



Commercial & Industrial Bakeries

Sustainable Waste Heat Recovery System



Commercial and Industrial bakeries use significant amounts of energy in the baking process and to maintain facilities ventilation and environmental conditioning. This combination of continuous process loads and building demands, allows significant potential for waste heat opportunities to reduce energy cost and also the opportunity to demonstrate environmental responsibility, by reducing your corporations carbon footprint.

Traditional Method

Steam boilers have been the traditional method of providing process heating in bakeries for many years. Given their ability to directly satisfy the humidification “wet-heat” requirements and serve as a reliable heat source, steam boilers were a good fit at that time. However, things have changed. Energy costs have more than doubled over the past few years and volatility is still a major concern. Thus, efforts must be taken to remain competitive. Air Management Technologies’ Waste Heat Recovery System is a step in the right direction.

Sources of Waste Heat

Sustainability measures have received increased attention over the past few years and technologies have emerged that offer various methods of energy conservation, as well as greenhouse gas reductions. Several commonly used technologies that also have a key waste heat component include oven/oxidizer stack economizers, combined heat and power systems (CHP) consisting of micro turbines and fuel cells, and industrial grade heat pumps.

Our Sustainable Waste Heat Management System (SWHMS) can efficiently manage these technologies from a single or multiple sources to deliver your facilities heating needs and

is flexible enough to have future devices added (generation or distribution) with minimal modifications, allowing expansion of your “free utilities” potential, to include CHP systems with electrical generation capabilities.

Considering which technology makes the most sense depends on numerous factors including throughput of products, utility rate structure, logistics, rebates, etc., but with various technologies available, a solution can now be achieved for almost any size bakery.

Why Waste Heat Recovery Systems?

- Significantly reduces energy usage and environmental impact
- Can result in lower installation costs versus steam
- Eliminates the need for a traditional boiler room and associated building costs
- Saves maintenance costs with no feedwater treatment and boiler maintenance
- Utility that can expand to meet future needs
- Electrical power generation (peak shaving, standby)

Sustainable Waste Heat Recovery System

How Does it Work?

System operation is accomplished by utilizing waste heat from the oven exhaust stream, CHP or industrial heat pump with control elements to regulate the heating output. Our patent pending Sustainable Waste Heat Management System (SWHMS) consisting of two copper-tube water heaters, fluid cooler (optional), pumps, controls and specialties manages the waste heat recovered and serves several purposes including backup in case of primary system failure, operation during cold starts, and as a peaking device to maximize the recovered energy. This system assures constant supply of heat to the processes during all modes of operation and is typically located outdoors eliminating need for building space and many boiler room code and operator requirements.

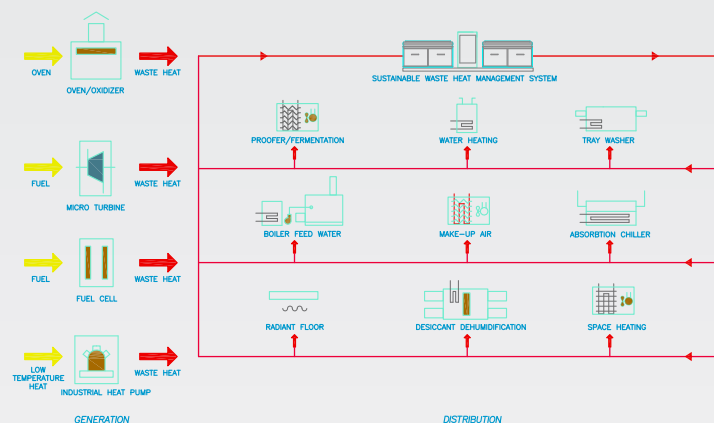
A central hot water glycolic distribution loop provides heating from the recovery system to end uses at a temperature between 200°-210°F. By incorporating a combination of compressed air atomization and/or high-pressure humidification systems to proofers and fermentation rooms, both dry and wet heat loads are satisfied at a fraction of the cost. Control of the processes is maintained by a combination of direct digital or programmable logic controls and interfaces with vendor equipment.

Guaranteed Energy Savings

When implementing a project like this, return on investment is a primary goal. With new installations, the cost is many times completely defrayed by eliminating the conventional steam boilers. Thus, savings immediately begin providing a positive cash flow!

- Two-line plants can save \$40,000-80,000 per year in energy costs or more depending on generation options.
- The system also provides a degree of protection against natural gas price volatility. Savings will increase proportionally with natural gas prices.
- Heat recovery is also very efficient, delivering greater than 98% of the energy, compared to traditional boilers, which deliver only 70%.
- The system is monitored 24/7 by a Web-based controller that allows remote access to the system
- Grant and utility incentives may be available to help offset initial cost

Waste Heat Recovery Schematic



Environmental Benefits

Environmental impacts now and in the future are a major consideration as we see an increased commitment to managing air and water quality to improve the environment. This is a major driving force behind this type of project, which will eliminate several hundred tons of greenhouse gas emissions per year!

Get Started Today!

When considering all of the benefits of heat recovery it is hard to imagine operating a bakery without implementing this design concept. In most cases, new installations will provide a positive cashflow from startup. There is also ample opportunity to retrofit existing plants with typical returns ranging from 15-25%. These retrofit costs can be offset to provide a quicker return when capital can be attributed due to a need to replace or upgrade existing boilers, refrigeration or power generation.

Operational Process Loads Annual Cost

