Electrification for Service Water Heating

What are the Requirements?

Section C404.10 prohibits fossil fuel and electric resistance instantaneous and storage water heaters for commercial and multifamily permits submitted after January 1st, 2024. Gas boilers that provide domestic hot water are still allowed. There are several exceptions including:

- Electric resistance elements in heat pumps.
- Electric resistance elements for recirculation loop temperature maintenance.
- Electric storage water heaters with a volume <= 20 gallons.
- Instantaneous electric water heaters within 10 feet of the point of use.
- Hot water storage tanks without electric resistance or fossil-fuel heating elements.
- Water heating systems that require water temperature >= 141°F. Space heating is not an accepted end-use requirement for water temperatures above 141°F.
- Electric resistance equipment where on-site renewables serve 100% of the annual service water heating requirement.
- Electric resistance storage water heating equipment where solar thermal serves 75% of the annual service water heating requirement.
- Electric resistance in buildings that use a performance path for compliance.
- Replacements of gas-fired storage water heaters or instantaneous water heaters that comply with Alterations C503.4.1. Like for like replacements of gas-fired water heaters cannot use quick permits as of March 1, 2023.
- Replacement of electric resistance water heater with the same kW input and tank volume.
- Water heating equipment with at least one of the following: heat input of 200,000 Btu/hr or greater; an operating temperature of 210°F or greater; a nominal storage capacity of 120 gallons or greater.

Related section C404.12 requires water heaters to be in a space that is 3’x3’x7’ with a minimum volume of 760 cubic feet or a have a grill and ductwork for venting. This is to allow for a future replacement with heat pump water heaters.

Additionally, section C404.11 requires demand-responsive controls for electric storage and heat pump water heaters with storage between 40-120 gallons and a capacity equal to or less than 12 kW.

How Does this Apply to Your Project?

Project teams will need to design systems that do not include the prohibited natural gas and electric resistance service hot water systems. Electric heat pump water heaters can replace the fossil fuel and electric resistance heating equipment in a one-for-one replacement scenario. Please note that heat pump water heaters do have specific venting requirements and are larger than electric resistance or natural gas equivalents. Central systems may be more desirable for projects and should be explored in early design.

Complying with this requirement helps buildings 25,000 sq. ft. and larger meet their performance targets. Buildings 25,000 sq. ft. and larger can also receive a 10% adjustment for their Energize Denver performance target if they are 80% electrified. Learn more about Energize Denver at denvergov.org/energizedenver.

Why is this Important?

The goal of these sections is to align new system requirements in the Denver Energy Code with the existing building partial electrification requirements in the Municipal Code and to future-proof the building to accommodate heat pumps. Electric equipment like heat pumps allow buildings to take advantage of low- to no- emissions as the electrical grid gets cleaner over time.

What is the Climate Impact?

The 2022 Denver Energy Code will reduce operational carbon emissions for commercial new construction by 15% over the 2021 IECC. C404.10 reduces the operational carbon emissions by 3.0% and requires electrification which aligns with Denver’s climate goals.

Email energy.review@denvergov.org with questions.