Code Amendment Proposal Form
For public amendments proposed to the 2018 editions of the International Codes

Instructions: Upload this form and all accompanying documentation at www.denvergov.org/BuildingCode. If you are submitting your proposal on a separate sheet, make sure it includes all information requested below.

All proposals must be received by April 26, 2019.

CONTACT INFORMATION

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Signature: __________________________

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AMENDMENT PROPOSAL

Please use a separate form for each proposal.

1) Code(s) associated with this proposal. Please use acronym: IECC

2) Please check here if a separate graphic file is provided: □

   Graphics may also be embedded within your proposal below.

3) Use this template to submit your proposal or attach a separate file, but please include all items requested below in your proposal. The only formatting needed is BOLDING, STRIKEOUT AND UNDERLINING. Please do not provide additional formatting such as tabs, columns, etc., as this will be done by CPD.

Code Sections/Tables/Figures Proposed for Revision:
IECC C404.2.1

Proposal:

Revise Section C404.2.1 as follows:
C404.2.1 High input service water-heating systems. Gas-fired water-heating equipment installed in new buildings shall be in compliance with this section. Where a singular piece of water-heating equipment serves the entire building and the input rating of the equipment is 1,000,000 Btu/h (293 kW) or greater, such equipment shall have a thermal efficiency, Et, of not less than 90 percent. Where multiple pieces of water-heating equipment serve the building and the combined input rating of the water-heating equipment is 1,000,000 Btu/h (293 kW) or greater, the combined input-capacity-weighted-average thermal efficiency, Et, shall be not less than 90 percent.

Exceptions:

1. Where not less than 25 percent of the annual service water-heating requirement is provided by onsite renewable energy or site-recovered energy, the minimum thermal efficiency requirements of this section shall not apply.
2. The input rating of water heaters installed in individual dwelling units shall not be required to be included in the total input rating of service water heating equipment for a building.
3. The input rating of water heaters with an input rating of not greater than 100,000 Btu/h (29.3 kW) shall not be required to be included in the total input rating of service water-heating equipment for a building.

Supporting Information:

Purpose:
The purpose of this proposal is advance the requirements for high output water heating systems to reflect advancements in the market.

Reason:
Section C404.2.1 addresses not just typical commercial service water heating loads like laundries; it also addresses larger boilers used for central heating in R-occupancies. Water heating is one of the largest loads in R-1 (hotels) and R-2 (multifamily) occupancies. It composes around 25-35% of the total building load in typical multifamily buildings. This makes this an important provision of the energy code. However, while federal minimums and boiler markets have advanced, this provision has not been updated. Therefore, the performance premium that this provision requires has eroded over time.

This proposal includes a modest increase in the efficiency requirement for C404.2.1 from 90% E\textsubscript{t} to 92% E\textsubscript{t}. This improvement can be met without making major technology shifts since achieving a 90% E\textsubscript{t} already generally requires condensing technology. Of the 2782 boilers that meet the 1,000,000 Btu/h threshold, 852 meet the existing 90% requirement and 792 meet a requirement of 92% E\textsubscript{t}, so market availability will be minimally impacted.

Savings for this proposal are significant. Using the high-rise multifamily model developed by Pacific Northwest National Lab’s determination study of the 2015 IECC, savings from this proposal would range from 2.3%-4.0% whole-building energy savings depending on climate zone. While 2015 is not exactly the same as 2018, the water heating provisions are very similar so the savings should be reasonably representative of savings for 2018.

Referenced Standards:
NA

Note: List any new referenced standards that are proposed to be referenced in the code.

Impact:
The effect of the proposal on the cost of construction: ☒ Increase ☐ Reduce ☐ No Effect
- There is a nominal increase in cost; however, boilers that meet the new requirement can frequently be acquired for the same or even lower cost than the old requirement.

The effect of the proposal on the cost of design: ☐ Increase ☐ Reduce ☒ No Effect
- There should be no increased cost for design since the proposal results in just a specification change.

Is the proposal more or less restrictive than the I-codes: ☒ More ☐ Less ☐ Same

Departmental Impact: (To be filled out by CPD staff)

Note: CITY STAFF ONLY. Discuss the impact of this proposal in this section AND indicate the impact of this amendment proposal for each of the following:
- The effect of the proposal on the cost of review: ☐ Increase ☐ Reduce ☐ No Effect
| The effect of the proposal on the cost of enforcement/inspection: | ☐ Increase | ☐ Reduce | ☐ No Effect |