

# Residential Electrification

*Modify the 2021 International Energy Conservation Code as follows:*

*Add new text as follows:*

## **R404.4 Electric readiness (Mandatory).**

Systems using gas or propane water heaters, dryers, or conventional cooking equipment to serve individual dwelling units shall comply with the requirements of Sections R404.4.1 through R404.4.3. All water heating systems shall comply with Section R404.4.4.

### **R404.4.1 Household Ranges and Cooking Appliances.**

An individual branch circuit outlet with a minimum rating of 250-volts, 40-amperes shall be installed within three feet of each gas or propane range or permanently installed cooking appliance.

### **R404.4.2 Household Clothes Dryers and Water Heaters.**

An individual branch circuit outlet with a minimum rating of 250-volts, 30-amperes shall be installed within three feet of each gas or propane household clothes dryer and water heater.

### **R404.4.3 Electrification-ready circuits.**

The unused conductors required by Sections R404.4.1 or R404.4.2 shall be labeled with the word "spare." Space shall be reserved in the electrical panel in which the branch circuit originates for the installation of an overcurrent device. Capacity for the circuits required by Sections R404.4.1 or R404.4.2 shall be included in the load calculations of the original installation.

### **R404.4.4 Water heater space.**

An indoor space that is at least 3 feet by 3 feet by 7 feet high shall be available surrounding or within 3 feet of the installed water heater.

**Exception:** The water heater space requirement does not need to be met where a heat pump water heater or tankless water heater is installed.

**Reason:**

This proposal enhances customer choice by making it easy for homeowners to choose either electric or gas appliances and water heating equipment. By ensuring that a home built with gas or propane can easily accommodate future electric appliances and equipment, this proposal protects homeowners from future costs, should natural gas become less affordable or even unavailable over the life of the building. As the electric grid becomes cleaner, and high-efficiency electric heat pump technology increasingly offers utility bill and pollution reduction benefits over gas, more customers may want to transition from natural gas to electric space and water heating. Federal, state, and local environmental and public health policies may also encourage, or even require the transition in some areas over the life of the building. Electric-ready requirements will protect customers from potential high retrofit costs.

**Cost Impact:**

The code change proposal will increase the cost of construction.

The cost of meeting these electric-ready requirements when the house is being built, walls are open, and the trades are already on-site, is marginal. In comparison, the cost of retrofitting a building for these requirements can be orders of magnitude higher and act as a barrier for the homeowner to choose electric appliances. An electrification engineering study reports that the electrical modifications needed to install a HP heating system and a HPWH is \$2,100 as a retrofit compared to \$500 as an original install for a single family home (Group-14 2020). Not making new buildings electric-ready would leave homeowners exposed to potentially high retrofit costs in the future and will greatly inhibit customer choice.

**Bibliography:**

Group 14 Engineering. 2020. *Electrification of Commercial and Residential Buildings: An Evaluation of the System Options, Economics, and Strategies to Achieve Electrification of Buildings*. Prepared for Community Energy, Inc.