

DOCKETED	
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September 9th, 2020

California Energy Commission
1516 Ninth Street, Docket Office, MS-4
Sacramento, CA. 95814
docket@energy.ca.gov,

Dear Commissioners,

Re: Docket Number 19-BSTD-03 - Uninsulated ducts in conditioned space

I am writing to recommend that language for the 2022 California Energy Code, Title 24, Part 6, Building Energy Efficiency Standards (residential) be changed from the current language (2019 Title 24) to allow wider use of uninsulated ducts for HVAC systems in low-rise residential buildings.

Energy use: the purpose of insulating ducts is to reduce heat exchange between the duct and its surroundings. For ducts located outside the thermal envelope of the building, insulation will reduce the heat gain (in the cooling season) or loss (in the heating season) by the duct and thus improve the energy efficiency of the HVAC system. In the case of ducts located within the thermal envelope of the building, any heat exchange between the ducts and their environment occurs entirely within the thermal envelope and there is therefore no energy efficiency benefit provided by duct insulation. This lack of benefit is already acknowledged in the fact that the energy Commission's own compliance modeling software (CBBECC-Res) does not award any compliance benefit to insulation on ducts in conditioned space.

Cost: insulating ductwork has a cost in both materials and labor. Requiring insulation which provides no energy benefits is contrary to the Warren-Alquist Act. In addition to these costs, insulation increases the diameter of a duct with a given cross sectional flow area, thereby reducing the builder's installation options.

Consistency: The requirement for insulation on ducts in conditioned space (Title 24 Section 150.0(m)1Bii) contains an exception for ducts located in wall cavities:

EXCEPTION 1 to Section 150.0(m)1B: Portions of the duct system located in wall cavities are not required to be insulated if the following conditions are met:

- i. The cavity, duct or plenum is located entirely inside the building's thermal envelope as confirmed by visual inspection.
- ii. At all locations where portions of non-insulated cavities, ducts, or plenums make a transition into unconditioned space, the transition shall be air-sealed to prevent air infiltration into the cavity and be insulated to a minimum of R-6 as confirmed by visual inspection.

There is no reason to single out wall cavities for exemption and not allow the exemption to apply to apply to other cavities located entirely within the thermal envelope.

I am therefore recommending that the language of exception 1 to Section 150.0(m)1Bii be modified to allow the use of uninsulated ducts in other cavities within the thermal envelope by including the italicized text below:

EXCEPTION 1 to Section 150.0(m)1B: Portions of the duct system located in wall cavities, *ceiling cavities, floor cavities, soffits, chases, or plenums* are not required to be insulated if the following conditions are met:

- i. The cavity, duct, *chase, soffit* or plenum is located entirely inside the building's thermal envelope as confirmed by visual inspection.
- ii. At all locations where portions of non-insulated cavities, ducts, or plenums make a transition into unconditioned space, the transition shall be air-sealed to prevent air infiltration into the cavity and be insulated to a minimum of R-6 as confirmed by visual inspection.

Sincerely,

A handwritten signature in black ink, appearing to read 'W. Allen', with a horizontal line extending to the right.

William Allen, PhD