



AC to Heat Pump Overlay - v1.0

For use with the 2024 International Energy Conservation Code



Technical document / May 2026

About this resource

This proposal is intended for jurisdictions considering the adoption of the **2024 International Energy Conservation Code (2024 IECC) and/or ANSI/ASHRAE/IES Standard 90.1-2022** (ASHRAE 90.1-2022). Comparable amendments may be adopted by jurisdictions considering the **2027 IECC**, as the 2024 and 2027 code editions are likely to have similar structures and base stringency levels as of this proposal's publication.

Proposed code text is depicted through underlining, and proposed deletions are depicted through ~~strike-through-formatting~~. Explanatory text, not intended to be part of the code, is depicted in italics. In the context of code text, italics indicate the use of a term defined in code.

The problem: one-way air conditioners. *Even minimum-efficiency electric heat pump equipment uses far less energy than high-efficiency combustion equipment because heat pumps move energy, rather than extract it from combusting fuel. Despite the potential for significant energy savings when heat pumps provide primary space heating, millions of one-way air conditioners (ACs) are installed annually. With a simple swap to similar equipment that includes a reversing valve, homes and businesses can benefit from high-efficiency heating and cooling and dramatically reduce their energy use and contributions to air pollution.*

This resource's approach: require heat pumps or equivalent efficiency improvements when ACs are installed. *This pathway encourages existing buildings that are adding or replacing one-way ACs to instead install heat pumps. Alternative compliance pathways remain available, allowing one-way ACs to be installed if additional energy efficiency credits from Sections R408 or C406 are earned or certain envelope and duct improvements are made, as applicable. These additional measures help close the performance gap.*

Limited applicability. *This resource only sets requirements for situations where it is very straightforward to choose a heat pump instead of like-for-like replacement equipment. As such, there are many systems it does not cover, such as large central plants with chillers, multi-zone systems, and more. For commercial buildings, only certain occupancy groups and building types within those groups are covered, reflecting current practice in adopting jurisdictions including California and Washington. These limitations are intended to minimize the risk of outsized cost burdens on building owners at the time of equipment replacement.*

How it works: residential low-rise buildings

Methodology: [ResStock](#) data, accessed through the [Green Upgrade Calculator](#) user interface, informed this proposal's estimates of the percent energy use reduction when a mixed fuel home installs a heat pump sized to the cooling load instead of a unidirectional air conditioner. The number of Table R408.2 credits dwelling units shall earn when they opt to install a unidirectional air conditioner instead of a heat pump is closely proportional to this percentage. Because existing building conditions vary significantly compared to new construction meeting the 2024 IECC, these percentages do not reflect precise savings estimates and should not be interpreted as such. Credit requirements are differentiated by region (hot/warm vs. mixed/cool) and are generally lower than ResStock data would suggest, especially for older homes.

Customization options:

- **Heating fuels:** In some jurisdictions, heat pumps are only a cost-effective energy efficiency measure when they displace certain heating fuels. This resource includes language to limit applicability in alterations based on the existing building's heating fuel.
- **New or replacement systems:** Cooling access is increasingly important for resilience to extreme weather in many regions of the US. Some jurisdictions may wish to avoid provisions that would increase the up-front cost of installing air conditioning in homes, even when such provisions provide cost-effective energy efficiency during heating season. This resource includes language to limit applicability solely to air conditioning system replacement, excluding alterations that would add cooling to an existing space for the first time.
- **Compatibility with Energy Choice Overlay (ECO) for new construction:** If a jurisdiction has also adopted new construction provisions to allow heat pump efficiency to count toward code compliance, this resource's amendments section pertaining to additions (in R502.2.2) may be deleted. Additions must comply with new construction provisions, which will already appropriately recognize heat pump efficiency if ECO is adopted; this resource's requirements for additions would be duplicative.

Code language: residential low-rise buildings

Additions

Revise Section R502.2.2 as follows:

R502.2.2 Heating and cooling systems. Additions whose scope includes heating and cooling systems that serve up to four dwelling units shall comply with Sections R502.2.2.1 and R502.2.2.2.

R502.2.2.1 Ductwork. HVAC ductwork newly installed as part of an addition shall comply with Section R403.

Exception: Where ductwork from an existing heating and cooling system is extended to an addition, Sections R403.3.7 and R403.3.8 shall not be required.

R502.2.2.2 Cooling Systems. When an addition includes the installation or replacement of an air-conditioner or heat pump, the system shall comply with either Section R502.2.2.2.1 or Section R502.2.2.2.2.

Exception: Buildings in climate zones 0-2.

R502.2.2.2.1 Heat Pump. An electric heat pump shall be installed and shall comply with R502.2.2.2.1.1 and either R502.2.2.2.1.2 or R502.2.2.2.1.3.

R502.2.2.2.1.1 Sizing Documentation and Approval. Documentation of the heating and cooling load calculations per R403.7 shall be approved by the code official prior to permitting.

R502.2.2.2.1.2 Full load heat pump. The heat pump shall be configured as the sole heating source and shall be sized to meet the design heating load in accordance with R403.7.

R502.2.2.2.1.3 Part load heat pump. The heat pump shall be configured as the primary, first-stage heating source and shall be sized to meet or exceed the design cooling load in accordance with Section R403.7.

R502.2.2.2.1.3.1 Supplementary Heat Source. Additional heating sources that serve the same zone(s) as an electric heat pump shall be configured as supplementary heating sources in accordance with R403.1.2.

R502.2.2.2.2 Air Conditioner. A dwelling unit or set of dwelling units for which an air conditioner is being installed shall earn additional credits from Table R408.2. Dwelling units in climate zone 3 shall earn 10 additional credits, and dwelling units in climate zones 4-8 shall earn 15 additional credits. Credits shall apply to the zone(s) cooled by the air conditioner or an area of equivalent or higher square footage in the same dwelling unit(s). Credits shall not be earned for pre-addition conditions.

Alterations

Revise Section R503.1.2.3 as follows:

R503.1.2.3 Duct system leakage. Where an alteration includes any of the following, duct systems shall be tested in accordance with Section R403.3.7 and shall have a total leakage less than or equal to 12.0 cubic feet per minute (339.9 L/min) per 100 square feet (9.29 m²) of conditioned floor area:

1. Twenty-five percent or more of the registers that are part of the duct system are relocated.
2. Twenty-five percent or more of the total length of all ductwork in the duct system is relocated.
3. The total length of all ductwork in the duct system is increased by 25 percent or more.
4. Cooling system alterations complying with Section R503.1.2.5.2.

Exceptions:

1. If total leakage exceeds 12.0 cubic feet per minute (339.9 L/min) and it is not possible to reduce leakage throughout the duct system, all accessible leaks shall be sealed and verified through a visual inspection and a smoke test by an approved party.
2. Duct systems located entirely inside a conditioned space in accordance with Section R403.3.4.

After Section R503.1.2.4, add new section R503.1.2.5 as follows:

R503.1.2.5 Cooling Systems. When an *alteration* of an existing space conditioning system that conditions up to four dwelling units includes the [TO COVER BOTH NEW AND REPLACEMENT SYSTEMS: “installation or replacement” | TO COVER REPLACEMENT SYSTEMS ONLY: “replacement”] of an air-conditioner or heat pump [TO LIMIT APPLICABILITY BY HEATING FUEL: “and the primary space heating source is [COVERED FUELS, e.g., “fuel oil, propane, or electric resistance”]], the altered system shall comply with either Section R503.1.2.5.1 or Section R503.1.2.5.2.

Exception: Buildings in climate zones 0-2.

R503.1.2.5.1 Heat Pump. An electric heat pump shall be installed and shall comply with R503.1.2.5.1.1 and either R503.1.2.5.1.2 or R503.1.2.5.1.3.

R503.1.2.5.1.1 Sizing Documentation and Approval. Documentation of the existing air conditioner's capacity, if any, and the heating and cooling load calculations per R403.7 shall be *approved* by the *code official* prior to permitting.

R503.1.2.5.1.2 Full load heat pump. The heat pump shall be configured as the sole heating source and shall be sized to meet the design heating load in accordance with R403.7.

R503.1.2.5.1.3 Part load heat pump. The heat pump shall be configured as the primary, first-stage heating source and shall be sized to meet or exceed the design cooling load in accordance with Section R403.7. If an air conditioner replacement, the heat pump may alternatively be sized to the capacity of the prior air conditioner.

R503.1.2.5.1.3.1 Supplementary Heat Source. Additional heating sources that serve the same zone(s) as an electric heat pump shall be configured as supplementary heating sources in accordance with R403.1.2.

R503.1.2.5.2 Air Conditioner. An air conditioner shall comply with R503.1.2.5.2.1 or R504.1.2.5.2.2.

R503.1.2.5.2.1 Duct and air sealing. A *dwelling unit* in which a ducted air conditioner is being [TO COVER BOTH NEW AND REPLACEMENT SYSTEMS: “installed or replaced” | TO COVER REPLACEMENT SYSTEMS ONLY: “replaced”] shall meet all of the following requirements:

- A. The duct system measured air leakage shall meet the requirements of Section R503.1.2.3.
- B. All accessible areas of the ceiling plane between an unconditioned attic and conditioned space shall be air sealed, including all joints, penetrations, and other openings that are potential sources of air leakage by caulking, gasketing, weather-stripping or otherwise sealing to limit infiltration and exfiltration.

Exceptions to R503.1.2.5.2.1 Part B:

- 1. The ceiling plane directly below a conditioned attic space with existing insulation incorporated into the roof system meeting the requirements of R402.2.
- 2. *Dwelling units* with existing insulation installed at the ceiling level meeting the requirements of R402.2.

R503.1.2.5.2.2 Energy efficiency credits. A *dwelling unit* or set of *dwelling units* for which a ducted air conditioner is being [TO COVER BOTH NEW AND REPLACEMENT SYSTEMS: “installed or replaced” | TO COVER REPLACEMENT SYSTEMS ONLY: “replaced”] shall earn credits from Table R408.2. *Dwelling units* in climate zone 3 shall earn 10 additional credits, and *dwelling units* in climate zones 4-8 shall earn 15 additional credits. Credits shall apply to the zone(s) affected by the air conditioner replacement or an area of equivalent or higher square footage in the same *dwelling unit(s)*. Credits shall not be earned for pre-alteration conditions.

How it works: commercial and taller multifamily buildings

Customization options. *This resource may be customized based on a jurisdiction's situation. One such customization involves covered equipment size. By default, this resource covers installations or replacements of RTUs up to 65,000 Btu (colloquially, 5 tons). In some jurisdictions, this measure may be cost-effective at larger equipment sizes. For example, California jurisdictions have considered adjusting the maximum Btu to 120,000 or 240,000 (colloquially, 10 or 20 tons). Jurisdictions may wish to adjust the maximum covered equipment size based on their policy goals and local equipment and energy price conditions.*

Methodology: *Energy savings for credits were calculated using Pacific Northwest National Laboratory (PNNL) analysis as described in the Energy Choice Overlay (ECO). Energy credits were averaged across building types to be closely proportional to the energy efficiency equivalent to a HP RTU measure.*

Code language: Commercial and taller multifamily buildings

Adopt the **2024 IECC** as modified. Add a new section after **Section C503.3.6** as follows:

C503.3.7 Single zone packaged systems. New or replacement single zone packaged direct expansion (DX) rooftop systems with rated cooling capacity less than 65,000 Btu/hr shall meet the requirements in Table C503.3.7 for the applicable building occupancy group.

Exceptions:

1. Systems installed in climate zones 0-2 or 3C.
2. The building code official may grant an exception if the required equipment exceeds the minimum circuit ampacity (MCA) of the existing branch circuit conductors or requires an upsize in the existing breaker as demonstrated by approved electrical load calculations.

TABLE C503.3.7— NEW OR REPLACEMENT SINGLE ZONE DX ROOFTOP PACKAGE SYSTEM EFFICIENCY

<u>BUILDING OCCUPANCY GROUP</u> ^a	<u>INCLUSIONS</u>	<u>EXEMPTED</u>	<u>REPLACEMENT EQUIPMENT TYPE</u>
<u>A-3</u>	<u>Libraries</u>	<u>All other A occupancies</u>	<u>SZHP^b, SZAC^c, or DFHP^d</u>
<u>B</u>	<u>Banks, Barber and Beauty Shops, Clinic Outpatient, Offices, Post Offices, Professional Services</u>	<u>All other B occupancies</u>	<u>SZHP, SZAC, or DFHP</u>
<u>E</u>	<u>K-12 Schools</u>	<u>All other E occupancies</u>	<u>SZHP, SZAC, or DFHP</u>
<u>M</u>	<u>Drug Stores, Markets, Retail Stores</u>	<u>All other M occupancies</u>	<u>SZHP, SZAC, or DFHP</u>
<u>F, H, I, R, S, U</u>		<u>All occupancies excluded</u>	

- Occupancy classification from the International Building Code Chapter 3.
- SZHP – Single Zone Heat Pump
- SZAC – Single Zone Air Conditioner with Furnace + achieve 100% of the credits required by Table C503.3.8
- DFHP – Dual Fuel Heat Pump + achieve 50% of the credits required by Table C503.3.8

TABLE C503.3.8 – ADDITIONAL ENERGY EFFICIENCY CREDIT REQUIREMENTS FOR NEW OR REPLACEMENT SINGLE ZONE DX ROOFTOP PACKAGE SYSTEMS

<u>BUILDING OCCUPANCY GROUPS</u>	<u>CLIMATE ZONE</u>											
	<u>3A</u>	<u>3B</u>	<u>4A</u>	<u>4B</u>	<u>4C</u>	<u>5A</u>	<u>5B</u>	<u>5C</u>	<u>6A</u>	<u>6B</u>	<u>7</u>	<u>8</u>
<u>A-3</u>	<u>56</u>	<u>19</u>	<u>99</u>	<u>42</u>	<u>84</u>	<u>117</u>	<u>75</u>	<u>98</u>	<u>117</u>	<u>96</u>	<u>109</u>	<u>122</u>
<u>B</u>	<u>59</u>	<u>20</u>	<u>109</u>	<u>37</u>	<u>85</u>	<u>122</u>	<u>76</u>	<u>102</u>	<u>132</u>	<u>101</u>	<u>88</u>	<u>82</u>
<u>E</u>	<u>59</u>	<u>15</u>	<u>62</u>	<u>39</u>	<u>85</u>	<u>83</u>	<u>81</u>	<u>86</u>	<u>83</u>	<u>66</u>	<u>80</u>	<u>90</u>
<u>M</u>	<u>84</u>	<u>17</u>	<u>188</u>	<u>51</u>	<u>154</u>	<u>228</u>	<u>132</u>	<u>231</u>	<u>211</u>	<u>171</u>	<u>196</u>	<u>228</u>

Erin Sherman and Jonny Kocher, *AC to Heat Pump Overlay v1.0*, RMI, 2026, <https://rmi.org/insight/the-energy-code-safe-harbor>.

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