

Commercial Electrification Working Group

Meeting #1

May 13th, 2022

1 p.m. – 2 p.m.

1. Introductions:

- a. CASR: Katrina Managan, Courtney Anderson, Tom Gleason
- b. CPD: Eric Browning, Chuck Bartel, Danny Boncich, Christy Collins, Antonio Navarra
- c. Attendees: Sean Denniston (NBI), Elizabeth Gillmor (Energetics), Libby Coleman (Group 14), Christine Brinker (Southwest Energy Efficiency Partnership), Darin Ramirez (RJA Engineering), Mark Jelinske (RMH), Mike Reynolds (Nava Real Estate), Mark Snyder (4240 Architecture), Teresa Gray (RJA) Engineering, Erik Johnson (Boulder Housing Owners Rep), Mike Fulton (Western Mechanical Solutions)

2. Review of Denver's Goals and Related Policies:

- a. Energize Denver Ordinance requires existing buildings to begin electrifying upon space and water system replacement when cost effective beginning in 2025. Want to ensure new buildings are in alignment with Energize Denver performance requirements and renewable heating and cooling building requirements.

3. Introduce Proposals:

- a. [P40](#): IECC C403.2 - Partial Space Heating Electrification Commercial
 - Summary: Heat pumps required to provide all space heating with exceptions (low energy buildings, very low energy buildings spot heating, makeup air systems, supplementary heat, etc.). Excludes single family duplex or IRC townhome type design. Applies to commercial and multifamily buildings.
- b. [P38](#): IECC C404.10 - Partial Water Heating Electrification Commercial
 - Summary: Service hot water to be provided by an electric heat pump and that heat pump to be sized to provide 100% of the peak hot water demand. Also has some requirements around when it's in unconditioned space versus conditioned space. Similar set of exceptions as space heating proposal – exception for electric resistance and small “pony/low boy” water heaters (20-

gallon water heaters that might be used for a laboratory or for kitchenette or boost heating. There really isn't a heat pump option for these small water heaters). There's also an exception for water heating systems that serve high temperature outputs (restaurants or healthcare).

4. Summary of topics discussed:

a. Electrification:

- Electrifying all space/water heat systems or aligning with Energize Denver?
- Focusing first on available technologies and then adding codes as technologies advance
- Flexibility in electrification – group mostly supportive of electrification/no gas for space and water heating, but want flexibility in how to do it – leaving room for creativity and innovation
- Interest in costs and how that factors into requirements/policies
 - How to deal with situations where electrification systems are not physically or financially feasible?
- Potential challenges with electrification of domestic water
- Space heating successes and electrification lessons learned in Boulder
- Low energy and low temperature when to allow electric resistance heating

5. Detailed Notes of Discussions/Questions

a. Space Heating Electrification

- Sean: Washington State just approved new commercial energy code requiring heat pumps for space and water heating. Only requiring heat pumps for 50% of service water heating load. Likely will result in heat pumps for all/most of individual water heaters and heat pump or hybrid system (partially heat pump) for central systems
- Sean: current proposal does not fully align with Energize Denver Ordinance – needs modification to create alignment
 - Darin: Benefit aligning with Energize Denver with small packaged equipment. Start with the simple and phase in as you go.
- Libby Coleman: Space heating as a whole is easier and domestic water is the harder piece and that aligns with technology available. Focus on space heating. Biggest concern is that it's mandatory and feels very prescriptive. Saying no gas

is ok for all space heating system types, saying exactly how they have to get there is the issue.

- Darin/Mark: 80/20 rule – it's very possible for a big chunk of it, it's just those exceptions when you get into the large makeup air or specialty type systems that's are not there yet
- Darin: By limiting this to warm air furnaces could you inadvertently be steering people towards medium size natural gas boiler systems?
- Erik: space heating has gone very well with multiple split systems on multifamily projects. We used heat pump water heaters on one large project and there have been operational issues with noise inside the units and a stream of cold air coming out of those units as they extract heat out of the ambient air.
- Mark Jelinske: where can this easily be applied first in the 2023 code and then incrementally add as codes and technologies catch up? Start with package type equipment.

b. Water Heating Electrification

- Sean: Energize Denver says when a storage water heater or instantaneous water heater is proposed to be replaced, it needs to be electric. And then there's a further requirement that if it's electric resistance, the electric resistance would need to be supplied by on site renewable energy.
- Mark: Water heating stealing space heating and then just adding resistance heat to the space – struggling to see value of heat pump water heaters
- Danny: definition of replaced and new systems and existing buildings – how are new tenants treated/considered as it relates to water heating systems
- Chuck: consideration of water vs. refrigerant in cooling systems and the GWP of refrigerants. Piping refrigerant through buildings instead of water increases the potential for leakage
- Darin Ramirez: agrees – significant difficulties on the larger central systems, especially when it comes to domestic water

c. Other Topics/Discussions

- Elizabeth: how will Energize Denver cost and feasibility reporting go into

considerations about whether or not things will be mandated. How to deal with situations where electrification systems are not physically or financially feasibility?

- Katrina: Developing processes for how that will work. For water heater replacement it will be very simple – just a few criteria: does it work to electrify the water heater in your building, do you have the electrical capacity, do you have somewhere to vent the cold air? Where systems are more complicated, exceptions will get more complicated. Would like to hear more from the group on this.
 - Chuck: Need availability of equipment cost the additional cost for substantiation or analysis how these electrifying buildings across the different building types have been done like in New York. How much will this cost building owners to operate these systems – will there be additional costs and what are they?
 - Katrina: Do we try to work on these proposals in terms of electrifying all space heat and water heat or do we want to align them with Energize Denver?
 - Mike Fulton: If we're going to get rid of gas just say we're going to get rid of gas, but don't say gas-fired warmer and furnace.
 - Mike Reynolds: How does the relate to the energy model? Heat pumps for space heating and electric water heaters satisfy the energy code or how does that tie into one another? That's the big roadblock on my current project is the energy model shoots us down from trying to electrify, but there's really nothing we can do about it.
 - Sean: we have another working group on this topic: how to encourage electric equipment within the modeling methodologies. There is a proposal to move from energy cost to site energy cost as the metric in modeling, which would go a long way to removing those modeling barriers to using electric equipment.
- d. Next steps/upcoming meeting topics:
- 5/24 – Space heating
 - 6/7 – Water heating
 - 6/21 – Finalizing both proposals

Meeting adjourned