available at* https://efiling.energy.ca.gov/GetDocument.aspx?tn=252915&DocumentContentId=88051. .
[2] Draft Express Terms § 150.2(a) at PDF p.435.
[3] Draft Express Terms § 170.2(d) at PDF p.560.
[4] Draft Express Terms § 160.9(e) & (f) at PDF p.513.
[5] Draft Express Terms § 160.9(a) at PDF p.513.
[6] Draft Express Terms § 140.4 at PDF p.306.
[7] Draft Express Terms § 120.6(k) at PDF p.256.
[8] Draft Express Terms § 110.4(c) at PDF p.190.
[9] Draft Express Terms § 120.2(l) at PDF p.230.

We recommend two changes to the Draft Express Terms' treatment of new construction and additions. First, the Draft Express Terms should be revised to eliminate an exception allowing instantaneous gas or propane water heating serving individual units in multi-family buildings 4 stories and above.[10] Locking in this source of gas dependency, methane leakage, and air pollution is unnecessary and will hinder future decarbonization efforts. Second, while the Draft Express Terms properly remove the prescriptive option of gas space or water heating in single-family home additions, it continues to allow gas heating systems in the case of additions to multi-family homes.[11] The Draft Express Terms should be revised to require that additions to multi-family homes meet the same prescriptive standards for space conditioning system types as new construction.

With regard to facilitating heat pump deployment in existing buildings, the Draft Express Terms add new provisions to the Building Code governing the replacement of residential A/C units and non-residential RTUs which overall we strongly support.[12] For replacement of residential A/C units the Draft Express Terms prescriptively require replacement with a heat pump or additional efficiency measures if replaced with another A/C. This requirement contains two exceptions, if heat pump installation would require a panel upgrade or if the installation of the heat pump exceeds the existing heating load by 12,000 Btu/h or more.[13] While we support exceptions where unusual circumstances present more complicated and costly installations, we are concerned these exceptions are overly broad and may be misused given the lack of a robust process of independent verification. The Draft Express Terms should be revised to limit applicability of exceptions to A/C replacement provisions to climate zones where these exceptions would occur, such as where heating load is higher than cooling load.

For new or replacement RTUs in non-residential buildings with a cooling capacity of less than 65,000 Btu/hr, the Draft Express Terms now include prescriptive heat pump replacement requirements for most climate zones or the installation of a gas RTU with complementary measures.[14] While we strongly support this measure, we are concerned with the proposed prescriptive requirement for non-residential buildings replacing an RTU in climate zones 1 and/or 16 to install an RTU with a furnace and air conditioner. This provision could unnecessarily result in installation of gas furnaces where heat pumps are a viable option. We recommend that this requirement be removed or that heat pumps be included as an option in the prescriptive pathway for these climate zones.

We agree with the primary intent of the draft proposed updates to the Title 24 part 6 California building energy efficiency standards: to increase readability and to decarbonize the building stock by requiring heat pumps for most space heating uses. The CEC has shown that heat pumps reduce life cycle costs by comparing the incremental cost of heat pumps to the resulting life cycle system wide energy cost savings. These simulated values are based on heat pumps being controlled in a rational matter:

- Heat pump controls must not turn on resistance heat except when the heat pump cannot meet load or when the heat pump is defrosting the outdoor coil.

---

[10] Draft Express Terms § 170.2(d) at PDF p.561.
[11] Draft Express Terms § 180.1, Exception 7 at PDF p.593.
[12] Draft Express Terms § 150.2(b)(1)(F)(ii) at PDF p.440.
[13] *Id*.
[14] Draft Express Terms § 141.0(b)(2)(C)(ii) at PDF p.378.

    - If the thermostat is set back at night, when the normal setpoint is restored, the system does not use resistance heating unless it is so cold outside that the heat pump cannot bring the house or dwelling unit up to temperature.
    - Heat pump defrost timers are not cycling excessively.
    - Heat pump crankcase heaters are operating only when the crankcase is cold and the compressor is not operating.

As currently proposed, this idealized system is evaluated one control feature at a time. Depending upon the climate zone, building type, building size and control type, these controls are considered cost-effective for different climate zones and as a result each control type is exempted for different climate zones as follows:

- Supplemental resistance heat lock-out above 35°F
    - Single family ≥ 500 sf – exempted in climate zone 15 [Exception 2 to Section 150.0(h)7]
    - Single family < 500 sf – exempted in climate zone 7 [Exception 3 to Section 150.0(h)7]
    - Multifamily – all sizes and all climate zones exempted [Exempted by omission of thermostat requirement in Section 160.2 or in Section 110.2(b)]
    - Nonresidential – no requirements outside of existing ambiguous requirements. [Section 110.2(b)]
- Defrost set timer to at least 90 minutes between defrosts
    - Single family ≥ 500 sf – no exceptions
    - Single family < 500 sf – exempted in Climate Zones 5 through 10 or in Climate Zone 15 [Exception 3 to Section 150.0(h)6]
    - Multifamily – exempted in climate zones 1, 6 through 10, 15, and 16. [Exception to 160.3(b)7]
    - Nonresidential – no requirements.
- Disclosure of presence of crankcase heating, the type of crankcase control and if the control is ambient temperature based, locked out above 71°F. This is written as an alternative to occupant controlled smart thermostats (i.e. demand responsive thermostats).
    - Single family ≥ 500 sf – exempted in climate zones 3, 5, and 6 [Exception 2 to 150.0(h)10]
    - Single family < 500 sf – exempted in all climate zones
    - Multifamily – no requirements
    - Nonresidential – no requirements.

We recommend that the correct way to evaluate the cost-effectiveness of heat pumps is to compare the life cycle cost of heat pumps plus controls that work correctly versus the cost of an air conditioning system with a gas furnace and controls that work correctly for the mixed fuel system. We expect that this comparison will result in controls that apply across all climate zones, dwelling unit sizes and building types. The outcome of such an approach is an expectation that all of these control features apply to all heat pumps, in all instances. This approach would be simpler to understand and enforce than the current hodgepodge of climate zones and dwelling unit sizes; and would result in the energy savings that are expected from heat pumps. With 6 million heat pumps expected to be installed by 2030, delay on adopting these common sense control measures until the next code cycle (effective in 2029) would mean that most of these 6 million heat pumps would only be covered by the patchwork of control requirements described above.

Finally, the Draft Express Terms include new ventilation and other criteria required for all installations of heat pump water heaters.[15] Particularly given existing buildings may have space and other constraints in fuel-switching from gas water heating to electric heat pump water heating, these criteria should be reviewed closely to avoid erecting needless barriers to heat pump water heater installations.

We appreciate the CEC's important work on these measures, and we look forward to continued engagement with the CEC on the 2025 Building Code.

Sincerely,

Courtney Bonas
Project Director
California Department of General Services

Gerard Manning
Director
Climate-Fixes.Org

Margie Chen
Physician
Climate Health Now

Clinton Young
Physician
Climate Health Now

Matt Vespa
Senior Attorney
Earthjustice

Steve Schmidt
Founder & COO
Home Energy Analytics, Inc.

Jose Trinidad Castaneda
Council Member
City of Buena Park

Gopal Shanker
President
Récolte Energy

Laura Neish
Executive Director
350 Bay Area

Laura Feinstein
Sustainability and Resilience Policy Manager
SPUR

Sven Thesen
Co-Founder
Project Green Home

Pauline Seales
Organizer
Santa Cruz Climate Action Network

Chance Cutrano
Mayor
Town of Fairfax

Zach Pierce
Senior Manager
Rewiring America

Alexander Gard-Murray
Director
Greenhouse

Ben Stapleton
Executive Director
USGBC-LA

[15] Draft Express Terms § 110.3(c)(7) at PDF p.186-87.

Sean Armstrong
Partner
Redwood Energy

Haley Ehlers
Executive Director
Climate First: Replacing Oil & Gas (CFROG)

Suzy Karasik
Director
Specialized-Systems.com

George Weiss
Councilmember
City of Laguna Beach

Matt Malinowski
Director of Climate Research
CLASP

Jonny Kocher
Manager
RMI

Kevin Kircher
Assistant Professor of Mechanical Engineering
Purdue University

Merrian Borgeson
California Director, Climate & Clean Energy
Natural Resources Defense Council (NRDC)

Rosie Yacou
Rick Codina
Peter Mackin
Karen Jacques
Ralph Propper
Ian Cowan
Megan Shumway
Electrification Team of 350 Sacramento