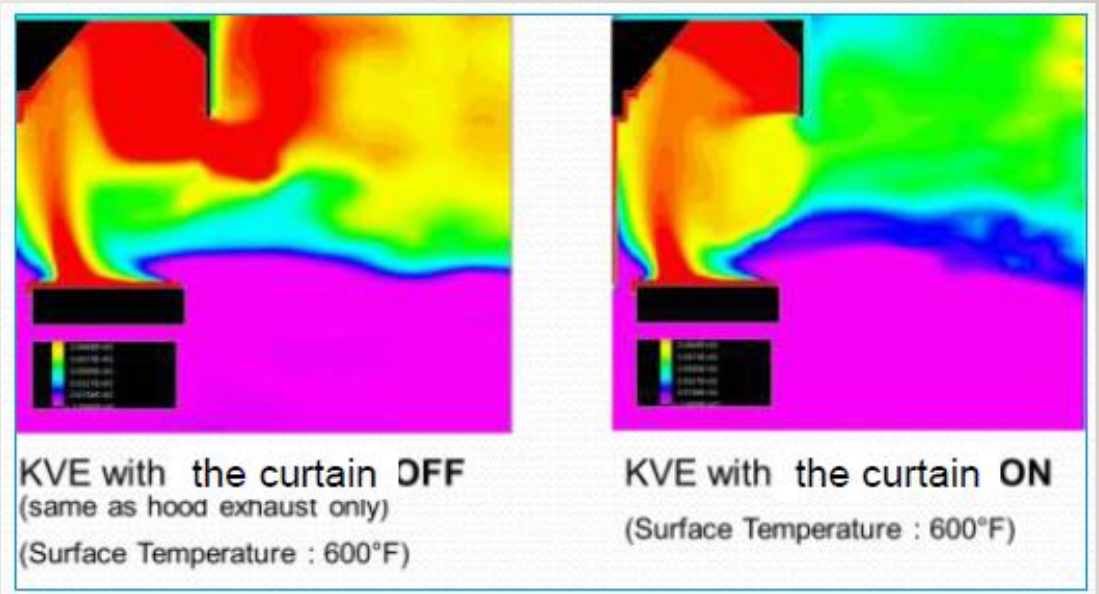
# HEAT RECOVERY IN COMMERCIAL KITCHENS

WITH THE ENERGY INTENSITY OF COMMERCIAL KITCHENS, THERE ARE SOME SIGNIFICANT OPPORTUNITIES TO RECOVER WASTE HEAT, SAVE ENERGY AND REDUCE YOUR CARBON FOOTPRINT.

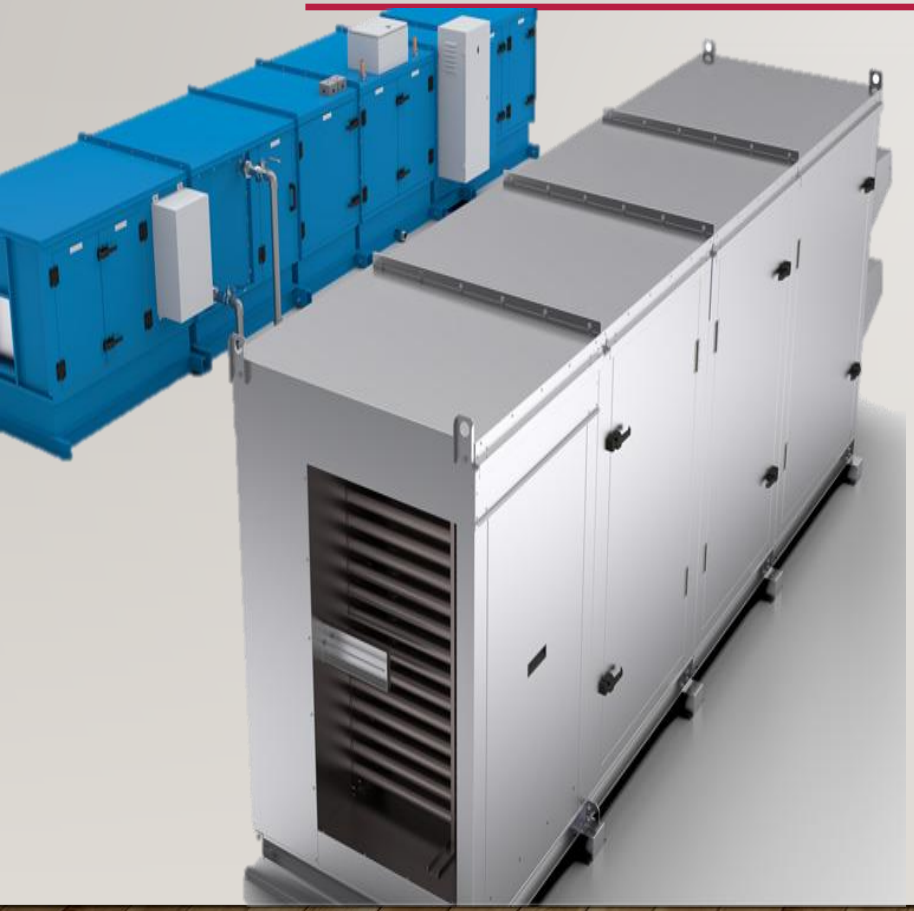
HTTP://WWW.TECHNICALAIR.COM/EC-COMMERCIALKITCHENS

# WHERE CAN HEAT BE RECOVERED IN A COMMERCIAL KITCHEN SYSTEM?

- The most obvious area to recover heat is the kitchen exhaust hood
- The typical temperature coming off the exhaust collar is approximately 100⁰ F
- Recapturing that heat has its challenges
  - The exhaust air is laden with effluent from the cooking process
    - Left untreated, it would clog a heat recovery coil in short order
- To prevent or minimize coil fouling and make the economic and environmental case for heat reclaim requires additional equipment



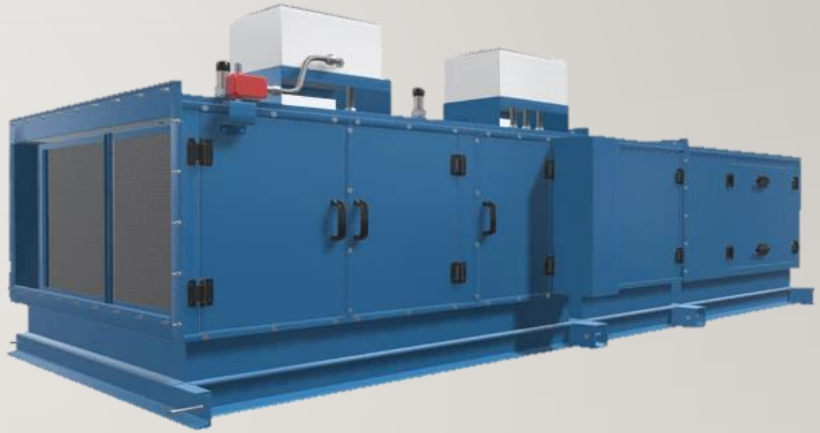
# BUT FIRST… WHAT IS A TYPICAL HEAT RECLAIM SYSTEM?

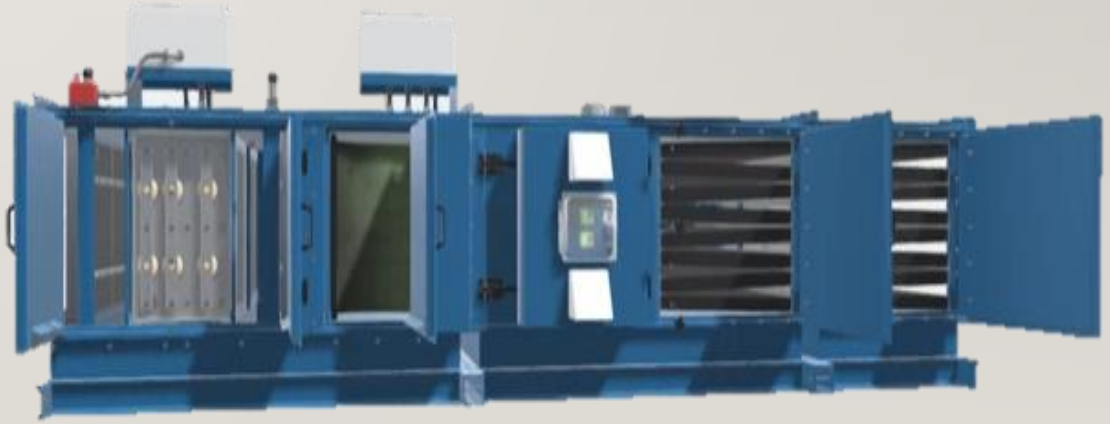


- Recovering heat requires a reciprocal heat reclaim system to offload and use the captured heat
  - Achieved through a glycol run-around loop
- A heat reclaim coil is installed in the exhaust air path, and the “loop” has glycol flowing through it
- Heated air passes over the coil, glycol warms and is pumped in a continuous loop to another coil in the make up air unit
  - Coil is typically installed in the path of the incoming outside air
  - Results in outside air temperature being raised (the temperature increase is a function of the outside air temperature and the recovered heat)
  - Effectively preheating the makeup air with free energy before the heating unit (direct gas, indirect gas, electric and alike.)
- Another option is to preheat hot water so that less energy is used to bring the water to temperature
  - In the case of hot water, storage has to be considered

# MITIGATING COIL FOULING

- To mitigate the coil fouling, Heat Recovery Unit coils are installed in pollution control units that filter the air before it travels to the HRU coil
- Refer to the articles at The Engineering Corner that cover this subject
- The pollution control unit is mated with a make-up air unit with a complementary coil
  - these units have a filter on the fresh air intake in front of the coil





# ENERGY RECOVERY RATIO / ROI / IMC CODE SUMMARY

- Systems can be designed to provide a sensible energy recovery ratio as high as 40% for design conditions
  - The manufacturer can calculate the sensible energy recovery ratio of the system
- Manufacturers producing these systems can estimate an ROI for the system
  - As a rule of thumb, the lower the design temperature the greater the opportunity for a quick payback
  - Northern border states and Canada are prime markets for these systems.
- The international mechanical code allows for heat reclaim systems in commercial kitchen exhaust
- HRUs can be confused with Energy Recovery Systems
  - **The requirement is that the HRUs only recover sensible heat utilizing a coil**

# CONTACT THE EXPERTS

- Learn more about Halton Group's Heat Recovery Solutions along with their complete commercial kitchen line by going to http://www.technicalair.com/halton
- Contact the Technical Air Systems' Sales Engineering Team at 973-285-0333 or by email at solutions@technicalair.com
- Learn more about Technical Air Systems, Inc at http://www.technicalair.com/
- Read more article about Commercial Kitchens along with Air Handling & Air Distribution and Building Performance & Controls from the Engineering Corner: https://bit.ly/techairEC