Energy Consumption and Waste in Food Service: The Impact & Solutions

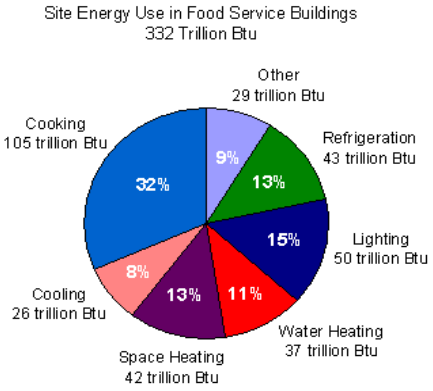
The food service industry contributes significantly to our nation's economy and way of life. In the last ten years, this industrial sector has experienced continued real sales growth outpacing that of our nation's own economy. In 2011, the total food sales were over $1.7 trillion[1]. Due to the vast number of food service operations (the NRA estimates over 970,000 restaurants along with non-traditional and other food locations there are about 1.2 million locations) and the nature of preparing and serving food, this industry uses tremendous volumes of natural resources and produces significant quantities of waste which together can result in major environmental impacts. The reasons for change within this industry in order to minimize waste are simple: food service managers can save money with decreased disposal fees, reduce energy consumption, gain efficiencies and stay competitive within their industry.

Changing or improving operations can have lasting effects on those food service establishments that are proactive in reducing waste and increasing efficiency. To remain competitive, businesses should consider going beyond traditional means of management and explore the opportunities to save money and help the environment with waste prevention. Many of the opportunities detailed may already be in place; however, every operation still has room for improvement.

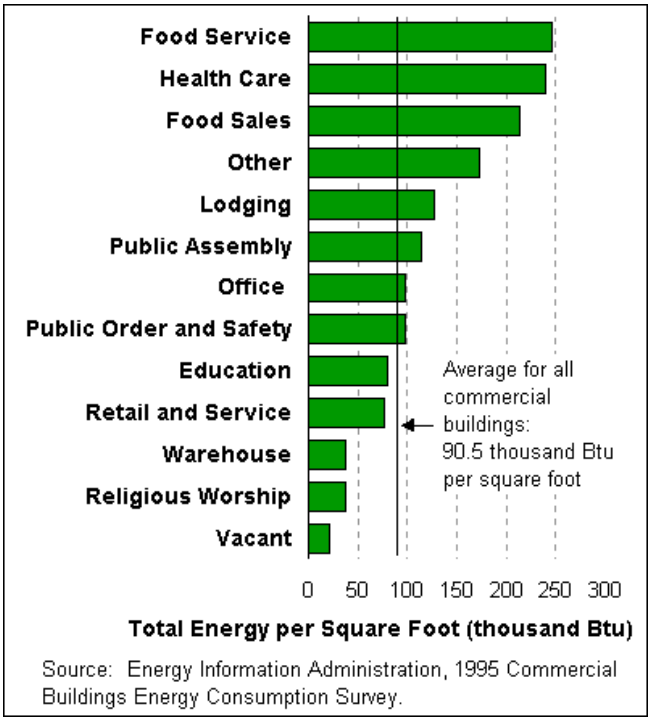
Energy Consumption in Food Service Sector

It is reported that the **total** energy consumption in commercial food service and food retail industries amounts to less than one percent of the total national energy consumption. Total energy consumption for commercial food service and food sales in 2003 was 242 trillion Btu and 64 billion kWh. This amounts to roughly 12.5 percent and 6.0 percent of total commercial building energy consumption, respectively.[2] Typically, 3-5 percent of total restaurant (food service operations) expenses are directly related to energy costs.[3] Food service and health care buildings are the most intensive users of energy. Both of these activities require specialized equipment that would result in higher than average energy use.

The chart below demonstrates that the most significant uses of energy for the commercial foodservice industry are cooking, lighting, refrigeration and space heating. (Source: Energy Information Administration, 1995 Study)



The data found in this profile is from the 1995 Commercial Buildings Energy Consumption Survey (CBECS), which is the most recent survey for which results are available. Currently, only office, education, health care, retail and service, and food service buildings are profiled.



Source: Energy Information Administration, 1995 Commercial Buildings Energy Consumption Survey.

Where to Start Saving?

The first thing is to quantify your 'waste' and determine what areas are the easiest to begin addressing. Use energy only at the exact time, the exact place and in the exact amount you need to produce the volumes and quality your customers require. Also, work with a food service operational consultant to understand your equipment/resource needs and then a professional design consultant that can identify and appropriately size the equipment to your volumes.

Energy providers point out most companies focus on the energy consumed by lighting, heat and other basic facility requirements. These costs comprise only about 40 percent of the average energy costs and, in an energy-intensive business like food, they may comprise an even smaller percentage.

An energy specialist may identify opportunities in the production and help slash the cost of that other 60 percent of the operations' total energy bill, which often is invisible to management.

Some resources to consider in identifying the waste and resources for efficiency improvement include:

- Local utility companies
- Independent Foodservice Operation, Design or Energy Consultants
- The federal government's Industrial Assessment Centers program (www.oit.doe.gov/iac)
- Universities with high-profile engineering departments often can provide energy audits that go beyond the scope of a utility-directed audit.
- The U.S. Dept. of Energy's Industrial Technologies Program (ITP) (www.eere.energy.gov)
- The California Energy Commission offers a series of handbooks on energy efficiency, including *How to Hire an Energy Auditor to Identify Energy Efficiency Projects; Energy Accounting: A Key Tool in Managing Energy Costs; How to Finance Public Sector Energy Efficiency Projects;* and *How to Hire an Energy Services Company.*
- Pacific Gas & Electric (www.pge.com), California's largest energy provider, actively assists its customers in energy management.
- The U.S. Environmental Protection Agency (EPA) (www.epa.gov) and their Energy Star® Program (www.energystar.gov)
- Rebate finder go to www.energystar.gov/CFSrebate_locator
- Consortium for Energy Efficiency (www.cee1.org) and their certification of efficient commercial kitchen equipment (www.cee1.org/com/programsummary/index.php). CEE also lists the utility company participants that will recognize and give incentives for using 'rated' equipment

Contributions by Kitchen Equipment Manufacturers

According to the Consortium for Energy Efficiency (CEE), the ability to reduce electric, gas and water consumption by using equipment identified as 'efficient is between 10 and 60 percent. There is equipment in the categories of cooking, refrigeration and sanitation to be used in the development of a new or replacement kitchen project. CEE uses the Energy Star® program to make its determination for 'qualified equipment'. A few highlights for the Energy Star® 2010 achievements include:

- Prevented 170 million metric tons of greenhouse gas emissions in 2010 alone
- 1,600 manufacturers are using the Energy Star® label with more than 40,000 individual product models available
- Almost 150 hospitals in the U.S. has been assessed using the EPA's energy performance rating system
- 70 architect and engineering firms are now participating and carrying the designation of "Designed to Earn the Energy Star®"
- 2012 Energy Star Award for Excellence---Hoshizaki America, Inc. Partner of the Year—Product Manufacturer was awarded to Scottsman Ice Systems and for Sustained Excellence went to Hobart Corporation.

Highlights representing some 1,600 manufacturers and their almost 40,000 products that meet the Energy Star® criteria and/or are documenting utility/waste savings, include:

Ice Machines: Manitowoc, Scotsman, Ice-O-Matic and Hoshizaki

Fryers: Frymaster, Henny Penny and Pitco

Refrigeration: Continental, Delfield, Traulsen, True and Victory

Holding/Heating/Cooking: Cambro, Metro, Traulsen, Vulcan Hart and Wittco

Sanitation: Hobart, Somat, Stero, Meiko and Champion

A few of the 40,000 pieces of equipment that are available[4]:

1. Everpure®—a water conditioning system can lower energy costs up to 39% by reducing the amount of scale build up over time around heating elements such as those found in steamers or combi ovens (www.everpure.com).
2. Scotsman's qualified Prodigy ice machines can save as much as 20% in energy costs.
3. Hobart's Opti-Rinse™ has been installed in their "C" and Flight dish machines. This feature has allowed a 50% reduction in water use and energy consumption.
4. Hobart's WastePro 1200 (a pulping system) saves in water use and reduces up to 88% waste by volume as compared to traditional disposals. *Pulpers from an array of manufactures can generate similar savings/reductions. However pulpers are best suited for larger operations that generate high volumes of waste.*
5. Don't forget direct water savings….check out www.allfountains.net/versafiller.html.

As a final note, food waste is a growing issue as well as utility waste. In addition to the high utility and natural resource use in food service, a remarkable 34 million tons of food annually goes to waste in the U.S.[5] This number encompasses both commercial as well as residential waste.

Foodservice being a large 'user' of food needs to look to the future as how to reduce this in the food preparation process as well as how we handle the disposal of the waste. Kitchen procedures, recipes, food specifications (raw ingredients to pre-prepared) and staff behavior/training can all be tapped to reduce the waste output. Additionally, focusing on operational changes, automation and tracking waste are key elements in reducing waste.

However, when food waste is inevitable there is now equipment/technology that can help process waste organically on site. Don't forget to review disposals, dehydrators, pulpers or digesters. One example of a dehydrator system is the Somat DH100. The process allows for food waste, compostable disposables and cardboard to be heated up to 180°F that converts to a product that is used for soil amendment/dry and odor-free. For more information go to www.somatcompany.com.

The food service industry is pushing to achieve more availability of energy efficient/waste reducing products to offer as well as to look at their own manufacturing processes. Specialist participants in design or operations of a kitchen need to take the time to learn what is available, how to specify the right equipment and advantage any local, state and/or federal savings and rebate programs.

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Resources:

1. Plunkett Research 2011 www.plunckettresearch.com and 2011U.S. Census Bureau News
2. Energy Information Administration, 1995 Commercial Building Energy Consumption Survey
3. Platts Research and Consulting: Managing Energy Costs in Restaurants 2002
4. Various websites of the manufacturers were used to compile this information. There are 1000's that could be listed; this is just a small sample.
5. 2010 EPA Estimate www.epa.gov/osw/conserve/materials/organics/food/fd-basic.htm