

building and shall not have gas lines within 50 feet of the building perimeter on the building property.

Exception 1. Electric resistance heating shall be permitted for reheat for variable air volume systems that serve multiple zones, provided that these systems meet the control requirements of IECC Section C403.6.1, and shall include the capability and be configured to to reduce the volume of air that is reheated, recooled or mixed in each zone to twenty percent of the zone design peak supply airflow. Electric resistance heating shall be permitted for reheat for variable air volume systems that serve multiple zones.

Exception 2. Electric resistance water heating is permitted for instantaneous point-of-use water heaters with a rated capacity not exceeding 25 kBtu/h and a storage capacity no greater than 5 gallons.

Supporting Information:

Purpose: New commercial and multi-family buildings can be designed as all-electric buildings. This greatly reduces onsite emissions from fossil fuels and has the potential to improve indoor air quality. Water heating products with storage that use electric resistance heating elements are roughly three times more inefficient than heat pump water heaters. For space heating, heat pumps provide efficient heating, but when heating needs are greatest, the systems are less efficient, and rely on supplemental electric resistance heating for backup. This measure restricts the use of resistance heating in buildings designed to be all-electric.

Reason: Electrification of buildings leads to a large reduction in emissions and reduces dependence on fossil fuel sources for heating appliances and other building needs. Electrification can also provide substantial benefits for indoor air quality. As the energy generation sources become cleaner and cleaner over time, electrification benefits will increase further. Electric resistance has been an option for commercial boilers and service water heating. Heat pumps are approximately three times as efficient as resistance heating and are available both for space heating and for water heating sources. Cold-climate heat pumps are available that provide much better efficiency at peak Denver heating conditions (0-15F outdoor dry-bulb) and can limit the use of supplemental resistance heating to cold winter conditions. This measure provides minimum equipment type requirements for buildings if they decide to go all-electric.

Substantiation: Heat pump water heaters are widely available that meet intended efficiency requirements. Heat pumps for space heating can be sized to meet the full load at a lower temperature than current standard practice. This will limit the use of electric resistance heating during the winter months.

Bibliography and Access to Materials (as needed when substantiating material is associated with the amendment proposal):

The 2022 California Title 24 Building Energy Efficiency Requirements limit the use of electric resistance heat as part of the base code.

Other Regulations Proposed to be Affected

***For proposals to delete content from the 2019 Denver Green Code in conjunction with adding it to other mandatory Denver codes and/or regulations, only.**

Please identify which other mandatory codes or regulations are suggested to be updated (if any) to accept relocated content.

Referenced Standards :

N/A

Impact

How will this proposal impact cost and restrictiveness of code? ("X" answer for each item below)

Cost of construction:	<input checked="" type="checkbox"/> Increase	<input type="checkbox"/> Decrease	<input type="checkbox"/> No Impact
Cost of design:	<input type="checkbox"/> Increase	<input type="checkbox"/> Decrease	<input checked="" type="checkbox"/> No Impact
Restrictiveness:	<input checked="" type="checkbox"/> Increase	<input type="checkbox"/> Decrease	<input type="checkbox"/> No Impact