
BetterBricks Industry Voices:

Chris Wolgamott

Chris Wolgamott, senior product manager at the Northwest Energy Efficiency Alliance (NEEA), discusses the future of gas and electric rooftop units (RTUs), and efficient solutions available in the market today.



A Q&A with NEEA's Chris Wolgamott about new ideas for making RTUs more efficient, what advancements are already available, and what lies ahead for the technology.

What HVAC solutions have you been exploring in your role at NEEA?

At NEEA, one of our areas of focus is third-party vetting and testing technologies for their energy-saving potential. This includes RTUs. Just as we look at building efficiency in a holistic way, we've started to study how all the aspects of RTUs work together to make the most efficient piece of equipment. Important RTU aspects include fans, the compressor, the burner, the return air, the supply air, and the ducts.

Why do you focus on RTUs over other types of HVAC systems?

Well, there's a lot of these units in the market. Strip malls, small businesses, almost every type of big-box store has an RTU. A [U.S. Department of Energy \(DOE\) study](#) shows approximately 60% of commercial building space in the U.S. is operated by single-zone RTUs. On average, HVAC is between 20% and 50% of a building's energy use. If we can make incremental energy improvements to even a fraction of these units, that results in significant energy savings.

Currently, most efficiency programs and measurements from the DOE are based on individual RTU components; however, we start exhausting our ability to increase energy savings when we focus on individual mechanical parts, like the compressor or the burner.

By taking a comprehensive look at how the whole RTU system works together, we see how the box is built and what components can be added to make it more efficient. For example, by including energy recovery and heat recovery ventilators (ERV/HRV) to the system, the savings start to add up – and we can do it without touching those mechanical pieces.

What new technologies or techniques are you exploring to make RTUs more efficient?

One of the things we're discussing at NEEA is a bolt-on ERV/HRV. Instead of being built into the box itself, it attaches to the outside, making it possible to retrofit older equipment to gain energy savings.

It may not achieve as much savings as a new efficient unit, but you could still gain 15% to 25% energy savings from a retrofit of a bolt-on ERV on a system. It's not done very often, but it's an avenue we're exploring.

As we look into the future of all HVAC systems, refrigerant is a big deal. The [2020 American Innovation and Manufacturing Act](#), which regulates the phase-out of hydrofluorocarbons, affects the refrigerant that HVAC systems can use starting in 2025. That deals with how the systems operate and how the components work, but it doesn't necessarily change how the box itself is built or how ERV/HRV are installed. While those changes are important to address, we can get additional energy savings by looking at the whole system.

Are there benefits beyond energy savings for RTU product advancements?

Obviously, we focus on the energy but there are other benefits, like reduced maintenance over time. For example, right now a lot of RTU boxes are built using a single piece of steel that can rust, with inadequate insulation that animals can make a nest in. We recommend using 2-inch double-wall insulation on the unit to improve the energy, strength, and longevity of the box. It's easier to clean and animals can't get through the metal to get to the insulation. Double-wall insulation tends to be used in places that are a little more corrosive, like coastal areas. Salt water does not treat metal well, and this type of insulation can help the box last longer.

How do these new products and technologies affect the cost of RTUs?

It really depends on the size of the system and the building owner's expectation of that system. In the early adopter phase for any technology, everything's a little more expensive. But if you're getting bigger energy savings, your payback may get better over time. As we move forward, we hope to see utility incentives that help offset some of the incremental upfront cost. That way, we can increase installations and help people start to understand how much better these units are than their old system.

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How do you explain the value of efficient RTUs to building owners or property managers?

The biggest value is the potential energy savings. If you include ERV/HRV, insulation, and dampers, you could get upward of 30% energy savings with an efficient RTU.

And with an efficient RTU retrofit or replacement, the business owner doesn't have to change how their HVAC system works or remodel their building. It's the same system already in place – they're just installing a better version of it.

What other developments do you see in the future for rooftop HVAC units?

When I think about the next 15 to 20 years, I think there will be a lot more dual-fuel RTUs on the market.

Dual-fuel RTUs use heat pumps with gas backup, giving the building owner options. They can decide which heating system they want to use based on the utility rates. They have the flexibility to turn on their heat pump when electricity prices are lower and use gas when gas prices are lower.

How does a building owner control a dual-fuel RTU to ensure it operates in a way that will achieve energy and cost savings?

We're seeing some interesting things with how companies switch between fuels to operate RTUs more efficiently. For example, a building owner may use the backup gas heat to preheat the air just enough to optimize heat pump functionality in low temperatures.

Another approach involves using [lighting controls](#) to adjust the thermostat based on occupancy. These sensors can communicate with the thermostat when a room is empty and adjust the temperature to save money.

Is a dual-fuel RTU available now?

Yes, the products are available, and you can check with your local distributor or contractor to see what options they carry. Our goal at NEEA is to increase their availability by helping some of the bigger manufacturers see its value, and start building and promoting more of these systems.



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