Refrigerant Changes & Geothermal

BY DREW CHAMPLIN, ASHRAE JOURNAL EDITOR

OKLAHOMA CITY – International Environmental Corporation (IEC), a subsidiary of Climate Control Group (CCG), held its 75th anniversary celebration in late October. IEC invited media representatives to share how the company, as a manufacturer, is dealing with industry changes, including with refrigerants and the push for geothermal systems.

CCG is one of many manufacturers rolling out the R-454B refrigerant for ducted systems over the next year, as the Environmental Protection Agency is phasing out R-410A due to global warming concerns, and manufacturers are preparing for this transition to begin in 2025.

"We're having to totally redesign equipment," CCG Chief Operating Officer Kevin McNamara said.

The testing process includes making sure equipment is up to safety standards, since R-454B is mildly flammable. There will have to be a serious look at mechanical room design as it pertains to exhaust and sensors, per McNamara.

"It's all hands on deck with the refrigerant changes," said Donald Decker, IEC's vice president of strategic growth and initiatives. "That is our primary focus—getting (our) line of products that currently use refrigerants ready for that refrigerant transition, which takes not only our engineering design time, but the support of our suppliers because they have to supply us different parts to make the units that will run with the new refrigerant."

Geothermal systems were also a hot topic. Manufacturers acknowledge the high up-front costs of these systems, but say they can be made up through cheaper maintenance and life-cycle costs.

"We are now seeing large corporate owners as well as residential homeowners asking for that technology," Decker said. "I don't know that (CCG) necessarily drove that. I know the industry is asking for it more than the companies are driving that."

Along with the up-front costs, another barrier for the systems is getting the energy loop into the ground.

"You need to understand your soil," said Eric Newberg, CCG's vice president of product management. "Not all soils conduct energy the same way. You're moving heat back and forth. The earth works like a battery, storing energy. It's important to make sure you have an even heat load, and you can balance that out with ways like a small heat cooler."

Proponents of geothermal point to the 2022 Inflation Reduction Act's tax credit, which provides a 30% credit for geothermal heat pump projects installed before January 1, 2033. ■

CORRECTION: In the November issue, in "ASHRAE/IES Standard 90.1-2022 Performance Path Changes," the wrong data was included in the "2019 Building Performance Factors" portion of Table 1. This is the correct version of that portion of the table, which has been corrected in the digital edition and at ashrae.org. The "2022 Building Performance Factors" portion of the table in the November issue was correct. *ASHRAE Journal* regrets the error.

TABLE 1 Changes to the Building Performance Factors (BPFs).

2019 BUILDING PERFORMANCE FACTORS																	
BUILDING AREA TYPE	CLIMATE ZONE																
	0A AND 1A	0B AND 1B	2A	2B	3A	3B	3C	4A	4B	4C	5A	5B	5C	6A	6B	7	8
Multifamily	0.68	0.70	0.66	0.66	0.69	0.68	0.59	0.74	0.76	0.74	0.70	0.73	0.75	0.68	0.71	0.68	0.72
Healthcare/hospital	0.60	0.60	0.58	0.54	0.56	0.55	0.55	0.55	0.54	0.54	0.57	0.52	0.54	0.57	0.52	0.57	0.57
Hotel/motel	0.55	0.53	0.53	0.52	0.53	0.54	0.54	0.53	0.53	0.52	0.50	0.51	0.51	0.50	0.51	0.50	0.50
Office	0.52	0.57	0.50	0.56	0.53	0.56	0.48	0.51	0.52	0.49	0.51	0.51	0.49	0.52	0.51	0.49	0.51
Restaurant	0.63	0.64	0.60	0.60	0.60	0.61	0.58	0.62	0.57	0.61	0.63	0.60	0.64	0.65	0.62	0.67	0.70
Retail	0.51	0.54	0.49	0.55	0.51	0.55	0.53	0.51	0.55	0.54	0.50	0.54	0.55	0.50	0.51	0.48	0.50
School	0.39	0.47	0.38	0.43	0.38	0.42	0.40	0.37	0.40	0.38	0.36	0.40	0.36	0.36	0.37	0.36	0.37
Warehouse	0.38	0.42	0.40	0.42	0.43	0.44	0.43	0.44	0.43	0.46	0.49	0.47	0.48	0.54	0.51	0.57	0.57
All others	0.56	0.57	0.50	0.52	0.50	0.54	0.53	0.53	0.52	0.54	0.51	0.51	0.50	0.50	0.50	0.50	0.46

Decarbonizing the Future

BY KELLY BARRAZA, ASHRAE JOURNAL MANAGING EDITOR

WASHINGTON, D.C. – In October, HVAC&R industry stakeholders gathered for the 2023 Decarbonization Conference for the Built Environment where thought leaders, consulting engineers, architects and others met to discuss prospective, exciting opportunities in reducing the carbon footprint of buildings.

The subject of how to achieve decarbonization goals in an industry fraught with jockeying interests came up throughout the meeting. "How to succeed in an industry with so many disparate players? I think simplicity is going to be key," said Laurie Kerr, principal climate advisor at U.S. Green Building Council, during a Building Industry Decarbonization Collaboration panel. "We have to move away from overly complex requirements and formulas that really scare people away. We must move toward simpler directions that everybody in our industry can understand. Embrace simplicity and the big picture and let go of some of that perfectionism we love so much."

THE IMPLEMENTATION AND COST of decarbonization strategies using U.S. federal program options was also covered in a panel with Bing Liu (Pacific Northwest National Laboratory), Kinga Porst Hydras (General Service Administration), Lindsey Falasca (White House Council on Environmental Quality), Mary Sotos (U.S. DOE) and Hayes Jones (U.S. DOE).

At the same panel, chaired by Clay Nesler, The Nesler Group, the challenges in adhering to a gamut of recent legislation passed by U.S. federal, state and local governments on reducing building carbon emissions were touched on by Don Davis, Vice President of Advocacy and Building Codes at the Buildings Owners and Managers Association (BOMA).

"BOMA is being impacted by all these regulations. We own the buildings. So when the state, local or the federal government start to implement a regulation against us, we are the ones that have to make sure we meet those goals," said Davis.

In a lightning round on predicted energy performance versus actual energy performance, Davis also noted the scarcity of accurate data available to building owners.

"It all goes back to data," Davis said. "Do we have the proper data and can we get it? From my members, this is the No. 1 problem. We cannot get the data from utilities on energy use and the whole building, and if we had a very clear picture on what energy is being used, we could then identify areas where it needed to be improved. We can't do modeling unless we have the data."

Whole life carbon was also on the docket in D.C. as was discussion on global warming potential (GWP). GWP measures greenhouse gas (GHG) heat absorption relative to CO_2 and is frequently evaluated over extended periods of time (20-year GWP [20 years], 100-year GWP [100 years]). Webly Lynn Bowles, Associate Director at the New Buildings Institute, cited in her presentation "Whole Life Carbon for Building Systems" that 20-year GWP was particularly crucial in short-lived GHGs like methane and refrigerants. Four other members of the ASHRAE Task Force for Building Decarbonization also presented with Bowles in this panel, outlining strategies to lowering carbon emissions within mechanical, electrical and plumbing (MEP) systems of buildings.

The conference, co-organized with the American Institute of Architects (AIA), APPA (formerly the Association of Physical Plant Administrators), BOMA and the International Facility Management Association (IFMA), was novel in its intentional inclusion of and collaboration with key industry associations.

ASHRAE continues to hold topical conferences on decarbonization, with the 2024 ASHRAE International Conference on Building Decarbonization scheduled for April 17-19, 2024, in Madrid, Spain.

Another meeting will be held Oct. 21-23, 2024, in New York City, and will be focused on decarbonizing existing tall buildings.

If you are interested in attending these meetings, visit https://www.ashrae.org/topical-conferences. ■