

# Code Amendment Proposal Form

For public amendments proposed to the 2021 editions of the International Codes



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

All proposals must be received by **July 23, 2021**.

## CONTACT INFORMATION

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**Organization or Representing Self:** Southwest Energy Efficiency Project

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**Signature:**

## AMENDMENT PROPOSAL

Please use a separate form for each proposal.

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

If you submitted a separate coordination change to another code, please indicate which code: \_\_\_\_\_

<u>Acronym</u>	<u>Code Name</u>	<u>Acronym</u>	<u>Code Name</u>
DBC-AP	Denver Building Code–Administrative Provisions	IFC	International Fire Code
DBC-xxx	Denver Building Code–xxx (code) amendments (e.g., DBC-IBC, DBC-IEBC)	IFGC	International Fuel Gas Code
IBC	International Building Code	IRC	International Residential Code
IEBC	International Existing Building Code	IMC	International Mechanical Code
IECC	International Energy Conservation Code	IPC	International Plumbing Code
		DGC	Denver Green Code

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:

**R403.5 Service hot water systems** (*Modify the section*)

**R403.5.4 Heat pump water heating** (*Add new section*)

### Proposal:

*Modify the section as follows:*

**R403.5 Service hot water systems.** Energy conservation measures for service hot water systems shall be in accordance with ~~Sections R403.5.1 through R403.5.3~~ this section.

*Add new section as follows:*

**R403.5.4 Heat pump water heating.** Service hot water in new *buildings* shall be provided by an electric heat pump system.

**Exceptions:**

1. Resistance heating elements integrated into heat pump storage water heaters
2. Electric water heaters with a rated water storage volume of no greater than 20 gallons.
3. Solar thermal systems
4. Waste heat recovery systems
5. Freeze protection systems
6. Snow and ice melt systems

**Supporting Information:**

**Purpose:**

Move Denver towards its community-driven climate goals, health goals, and affordability goals through the use of clean, highly-efficient, cost-effective, and all-electric technologies.

**Reason/Substantiation:**

Electrification is a critical pillar of Net Zero Energy, and is required to meet Denver’s goal of Net Zero Energy in new homes and buildings by 2030. Denver’s existing building policy is likely to start requiring heat pump water heaters ahead of the next 2024 code cycle, as recommended by the Energize Denver Task Force. New homes should pave the way for electrification, and should be on a more ambitious track than existing homes. Denver’s recently-released Renewable Heating and Cooling Implementation Plan and other local and regional studies have already demonstrated both the cost-effectiveness and the importance of this approach.

All-electric homes are healthier, more comfortable, and lower-cost to build and operate. The health disparities and energy burden are already greatest for low-income households, and this proposal helps on both fronts. On the health side, people living in the United States spend roughly 90% of their time indoors where pollution levels are largely unregulated and often worse than outdoor air quality (RMI 2020). Indoor air pollution caused by natural gas contributes significantly to exacerbating asthma and triggering asthma attacks, risks carbon monoxide poisoning, and causes other adverse health impacts.

Denver can transition its homes and buildings to clean, highly efficient, all-electric heat powered by renewable electricity through the use of heat pump technology. Heat pumps use electricity to move heat from a cool space to a warm space, making the cool space cooler and the warm space warmer. They can work in either direction: providing heating in the wintertime (in temperatures down to -12 Fahrenheit) and cooling in the summertime, all in one unit. The cooling is particularly important for Denver’s under-resourced communities and communities of color, which currently bear the greatest burden of lack of air conditioning, heat island effects, lower tree-cover, and negative health impacts of excessive heat.

In addition to the health, climate, and efficiency benefits outlined above, all-electric and renewably-powered buildings are affordable and can reduce construction costs. See more detail on cost impacts in the “Impact” section below.

**Additional Notes:**

- These requirements include multiple exceptions. The intention is to make this only apply to general purpose water heating systems that are found in nearly all homes and not to the specialty systems that are sometimes present for which heat pump water heaters may not be a good fit.
- Each list of exceptions includes “other systems as approved.” This allows the code official to respond to unique situations without a full “alternate means and methods” submission.
- The exceptions specifically list the resistance coils found in most storage heat pump water heaters for clarity.
- The exceptions also include recirculation temperature maintenance systems, allowing for both heat trace systems and gas loop re-heaters.

**Bibliography:**

City and County of Denver, “Denver Renewable Heating and Cooling Plan,” 2021,  
<https://www.denvergov.org/Government/Departments/Climate-Action-Sustainability-Resiliency/Initiatives/High-Performance-Buildings-and-Homes/Renewable-Heating-Cooling>

RMI, "All Electric Homes: A Win for the Climate and the Economy," 2018, <https://rmi.org/all-electric-new-homes-a-win-for-the-climate-and-the-economy/>

**Referenced Standards:**

N/A

**Impact:**

In addition to the health, climate, and efficiency impacts outlined above, all-electric homes and buildings can make housing more affordable. All-electric new construction costs less than mixed-fuel new construction during the construction phase. RMI's Denver-specific study "All-Electric New Homes: A Win for the Climate and the Economy," followed upfront and lifetime cost estimates for new construction of all electric single family home model compared to a mixed fuel model, and found that building an all-electric home saved \$2,900 in net present costs over 15 years and saved \$2,700 dollars in upfront costs. The study also found that all electric homes have 2% lower annual utility costs than mixed fuel homes.

Xcel Energy is poised to increase its rebates for heat pumps as directed by a law passed this past 2021 legislative session (SB 246), adding to its incentives for highly-efficient home construction.

**Note:** 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 construction:     Increase     Reduce     No Effect
- The effect of the proposal on the cost of design:         Increase     Reduce     No Effect
- 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