

Electric Readiness in Residential Energy Code

Building Energy Code Technical Brief

INTRODUCTION

The increasing availability of clean electricity sources, such as wind and solar power, provides an opportunity for the nation to transition from natural gas and propane to electricity, which can save costs while substantially reducing carbon emissions. Electric-readiness provisions incorporated into residential energy codes make it possible for a home built with gas or propane to accommodate future electric appliances. Readiness considerations include providing sufficient electric panel capacity, necessary branch circuit outlets and pre-wiring for future electric appliances, and sufficient space for electric heat pump water heating equipment.

From Maine to California, many cities and states already are enacting new laws, updating building codes, and advancing regulatory action in efforts to phase out gas appliances and make sure homes are heated and powered with clean electricity. The Department of Energy (DOE) created a technical brief to assist state and local governments in incorporating readiness elements directly into their respective codes, as well as to help inform future International Energy Conservation Code (IECC) development. The technical brief includes four electric-readiness strategies for residential buildings:

- household ranges and cooking appliances
- household clothes dryers and water heaters
- electrification-ready circuits
- water heater space.

IMPACTS

- Buildings account for more than 70 percent of U.S. electricity use. Effectively managing their loads can greatly facilitate the transition toward a clean, reliable power grid.
- National adoption of strategic building electrification combined with energy efficiency and demand flexibility will help assure access to an affordable, reliable, and modern U.S. electric power system. Under this scenario, it's estimated that up to \$200 billion in U.S. electric power system cost savings could be realized over the next two decades, along with associated reductions in carbon dioxide emissions of 6 percent annually by 2030.
- Across America, millions of homes built with combustion equipment and appliances tend to possess lower-capacity electric panels that likely will need an upgrade for electrification. Investments of tens of billions of dollars may be needed to electrify these homes.
- It's therefore important to address electric-readiness in *new* construction. Electrical panels that are sized sufficiently to accommodate future full electrification cost far less than the estimated \$1,000 to \$5,000 for upgrading an electrical panel as part of a home renovation.

- In addition to improving the cost-effectiveness of future electrification, energy codes that contain electric-readiness provisions support consumers' ability to realize the cost and environmental benefits derived from demand flexibility and increased use of variable renewable energy.
- Electric readiness makes it easier for homeowners to accommodate future electrical appliances and equipment, which protects against carbon pricing or other future policy-imposed costs associated with fossil-fuel-based energy sources.
- Electric appliances can provide homeowners with health and safety benefits, such as improved indoor air quality.

BACKGROUND

DOE and Pacific Northwest National Laboratory have developed a series of technical briefs supporting national, state, and local initiatives to update and advance building energy codes. Each brief is presented in a module-based format, centered on technologies, measures, or practices that can be incorporated as “plug-ins” to building energy codes. These are made available for adoption directly by state and local governments pursuing advanced energy savings and greenhouse gas emission reductions, or for future consideration as part of the national model energy codes such as the IECC or ASHRAE Standard 90.1. The collection of briefs supports DOE's mission to provide technical assistance supporting states and local governments, helping them to successfully implement their building codes, as well as pursue energy and climate goals.

LEARN MORE

Find the full technical brief, including supporting technical information and sample code language, at https://www.energycodes.gov/sites/default/files/2021-10/TechBrief_Electric_Readiness_Oct2021.pdf.

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