DEPARTMENT OF LABOR AND INDUSTRY

CODE CHANGE PROPOSAL FORM

(Must be submitted electronically)

Author/requestor: Ben Rabe

Date: 8/22/23

Email address:

Model Code: 2021 IECC

Telephone number:

Code or Rule Section: Residential Energy Code

Firm/Association affiliation, if any: New Buildings Institute

Code or rule section to be changed: R404.4

Intended for Technical Advisory Group ("TAG"):

General Information	**Yes**	**No**
A. Is the proposed change unique to the State of Minnesota?	☐	☒
B. Is the proposed change required due to climatic conditions of Minnesota?	☐	☒
C. Will the proposed change encourage more uniform enforcement?	☒	☐
D. Will the proposed change remedy a problem?	☒	☐
E. Does the proposal delete a current Minnesota Rule, chapter amendment?	☐	☒
F. Would this proposed change be appropriate through the ICC code development process?	☒	☐

Proposed Language

1. The proposed code change is meant to:

   ☐ change language contained the model code book? If so, list section(s).

   ☐ change language contained in an existing amendment in Minnesota Rule? If so, list Rule part(s).

   ☐ delete language contained in the model code book? If so, list section(s).

   ☐ delete language contained in an existing amendment in Minnesota Rule? If so, list Rule part(s).

   ☒ add new language that is not found in the model code book or in Minnesota Rule.

2. Is this proposed code change required by Minnesota Statute? If so, please provide the citation.

   No, but it would aid the state in meeting our state and local climate goals.

3. Provide *specific* language you would like to see changed. Indicate proposed new words with underlining and ~~strikethrough~~ words proposed for deletion. Include the entire code (sub) section or rule subpart that contains your proposed changes.

Add new text as follows:

R103.2.4 Electrification system. The construction documents shall provide details for additional electric infrastructure, including branch circuits, conduit, or pre-wiring, and panel capacity in compliance with the provisions of this code.

Add new text as follows:

R105.2.5 Electrical rough-in inspection. Inspections at electrical rough-in shall verify compliance as required by the code and the approved plans and specifications as to the locations, distribution, and capacity of the electrical system.

Revise numbering as follows:

~~R105.2.5~~ R105.2.6 Final inspection.

Add new definitions as follows:

ALL-ELECTRIC BUILDING. A *building* that contains no *combustion equipment*, or plumbing for *combustion equipment*, installed within the *building*, or *building site*.

APPLIANCE. A device or apparatus that is manufactured and designed to utilize energy and for which this code provides specific requirements.

COMBUSTION EQUIPMENT. Any *equipment* or *appliance* used for space heating, *service water heating*, cooking, clothes drying, or lighting that uses *fuel gas* or *fuel oil*.

EQUIPMENT. Piping, ducts, vents, control devices and other components of systems other than appliances that are permanently installed and integrated to provide control of environmental conditions for buildings. This definition shall also include other systems specifically regulated in this code.

FUEL GAS. A natural gas, manufactured gas, liquified petroleum gas or a mixture of these.

FUEL OIL. Kerosene or any hydrocarbon oil having a flash point not less than 100°F (38°C).

MIXED-FUEL BUILDING. A *building* that contains *combustion equipment* or includes piping for *combustion equipment*.

Revise text as follows:

R401.2.5 Additional energy efficiency. This section establishes additional requirements applicable to all compliance approaches to achieve additional energy efficiency.

1. For *all-electric buildings* complying with Section R401.2.1, one of the additional efficiency package options shall be installed according to Section R408.2.

2. For *mixed-fuel buildings* complying with Section R401.2.1, the building shall be required to install either R408.2.1 or R408.2.5 of the additional efficiency package

options, and any two of R408.2.2, R408.2.3, or R408.2.4 of the additional efficiency package options.

~~2~~3. For buildings complying with Section R401.2.2, the building shall meet one of the following:

~~2~~3.1. *All-electric buildings* shall have ~~O~~one of the additional efficiency package options in Section R408.2 ~~shall be~~ installed without including such measures in the proposed design under Section R405; or

~~2~~3.2. The proposed design of the *all-electric building* ~~building~~ under Section R405.3 shall have an annual energy cost that is less than or equal to the 95 percent of the annual energy cost of the standard reference design~~.~~; or

3.3 Mixed-fuel buildings shall have either R408.2.1 or R408.2.5 of the additional efficiency package options, and any two of R408.2.2, R408.2.3, or R408.2.4 of the additional efficiency package options installed without including such measures in the proposed design under Section R405; or

3.4 The proposed design of the mixed-fuel building under Section R405.3 shall have an annual energy cost that is less than or equal to 85 percent of the annual energy cost of the standard reference design.

~~3~~4. For buildings complying with the Energy Rating Index alternative Section R401.2.3, the Energy Rating Index value shall be at least 5 percent less than the Energy Rating Index target specified in Table R406.5.

The option~~s~~ selected for compliance shall be identified in the certificate required by Section R401.3.

Revise text as follows:

R401.3 Certificate. A permanent certificate shall be completed by the builder or other approved party and posted on a wall in the space where the furnace is located, a utility room or an approved location inside the building. Where located on an electrical panel, the certificate shall not cover or obstruct the visibility of the circuit directory label, service disconnect label or other required labels. The certification shall indicate the following:

4. The types, sizes, fuel sources, and efficiencies of heating, cooling and service water heating equipment. Where a gas-fired unvented room heater, electric furnace or baseboard electric heater is installed in the residence, the certificate shall indicate “gas-fired unvented room heater,” “electric furnace” or “baseboard electric heater,” as appropriate. An efficiency shall not be indicated for gas-fired unvented room heaters, electric furnaces and electric baseboard heaters.
8. The fuel sources for cooking and clothes drying equipment.
9. Where combustion equipment is installed, the certificate shall indicate information on the installation of additional electric infrastructure including which *equipment* and/or *appliances* include additional electric infrastructure, capacity reserved on the electrical service panel for replacement of each piece of combustion *equipment* and/or *appliance*

R402.1 General. The building thermal envelope shall comply with the requirements of Sections R402.1.1 through R402.1.5.

Exceptions:

1. The following low-energy buildings, or portions thereof, separated from the remainder of the building by *building thermal envelope assemblies* complying with this section shall be exempt from the building thermal envelope provisions of Section R402.

    1. Those containing no *combustion equipment* with a peak design rate of energy usage less than 3.4 Btu/h·ft2 (10.7 W/m2) or 1.0 watt/ft2 of floor area for space conditioning purposes.
    2. Those containing no *combustion equipment* that do not contain *conditioned space*.

Add new text as follows:

R404.6 Additional electric infrastructure. *Combustion equipment* shall be installed in accordance with this section.

R404.6.1 Equipment serving multiple units. *Combustion equipment* that serves multiple *dwelling units* shall comply with Section C405.16.

R404.6.2 Combustion water heating. Water heaters shall be installed in accordance with the following:

1. A dedicated 240-volt branch circuit with a minimum capacity of 30 amps shall terminate within 3 feet (914 mm) from the water heater and be accessible to the water heater with no obstructions. Both ends of the branch circuit shall be labeled with the words "For Future Heat Pump Water Heater" and be electrically isolated.
2. A condensate drain that is no more than 2 inches (51 mm) higher than the base of the installed water heater and allows natural draining without pump assistance shall be installed within 3 feet (914 mm) of the water heater.
3. The water heater shall be installed in a space with minimum dimensions of 3 feet (914 mm) by 3 feet (914 mm) by 7 feet (2134 mm) high.
4. The water heater shall be installed in a space with a minimum volume of 700 cubic feet (20,000 L) or the equivalent of one 16-inch (406 mm) by 24-inch (610 mm) grill to a heated space and one 8-inch (203 mm) duct of no more than 10 feet (3048 mm) in length for cool exhaust air.

R404.6.3 Combustion space heating. Where a building has combustion equipment for space heating, the building shall be provided with a designated exterior location(s) in accordance with the following:

1. Natural drainage for condensate from cooling equipment operation or a condensate drain located within 3 feet (914 mm), and
2. A dedicated branch circuit in compliance with IRC Section E3702.11 based on heat pump space heating equipment sized in accordance with R403.7 and terminating within 3 feet (914 mm) of the location with no obstructions. Both ends of the branch circuit shall be labeled “For Future Heat Pump Space Heater.”

Exception: Where an electrical circuit in compliance with IRC Section E3702.11 exists for space cooling equipment.

R404.6.4 Combustion clothes drying. A dedicated 240-volt branch circuit with a minimum capacity of 30 amps shall terminate within 6 feet (1829 mm) of natural gas clothes dryers and shall be accessible with no obstructions. Both ends of the branch circuit shall be labeled with the words “For Future Electric Clothes Drying” and be electrically isolated.

R404.6.5 Combustion cooking. A dedicated 240-Volt, 40A branch circuit shall terminate within 6 feet (1829 mm) of natural gas ranges, cooktops and ovens and be accessible with no obstructions. Both ends of the branch circuit shall be labeled with the words “For Future Electric Range” and be electrically isolated.

R404.6.6 Other combustion equipment. *Combustion equipment* and end-uses not covered by Sections R404.6.2-5 shall be provided with a branch circuit sized for an electric *appliance*, *equipment* or end use with an equivalent capacity that terminates within 6 feet (1829 mm) of the *appliance* or *equipment*.

Revise table as follows:

TABLE R405.2 REQUIREMENTS FOR TOTAL BUILDING PERFORMANCE

SECTION [a]	TITLE
Electrical Power and Lighting Systems	
R404.1	Lighting equipment
R404.2	Interior lighting controls
R404.6	Additional electric infrastructure

Revise table as follows:

TABLE R406.2 REQUIREMENTS FOR ENERGY RATING INDEX

SECTION [a]	TITLE
Electrical Power and Lighting Systems	
R404.1	Lighting equipment
R404.2	Interior lighting controls
R404.6	Additional electric infrastructure
R406.3	Building thermal envelope

Revise text as follows:

R406.5 ERI-based compliance. Compliance based on an ERI analysis requires that the rated *proposed* design and confirmed built dwelling be shown to have an ERI less than or equal to the appropriate value for the proposed *mixed-fuel building* or the proposed *all-electric building* as indicated in Table R406.4 when compared to the *ERI reference design*.

TABLE R406.4 MAXIMUM ENERGY RATING INDEX

Climate Zone	~~Energy Rating Index~~ All-Electric Building	Mixed Fuel Building
5	55	47
6	54	46
7	53	46

Add new text as follows:

R408.2.3 Reduced energy use in service water-heating option. The hot water system shall meet one of the following efficiencies:

4. Greater than or equal to 82 EF instantaneous fossil fuel service water-heating system and drain water heat recovery unit meeting the requirements of Section R403.5.3 installed on at least one shower.

4. Will this proposed code change impact other sections of a model code book or an amendment in Minnesota Rule? If so, please list the affected sections or rule parts.

No, it will not.

Need and Reason

1. Why is the proposed code change needed? Please provide a general explanation as well as a specific explanation for any changes to numerical values (heights, area, etc.)

In order to meet the state's aggressive climate goals, Minnesota must not only reduce energy use through energy efficiency and move to utility scale and on-site renewable energy, but also begin to transition away from using combustion equipment in buildings to electric equipment. Therefore, it is crucial that new buildings built today can be cost-effectively retrofitted in the future with electric

equipment so that emissions are not “locked-in” by gas-dependent building infrastructure. Fortunately, heat pump technology has dramatically improved over the last few decades, giving contractors and building owners access to highly efficient electric heating and cooling, and water heating technologies.

One of the biggest expenses of electrification retrofits – and therefore barriers to electrification in existing buildings - is running electrical infrastructure through a completed and enclosed building that has combustion equipment. This significant future cost can be greatly reduced through making simple, low-cost modifications to buildings during construction that enable easier electrification in the future. The requirements in this proposed amendment ensure that the electrical infrastructure is in place so that building owners can convert -electric equipment in the future and ensures that unitized gas water heaters can be replaced with high-performance heat pump water heaters (HPWHs).

2. Why is the proposed code change a reasonable solution?

   This proposed code change future proofs homes so that it will be technically and economically feasible for owners with natural gas water heaters to install efficient electric appliances in the future if they wish.

3. What other factors should the TAG consider?

   None

Cost/Benefit Analysis

1. Will the proposed code change increase or decrease costs? Please explain and provide estimates if possible.

   This code will only nominally increase costs.

2. If there is an increased cost, will this cost be offset by a safety or other benefit? Please explain. If the benefit is quantifiable (for example energy savings), provide an estimate if possible.

   Yes. If not enacted, costs to install an electric heat pump water heater in the future maybe too costly for buildings designed only for natural gas water heaters.

3. If there is a cost increase, who will bear the costs? This can include government units, businesses, and individuals.

   Cost will be passed to homeowner and will save cost over retrofit.

4. Are there any enforcement or compliance cost increases or decreases with the proposed code change? Please explain.

   No.

5. Will the cost of complying with the proposed code change in the first year after the rule takes effect exceed $25,000 for any one small business or small city (Minn. Stat. § 14.127)? A small business is any business that has less than 50 full-time employees. A small city is any statutory or home rule charter city that has less than ten full-time employees. Please explain.

   No.

Regulatory Analysis

1. What parties or segments of industry are affected by this proposed code change?

   This proposed code change would require additional electrical work.

2. Can you think of other means or methods to achieve the purpose of the proposed code change? What might someone opposed to this code change suggest instead? Please explain what the alternatives are and why your proposed change is the preferred method or means to achieve the desired result.

   I cannot think of another way to achieve the goals of this proposal.

3. What are the probable costs or consequences of not adopting the code change, including those costs or consequences borne by identifiable categories of affected parties, such as separate classes of government units, businesses, or individuals?

   This proposal will save homeowners the burden of upgrading electrical capacity and installing conduit before when electrifying appliances.

4. Are you aware of any federal or state regulation or requirement related to this proposed code change? If so, please list the federal or state regulation or requirement and your assessment of any differences between the proposed code change and the federal regulation or requirement.

   No.

***Note: Incomplete forms may be returned to the submitter with instruction to complete the form. Only completed forms can considered by the TAG.

DEPARTMENT OF LABOR AND INDUSTRY

CODE CHANGE PROPOSAL FORM

(Must be submitted electronically)

Author/requestor: Ben Rabe

Date: August 18, 2023

Email address:

Model Code: 2021 IECC

Telephone number:

Code or Rule Section: Residential Energy Code

Firm/Association affiliation, if any: New Buildings Institute

Code or rule section to be changed: R404.4

Intended for Technical Advisory Group ("TAG"):

General Information	**Yes**	**No**
A. Is the proposed change unique to the State of Minnesota?	☐	☒
B. Is the proposed change required due to climatic conditions of Minnesota?	☐	☒
C. Will the proposed change encourage more uniform enforcement?	☒	☐
D. Will the proposed change remedy a problem?	☒	☐
E. Does the proposal delete a current Minnesota Rule, chapter amendment?	☐	☒
F. Would this proposed change be appropriate through the ICC code development process?	☒	☐

Proposed Language

1. The proposed code change is meant to:

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   ☐ change language contained in an existing amendment in Minnesota Rule? If so, list Rule part(s).

   ☐ delete language contained in the model code book? If so, list section(s).

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   ☒ add new language that is not found in the model code book or in Minnesota Rule.

2. Is this proposed code change required by Minnesota Statute? If so, please provide the citation.
   No

3. Provide *specific* language you would like to see changed. Indicate proposed new words with underlining and ~~strikethrough~~ words proposed for deletion. Include the entire code (sub) section or rule subpart that contains your proposed changes.

Add definition as follows:

ENERGY STORAGE SYSTEM (ESS) . One or more devices, assembled together, capable of storing energy in order to supply electrical energy at a future time.

Add new text as follows:

R103.2.4 Energy storage-ready system. The construction documents shall provide the location of pathways for routing of raceways or cable from the energy storage system to the electrical service panel, from the panelboard to dedicated branch circuits, the location and layout of a designated area for electrical energy storage system and system isolation equipment.

R105.2.5 Electrical rough-in inspection. Inspections at electrical rough-in shall verify compliance as required by the code and the approved plans and specifications as to the locations, distribution, and capacity of the electrical system. Where the energy storage system area is not in the same space as the electrical panel, inspections shall verify conduit or pre-wiring from the energy storage ready zone to the electrical panel.

R404.4 Electrical energy storage system. One- and two-family dwellings, townhouse units, and Group R-3 occupancies shall either comply with R404.4.1 or R404.4.2. Buildings with Group R-2 and R-4 occupancies shall comply with C405.15.

R404.4.1 Electrical energy storage energy capacity. Each building shall have an *ESS* with a minimum rated energy capacity of 5 kWh with a minimum of four *ESS* supplied branch circuits.

R404.4.2 Electrical energy storage system ready. Each building shall be energy storage ready area in accordance with Sections R404.4.2.1 through R404.2.2.4.

R404.4.2.1 Energy storage system space. Interior or exterior space with dimensions and locations in accordance with Section R328 of the International Residential Code and Section 110.26 of NFPA 70 shall be reserved to allow for the future installation of an energy storage system.

R404.4.2.2 System Isolation Equipment Space. Space shall be reserved to allow for the future installation of a transfer switch within 3 feet (305 mm) of the main panelboard. Raceways shall be installed between the panelboard and the transfer switch location to allow the connection of an *ESS*.

R404.4.2.3 Panelboard with backed-up load circuits. A dedicated raceway from the main service to a panelboard that supplies the branch circuits served by the *ESS*. All branch circuits are permitted to be supplied by the main service panel prior to the installation of an *ESS*. The track size of the raceway shall be not less than one inch. The panelboard that supplies the branch circuits shall be labeled "Subpanel reserved for future battery energy storage system to supply essential loads."

R404.4.2.4 Branch circuits served by ESS. A minimum of four branch circuits shall be identified and have their source of supply collocated at a single panelboard supplied by the *ESS*. The following end uses shall be served by the branch circuits:

1. A refrigerator.
2. One lighting circuit serving the primary path of egress the primary egress.
3. A sleeping room receptacle outlet.

Revise table as follows:

TABLE R405.2 REQUIREMENTS FOR TOTAL BUILDING PERFORMANCE

SECTION	TITLE
Electrical Power and Lighting Systems	
R404.1	Lighting equipment
R404.2	Interior lighting controls
R404.6	Energy storage infrastructure

SECTION R406
ENERGRY RATING INDEX COMPLIANCE ALTERNATIVE

Revise table as follows:

TABLE R406.2 REQUIREMENTS FOR ENERGY RATING INDEX

SECTION	TITLE
Electrical Power and Lighting Systems	
R404.1	Lighting equipment
R404.2	Interior lighting controls
R404.6	Energy storage infrastructure
R406.3	Building thermal envelope

4. Will this proposed code change impact other sections of a model code book or an amendment in Minnesota Rule? If so, please list the affected sections or rule parts.

   No.

Need and Reason

1. Why is the proposed code change needed? Please provide a general explanation as well as a specific explanation for any changes to numerical values (heights, area, etc.)

   Energy storage is critical to achieving Minnesota's goal of a carbon-free power sector by 2040. These systems also bolster the economy, present a cost savings opportunity for homeowners and increase resiliency to power outages. In 2020, 21% of the United State's electricity is sourced from renewable energy, primarily wind, an intermittent source of energy. As the U.S. increases the amount of electricity generated from renewables, buildings must be prepared to aid in this transition by storing energy to match grid demands.

   Policies to encourage energy storage will improve the U.S. economy. Energy storage is expected to grow by over 40% each year until 2025 and the U.S., because of its manufacturing background and experience in battery-storage technology for cars is becoming a clear leader in this market.

   Energy storage will also present a cost-saving opportunity for homeowners. Battery prices have and will likely continue to fall in the United States, meaning that behind-the-meter storage will likely become more accessible and affordable in the short-term. More and more utilities are moving beyond voluntary programs and are expanding use of time-of-use rates for electricity as a tool for shaping demand. Ensuring homes are energy-storage ready now will allow them to cost effectively install storage systems in the future and take advantage of these voluntary programs.

   Finally, energy storage will improve resilience to power outages. In 2020, DOE found that an average household in the United States goes without power for 8 hours in a year. Because of extreme weather events caused by climate change, those outages are increasing. These outages are estimated to cost the U.S. economy between $25 billion to $70 billion annually. Requiring

homes to be storage-ready will ensure communities are more resilient by allowing buildings to cost effectively install storage which can operate for a short-period of time without relying on the electricity grid.

2. Why is the proposed code change a reasonable solution?

   Installing the infrastructure for a future energy storge is a more cost-effective way to future-proof homes.

3. What other factors should the TAG consider?

   This proposal will help future proof homes for the clean energy transition.

Cost/Benefit Analysis

1. Will the proposed code change increase or decrease costs? Please explain and provide estimates if possible.

   This code will only nominally increase costs.

2. If there is an increased cost, will this cost be offset by a safety or other benefit? Please explain. If the benefit is quantifiable (for example energy savings), provide an estimate if possible.

   Commercial analysis for a similar measure showed no incremental costs. Some costs are expected on residential. Overall savings potential impacts are outlined in reason statement - costs of outages and other grid infrastructure are passed on to consumers, it just isn't as recognizable on an energy bill. Measure will also allow consumers the ability to install energy storage in the future, removing retrofit costs, and allowing homeowners to have resiliency onsite, which have quantifiable health, wellness, and comfort co-benefits.

3. If there is a cost increase, who will bear the costs? This can include government units, businesses, and individuals.

   Cost will be passed to homeowner and will save cost over retrofit.

4. Are there any enforcement or compliance cost increases or decreases with the proposed code change? Please explain.

   This system can be inspected during normal electrical inspection and will increase the cost of compliance.

5. Will the cost of complying with the proposed code change in the first year after the rule takes effect exceed $25,000 for any one small business or small city (Minn. Stat. § 14.127)? A small business is any business that has less than 50 full-time employees. A small city is any statutory or home rule charter city that has less than ten full-time employees. Please explain.

   No.

Regulatory Analysis

1. What parties or segments of industry are affected by this proposed code change?

   This proposed code change would require additional electrical work.

2. Can you think of other means or methods to achieve the purpose of the proposed code change? What might someone opposed to this code change suggest instead? Please explain what the alternatives are and why your proposed change is the preferred method or means to achieve the desired result.

   I cannot think of another way to achieve the goals of this proposal.

3. What are the probable costs or consequences of not adopting the code change, including those costs or consequences borne by identifiable categories of affected parties, such as separate classes of government units, businesses, or individuals?

   This proposal will save homeowners the burden of upgrading their homes have energy storage systems.

4. Are you aware of any federal or state regulation or requirement related to this proposed code change? If so, please list the federal or state regulation or requirement and your assessment of any differences between the proposed code change and the federal regulation or requirement.

   No.

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DEPARTMENT OF LABOR AND INDUSTRY

CODE CHANGE PROPOSAL FORM

(Must be submitted electronically)

Author/requestor: Ben Rabe

Date: 8/16/23

Email address:

Model Code: 2021 IECC

Telephone number:

Code or Rule Section: Residential Energy Code

Firm/Association affiliation, if any: New Buildings Institute

Code or rule section to be changed: R404.4

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General Information	**Yes**	**No**
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   ☒ add new language that is not found in the model code book or in Minnesota Rule.

2. Is this proposed code change required by Minnesota Statute? If so, please provide the citation.

No, it does not, however, a requirement for EV charging in commercial and multifamily buildings passed during the 2023 legislative session.

3. Provide *specific* language you would like to see changed. Indicate proposed new words with underlining and ~~strikethrough~~ words proposed for deletion. Include the entire code (sub) section or rule subpart that contains your proposed changes.

Add new definitions as follows:

AUTOMOBILE PARKING SPACE. A space within a building or private or public parking lot, exclusive of driveways, ramps, columns, office and work areas, for the parking of an automobile.

ELECTRIC VEHICLE (EV). An automotive-type vehicle for on-road use, such as passenger automobiles, buses, trucks, vans, neighborhood electric vehicles, and electric motorcycles, primarily powered by an electric motor that draws current from a building electrical service, *EVSE*, a rechargeable storage battery, a fuel cell, a photovoltaic array, or another source of electric current.

ELECTRIC VEHICLE READY SPACE (EV READY SPACE). An *automobile parking space* that is provided with a branch circuit and either an outlet, junction box or receptacle, that will support an installed *EVSE*.

Add new text as follows:

R404.4 Electric Vehicle Power Transfer Infrastructure. New automobile parking spaces for one- and two-family dwellings and townhouses shall be provided in accordance with this section. All other new *residential* parking facilities shall be provided with electric vehicle power transfer infrastructure in accordance with Section 8.9 of the Minnesota Commercial Energy Code.

R404.4.1 Quantity. Each *dwelling unit* with a designated attached or detached garage or other onsite private parking provided adjacent to the *dwelling unit* shall be provided with one *EV ready space*.

R404.4.2 EV Ready Spaces. Each branch circuit serving *EV ready spaces* used to comply with Section R404.4 shall comply with all of the following:

5. Terminate at an outlet or enclosure located within 3 feet (914 mm) of each *EV ready space* it serves.
6. Have a minimum circuit capacity of 9.6 kVA (or 40A at 240V).
7. The panelboard or other electrical distribution equipment directory shall designate the branch circuit as “For electric vehicle supply equipment (EVSE)” and the outlet or enclosure shall be marked “For electric vehicle supply equipment (EVSE).”
8. Where a circuit is shared or managed, it shall be in accordance with NFPA 70.

4. Will this proposed code change impact other sections of a model code book or an amendment in Minnesota Rule? If so, please list the affected sections or rule parts.

No.

Need and Reason

1. Why is the proposed code change needed? Please provide a general explanation as well as a specific explanation for any changes to numerical values (heights, area, etc.)

   Preparing our homers for safe and convenient EV charging infrastructure is critical to deployment of electric vehicles. The transportation sector is the single largest source of GHG emissions in the nation. Near complete electrification of the transportation sector is necessary to achieve the GHG emission reductions needed to avoid the worst effects of climate change.

   Electric vehicle sales increased by 80 percent from 2017 to 2018, and is expected to grow from 1 million vehicles at the end of 2018 to 18.7 million by 2030. As newer EVs with longer drive ranges enter the market, the older, shorter drive range EVs will move to the used vehicle market, and become readily accessible to a secondary market for which the accessibility of EV charging infrastructure at home and at work will be critical.

   As electric vehicles (EVs) become more prevalent (as noted in reason statement) they will provide a valuable resource to the electric grid. EVs will essentially become mobile batteries that can help absorb load at renewable peak generation, or supply buildings to help smooth load peak demand or during emergency events. Beyond their contribution to buildings and the grid, EVs will remove another direct combustion source from climate the equation, helping prevent the worst impacts of climate change. Providing charging infrastructure to new residential buildings will help speed the EV transition.

2. Why is the proposed code change a reasonable solution?

   This proposal will prepare homeowners for charging the large influx of electric vehicles predicted over the oncoming years.

3. What other factors should the TAG consider?

   Cost benefit of installing electric vehicle charging infrastructure during new construction compared to adding via retrofit later.

Cost/Benefit Analysis

1. Will the proposed code change increase or decrease costs? Please explain and provide estimates if possible.

   This code will only nominally increase costs.

2. If there is an increased cost, will this cost be offset by a safety or other benefit? Please explain. If the benefit is quantifiable (for example energy savings), provide an estimate if possible.

   Research by NBI and partners indicate that the cost of adding a dedicated branch circuit to parking in a single-family home to create an EV Ready space would come to $49 in materials – for 2-pole breaker, wiring, junction box and receptacle – and $65 in labor – ½ hour for an electrician already on-site during new construction – for a total incremental cost of $114.

   Retrofit costs are highly variable, and can range from $400-1700 (not including the cost of the charger itself) according to homeguide.com.

   Neither of these costs include the cost of panel upgrades. Upsizing during new construction incurs minimal costs. All of the costs of a panel upgrade during new construction (panel, connection fees, potential wiring upgrades) are also part of the retrofit cost. If an EV space necessitates a service retrofit, the costs increase substantially with the cost of upgrading to a 200A service, averaging from $1300 to $2500 (also according to homeguide.com).

This change will also allow residents to purchase an Electric Vehicle which will save them money. According to AAA, an electric vehicle (EV) will save roughly $1,039 per year in total fuel and maintenance costs compared to a comparable gasoline vehicle. Although Electric Vehicles are often more expensive than gasoline powered vehicles, Bloomberg New Energy Finance on battery costs suggests EVs could reach upfront cost parity with gasoline vehicles by the early-to-mid 2020s.

A small investment during new construction will save homeowners substantial future costs. Given the market trends identified in the reason statement, it is not a question of whether homes will need EV charging infrastructure, but when. Failing to adopt this proposal will be saddling future homeowners with substantially higher costs.

3. If there is a cost increase, who will bear the costs? This can include government units, businesses, and individuals.

   Cost will be passed to homeowner and will save cost over retrofit.

4. Are there any enforcement or compliance cost increases or decreases with the proposed code change? Please explain.

   This system can be inspected during normal electrical inspection and will increase the cost of compliance.

5. Will the cost of complying with the proposed code change in the first year after the rule takes effect exceed $25,000 for any one small business or small city (Minn. Stat. § 14.127)? A small business is any business that has less than 50 full-time employees. A small city is any statutory or home rule charter city that has less than ten full-time employees. Please explain.

   No, see cost estimates above.

Regulatory Analysis

1. What parties or segments of industry are affected by this proposed code change?

   This proposed code change would require additional electrical work.

2. Can you think of other means or methods to achieve the purpose of the proposed code change? What might someone opposed to this code change suggest instead? Please explain what the alternatives are and why your proposed change is the preferred method or means to achieve the desired result.

   I cannot think of another way to achieve the goals of this proposal.

3. What are the probable costs or consequences of not adopting the code change, including those costs or consequences borne by identifiable categories of affected parties, such as separate classes of government units, businesses, or individuals?

   This proposal will save homeowners the burden of upgrading their homes to provide electrical vehicle charging.

4. Are you aware of any federal or state regulation or requirement related to this proposed code change? If so, please list the federal or state regulation or requirement and your assessment of any differences between the proposed code change and the federal regulation or requirement.

   No, although a legislation passed in the 2023 Minnesota legislative session requiring adding electric vehicle charging to the commercial budling code.

***Note: Incomplete forms may be returned to the submitter with instruction to complete the form. Only completed forms can considered by the TAG.

DEPARTMENT OF LABOR AND INDUSTRY

CODE CHANGE PROPOSAL FORM

(Must be submitted electronically)

Author/requestor: Ben Rabe

Date: August 23, 2023

Email address:
Telephone number:

Model Code: 2021 IECC
Code or Rule Section: Residential Energy Code

Firm/Association affiliation, if any: New Buildings Institute

Code or rule section to be changed: R404.4

Intended for Technical Advisory Group ("TAG"):

General Information	**Yes**	**No**
A. Is the proposed change unique to the State of Minnesota?	☐	☒
B. Is the proposed change required due to climatic conditions of Minnesota?	☐	☒
C. Will the proposed change encourage more uniform enforcement?	☒	☐
D. Will the proposed change remedy a problem?	☒	☐
E. Does the proposal delete a current Minnesota Rule, chapter amendment?	☐	☒
F. Would this proposed change be appropriate through the ICC code development process?	☒	☐

Proposed Language

1. The proposed code change is meant to:

   ☐ change language contained the model code book? If so, list section(s).

   ☐ change language contained in an existing amendment in Minnesota Rule? If so, list Rule part(s).

   ☐ delete language contained in the model code book? If so, list section(s).

   ☐ delete language contained in an existing amendment in Minnesota Rule? If so, list Rule part(s).

   ☒ add new language that is not found in the model code book or in Minnesota Rule.

2. Is this proposed code change required by Minnesota Statute? If so, please provide the citation.

   No, however solar ready homes will help the state meet the statutory goal of 100 percent clean energy by 2040.

3. Provide *specific* language you would like to see changed. Indicate proposed new words with underlining and ~~strikethrough~~ words proposed for deletion. Include the entire code (sub) section or rule subpart that contains your proposed changes.

SECTION R103
CONSTRUCTION DOCUMENTS

Add new text as follows:

R103.2.3 Solar-ready system. The construction documents shall provide details for dedicated roof area, structural design for roof dead and live load, and routing of conduit or pre-wiring from *solar-ready zone* to electrical service panel or plumbing from *solar-ready zone* to *service water heating* system for the *solar-ready zone* shall be represented on the construction documents.

SECTION R105
INSPECTIONS

Revise text as follows:

R105.2.3 Plumbing rough-in inspection. Inspections at plumbing rough-in shall verify compliance as required by the code and approved plans and specifications as to types of insulation and corresponding R-values and protection and required controls. Where the *solar-ready zone* is installed for solar water heating, inspections shall verify pathways for routing of plumbing from *solar-ready zone* to service water heating system.

Add new text as follows:

R105.2.5 Electrical rough-in inspection. Inspections at electrical rough-in shall verify compliance as required by the code and the approved plans and specifications as to the locations, distribution, and capacity of the electrical system. Where the *solar-ready zone* is installed for electricity generation, inspections shall verify conduit or pre-wiring from *solar-ready zone* to electrical panel.

Revise numbering as follows:

~~**R105.2.5**~~ **R105.2.6 Final inspection.**

SECTION R202
GENERAL DEFINITIONS

Add new definition as follows:

SOLAR-READY ZONE. A section or sections of the roof or building overhang designated and reserved for the future installation of a solar photovoltaic or solar thermal system.

SECTION R401
GENERAL

Revise text as follows:

R401.3 Certificate. A permanent certificate shall be completed by the builder or other approved party and posted on a wall in the space where the furnace is located, a utility room or an approved location inside the building. Where located on an electrical panel, the certificate shall not cover or obstruct the visibility of the circuit directory label, service disconnect label or other required labels. The certification shall indicate the following:

8. Where a *solar-ready zone* is provided, the certificate shall indicate the location, dimensions, and capacity reserved on the electrical service panel.

SECTION R404
ELECTRICAL POWER AND LIGHTING SYSTEMS

Add new text as follows:

R404.4 Renewable energy infrastructure. The building shall comply with the requirements of R404.4.1 or R404.4.2

R404.4.1 One- and two- family dwellings and townhouses. One- and two-family dwellings and townhouses shall comply with Sections R404.4.1.1 through R404.4.1.4.

Exceptions:

1. A *building* with a permanently installed on-site renewable energy system.
2. A *building* with a solar-ready zone area that is less than 600 square feet (55 m^2) of roof area oriented between 110 degrees and 270 degrees of true north.
3. A *building* with a *solar-ready zone* area that is shaded for more than 70 percent of daylight hours annually.

R404.4.1.1 Solar-ready zone area. The total area of the *solar-ready zone* shall not be less than 300 square feet (28 m^2) and shall be composed of areas not less than 5.5 feet (1676 mm) in width and not less than 80 square feet (7.4 m^2) exclusive of access or set back areas as required by the International Fire Code.

Exception: Townhouses three stories or less in height above grade plane and with a total floor area less than or equal to 2,000 square feet (186 m^2) per dwelling shall be permitted to have a solar-ready zone area of not less than 150 square feet (14 m^2).

R404.4.1.2 Obstructions. *Solar-ready zones* shall be free from obstructions, including but not limited to vents, chimneys, and roof-mounted equipment.

R404.4.1.3 Electrical service reserved space. The main electrical service panel shall have a reserved space to allow installation of a dual pole circuit breaker for future solar electric installation and shall be labeled "For Future Solar Electric." The reserved space shall be positioned at the opposite (load) end from the input feeder location or main circuit location.

R404.4.1.4 Electrical interconnection. An electrical junction box shall be installed within 24 inches (610 mm) of the main electrical service panel and shall be connected to a capped roof penetration sleeve or a location in the attic that is within 3 feet (914 mm) of the *solar ready zone* by one of the following:

1. Minimum ¾-inch nonflexible conduit
2. Minimum #10 Metal copper 3-wire

Where the interconnection terminates in the attic, location shall be no less than 12" (35 mm) above ceiling insulation. Both ends of the interconnection shall be labeled "For Future Solar Electric".

R404.4.2 Group R occupancies. Buildings in Group R-2, R-3 and R-4 shall comply with Section C405.13.

SECTION R405
TOTAL BUILDING PERFORMANCE

Revise table as follows:

TABLE R405.2 REQUIREMENTS FOR TOTAL BUILDING PERFORMANCE

SECTION	TITLE
Electrical Power and Lighting Systems	
R404.1	Lighting equipment
R404.2	Interior lighting controls

R404.4	Renewable energy infrastructure

The mandatory requirements table has been modified to include the new requirements for renewable energy as mandatory elements of the code amendments.

SECTION R406
ENERGRY RATING INDEX COMPLIANCE ALTERNATIVE

Revise table as follows:

TABLE R406.2 REQUIREMENTS FOR ENERGY RATING INDEX

SECTION	TITLE
Electrical Power and Lighting Systems	
R404.1	Lighting equipment
R404.2	Interior lighting controls
R404.4	Renewable energy infrastructure
R406.3	Building thermal envelope

4. Will this proposed code change impact other sections of a model code book or an amendment in Minnesota Rule? If so, please list the affected sections or rule parts.

   No.

Need and Reason

1. Why is the proposed code change needed? Please provide a general explanation as well as a specific explanation for any changes to numerical values (heights, area, etc.)

   Minnesota's new 2023 climate legislation plans out a goal for a 100% carbon-free electricity standard by 2040. In order to meet this goal, there will need to be a huge increase in renewable energy installation. Having solar ready homes vastly decreases the cost of adding solar to residential buildings. According to a recent study entitled “A New Roadmap for the Lowest Cost Grid”, the least expensive grid involves a large amount of centralized renewables and a large amount of distributed renewables located on the building site. More renewables placed on site enables more clean utility-scale renewables to be deployed efficiently. It is therefore crucial for new residential buildings to be solar-ready so that the U.S. can reach its 100% carbon-free electricity goal by 2035 in the most cost-effective manner. Installing renewables on-site will also allow homeowners to economically benefit from the transition towards a low-carbon economy and benefit from additional resiliency during disruptions in centrally supplied power.

2. Why is the proposed code change a reasonable solution?

   Installing the infrastructure for a future solar installation is a cost-effective way to provide a glidepath to carbon neutrality for homeowners.

3. What other factors should the TAG consider?

   None.

Cost/Benefit Analysis

1. Will the proposed code change increase or decrease costs? Please explain and provide estimates if possible.

Recent analysis by NBI and partners using cost data from RSMeans indicates that adding the infrastructure to make a home solar ready would cost $216 or $0.09 per square foot for a typical home at the time of construction

2. If there is an increased cost, will this cost be offset by a safety or other benefit? Please explain. If the benefit is quantifiable (for example energy savings), provide an estimate if possible.

   Installing solar ready infrastructure during construction will vastly decrease the cost of solar installation later.

3. If there is a cost increase, who will bear the costs? This can include government units, businesses, and individuals.

   Cost will be passed to homeowner and will save cost over retrofit.

4. Are there any enforcement or compliance cost increases or decreases with the proposed code change? Please explain.

   Solar ready infrastructure can be inspected during the regular inspection schedule.

5. Will the cost of complying with the proposed code change in the first year after the rule takes effect exceed $25,000 for any one small business or small city (Minn. Stat. § 14.127)? A small business is any business that has less than 50 full-time employees. A small city is any statutory or home rule charter city that has less than ten full-time employees. Please explain.

   No.

Regulatory Analysis

1. What parties or segments of industry are affected by this proposed code change?

   This proposed code change would require additional electrical work.

2. Can you think of other means or methods to achieve the purpose of the proposed code change? What might someone opposed to this code change suggest instead? Please explain what the alternatives are and why your proposed change is the preferred method or means to achieve the desired result.

   I cannot think of another way to achieve the goals of this proposal.

3. What are the probable costs or consequences of not adopting the code change, including those costs or consequences borne by identifiable categories of affected parties, such as separate classes of government units, businesses, or individuals?

   This proposal will save homeowners the burden of upgrading electrical capcity and installing conduit before adding a photovoltaic solar system.

4. Are you aware of any federal or state regulation or requirement related to this proposed code change? If so, please list the federal or state regulation or requirement and your assessment of any differences between the proposed code change and the federal regulation or requirement.

   No

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DEPARTMENT OF LABOR AND INDUSTRY

CODE CHANGE PROPOSAL FORM

(Must be submitted electronically)

Author/requestor: Jonny Kocher

Date: 8/29/23

Email address:

Model Code: IECC 2021

Telephone number:

Code or Rule Section: Res Energy Code

Firm/Association affiliation, if any: RMI

Code or rule section to be changed: R404.4

Intended for Technical Advisory Group ("TAG"): *Residential Energy*

General Information	**Yes**	**No**
A. Is the proposed change unique to the State of Minnesota?	☐	☒
B. Is the proposed change required due to climatic conditions of Minnesota?	☐	☒
C. Will the proposed change encourage more uniform enforcement?	☐	☒
D. Will the proposed change remedy a problem?	☒	☐
E. Does the proposal delete a current Minnesota Rule, chapter amendment?	☐	☒
F. Would this proposed change be appropriate through the ICC code development process?	☒	☐

Proposed Language

1. The proposed code change is meant to:
   ☐ change language contained the model code book? If so, list section(s).
   ☐ change language contained in an existing amendment in Minnesota Rule? If so, list Rule part(s).
   ☐ delete language contained in the model code book? If so, list section(s).
   ☐ delete language contained in an existing amendment in Minnesota Rule? If so, list Rule part(s).
   ☒ add new language that is not found in the model code book or in Minnesota Rule.

2. Is this proposed code change required by Minnesota Statute? If so, please provide the citation.
   In order to reach Minnesota's climate goals, the State developed the Minnesota Climate Action Framework. Under the Smarter Buildings and Construction initiative, one of the suggested state action steps included: "Develop clear options for building owners and families to make informed environmentally preferable selections for their building materials and products, including appliances such as furnaces, water heaters, and cooktops/ovens."[1] Creating readiness requirements will enable building owners to make these informed selections in the future without it being prohibitively expensive.

[1] https://climate.state.mn.us/sites/climate-action/files/Climate%20Action%20Framework.pdf, page 19

3. Provide *specific* language you would like to see changed. Indicate proposed new words with underlining and ~~strikethrough~~ words proposed for deletion. Include the entire code (sub) section or rule subpart that contains your proposed changes.

R404.4 Electric readiness. Water heaters, space heaters, household clothes dryers, and cooking appliances that use fuel gas or liquid fuel shall comply with Sections R404.4.1 through R404.4.5.

R404.4.1 Cooking appliances. A dedicated branch circuit outlet with a rating not less than 240-volts, 40-amperes shall be installed and terminate within three feet of conventional cooking tops, conventional ovens or cooking appliances combining both.

Exception: Cooking appliances not installed in an individual dwelling unit .

R404.4.2 Household Clothes Dryers. A dedicated branch circuit with a rating not less than 240-volts, 30-amperes shall be installed and terminate within three feet (304 mm) of each household clothes dryer.

Exception: Clothes dryers not installed in an individual dwelling unit.

R404.4.3 Space heaters. A dedicated branch circuit with a rating not less than either 240-volts, 30-amperes or 120V, 20-amperes shall be installed and terminate within three feet (304 mm) of each space heater.

Exception: Space heaters serving multiple dwelling units in a R-2 occupancy

R404.4.4 Water heaters. A dedicated branch circuit with a rating not less than either 240-volts, 30-amperes or 120V, 20-amperes shall be installed and terminate within three feet (304 mm) of each water heater.

Exception: Water heaters serving multiple dwelling units in a R-2 occupancy

R404.4.4.1 Water heater space. An indoor space that is at least three feet by three feet by seven 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.

R404.4.5 Electrification-ready circuits. The unused conductors required by Sections R404.4.1 through R404.4.4 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 through R404.4.4 shall be included in the load calculations of the original installation.

TABLE R405.2
REQUIREMENTS FOR SIMULATED BUILDING PERFORMANCE

SECTION	TITLE
R404.4	Electric readiness

TABLE R406.2
REQUIREMENTS FOR ENERGY RATING INDEX

SECTION[a]	TITLE
R404.4	Electric readiness

4. Will this proposed code change impact other sections of a model code book or an amendment in Minnesota Rule? If so, please list the affected sections or rule parts.
   No

Need and Reason

1. Why is the proposed code change needed? Please provide a general explanation as well as a specific explanation for any changes to numerical values (heights, area, etc.)
   Currently it is very expensive for consumers to switch from furnaces, gas water heaters, gas stoves and gas dryers to their electric alternatives. The expensive cost is one of the primary barriers in the fuel switching needed to reach the state and countries climate goals.

2. Why is the proposed code change a reasonable solution?
   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.

3. What other factors should the TAG consider?
   According to RMI's State Climate Policy scorecard, Minnesota's building sector is not on track to reach a 27% reduction in GHG emissions by 2030 from a 2005 baseline, the emissions target benchmark set during the Paris Climate Agreement.[2] To reach this goal, Minnesota will need to reduce its natural gas usage by 32% from today's levels and move towards selling only all electric appliances by 2030. This policy is fully aligned with reaching that goal.

Cost/Benefit Analysis

1. Will the proposed code change increase or decrease costs? Please explain and provide estimates if possible.
   The cost will increase upfront costs. Sources from the New Buildings Institute, Group14 Engineering and the California Energy Commission estimate that the upfront costs of electric readiness ranges between $500 to $1,010.[3,4,5]

2. If there is an increased cost, will this cost be offset by a safety or other benefit? Please explain. If the benefit is quantifiable (for example energy savings), provide an estimate if possible.
   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 an order of magnitude higher and act as a barrier for the homeowner to choose electric appliances.

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[2] RMI State Score Card, 2022, https://statescorecard.rmi.org/mn
[3] NBI, Cost of Decarbonization Code, 2022, page 26
https://newbuildings.org/wp-content/uploads/2022/04/BuildingDecarbCostStudy.pdf
[4] California Energy Commission, 2022, page 2-3
https://efiling.energy.ca.gov/GetDocument.aspx?tn=238049&DocumentContentId=71300
[5] Group 14, 2020, page 12
https://www.communityenergyinc.com/wp-content/uploads/Building-Electrification-Study-Group14-2020-11.09.pdf

An electrification engineering study by Group 14 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 3,000 sq ft single family home. The California Energy Commission cost study found that the retrofit cost to add electrical infrastructure for water heating, space heating, dryers and cooking appliances after construction is at least $2,560 (likely higher), compared to the upfront cost of around $1,010 to do it during construction. These studies indicate that it is about 3-4 times less expensive to do this work during construction. Not making new buildings electric-ready would leave homeowners exposed to potentially high retrofit costs in the future and will greatly inhibit customer choice.

3. If there is a cost increase, who will bear the costs? This can include government units, businesses, and individuals.
   Construction contractors and developers will bear most of the costs. The substantial cost savings for reduced costs of future retrofits will benefit homeowners.

4. Are there any enforcement or compliance cost increases or decreases with the proposed code change? Please explain.
   There will be a negligible impact in inspection and enforcement cost when code inspectors ensure this portion of the code is complied with.

5. Will the cost of complying with the proposed code change in the first year after the rule takes effect exceed $25,000 for any one small business or small city (Minn. Stat. § 14.127)? A small business is any business that has less than 50 full-time employees. A small city is any statutory or home rule charter city that has less than ten full-time employees. Please explain.
   No. This will not impact businesses or cities. This is a residential code proposal.

Regulatory Analysis

1. What parties or segments of industry are affected by this proposed code change?
   Electrical contractors will have slightly more work because of this proposal

2. Can you think of other means or methods to achieve the purpose of the proposed code change? What might someone opposed to this code change suggest instead? Please explain what the alternatives are and why your proposed change is the preferred method or means to achieve the desired result.
   This is the only feasible option to cost effectively prepare homes for future electrification required to reach the state's climate action goals. The main argument will be around the upfront cost, which I have already addressed by showing that this will save thousands of dollars of future retrofit costs.

3. What are the probable costs or consequences of not adopting the code change, including those costs or consequences borne by identifiable categories of affected parties, such as separate classes of government units, businesses, or individuals?
   If we continue to build with fossil fuels in new buildings without preparing for the future energy transition, we will simply not meet our climate goals, which is unthinkable.

4. Are you aware of any federal or state regulation or requirement related to this proposed code change? If so, please list the federal or state regulation or requirement and your assessment of any differences between the proposed code change and the federal regulation or requirement.
   The Inflation Reduction Act currently has many incentives and tax credits for installing new clean energy technologies. By preparing for electric ready homes, consumers whose appliances break between now and 2031 will be able to easily take advantage of these tax credits. Ideally, future administrations will continue to extend these incentives and tax credits.

***Note: Incomplete forms may be returned to the submitter with instruction to complete the form. Only completed forms can considered by the TAG.