



Design and equipment play a key role in the environmentally friendly kitchen

Many foodservice operators recognize the importance of minimizing their environmental footprint. Resources, such as energy, foodstuffs, and waste disposal, face pressure in terms of price and logistics. It makes sense to carefully examine how an operation can utilize these resources efficiently and minimize the impact on the supply chain.

We often hear about the need for sustainability. When it comes to commercial kitchens, what does that look like in practice?

Carbon neutral and its role in practice for a commercial kitchen

One consideration in assessing an operation's sustainability is its carbon footprint. This refers to the impact of a facility's carbon dioxide emissions, both directly and indirectly. The state of being carbon neutral means the amount of carbon dioxide emissions produced is offset by the equivalent amount of carbon dioxide removed from the atmosphere. Carbon dioxide is a significant contributor to climate change.

Achieving carbon neutrality in commercial kitchens may seem daunting, but there are several ways to reduce or offset carbon emissions. One example of this is energy-efficient equipment. By investing in energy-efficient equipment, whether appliances or ventilation systems, you can significantly reduce carbon emissions. Calculations can be made to compare different types of equipment and their energy use and related carbon impact. Purchasing energy-efficient equipment may require more upfront investment, but it can generate long-term savings on energy bills. Such equipment includes Demand Control Ventilation, the kitchen exhaust system, high-efficiency exhaust hoods and Energy Star appliances.

The second way to reduce carbon emissions is improved waste management. Implementing recycling and composting programs reduces the amount of waste entering landfills that emit methane, a greenhouse gas.

You can also reduce or offset carbon emissions by using renewable energy. This can be purchased from your local energy provider, or by installing the means of producing such energy (solar, wind) on your property. Tax incentives may offset the costs of renewables and save energy costs over time.

The fourth way to reduce carbon emissions is local sourcing. Depending on the size of the operation, local sourcing of ingredients from local farms may be a viable option. This would reduce carbon emissions associated with transportation.

Becoming carbon neutral involves some additional costs, and the additional investment will lead to long-term savings and benefits. It will reflect positively on your brand and customer loyalty, as customers seek businesses that invest in these practices and, importantly, reduce environmental impact.

What does a sustainable kitchen look like?

Commercial kitchens and ventilation are essential for maintaining a safe and healthy environment. It's important to consider that the ventilation system is only one aspect of the total kitchen design that impacts sustainability. Everything from sourcing foodstuffs, how they are processed and distributed to the water usage, construction methods, and a host of other elements all impact sustainability. Inherently, the kitchen ventilation system uses energy, so how does one reduce that impact and move toward sustainability? And what would be the steps for achieving sustainable commercial kitchen ventilation?

First, it is important to pay attention to the design. It may seem obvious to properly design the kitchen ventilation system, but choosing the type and style of hood directly impacts performance. All exhaust hoods over the same cookline extract the same convective load and effluent, but they do them at different exhaust rates. Like miles per gallon ratings, exhaust hoods by type (backshelf, hybrid, canopy) exhaust to varying rates for the duty load. Choose one that is highly efficient, and exhausts at the lowest possible exhaust rate for the given cooking load while providing full capture and containment. An efficiency standard test method, ASTM 1704, was developed in North America. It measured the efficiency of exhaust hoods under the same load conditions for full capture and containment of the convective plume and effluent. In this way one can compare the efficiency of different hoods from different manufacturers. One that stood out was Halton's Capture Jet, reducing the exhaust volume by as much as 30% over conventional hoods.

As a second step, use energy-efficient appliances. Most appliances have an Energy Star rating, and this is an excellent starting point. For a given energy input, an appliance type can utilize that energy more efficiently, and cook more or for longer than another appliance that is not Energy Star rated. Seek out your appliance expert for guidance on the proper selection.

The third step would be utilizing Demand Control Ventilation (DCV). These systems vary the volume of the exhaust based on the cooking duty, and when off, idling, and cooking to minimize the exhaust and match it to what is needed for the generated load. The types of DCV systems vary and are addressed in a previous KV.com article. The return on investment for these systems is generally pretty short (2–3 years), and ASHRAE 90.1 identifies it as one of three prescribed energy reduction methods for kitchen exhaust. The offering of Demand Control Ventilation varies widely in the industry. The most basic use an RTD (Resistance Temperature Detector), a bimetallic device that expands at a known temperature, while others may use a Thermal Imaging Sensor that can measure over 190 separate points on the cooking surface. The principal difference between them is reaction time and accuracy. The more sophisticated systems are connected to an IoT platform for data collection and analysis. These systems are also provided with other sensors, such as IEQ and Fire Prevention detection. One such system is Halton's SafeGuard, incorporating a common IoT-based platform and integrating DCV, IEQ and fire mitigation technologies.

The next step is to focus on maintenance. Maintenance is an often overlooked facet of sustainability. An improperly maintained exhaust and associated components increase energy use, and filters can become clogged, thus increasing resistance to airflow, for example.

The fifth step would be to evaluate the use of transfer air or recirculating air. Already conditioned air is effectively used twice when transferred to an adjoining space. Your mechanical engineer can guide you in this approach. It is also another element of ASHRAE 90.1 for meeting energy reduction methods for commercial kitchen exhaust.

As a last step you should consider the use of natural ventilation. This can be done in a controlled way, especially during the ideal times of "bridge seasons" of spring and fall, depending on your local climate, to take advantage of nature's free cooling.

These are a few steps that can be taken to improve the sustainability of your commercial kitchen ventilation system, reduce energy usage, and create a safer and healthier environment for your staff and customers.



Halton SafeGuard



Thermal Imaging Sensors