



Commercial Cooking Appliance Technology Assessment

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Executive Summary

This technology review presents a comprehensive description and energy performance assessment of commercial cooking equipment. In the absence of energy-efficiency standards and rating systems, all classes of commercial food service equipment have historically exhibited relatively poor energy performance. Possibly the greatest hurdle to improving the efficiency of commercial food service and refrigeration equipment is the lack of understanding (by both manufacturers and purchasers) of benchmark efficiency. If the buyer is not exposed to accurate efficiency data, there is less incentive on the part of the manufacturers to improve equipment performance. If the buyer does not realize that the most energy efficient appliance option may also be the best performer, the hurdle is even more difficult to knock down. Significant energy savings have been achieved in residential refrigeration equipment, yet proven energy savings technologies have not been implemented in the commercial markets.

In 1987, with co-funding by the Electric Power Research Institute (EPRI), the Gas Technology Institute (GTI), and the National Restaurant Association, the Pacific Gas and Electric Company undertook the development of uniform testing procedures to measure energy efficiency and evaluate the overall performance of gas and electric cooking equipment within the scope of the Food Service Technology Center project (FSTC), operating in San Ramon, California. At the end of 2001, the FSTC had developed 30 standard test methods for the performance of commercial food service equipment.

When the FSTC research team completes a uniform testing procedure for a particular appliance category, the document is submitted to the American Society for Testing and Materials (ASTM) F 26 Food Service Equipment Committee, where it is reviewed by a group of industry professionals, then ratified and published as an official ASTM Standard Test Method. These test methods produce unbiased energy performance data that can be used to help end users and designers specify energy efficient equipment, qualify Energy Star[®] candidates and help determine minimum mandated standards for

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energy efficiency. Manufacturers use these test methods to benchmark and improve the efficiency and performance of their equipment. End users have used the test methods in partnership with their equipment suppliers to improve the efficiency of specific appliances they purchase.

Although the application of advanced technologies could improve the performance and energy efficiency of the existing stock of food service equipment, the application of existing technologies, such as insulation, improved heat exchanger design, and enhanced controls, may provide the greatest return over the short term.

Overall recommendations of this study include:

- Continuing commercial appliance testing programs (e.g., FSTC) that can be used to further benchmark energy performance in direct support of R&D projects for commercial cooking equipment.
- Using benchmark performance data as justification, developing an industry strategy that will influence the purchase-decision criteria so that customers will specify more energy efficient equipment.
- Developing and sponsoring training courses and workshops for the food service and utility industries based on this appliance technology review.
- Initiating research and development projects that will deliver the greatest return for R&D dollars invested (i.e., that achieve the largest efficiency gain for the largest percentage of equipment installed in food service facilities). The R&D focus needs to be on improving part-load performance of gas cooking equipment and reducing the cost premium associated with producing more efficient equipment. New equipment needs to be compatible with the NAFEM Online Kitchen Protocol.
- Collaborating with European utilities and research groups (such as Gaz de France) on appliance R&D initiatives.
- Developing a web-based appliance efficiency directory reporting data acquired through testing in accordance with the ASTM Standard Test Methods for evaluating the performance of commercial cooking

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equipment. Initially, such a directory would rely extensively on the efficiencies reported by FSTC and cover a fraction of the cooking equipment on the market. However, such an initiative would increase awareness in the industry, hence stimulate manufacturers to have their equipment tested in accordance with the ASTM test methods in other U.S. and Canadian laboratories. A natural extension is promoting Energy Star[®] as a voluntary labeling program.