Eagle County Code Cohort Webinar: Frequently Asked Questions

View the webinar recording here: https://youtu.be/h4AdJEQN4fM

What communities are participating in the Code Cohort?

The Cohort comprises the Town of Avon, Town of Vail, Town of Eagle, Town of Minturn, and Eagle County Government. The Town of Gypsum and the Town of Basalt participated as listening members in Cohort meetings, and Red Cliff received support toward the end of the Cohort process.

Why are we undertaking this effort?

The goal of this project is to support the participating communities in adopting a consistent base energy code throughout the valley as well as amendments that support the region's sustainability, climate, and resiliency goals. Reducing the patchwork of differing local energy codes has many benefits including streamlining compliance for builders and reducing workload for local government staff (because of increased compliance).

What have communities committed to so far?

Our collaborative cohort of communities recognizes the urgency and community-wide benefits of addressing energy use in the built environment through the adoption of the 2021 International Energy Conservation Codes (IECC), with supporting amendments.

Most communities in the Cohort have committed to adopt the 2021 IECC with the proposed amendments that support the achievement of regional climate goals.

What is each community's timeline for adoption of the 2021 IECC?

This differs by community, but most are expected to adopt within a year. Avon and Vail have already adopted the 2021 IECC with a few supporting amendments.

What is each community's process for adoption?

Each community's exact adoption process and terminology is slightly different, but the general order is the same. The building department will bring forward recommendations to the community's City Council, County Commissioners, or Board of Trustees (governing body), along with background information such as costs, benefits, and which other jurisdictions are pursuing similar measures. This is either conducted at a regular meeting or a "study session," and it may be co-presented by the sustainability staff, other staff, or consultants. It may also stem from recommendations from the local sustainability commission. At that initial presentation meeting, the governing body asks questions of the staff and consultants, and gives general feedback to the staff. The staff brings back a revised measure and/or answers to the governing body's questions, as applicable. The measure is voted on twice ("first reading" and "second reading," sometimes incorporated into the "consent agenda.").

The governing body typically allows general public comment at every meeting (on any topic), and some also allow a second round of public comment in the meeting for specific agenda items.

Lastly, since the timeline and process for each community is slightly different, one or more communities may adopt the 2021 IECC base code before separately adopting supporting amendments.

Who else has adopted the 2021 code?

Arapahoe County, Aurora, Denver, Dolores, Erie, Fort Collins, Golden, Larimer County, Littleton, Longmont, Louisville, Parker, Superior, and Vail have adopted the 2021 IECC. At least 67 other communities have announced intentions to adopt it in the next year or two, covering 70 percent of the population of Colorado. A new Colorado law, starting in July, requires all local jurisdictions to adopt at least the 2021 IECC upon updating any other building codes, along with solar-ready, EV-ready, and electric-ready.

What are the differences between the 2021 IECC and previous editions?

Most if not all changes either increase clarity or increase efficiency. A few of the notable ones for residential:

- Better thermal envelope performance (e.g. walls, windows, doors).
- Duct testing (even inside the thermal envelope)
- Some lighting controls.

A few of the notable changes for commercial:

- More commercial occupancies are required to have air leakage testing performed.
- More efficient mechanical systems.
- More options for reaching the required number of efficiency points.

For a full list of significant changes to the Residential IECC please see this link. For a full list of significant changes to the Commercial IECC please see this link.

What are the upfront cost impacts between 2021 code and previous versions?

The Pacific Northwest National Lab (PNNL) prepared a thorough cost-effectiveness analysis of the base (unamended) 2021 IECC compared to the base 2015 IECC in December 2021. The table below was pulled from the analysis and shows information for buildings in Climate Zone 6B, Eagle County's climate zone.

Increased First Cost (vs 2015)	Mortgage Increase	Annual Energy Savings	Net Savings	Years to Positive Savings	Lifecycle Cost Savings
$1,470	$59	$119	$51/yr	4	$1,144

PNNL's methodology for energy code cost-effectiveness is the national standard, having been thoroughly vetted and peer reviewed by hundreds of experts in all affected fields of homebuilding, contracting, architecture, materials supply, and equipment supply. PNNL is the entity specifically charged by Congress to perform cost-effectiveness analyses for energy codes.

Cost-effectiveness analysis was also a key component of the public and transparent code development process at the national level, and was considered for every material or labor-related change. Notably, affordability and low-income advocates such as Habitat for Humanity have become increasingly involved in the code development process, and found the code changes and the final 2021 IECC to be both cost-effective and justifiable.

Of course, individual home specifications and individual builder prices will differ. Also, some of PNNL's estimates may in fact be at the high end given realities of what is *already* being installed in the field. The Colorado Residential Field Study from this past year shows that builders are already installing base 2021 IECC-level high-efficiency lighting, mechanicals, and

some of the envelope components, even in areas without the 2021 IECC in place. It's most accurate to show the cost difference between what builders are already doing and the extra that would be required with a new code. The biggest construction item not already meeting the 2021 IECC levels is ceiling insulation, so that's where the extra incremental costs lay. Everything else is basically already at newer code values. That said, recent misinformation and confusion about the cost of energy code compliance for Marshall Fire rebuild efforts has likely increased what affected homeowners will expect to pay and what home builders will be able to charge.

Source

PNNL also completed a study comparing the 2021 IECC to the 2018 IECC. It is not Colorado specific, but details cost estimates for communities in Climate Zone 6. Click here to access that study.

How much energy savings does the 2021 IECC provide compared to the 2015 IECC?

The total annual energy savings expected for a new home built to the 2021 IECC over the 2015 or 2018 IECC is 8.6%.

Source

What are the climate and emissions impacts from the 2021 IECC?

PNNL has calculated the emissions benefit of Colorado-wide adoption of the 2021 IECC. As noted, at least half of the Colorado population lives in an area that has adopted or is planning to adopt the 2021 IECC.

Statewide Impact - Emissions

Statewide Impact	First Year	30 Years Cumulative
Energy cost savings, $	4,983,000	1,742,000,000
CO_2 emission reduction, Metric tons	41,630	20,301,000
CH_4 emissions reductions, Metric tons	2.20	1,072
N_2O emissions reductions, Metric tons	0.30	148
NOx emissions reductions, Metric tons	26.0	12,690
SOx emissions reductions, Metric tons	9.0	4,368

Source

Is the code cohort considering a stretch code?

No. The code cohort is only considering the base 2021 IECC plus supporting amendments.

How can other communities connect with the effort?

If your community is interested in learning more about the Code Cohort please reach out to Kim Schlaepfer, Senior Associate at Lotus Engineering & Sustainability at kim@lotussustainability.com.

What 2021 IECC supporting amendments is the cohort considering?

Solar-ready (see factsheet)

EV-ready (see factsheet)

Electric-preferred (see factsheet)

Efficiency Supporting:

- **New Construction**
  - Ensure all hot water piping is insulated.
  - Install heat tape timers.

- **Existing Buildings**
    - Require addition, alteration, and remodel projects to investigate which efficiency upgrade options that could be pursued, and submit this in a report during permitting.
    - Install programmable thermostats for heating systems when permits are pulled for HVAC updates.
    - Optional language: Require permits for gas furnaces and gas water heaters to also show a bid for a comparable heat pump system, including incentives.

Exterior Energy Offset Program (EEOP) (see factsheet)

- Increase the assumed energy use for snowmelt systems used in the fee calculations to be in line with verified energy system data.
    - From 34,435 BTUs / sqft to 81,800 BTUs / sqft.
- Adjust the fee for exterior energy use to align with the cost to provide a 50% solar offset for the energy used in the qualifying outdoor systems.
- Add commercial buildings to the EEOP.
- Include outdoor fireplaces as a qualified exterior energy use in the program.

Heat Pump FAQs:

Will heat pumps be required in the new code update?

No, but they will be encouraged as an option.

Are we talking about heating/cooling from the ground?

"Ground source heat pumps" are one type of heat pump, and they are more efficient but also more expensive than the more common "air source heat pumps."

Do they work in our cold winters?

New "cold climate" heat pumps work in temps down to -22°F. Non-cold climate heat pumps can work in temps down to 0-25°F depending on unit, and integrated "strip heat" can kick on in the colder temps.

Are they more expensive to run?

It depends on the type and configuration of the system and the comparative costs of electricity versus natural gas at the time. In general, with current prices, cold-climate heat pumps are slightly less expensive to run compared to natural gas systems and non-cold heat pumps are also slightly less expensive to run compared to natural gas systems except when the temperature is below the "set point," when strip heating kicks on, during which times they cost significantly more to run compared to natural gas systems.

Can our grid handle the increased load?

Our grid was built for high summer cooling load, so it has room to space for extra winter heating load. Holy Cross Energy & Xcel are aware of the transition and conduct long-range planning to ensure sufficient capacity.

What happens in a power outage?

They won't work (but neither will gas furnaces since they too need electricity to run).

Webinar Q&A Session

To have an all electric home with heat pump heating, this typically requires a 400 amp electric service, will this be a requirement in new construction? This can get overlooked if not a requirement and is a large cost to change an electrical service.

This is not explicitly written in the code. At a minimum, 200 amp panels have become the default norm. It is really tight if you're trying to service a heat pump, heat pump water heater, and EV. You might need additional equipment like a smart panel to manage loads on a 200-amp panel.

A 400-amp would be more likely to easily accommodate all the loads, but that isn't currently required. We wish there were more options between 200 and 400, but those are harder to come by.

If a heat tape timer is required, many timers may be set for the peak time (4-9 pm for HCE) and into the evening. Will there be education around setting timers to run during the day and off at night?

It is going to be a requirement. The wording in the code language will talk about running during the day and shutting off at night. It is specific to make sure this is the case.

Are there any thoughts around battery storage requirements?

Yes. Battery storage is included in a minor way. On the commercial side, the solar ready appendix already includes energy storage ready: you need space for the battery and the conduit going to that space. As far as requiring energy storage, that is not in the code language currently but it is on everyone's radar.

If this is something that you want your community to consider, we recommend you bring it to your City Council. We also were waiting to see what building and fire codes said about it. 2021 IECC finally approached it, and the 2024 IECC will cover it in depth.

Observation: The Federal Govt (CPSC) has performed multiple studies which identify how unhealthy gas stoves are as related to dangerous emissions. The appeal of gas cooking is losing the appeal as time goes on and convection cooking equipment is moving forward.

This is something all-electric requirements could address.

If the 2021 IECC is adopted fairly soon by most communities in Eagle County, do the electric service providers have the infrastructure to meet the demand? If not, when do they expect to be ready for the demand?

We included Holy Cross Energy and other relevant utilities in the process as we were evaluating, screening, and revising potential amendments. They are in support of a movement toward electrification and are planning for this in short-term, medium-term, and long-term capacity planning. Across the board, utilities across the state broadly have the capacity. They have a summer peak load which leaves capacity to spare for the winter.

Also, this is for new construction only. You're adding one at a time and a utility needs to ensure, as with any new building, they can serve it. It is a gradual process.

We have not addressed how the 2021 code cycle will increase requirements for additional insulation, continuous insulation, and other changes to the manner in which these buildings have to be insulated and airsealed. Is that beyond the scope of this cohort? It appears that building officials are allowing work-arounds for some of these requirements. Any updates on this subject?

The 2021 does take an increase. There are many paths of compliance in the code so there are lots of workarounds. The Cohort was looking at what the state will require. It will require the 2021 IECC adoption, EV, PV, and some form of electrification. The 2021 IECC is already written, so we mostly focused on the additional code elements. We can't amend a code to be less restrictive than it is, but we're happy to work with anyone if you want to make amendments to the base code but we didn't tackle it as a whole.

How do the IRA incentives impact the way you are thinking about the codes for retrofits? The IRA rebates for adding heat pumps, larger panels, updating wiring, electric stoves etc are pretty material. eg up to $8,000 for a heat pump (depending on income)?

The IRA incentives change the game completely. It will accelerate retrofits and most of the incentives available from the IRA are for retrofits. Wasn't considered in depth for the cohort for the following reasons:

1) The IRA caught a lot of people off guard. We didn't think it would happen.

2) The main focus of codes is on new buildings.

For retrofits, every home and building is different. You might need a new duct system, you might have radiant heating, etc. Requiring heat pump technology for retrofits didn't seem feasible at this juncture.

You could bring this up to elected officials as well.

When will the IRA rebates start to be available? Any idea on what rebates will be available?

Starting January 1, 2023, homeowners can get a 30% tax credit for electrification equipment and infrastructure. Same with the 10% state tax credit. There are additional incentive programs in the IRA, called "HOMES" and "HEERHA," that will be run through each state energy office – including, for example, up to $8,000 towards a heat pump for income-qualified homes – but they are waiting for guidance from DOE before being able to launch them, and that could take an estimated 1-2 years.

When will Eagle County and most jurisdictions in Eagle County start enforcing the 2021 IECC?

Working with communities on adoption implementation as we speak. The ultimate goal is before the July 1, 2023 deadline where the state enforcement jumps in.