

Option A

2021 International Building Codes + Select Appendices

BASELINE: 2021 ICC CODES



International Codes or I-Codes, are model codes published by the International Code Council and developed by ICC Members to provide minimum safeguards for homes, buildings and other structures. ICC uses a governmental consensus process to develop its codes.

International Energy Conservation Code 2021 is part of the ICC code options for commercial and residential buildings. This code encourages high efficiency building envelopes, indoor lighting, and mechanical systems. It also encourages adequate ventilation rates. An initial U.S. Department of Energy determination estimates a national average of 9.38 percent site energy savings and 8.66 percent energy cost savings compared to the 2018 IECC, with variance dependent upon climate zones.



Additional codes that are part of the baseline are as follows: International Energy Efficiency Code, International Building Code, International Energy Conservation Code, International Fire Code, International Fuel Gas Code, International Existing Buildings Code, International Mechanical Code, International Plumbing Code, International Residential Code, National Electrical Code.

PLUS

2021 IECC Zero Energy Appendix



Covers Commercial



Covers Residential

ZERO CODE

1. Allows jurisdictions to make zero-net-carbon their minimum code standard. Net zero refers to the balance between the amount of greenhouse gas produced and the amount removed from the atmosphere. This appendix encourages renewable energy generation, elimination of combustion fuels onsite, and all electric systems when possible.

AND/OR Readiness Code Packages/ Appendices

2. Electric Readiness (prepared to change all gas/fuel features to electric in the future)
 - Panel Capacity for future electrical systems
 - Wiring receptacles for electric counterparts
3. Electric Vehicle Charging Station Preparedness
 - Parking spaces that provide wiring capable of supporting a minimum 40 ampere, 208/240-Volt circuit, to prepare for future EV charging capabilities.
4. Solar Ready Zone
 - Reduced Costs for future Solar installs
 - Sets up buildings to add solar in the future (Reserves space, Conduit, dedicated space in electrical panel)

Option B

2021 International Building Codes + New Buildings Institute Zero Energy Construction Code

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PLUS



National Building Institute Pathways



Covers Commercial



Covers Residential

Mixed Fuel Overlay

Cities and towns can layer whichever version of this “decarbonization overlay” they are ready for on top of the 2021 International Energy Conservation Code (IECC) and ASHRAE 90.1. The language is structured to be compatible with the current version of the IECC and covers both residential and commercial construction. While not an all-electric code, the language does prioritize efficient electric equipment and is designed to be flexible. Jurisdictions may use either section of the overlay in its entirety or use portions of either or both to amend the 2021 IECC. This overlay also includes Electric Vehicle Readiness, PV- readiness, and Electric Ready language. In addition to onsite battery storage. This allows onsite solar to produce excess power that can be stored for later use. Finally, grid responsive controls are a critical part of this overlay. These are Building controls systems that account for demand response and are designed to enhance building-grid integration so the buildings can be effectively used as an asset to shift times when energy is used and alleviate pressure on the electricity grid during peak demand periods.

- Regulate the design, and construction of buildings for the reduction of greenhouse gas emissions and for the efficient production, use and storage of energy over the useful life of each building.
- Inclusion of multiple fuel sources including but not limited to: fuel oil, propane, and natural gas.
- Demand-responsive thermostats are required.
- Jurisdictions might also choose to mix and match provisions—requiring all-electric water heating, for example, but still allowing combustion fuels for space heating.
- The overlay incorporates code solutions to the inclusion of key electrification technologies including solar, electric vehicles, battery storage, and demand response.

All Electric Overlay

It is important to note that the NBI Overlay also provides a path for all electric provisions. Simply put these paths requires all systems onsite to be combustion free and run on 100% electric.

- All Electric Mechanical systems,
- All Electric Appliances
- High Efficiency requirements



City of
Golden



LOTUS
Engineering & Sustainability

Option C

2021 International Building Codes +

2018 International Green Construction Code (IgCC) + Department of Energy's Zero Energy Ready Homes

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PLUS

International Green Construction Code



Covers Residential



Covers Commercial



International Green Construction Code (IgCC) provides the design and construction industry with the single, most effective way to deliver sustainable, resilient, high-performance buildings. Only for new commercial and multi-family new construction. Requirement categories include (Modeled after LEED)

- Site sustainability, Water use efficiency, PV ready, Energy Efficiency, Indoor environmental quality, Materials and resources, and Construction practices and plans for operation
- For more information, please see: <https://www.iccsafe.org/products-and-services/i-codes/2018-i-codes/igcc/>

AND, DOE Zero Energy Ready Home (Including Energy Star, Indoor airPLUS, and Verification)



- Impacts residential new construction, Typically, 40-50% more efficient
- Designed such that the addition of onsite renewable energy systems can offset most or all of the home's annual energy consumption

ENERGY STAR v3.2 Certified

- Covers single family, multifamily new construction, and rehabs.
- The Builder or Developer for the project is required to sign an ENERGY STAR Partnership Agreement.
- The certification process offers three paths to meet the performance target for Multifamily: (Single Family uses Energy Rating index (ERI) path only)

Indoor airPLUS Certified

- Recognize new homes equipped with a comprehensive set of indoor air quality (IAQ) features, covers HVAC Equipment, Combustion Pollutants, and Low-emitting material (Volatile organic compounds, Formaldehyde, adhesives).

Verification of Energy Performance Using an Energy Rater

A Certified Home Energy Rater or Rater is a person trained and certified by an accredited Home Energy Rating Provider to inspect and evaluate a home's energy features, prepare a home energy rating and make recommendations for improvements that will save the homeowner energy and money.