# A picture containing building, wooden, deck, wood Description automatically generatedIECC - Residential Provisions (Mixed-Fuel)

### Chapter 1 – Scope and Application

#### R101 SCOPE AND GENERAL REQUIREMENTS

**Revise text as follows:**

**R101.3 Intent.** This code shall regulate the design, and construction of buildings for the ~~effective use and conservation~~ reduction of greenhouse gas emissions and for the efficient production, use and storage of energy over the useful life of each building. This code is intended to provide flexibility to permit the use of innovative approaches and techniques to achieve this objective. This code is not intended to abridge safety, health or environmental requirements contained in other applicable codes or ordinances.

# Intent has been modified to include consideration of greenhouse gas emissions as well as both production and storage of energy.

#### R103 Construction documents

**Revise text as follows:**

**R103.2 Information on construction documents.** Construction documents shall be drawn to scale upon suitable material. Electronic media documented are permitted to be submitted when approved by the code official. Construction documents shall be of sufficient clarity to indicate the location, nature and extent of the work proposed, and show in sufficient detail pertinent data and features of the building, systems and equipment herein governed. Details shall include the following as applicable:

6. Mechanical and service water heating systems and equipment types, sizes, fuel sources and efficiencies.

Fuel sources are a critical piece of code compliance enforcement for the full implementation of this code overlay. Clear identification on the construction documents will allow for easier code compliance review and inspections. Inclusion of fuel sources is most critical in areas where there are multiple fuels available such as fuel oil, propane, and natural gas, as the equipment type alone may not provide this information.

**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.

Revisions to this section incorporate critical elements of solar readiness to be clearly identified on the construction documents to allow for easier code compliance review and inspections. This code language

has been migrated and amended from the 2021 IECC Appendix RB Solar-Ready Provisions to the most appropriate place in the base code.

**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.

Current 2021 IECC language does not include specific requirements for electrical systems on construction documents for residential construction. Given the importance of the electrical system in a mixed-fuel building, including an explicit requirement in the construction documents will allow for easier implementation and enforcement of the requirements on code compliance plan review staff.

#### 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.

Revisions to this section incorporate critical elements of solar readiness used for service water heating to allow for inspection enforcement of this provision. This code language is not in the current version of the 2021 IECC Appendix RB Solar-Ready Provisions but is derived from the that language to fully incorporate all aspects of that appendix throughout the base code for enforceability by adopting jurisdictions.

**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.

Current 2021 IECC inspections do not require dedicated electrical inspections. Additional electrical inspection code language that is not in the current version of the 2021 IECC Appendix RB Solar-Ready Provisions but is derived from the that language to fully incorporate all aspects of that appendix throughout the base code for enforceability by adopting jurisdictions.

**Revise numbering as follows:**

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

### Chapter 2 – Definitions

#### R202 GENERAL DEFINITIONS

**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.

Definition for appliance is mirrored from 2021 IMC to be useful in defining combustion equipment.

**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*.

**DEMAND RESPONSIVE CONTROL.** An automatic control that can receive and automatically respond to demand response requests from a utility, electrical system operator, or third-party demand response program provider.

**ELECTRIC VEHICLE (EV).** An automotive-type vehicle for on-road use, such as passenger automobiles, buses, trucks, vans, neighborhood electric vehicles, electric motorcycles, and the like, primarily powered by an electric motor that draws current from a rechargeable storage battery, a fuel cell, a photovoltaic array, or another source of electric current. Plug-in hybrid electric vehicles are electric vehicles having a second source of motive power. Off-road, self-propelled electric mobile equipment, such as industrial trucks, hoists, lifts, transports, golf carts, airline ground support equipment, tractors, boats and the like, are not considered electric vehicles.

Definition for EV is mirrored from NEC-2020 to be useful in defining requirements for electric vehicle infrastructure.

**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.

Definition for equipment is mirrored from 2021 IMC to be useful in defining combustion equipment.

**EV-READY SPACE.** A parking space that is provided with dedicated branch circuit that meets the following requirements:

1. Wiring capable of supporting a 40-amp, 208/240-volt circuit,
2. Terminates at a junction box or receptacle located within 3 feet (914 mm) of the parking space, and
3. The electrical panel directory shall designate the branch circuit as “For electric vehicle charging” and the junction box or receptacle shall be labelled “For electric vehicle charging”.

The definition for EV Ready does not include requirements for minimum capacity for the branch circuit. Different levels of capacity are appropriate for different EV charging scenarios (charging at different building types, parking types, residential types, business types, times of day, etc.) as well as different levels of penetration of EV charging spaces in a parking lot. Therefore, capacity requirements are set in the code text itself to allow for consistent use of the definitions while the capacity requirements change to match the specific EVCI requirements of the jurisdiction. The wiring requirement ensures that the space can be upgraded to a load-managed Level 2 EVSE in the future.

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

Definition for fuel gas is mirrored from 2021 IMC to be useful in defining combustion equipment.

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

Definition for fuel oil is mirrored from 2021 IMC to be useful in defining combustion equipment.

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

### 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.

Definition for solar-ready zone has been migrated from the 2021 IECC Appendix RB Solar-Ready Provisions to the base code.

### Chapter 4 – Residential Energy Efficiency

#### R401 GENERAL

**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.

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

~~2.1. One of the additional efficiency package Options in Section R408.2 shall installed without including such measures in the proposed design under Section R405; or~~

~~2.2. The proposed design of the 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.~~

* 1. 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 options selected for compliance shall be identified in the certificate required by Section R401.3.

All-electric newly constructed homes typically use less energy when compared to newly constructed mixed-fuel homes. A recent Ecotope study[[1]](#footnote-1) of the 2017 Oregon Residential code found that homes heated by electric heat pumps use 40 percent less energy than homes heated with gas (including water heating). This change seeks to encourage electrification and more evenly weigh the impact of the additional efficiency credits by requiring the mixed-fuel home to select a total of three packages from the options while the all-electric home is required to select one package. Of the three packages required for the mixed-fuel home, one must address the envelope (improved envelope or reduced infiltration plus better ventilation) while the remaining two impact HVAC (better equipment or more efficient ducts) and water-heating (better equipment) requirements.

**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*

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

Revisions to this section incorporate critical elements of electrification and solar readiness to be clearly identified to the original homeowner/building owner and any subsequent owners to allow for easier mechanical swaps to electrical equipment and the installation of solar panels. By including on the certificate, the information is more likely to remain in the building for future owners.

#### R402 BUILDING THERMAL ENVELOPE

**Revise text as follows:**

**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*.

Low energy buildings are currently exempt from thermal envelope requirements. This revision applies the same intention of low greenhouse gas impact that was given to low energy use impact when these building types were exempted.

#### R403 SYSTEMS

**Revise text as follows:**

**R403.1.1 Thermostat ~~Programmable thermostat~~.** The thermostat controlling the primary heating or cooling system of the dwelling unit shall be capable of controlling the heating and cooling system on a daily schedule to maintain different temperature setpoints at different times of the day. This thermostat shall include the capability to set back or temporarily operate the system to maintain zone temperatures of not less than 55°F (13°C) to not greater than 85°F (29°C). The thermostat shall be programmed initially by the manufacturer with a heating temperature setpoint of not greater than 70°F (21°C) and a cooling temperature setpoint of not less than 78°F (26°C). The thermostat shall be a d*emand responsive control*capable of increasing the cooling setpoint by no less than 4°F (2.2°C) and decreasing the heating setpoint by no less than 4°F (2.2°C) in response to a demand response request.

Demand responsive controls for thermostats are added based on language from California Title 24 and integrated into the current requirement for thermostats.

**Add new text as follows:**

**R403.5.4 Demand responsive water heating.** All electric water heating systems with a storage tank larger than 20 gallons (76 L) shall be provided with *demand responsive controls* that comply with ANSI/CTA-2045-B or another *approved demand responsive control*.

ANSI/CTA-2045-B standardizes the socket, and communications protocol, for heat pump water heaters so they can communicate with the grid, and with demand response signal providers. In addition, 2045-B adds control and communications requirements for mixing valves in HPWH to enable them to provide greater storage capacity to support increased load shifting. Versions of this standard are included in codes or other requirements in California, Oregon, and Washington.

#### 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

This code language has been migrated from the 2021 IECC Appendix RB Solar-Ready Provisions to the most appropriate place in the base code. By ensuring solar-ready zones, all-electric buildings will have the potential for an even greater impact on building decarbonization by contributing to the continued cleaning of the electricity supply.

**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 m2) 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 solar-ready zone area shall be not less than 300 square feet (28 m2) exclusive of mandatory access or set back areas as required by the International Fire Code. 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 m2) per dwelling shall have a solar-ready zone area of not less than 150 square feet (14 m2). The solar-ready zone shall be composed of areas not less than 5 feet (1524 mm) in width and not less than 80 square feet (7.4 m2) exclusive of access or set back areas as required by the International Fire Code.

**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 beno less than 12” (35 mm) above ceiling insulation. Both ends of the interconnection shall be labeled “For Future Solar Electric”.

As it is currently written, Appendix RB only requires that the construction documents indicate pathways for routing of conduit from the solar-ready zone to the service panel. This update requires the installation and verification of either conduit or wire from the roof or attic to the panel. This language has been adapted from the solar-ready language proposed for the residential Oregon Reach Code.

**R404.4.1 Group R occupancies.** Buildings in Group R-2, R-3 and R-4 shall comply with Section C405.13.

The 2021 IECC Appendix RB Solar-Ready Provisions address single and two-family dwellings only. Additional language is added to apply the approach for commercial buildings to multifamily residential construction.

**Add new text as follows:**

**R404.5 Electric vehicle charging infrastructure.** Electric infrastructure for the current and future charging of *electric vehicles* shall be installed in accordance with this section*. EV ready spaces* are permitted to be counted toward meeting minimum parking requirements.

**R404.5.1 One- and two- family dwellings and townhouses.** One- and two-family dwellings and townhouses with a dedicated attached or detached garage or on-site parking spaces and new detached garages shall be provided with one *EV-ready space* per *dwelling unit.* The branch circuit for the *EV ready space* shall have a minimum capacity of 9.6 kVA.

**R404.5.2 Group R occupancies.** Parking facilities serving Group R-2, R-3 and R-4 occupancies shall comply with Section C405.15.

Tailored requirements for single-family and multifamily housing have been included. Single-family homes, where the occupants will choose the specific EVSE that meets their EV charging needs, are required to have one parking space with an EV Ready space that is sized to accommodate the most common EVSE on the market. The requirements for EV charging infrastructure for multifamily buildings are referenced to the commercial requirements as those are more appropriate for EV charging in parking lots. The required capacity for the branch circuit for the EV Ready space is the equivalent of a 240V, 40A circuit and is expressed in kVA as that is the standard metric for capacity or “apparent power” in electrical infrastructure.

**Add new text as follows:**

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

The following sections ensure that gas equipment can be more easily and cost-effectively retrofit with electric equipment in the future. This language is based on the approach adopted in the electrification reach codes adopted by various California cities. It combines the best elements from those reach codes and adapts them to the I-Code format.

**R404.6.1 Equipment serving multiple units.** *Combustion equipment* that serves multiple *dwelling units* shall comply with Section C405.13.

**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.

The addition of this section provides a series of requirements that ensure that the building can accommodate a HPWH in the future. Requirement 1 ensures that there is a branch circuit ready to support the future installation of a HPWH. Requirement 2 ensures that the condensate generated by a HPWH compressor can be easily drained away. Requirement 3 ensures that the water heater location is physically large enough to accommodate HPWHs that are frequently wider and/or taller than code-minimum gas water heaters. Requirement 4 ensures that a future HPWH has access to sufficient air volume to effectively operate.

**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.

IRC Section E3702.11 sets the requirement for sizing a branch circuit serving a heat pump and relies on the size of the actual equipment to be installed. Since there is not an actual equipment size to reference and equipment size can vary depending on the size of the home and the climate, the section references Section R403.7 to establish the size of the heat pump equipment that would be required for the specific home.

**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.

For jurisdictions concerned about impacts and stakeholder feedback on cooking appliances, language in R404.5 can be amended and combined with the requirements of an all-electric version of this code to allow for continued installation of combustion cooking, provided that the appliances be electric ready for future homeowner choice. IRC Section E3702.9.1 requires a 240V/40A branch circuit for a standard 8.75 kVA or larger electric residential range and has been used as the basis for the sizing of the branch circuit. Six feet is cited per requirements from IRC Section E3901.5 requiring appliance receptacles to be within 6 feet of the intended appliance.

**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*.

#### Section 405 Total building Performance

**Delete without substitution:**

**~~R405 Total Building Performance~~**

Compliance with the performance path for consideration of greenhouse gas emissions and the needed increased stringency for mixed-fuel buildings requires manipulation of the standard reference design for space heating, water heating, and any other potential combustion end use. Given the limited application of Section R405 in new residential construction, for the purposes of this overlay, compliance via prescriptive path or ERI path create simpler enforcement options for jurisdictions.

#### Section 406 ENERgy rating index compliance alternative

**Revise table as follows:**

**Table R406.2 Requirements for Energy Rating Index**

|  |  |
| --- | --- |
| **SECTION** | **TITLE** |
| Mechanical | |
| R403.5 except Section R403.5.2 | Service hot water systems |
| ~~R403.5.1~~ | ~~Heated water circulation and temperature maintenance systems~~ |
| ~~R403.5.3~~ | ~~Drain water heat recovery units~~ |

The ERI mandatory requirements table has been modified to include the new requirement for demand responsive hot water control. Based on the structure of the table currently, combining R403.5 and creating a single in line exception is the most straightforward approach to this revision.

**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 |
| R404.4 | Renewable energy infrastructure |
| R404.5 | Electric vehicle charging infrastructure |
| R404.6 | Additional electric infrastructure |
| R406.3 | Building thermal envelope |

The ERI mandatory requirements table has been modified to include the new requirements for renewable energy, electric vehicle charging, and electric infrastructure as mandatory elements of the code amendments.

**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** |
| 0-1 | 52 | 43 |
| 2 | 52 | 45 |
| 3 | 51 | 47 |
| 4 | 54 | 47 |
| 5 | 55 | 47 |
| 6 | 54 | 46 |
| 7 | 53 | 46 |
| 8 | 53 | 45 |

This modification encourages homes following the ERI performance path to be all-electric by setting more stringent ERI values for mixed-fuel homes. This is needed as Standard 301, which sets the calculation methodology for calculating ERI, claims to be fuel agnostic. This means that there is no way to require that a home be all-electric without making significant modifications to Standard 301.

The ERI values for mixed-fuel homes match those from ASHRAE 90.2 and Appendix RC Zero Energy Residential Building Provisions as published in the 2021 IECC. The ERI values for all-electric homes are the same as the values published in Table R406.5 of the 2021 IECC.

#### R407 TROPICAL CLIMATE REGION COMPLIANCE PATH

**Revise text as follows:**

**R407.2 Tropical climate region.** Compliance with this section requires the following:

1. Not more than one-half of the *occupied* space is air conditioned and is controlled by a thermostat in accordance with Section R403.1.1.

3. Solar, wind or other renewable energy source supplies not less than 80 percent of the energy for service water heating controlled in accordance with Section R403.5.4.

12. Parking is in accordance with Section R404.6.

13. All *combustion equipment* is in accordance with Section R404.5.

Modifications to the Tropical Climate Region Path are minimal. This pathway in the 2021 IECC already does not allow any space heating and requires 80% of hot water be supplied by renewable energy. To ensure the inclusion of demand response controls, electric vehicles, and all other combustion equipment is addressed additional requirements are added to the tropical compliance list under R407.2.

#### R408 ADDITIONAL EFFICIENCY PACKAGE OPTIONS

**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:

1. 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.

This new additional efficiency option provides builders with a fourth service hot water package that combines the efficiency benefits of an instantaneous gas water heater with a drain water heat recovery unit). Since mixed fuel buildings will be required to select more package options, the addition of this option provides additional flexibility for builders selecting to construct mixed fuel buildings, while continuing to encourage efficiency in combustion systems. This package reflects the requirements proposed in the Oregon Reach Code which was calibrated to other hot water package options based on analysis conducted by the Northwest Energy Efficiency Alliance[[2]](#footnote-2) (NEEA).

### Chapter 6 – Referenced Standards

**Add new standard as follows:**

|  |  |  |
| --- | --- | --- |
| **CTA** | Consumer Technology Association  1919 S. Eads Street  Arlington, VA 22202 |  |
| Standard  reference  number | Title | Referenced  in code  section number |
| ANSI/CTA-2045-B | Modular Communications Interface for Energy Management . . . . . . . | . . . . . . . R403.5.4 |
|  |  |  |

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1. *Oregon Residential Specialty Code: 2005 Baseline and Code Roadmap to Achieve the 2030 Goal;* Ecotope (2020) [↑](#footnote-ref-1)
2. Heny Odum; Paul Kinter; *Oregon Residential Specialty Code: Energy Efficiency Analysis,* NEEA (March 2020) [↑](#footnote-ref-2)