



## Getting the Most from Your Cooking Equipment



# THE BALANCE POINT ISSUE

## “Simultaneous Heating & Cooling of Kitchens”

by Tom Stroozas, CFSP — Manager – Commercial Marketing Piedmont Natural Gas

Would you ever think of not balancing your checkbook from time to time to ensure your fiscal integrity? The same philosophy should apply to your kitchen exhaust system. Many of us simply assume that things are operating properly when the possibility that they are not could amount to thousands of dollars a year literally going up the hood!

The issue at hand is the inadvertent, simultaneous heating and cooling of your kitchen. This is a commonplace situation that so often goes unchecked. In these days of higher energy costs, this BALANCE POINT ISSUE, properly implemented, can save you money and make a significant contribution to that ever important bottom line!

Consider this example taken from a restaurant in the Midwest. The operator called a local energy consultant for the purpose of determining ways to save money by reducing energy costs and making the kitchen environment more comfortable for the employees. Here is what was found:

- Outdoor temperature is 35°F.
- Kitchen thermostat is set for 70°F (heating) & 75°F (cooling).
- Kitchen is warm and the temperature is higher than 75°F.
- Warm air is being discharged into the kitchen

through openings in front of the exhaust hood.

- Cool air is being discharged into the kitchen through diffusers in the upper wall across from the exhaust hood.

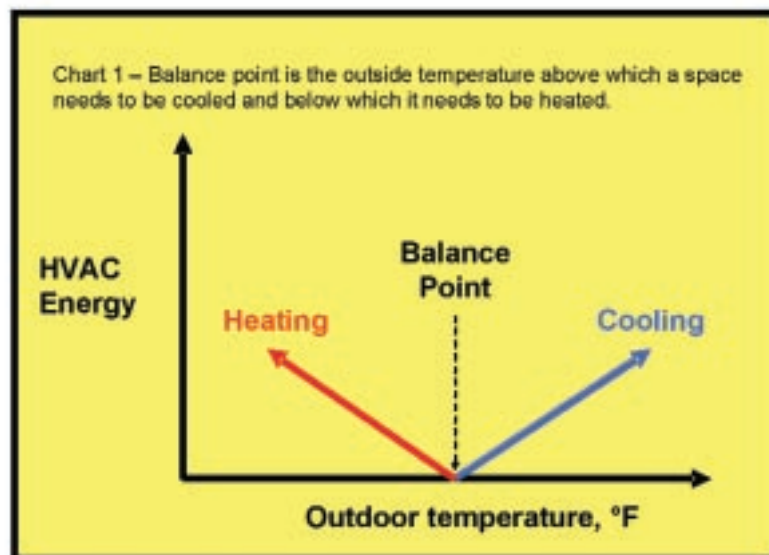
- The galley type kitchen is long and narrow with a long hood located across from a pass through opening between the kitchen and dining room service area.

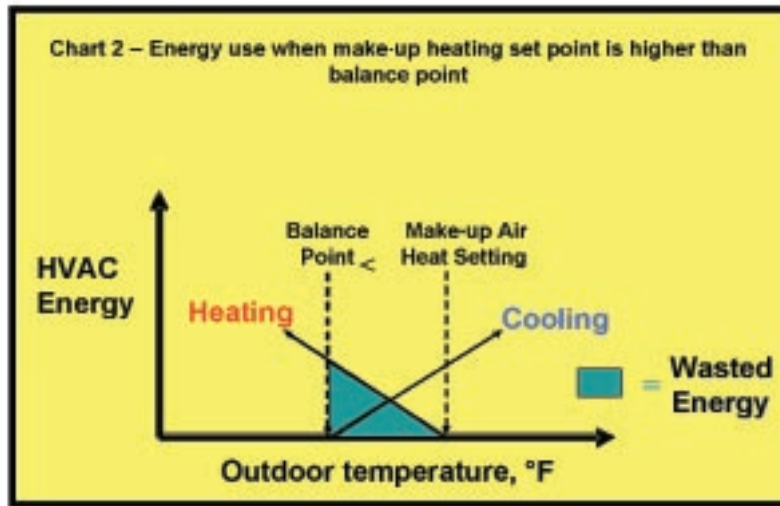
### What’s the problem?

A rocket scientist isn’t needed here to realize that the kitchen is warm enough from the ambient internal heat gains and heated makeup air to cause the temperature to rise above the thermostat set point. This in turn causes the AC to come on to cool the kitchen. The result is that the kitchen is being heated and cooled simultaneously! It may be accidental, but nevertheless, it’s a common situation that is clearly a waste of energy and money! Put another way, there is a silent and invisible “thief” stealing your hard earned profits!

### The Balance Point Issue...

A simple understanding of the “heating/cooling balance point” helps explain this problem. The balance point is the outside temperature above which a space needs to be cooled and below which it needs to be heated. (see Chart 1) Since there are a number of





sources of heat in all buildings, the balance point in most residential and commercial applications is typically about 65° F. But because there are greater opportunities for internal heat gains in typical foodservice facilities, including cooking equipment heat, lights, refrigeration, people, etc., the balance point is generally much lower, often in the 50s or even lower in some instances.

In the case study example above, the balance point is in the lower 30s, which is not all that unusual given the fact that there are a lot of appliances radiating a fair amount of heat in a small kitchen. And, one must realize that applying heat to the kitchen from HVAC lowers the effective balance point further since the cooling run time increases as the outdoor temperature decreases.

### Explaining the Control Issue...

In most cases, the kitchen make-up units and controls are sourced through restaurant equipment suppliers and the HVAC systems are supplied by mechanical contractors. The HVAC units are usually controlled via zone thermostats, with the kitchen and dining room(s) each controlled separately. Typically, the make-up air units are controlled by setting an outdoor temperature “turn on” temperature (a thermostat setting at which the make-up air is either heated or cooled) and a discharge temperature (the desired temperature of the make-up air as it enters the kitchen). If the kitchen temperature is high enough to cause the air conditioning to turn on, there is usually nothing “hard wired” to prevent the make-up units from providing heat to the kitchen simultaneously. This was the situation in the case study, and Chart 2 illustrates the energy use in such a situation: the make-up heating set point is higher than the balance point. The triangular area is the wasted heat energy.

### Bottom Line...

Some suggested solutions to avoid this simultaneous heating and cooling phenomenon may include: (1) install an interlock between the HVAC and make-up unit controls. This is the best solution but possibly difficult to do because of system control incompatibility; (2) set the make up heat discharge temperature to below the known or estimated balance point for your kitchen. Consider a starting point of around 55° F then monitor the kitchen conditions and rooftop equipment to check for simultaneous heating and cooling. From there you can continue to lower the make-up heating temperature until the simultaneous condition goes away. This will help you master the challenging “balancing act” and be on your way to having a more comfortable kitchen while reducing energy costs and adding more profits to your bottom line!

There are many manufacturers of ventilation systems that produce a variety of make-up air designs. In the 30th Edition of the Foodservice Gas Equipment Catalog, published by *Cooking for Profit*, you will see many examples of modern kitchen ventilation systems and make up air units to choose from.

I hope this brief overview has provided you some valuable insight on the importance of how a properly controlled kitchen ventilation system will make your operation more employee and customer friendly and contribute to your overall bottom line! And, I would like to express appreciation to Doug Horton, CFSP, D. J. Horton & Associates, Inc. for contributing to this article. Remember, eliminating the simultaneous heating and cooling of your kitchen will pay big dividends!

For more information on the GFEN series of Commercial Kitchen Ventilation Workshops, please log on to the Gas Foodservice Equipment Network’s website at [www.gfen.info](http://www.gfen.info) or e-mail me at: [tom.stroozas@piedmontng.com](mailto:tom.stroozas@piedmontng.com).



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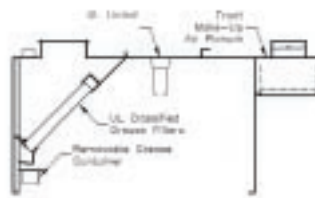
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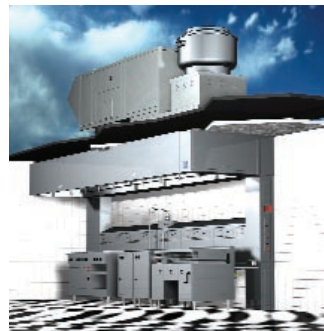
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