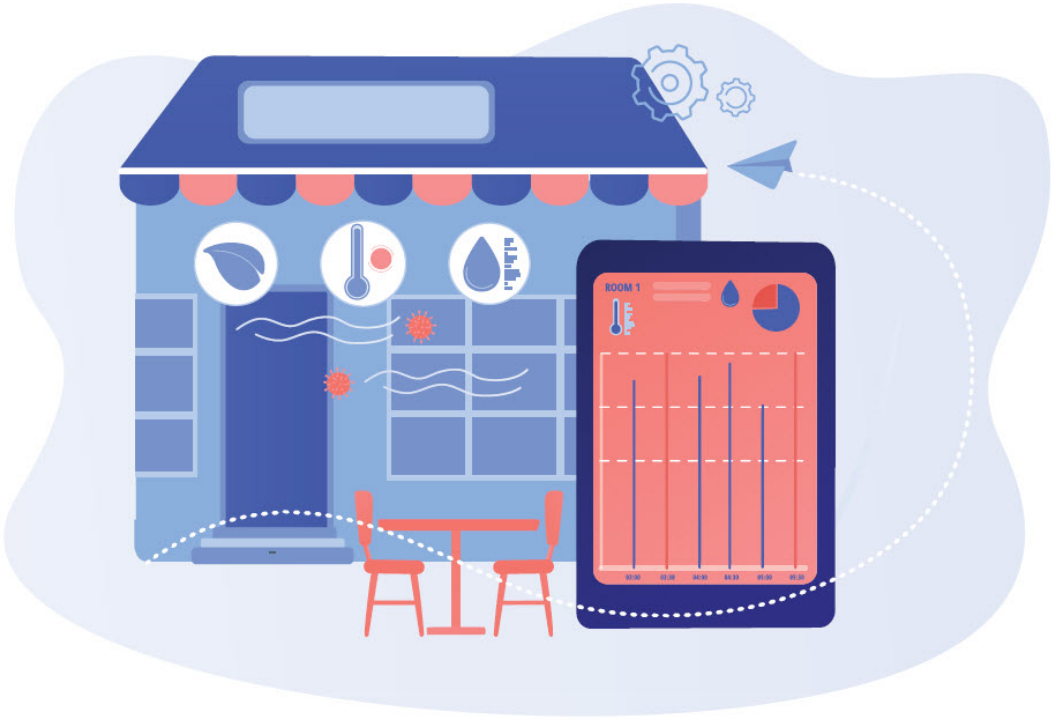
Emerging Trends

Krysta Kincaid, Darren Witter



The Future of HVAC

Factors like COVID-19 and sustainability are pushing the industry in innovative new directions

No one notices an HVAC system performing exactly as it is supposed to. On the contrary, when an HVAC system in a restaurant is not functioning as intended, employees and customers will notice quickly.

The HVAC industry moves quickly, and it is important for restaurant facilities and construction professionals to stay informed. The information provided below is a resource to help you learn and plan the next steps your organization can take to avoid falling behind industry trends.

Many of the top trends for restaurant HVAC and sustainability can be summarized within five general categories: indoor air quality, energy efficiency, commissioning (retro and new construction), carbon reduction, and evolving customer and employee expectations.

Indoor Air Quality

Throughout 2020 and 2021, COVID created a renewed interest in the performance and quality of restaurant HVAC systems. Never before had customers been aware of, let alone interested in, air changes per hour, or the effectiveness of filters installed in rooftop units. It is safe to presume that now that the average American diner is more aware, they also know how to spot when a facility's HVAC system is failing to operate as intended.

Every stakeholder wants their restaurant to bring in patrons, not drive them away. Poor indoor air quality can be detected immediately at the front door and throughout the facility, creating a negative impression of the entire restaurant.

A restaurant typically has a more complex HVAC system than a retail space, with more air movement due to the kitchen ventilation needs. In order to preserve IAQ and keep patrons comfortable, the exhaust and supply air must be proportional to each other. Additionally, keeping up with preventive maintenance is crucial to maintain those air proportions. One broken belt, failed damper, dirty coil or clogged air filter will disrupt the balance and lead to comfort complaints, higher energy costs and worse.

PRO TIP: *When you open a door at your restaurant, do you feel a small gust of air flowing toward you or does it feel like a vacuum pulling into the space? If your answer is the latter, you'll need to evaluate the building air balance.*

Energy Efficiency

Energy efficiency was a recurring topic at the RFMA conference this year in Nashville, with a large presence in the speaker's topics. Making a restaurant's building operation more energy efficient does not have to be daunting; an entire industry of professionals is willing to help. In fact, increasing the efficiency of a facility will benefit the individual location, as well as the entire organization.

A few simple changes can add up when it comes to saving energy. As many facilities professionals are aware, lighting fixture upgrades and control measures can be very helpful in energy reduction and can even improve safety at the facility. In the same way, a simple upgrade for an existing HVAC system is incorporating occupancy sensors for restroom exhaust. Often, the restroom exhaust is running all day. Demand-controlled exhaust that uses an occupancy sensor reduces the energy used by the fan and ensures the space has been properly exhausted after use.

A similar upgrade with higher energy savings for a restaurant would be to add demand controls to the kitchen hoods. Not only will the exhaust fan speed be lower on average, which saves energy, the conditioned air in the kitchen or adjacent spaces will not be sucked out through the roof at an unnecessary rate, which saves even more energy.

Energy efficiency alone cannot be the goal; it must be considered in conjunction with the purpose of the HVAC system. The functionality of the exhaust needs to meet the expectations of carrying out smells and smoke, depending on the application. This idea of balancing the energy efficiency and function of the HVAC system components is called resiliency. For example, the HVAC system needs to provide enough ventilation to keep the air inside the space fresh and clean. But too much outside air will increase energy costs when conditions outside are unfavorable. Therefore, energy and air quality must be considered together.

Once the HVAC units have ventilated, tempered and dehumidified the air being brought into the restaurant, it will need to be contained. Leaky building envelopes can cost thousands of dollars every year by letting conditioned air escape and, in a negative building pressure situation, by sucking in untreated air. Replacing inefficient windows and sealing up penetrations near plumbing, doors and other holes in the envelope will improve the retention of conditioned air.

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PRO TIP: *When the time comes to plan HVAC unit replacements, consider high-efficiency units. Additional equipment such as an energy recovery ventilator or a dedicated outside air unit can be incorporated in a redesign to improve efficiency further than simply choosing more efficient versions of the previous units.*

Commissioning

Arguably, the easiest and most impactful step you can take to ensure your facility's energy efficiency is simply verifying the existing system is in good shape and performing as intended. Building systems tend to deteriorate over time, so a "tune-up" can help get them back to their intended performance.

According to the Lawrence Berkeley National Laboratory, "The commissioning projects for which data are available revealed over 10,000 energy-related problems, resulting in 16% median whole-building energy savings in existing buildings and 13% in new construction, with payback time of 1.1 years and 4.2 years, respectively. These findings demonstrate that commissioning is arguably the single-most cost-effective strategy for reducing energy, costs, and greenhouse gas emissions in buildings today."

A monitoring system is a great tool to augment a small facilities team and prioritize sites for HVAC repairs and replacements. Monitoring systems come in all levels of complexity and investment, from alerting the facilities contacts when a metric is out of tolerance to controlling the building systems autonomously.

While a monitoring system can provide round-the-clock updates and control according to its capabilities, it is highly recommended by the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) to retro-commission aging sites. A system is only as good as the quality of installation and maintenance, which requires a trained professional onsite to evaluate and provide recommendations on needed repairs and adjustments. Automated systems utilize a variety of sensors, which need to be verified for function, calibration and correct installation in order for the systems to be effective.

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When selecting a commissioning authority, or CxA, there are a few key characteristics to keep in mind. Experience in the industry is crucial, so be sure to ask for references and examples of past work. The CxA needs to be independent and objective and should report directly to the building owner. The CxA chosen must have a strong sense of integrity and a partnership mindset.

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Commissioning can include many aspects of the facility, but all may not be necessary. Discuss the plan with your trusted CxA partner to determine exactly what is needed for your facilities and to get the most value for your investment.

PRO TIP: *Recommission your buildings periodically, as recommended by numerous authorities such as ASHRAE, the Building Commissioning Association and the U.S. Environmental Protection Agency. Three to five years is a commonly cited frequency for recommissioning. By investing only 1.5% to 2% of the value of the building systems, you ensure the continued function and value of the building assets.*

Carbon Reduction

The idea of resiliency can be applied to one building system or to a nationwide chain's fleet of stores. As a few speakers at the 2022 conference mentioned, cost and availability of energy in the future may not be as dependable as in the past.

Reducing carbon emissions, or CO2 gasses released by burning fossil fuels, is beneficial for the environment and the balance sheet. Utilizing onsite power production, such as solar, helps reduce the kilowatt-hours used by a facility while helping to reduce the peak demand and associated charges. As the grid ages and becomes less dependable, disruption will increase. Effects are already being felt in places such as Texas and California and are likely to continue to increase as weather patterns become more volatile and extreme.

One easy way to reduce the carbon footprint of the facility is simply choosing the "clean energy" option from the local utility. Another step is to eliminate the burning of fossil fuels in the building by using all-electric appliances for cooking, water heating and space heating.

Reducing energy usage not only reduces energy bills, but it is also just as effective at reducing carbon. Utilizing high-efficiency HVAC units, refrigeration equipment, cooking appliances, water heaters and lighting; operating intelligent building system controls; sealing up leaking building envelopes; and retro-commissioning are all great strategies for saving energy and carbon.

****PRO TIP:*** *Reducing carbon isn't limited to the walls of your building. Consider what comes into and out of your operation. Challenge your supply chain for carbon reduction opportunities with the materials you purchase, and start recycling and compost programs for the waste you generate. With these steps, facilities can cost less to operate and have less of an impact on our environment.*

Evolving Customer and Employee Expectations

The global pandemic caused a revolution in working from home, cleanliness standards in public spaces, and increased customer awareness of functional systems like ventilation. In this new world order, it pays to be a leader.

Customers have many choices on where to spend their money, and they tend to support businesses that contribute to the greater good. Stewardship of the earth is becoming a larger opportunity than ever, not only for the environment, but for marketing and helping brands stand out against the competition.

Corporations with carbon reduction goals will begin to instruct traveling employees to patronize businesses that have similar carbon and sustainability goals. Carbon benchmarking will become

businesses that have similar carbon and sustainability goals. Carbon benchmarking will become standard practice throughout the hospitality industry, as it has already taken over the lodging sector of hospitality.

Gone are the days in which employees put up with a smoky, hot kitchen or endure sub-standard cleanliness protocols when their labor is in high demand and short supply. Employees expect, and deserve, to be treated with respect and provided a healthy environment in which to work.

To continue to operate “the way it has always been done” will cost more than it makes. All this change in attitude and technology does not have to be overwhelming and scary—it can be leveraged to improve brand recognition, gain industry respect, attract quality employees and more customers. Embrace these trends, and be an energy efficient, customer expectation leader in the restaurant world— because we can and should do better.

Darren Witter »

Krystal Kincaid »

Darren Witter has been with Melink for more than 25 years and is currently the senior vice president of strategic programs. Special thanks to Krysta Kincaid for contributing to this article.