Why Are Commercial Food Service Utility Incentives so Tasty? Best Practices and Technologies for Utilities to Create Energy- and Water-Efficient Restaurants

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ABSTRACT

Utility incentives for energy-efficient commercial food service (CFS) equipment are growing in popularity and diversity due to the significant savings potential. While many utilities are planning to develop CFS incentive programs, this particular sector is a complex and challenging marketplace to transform. Utilities must overcome market barriers such as difficulty in reaching key decision makers, lack of energy efficiency knowledge, and the higher prices of energy-efficient CFS equipment. To assist this market segment's transformation, the ENERGY STAR® program and the Pacific Gas and Electric Company Food Service Technology Center (PG&E FSTC) created free tools and resources for utility CFS program administrators (and other market actors) to help create successful CFS incentive programs or improve upon programs already in place.

Introduction

The paper *Cooking Up a New Approach for Program Design II: A Recipe for Success* (Abadir et al. 2008) highlights the expansive growth of three CFS incentive programs when the program administrators implemented a market segment strategy (i.e., focus upon the different needs of CFS market segment: quick-service restaurants, full-service restaurants, schools, etc.). The authors then outlined successes of this strategy by highlighting the impressive growth of three utility programs: Pacific Gas and Electric Company (PG&E), Wisconsin's Focus on Energy, and New York Energy Research and Development Authority (NYSERDA).

Other utilities are following suit and developing their own CFS incentive programs. According to the Consortium for Energy Efficiency (CEE), the number of CFS incentive programs in the U.S. and Canada grew by 18 utilities to a total of 79 in 2010 (see table 1).

This paper outlines possible reasons for CFS program uptake, building upon ideas expressed in *Cooking up a New Approach to Program Design II.* This paper also presents tools and resources that the ENERGY STAR program[1] and PG&E FSTC[2] offer utilities for developing a successful incentive program and for reducing program costs.

[1] ENERGY STAR is a joint program of the U.S. Environmental Protection Agency and the U.S. Department of Energy helping us all save money and protect the environment through energy efficient products and practices. Learn more at: www.energystar.gov.

[2] PG&E FSTC is the industry leader in commercial kitchen energy efficiency and appliance-performance testing as well as a leading source of expertise in commercial kitchen ventilation and sustainable building design. The FSTC

CFS Market: Long-Term Potential for Profound Energy Savings

Commercial kitchens can vary significantly in the types of equipment they use to prepare, store, and present/serve food. Therefore, to be effective in reaching an audience that will purchase energy-efficient equipment and apply for rebates, program administrators should focus on decision makers and their processes for purchasing CFS equipment as well as overcoming barriers in the market place to program uptake (i.e., the market segment approach) (Abadir et al. 2008; Andrews et al. 2006).

Average Energy and Water Use in Restaurants

Restaurants and commercial kitchens consume a disproportionately large amount of energy compared to other commercial buildings—approximately 350,000 British thermal units (Btu) per square foot or approximately seven times more energy per square foot than other commercial buildings (CEC 2006; Young 2010). The average restaurant consumes 59% of its energy use in food preparation, refrigeration, and sanitation (35%, 6%, and 18% respectively). Lighting and heating/ventilation/air conditioning (13% and 28% respectively), make up the remaining 41% of energy use (Fisher et al. 2002). Restaurant kitchens also dominate the water use, accounting for more than 50 percent of water consumption in an average restaurant (ICF 2008).

Table 1: Growth in Number of CFS Incentive Programs in the United States and Canada

Year	CEE Member Programs Promoting CEE and ENERGY STAR Specifications for CFS Equipment Incentives
2004	5
2005	6
2006	18
2007	21
2008	43
2009	61
2010	79

Source: CEE 2010

With high energy and water use, restaurant energy bills average 3 to 4% of sales (NRA 2009). Since this is close to average restaurant profit margins—approximately 5%—energy costs have a strong influence upon profit margins and restaurateurs are beginning to take notice of their energy use (NRA 2009). The intersection of profit motive and energy efficiency is where utilities can drive home the notion that energy-efficient CFS equipment is good for business as well as the environment.

Savings Opportunities and Incremental Price Increases

With few federal standards mandating energy efficiency of CFS equipment, there is wide variability in energy and water use of CFS equipment within each appliance category and depending upon the specific manufacturer and model (Fisher et al. 2002). Energy-efficient equipment saves water and energy through better design, additional insulation, and more energy-efficient components. When properly designed, individual CFS equipment types are often 10 to 30% more energy efficient than their conventional counterparts without sacrificing service quality (Fisher et al. 2002; EPA 2010c).

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program is funded by California utility customers and administered by Pacific Gas and Electric Company under the auspices of the California Public Utilities Commission. Learn more at: www.fishnick.com.

Improved designs often—but not always—come at an increase in purchase price. Differences can range from a low of approximately $100 to $200 for ENERGY STAR qualified refrigerators, to a high of $500 to $1,000 for ENERGY STAR qualified fryers (Andrews et al. 2006). Even with such price premiums, there are significant savings opportunities for end users that purchase ENERGY STAR qualified and energy-efficient CFS equipment (see table 2).

Nationally, the energy saving opportunities are significant as well. The PG&E FSTC estimates that utility costs exceed $25 billion per year[3] for the 945,000 restaurants currently operating in the U.S. (NRA 2010). Approximately one third of surveyed restaurant operators plan to purchase more energy-efficient kitchen equipment in 2010. If one third of 215,000 full-service restaurants in the U.S. acted upon their plan and would purchase a suite of ENERGY STAR qualified CFS equipment,[4] they would annually save the following nationwide: 224 million kilowatt-hours (kWh), 11 million MBtu[5] of natural gas, and 9 billion gallons of water; $213 million dollars in utility expenses (approximately $3,000 per restaurant per year); and 32,000 passenger vehicles' worth emissions (CO_2 equivalent) for a year (BLS 2009; EPA 2010a).

Table 2: Potential Energy, Water, and Cost Savings of Qualified Equipment

	Annual Utility Cost Savings			**Annual Energy and Water Savings**		
Equipment Type	**Electricity** ($)	**Natural Gas** ($)	**Sewer + Water** ($)	**Electricity** (kWh)	**Natural Gas** (MBtu)	**Water** (gallons)
ENERGY STAR Qualified						
Commercial Dishwashers	-	900	364	-	90	52,000
Commercial Fryers	120	590	-	1,100	50	-
Commercial Griddles	230	170	-	2,270	15	-
Hot Food Holding Cabinets	340 to 960	-	-	3,200 to 9,300	-	-
Ice Machines	110	-	18	1,200	-	2,500
Convection Ovens	190	360	-	1,870	30	-
Commercial Refrigerators	200	-	-	1,960	-	-
Commercial Freezers	140	-	-	1,380	-	-
Commercial Steamers	510	400	1,190	4,930	33	170,000
PG&E FSTC Qualified						
Combination Oven	2,030	595	840 to 1,040	19,700	5	148,000
Pre-rinse spray valves	2,240	1,210	875	22,450	104	124,830

Cost estimates based upon: kWh = $0.103; MBtu = $11.77; water + sewer (per gallon) = $0.007

Source: EPA 2010c; PG&E FSTC 2010a, 2010b; NUS Consulting 2009

[3] In PG&E service territory alone, commercial food service facilities account for more than a billion dollars in gas and electric revenues per year.

[4] Suite of equipment includes: ice machine, reach-in refrigerator, natural gas fryer, and high-efficiency pre-rinse spray valve with natural gas water heater.

[5] Million British thermal units (MBtu); 1 MBtu = 10 therms

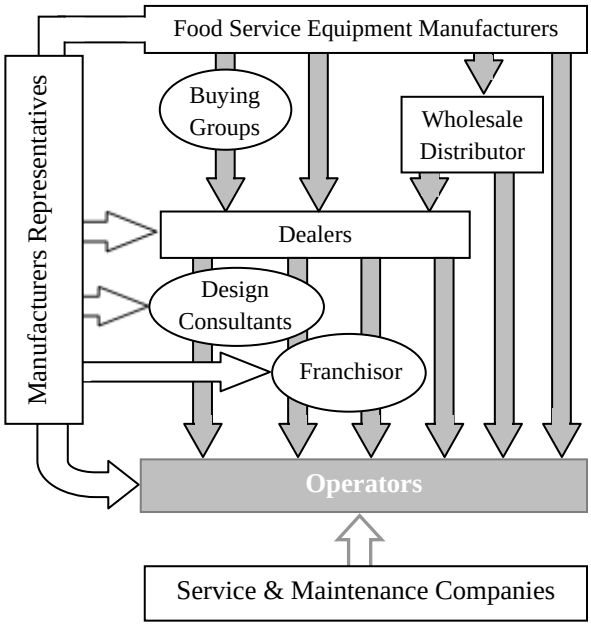
The Complex CFS Equipment Marketplace

The CFS marketplace is a complex grouping of businesses that channel equipment from the manufacturer to the end user. As noted in the previous section, there are a number of significant energy and water saving opportunities that utilities can capitalize upon in the CFS market, but utility program administrators often find gaining access to and informing CFS market actors can be a challenging task (Andrews et al. 2006).

Exacerbating this issue is the sheer number of different companies that work in the CFS market. In 2003, there were 2,000 companies that built, distributed, installed, and serviced equipment used to prepare food outside the home (Cherry Tree 2003). These companies create a complex CFS equipment supply chain (from manufacturer to operator) that utility program administrators often have difficultly untangling in order to target key stakeholders (see figure 1).

In addition to the complex supply chain, how different end-users make their purchasing decisions varies significantly, adding additional complexity. For example, large multi-unit or "chain" restaurants collect information and make equipment purchasing decisions in a very different manner than independent restaurateurs (Andrews et al. 2006). Equipment purchasing decision-makers for quick-service restaurants (QSRs) are often located far from the utility service territory and by the time the utility program administrators hear about the construction of new facilities or upgrading equipment, it is often far too late to influence the decision-making. Unfortunately, the majority of equipment specifications at the corporate level do not embrace ENERGY STAR levels of performance. Independent operators, on the other hand, make their purchasing decisions locally, and are driven more by their individual profitability or the immediate need to replace broken equipment (Andrews et al. 2006). These different decision-making processes can affect the types of utility incentives that are most effective for each facility type or end user (hence the importance of the market segment approach).

Figure 1: Food Service Industry Map



Source: Cherry Tree 2003

Utility Program Description

Utilities must carefully research and design their CFS programs using a market segment approach to affect the complex—and often remote—decision-making processes exhibited by operators. This will also help to overcome the complicated CFS marketplace and take advantage of the significant energy-saving opportunities in this sector. Utility programs should consider the following points when designing their market-segment approach incentive programs: 1) identify a group of utility customers who are primed for the energy efficiency message; 2) identify multiple energy and water saving technologies appropriate to that group that is significant

enough to generate interest; and 3) understand the decision-making process of the group and tailor the program's delivery based upon this process (Abadir et al. 2008).

All three steps are necessary for program success and "the omission of any one of these steps led to mediocre results prior to 2006, whereas once programs addressed all three areas they quickly gained momentum" (Abadir et al. 2008, 11).

A "fourth step" or attribute to consider is having patience. The United States Environmental Protection Agency (EPA) notes that, "While CFS programs can be operational within a two to four month period, given the diffuse nature of the distribution and purchasing patterns associated with this equipment, seeing significant progress in terms of program participation may take as long as one year" (EPA 2009, 7). This time lag can be attributed to the need to educate the CFS marketplace and allow for dealers to churn through their equipment stocks so that new energy-efficient equipment can be stocked on showroom floors.

Three General Incentive Types

There are typically three types of CFS incentives: 1) sales incentives (e.g., salesperson incentive or spiff) to incentivize supply-side market channel actors to sell energy-efficient equipment to customers; 2) prescriptive equipment rebates to offset the incremental price of energy-efficient equipment for customers—usually about half or less of the incremental costs (EPA 2009, 4); and 3) custom incentives which are often offered to utility customers on a case-by-case basis depending upon the specific energy saving opportunity.

Prescriptive incentives are the most common of these three incentive types with a wide range of incentive levels as outlined in table 3.

Table 3: Range of Incentive Offered by Utilities

Equipment Type	Incentive Range
Commercial Dishwashers	$200 to 2,000
Commercial Fryers	$200 to 1,000
Commercial Griddles	$125 to 2,100
Hot Food Holding Cabinets	$150 to 1,000
Ice Machines	$50 to 600
Combination Oven	$200 to 2,000
Convection Ovens	$200 to 1,000
Pre-rinse Spray Valve	$30 to Free
Refrigerators and Freezers	$50 to 500
Steam Cookers	$200 to 1,500

Source: EPA 2010d

Custom incentives often allow utilities to capture energy savings from non-standard equipment and allow utilities the flexibility of offering incentives for equipment that might not be listed in their prescriptive list. This can also be applied to proprietary equipment designed for a specific chain (not slated for the general market), since "the equipment used by chains is often custom-designed for the chain's specific application, which makes prescriptive rebate program supported by a qualified products list irrelevant" (Abadir et al. 2008, 5).

Market Barriers Hindering Program Uptake

An important aspect of designing a CFS incentive program is understanding the barriers to program uptake. Common barriers in the CFS market include:

- **Higher incremental costs**. ENERGY STAR and PG&E FSTC qualified CFS equipment is often more expensive than standard efficiency equipment and significantly more expensive than refurbished models sold in the used equipment market. Also, as previously cited, profit margins for the average restaurant hover around 5%, often making it difficult to have enough cash flow for an additional $1,000 towards an ENERGY STAR qualified fryer.
- **Knowledge gap**. According to PG&E FSTC, the lack of knowledge and understanding by both manufacturers and purchasers of CFS equipment is possibly the largest hurdle to improving the efficiency of equipment overall. Very few suppliers or buyers understand the magnitude of the energy cost savings associated with ENERGY STAR qualified equipment and that these appliances could also be the best performers in their equipment class (Fisher et al. 2002).
- **Complex and difficult market to reach**. As demonstrated with the food service industry map (figure 1), the CFS marketplace is a highly fragmented supply channel making it difficult and time consuming for utility program administrators to reach market actors in their service territory.
- **Low-cost equipment stocking by dealers**. CFS market channel actors (manufacturers, dealers, etc.) often compete on the "low price" of their CFS equipment and therefore stock a limited supply of energy-efficient models. This issue is exacerbated by independent restaurateurs often purchasing equipment only after their current model breaks and they need a replacement model immediately to "keep the doors open."

Overcoming Barriers: Free Tools and Resources

CFS incentives are primarily designed to overcome the "higher incremental cost" barrier. To complement such programs, EPA and PG&E FSTC developed a number of tools, resources, and other types of assistance to diminish market barriers that utilities face: all free of charge. Most of these resources are available online (www.energystar.gov/cfs; www.fishnick.com) and fall into three general categories:

Resources to Overcome the "Knowledge Gap"

- **Education resources**. These include online reports, equipment test results, and guides such as the ENERGY STAR Guide for Restaurants, PG&E FSTC's Green Sheets, and training resources such as seminars offered by PG&E FSTC.
- **Lifecycle savings calculators**. Both PG&E and ENERGY STAR created online calculators that compare the lifecycle costs of energy-efficient CFS equipment to their conventional counterparts, estimating the energy, water, and cost.
- **Marketing and outreach resources**. Utilities that join ENERGY STAR as partners can co-brand marketing and outreach materials including incentive fact sheets, the ENERGY STAR Guide for Restaurants, PowerPoint presentations, and their Web sites. PG&E

FSTC provides technical content for a state-wide educational program sponsored by the four investor owned utilities in California.

Resources to Overcome the "Complex and Difficult Market to Reach"

- **Specifying equipment and qualified product lists**. ENERGY STAR and PG&E FSTC, along with CEE, offer lists of equipment that possess superior attributes to save energy and water. Utilities often cite these equipment lists as the threshold for which to allocate incentives. As the market for a specific appliance type becomes more energy efficient (i.e., manufacturers produce more energy-efficient equipment) or energy efficiency regulations are developed, EPA revises that category's energy efficiency specification (usually making the levels more stringent). EPA usually revises specifications once an ENERGY STAR equipment category reaches 50% or higher market penetration (based upon number of models in the market). EPA calculates penetration rates from data supplied by ENERGY STAR manufacturing partners (EPA 2010b).
- **Matchmaking resources**. ENERGY STAR and PG&E FSTC both have strong networks with utilities and associations, as well as restaurants (both chain and independent), which can facilitate connections between CFS equipment decision-makers and utility program administrators. The four California IOUs also share program information and offer incentives to various other chain restaurants such as Taco Bell and Jack in the Box as well as open channels of communication with CFS equipment manufacturers, which led to incentivizing bottling companies to purchase energy saving refrigeration equipment.
- **ENERGY STAR CFS incentive finder**. This online database of available rebates for qualified equipment is searchable by zip code or by product type. The database is updated frequently and contains most of the utility incentives for ENERGY STAR qualified CFS equipment found in the United States
- **Annual ENERGY STAR CFS incentive guide**. This electronic resource is compiled each year by EPA and contains contact information and incentive amounts for most of the CFS programs in the United States The document is electronically disseminated to ENERGY STAR CFS manufacturing partners, CFS equipment dealers and other interested parties.

Resources to Overcome the "Low-Cost Equipment Stocking by Dealers"

- **Dealer training**. Both PG&E FSTC and ENERGY STAR have CFS dealer trainings available online that helps educate the benefits of energy efficiency.
- **Case studies**. Two case studies describe how Saratoga Restaurant Equipment Sales and Kessenich's boosted their bottom line by stocking ENERGY STAR qualified CFS equipment and leveraging utility incentives to increase sales.

Success Story: PG&E CFS Program

As mentioned in the introduction, PG&E demonstrated impressive success with incentivizing the purchase of energy- and water-efficient CFS equipment in their service territory after adopting a market segment approach. PG&E, in collaboration with the other California investor owned utilities (IOUs), implemented this new approach in 2006 and, by doing so,

increased the value of rebates the utility issued by 8,800% compared to the previous year ($4,815 to $421,907) between 2005 and 2006. The following year rebates issued by the company grew another 250%, or a total of $1,034,000 for 1,322 pieces of equipment. For 2003, 2004, and 2005, PG&E issued rebates for nine, six, and eight pieces of equipment per year respectively (Abadir et al. 2008).

PG&E estimates that in 2006 and 2007, their CFS incentive program generated energy savings (based upon equipment lifetime) of: 1.2 million therms and 24 million kWh in 2006; 2.1 million therms and 93 million kWh in 2007. According to the EPA Greenhouse Gas Equivalency Calculator, the combined energy savings (therms + kWh) from CFS equipment for PG&E in 2006 and 2007 abated the emission of 111,000 tons of carbon dioxide (CO_2) equivalent or the annual greenhouse gas emissions from 19,200 passenger vehicles (EPA 2010a).

For the years 2008 and 2009, even with significant economic decline, PG&E has maintained its rebate redemption at more than 1,200 pieces of equipment per year. This is also significant because California adopted new appliance code requirements, forcing PG&E to "reset" their program specifications and required time for the market to engineer and floor new equipment at higher efficiencies than when the program launched in 2005 (solid door refrigerators 2006, glass door refrigerators 2007, and ice machines 2008). In the three short years after adopting a market segment approach, the PG&E program manager has witnessed CFS equipment manufacturers engineer, floor, and promote equipment that is substantially more energy-efficient. PG&E's market outreach has paid off and CFS dealers are beginning to modify their business practices and promote energy- and water-efficient CFS equipment.

How Much Does It All Cost

Utilities that develop and implement a CFS incentive program must expend significant financial and human resources to make the program a success when compared to other energy efficiency or demand-side management programs. As previously mentioned, this is due to the complexity of the CFS market and the need to overcome the "knowledge gap" barrier (EPA 2009). EPA calculated the levilized cost of conserved energy (LCCE) for three CFS incentive programs, reproduced in table 4 below.

The three programs display very different LCCE estimates. Southern Minnesota Municipal Power Agency (SMMPA), which is a conglomerate of 18 municipal utilities, has the lowest LCCE for electricity. Two possible reasons for this include: 1) the 18 municipal utilities reduce administrative costs and achieve economies of scale by sharing marketing and outreach between them; and 2) the relatively small size of the 18 municipal utilities and their associated service territories (fewer restaurants require fewer utility staff to perform marketing and outreach, hence reducing costs). Alternatively, the Energy Trust of Oregon (ETO), a non-profit funded by a state-mandated public purpose charge, displays the lowest LCCE for natural gas. In contrast to SMMPA, ETO offers incentives for CFS equipment across the majority of the state of Oregon. ETO most likely achieved this by providing 2,200 free high-efficiency pre-rinse spray valves to restaurants across the state: a very cost-effective way to reduce natural gas use.

Table 4: Cost Effectiveness for Three CFS Utility Programs

	PG&E	Southern Minnesota Municipal Power Agency (SMMPA)	Energy Trust of Oregon
Implementation Period (years)	2.75	2.00	4.00
Implementation Dates	01/06 to 09/08	05/06 to 05/09	05/05 to 04/09
Total Rebated Units	3,026	60	4,757
Gas	858	7	2,601
Electric	2,168	53	2,156
Total Therms Saved	490,625	1,402	458,970
Total KWh Saved	13.3 million	183,147	3.4 million
LCCE–Natural Gas[6, 7] ($/therm)	$1.06–1.18	$1.54–1.70	$0.44–0.47
LCCE–Electricity[6, 7] ($/kWh)	$0.04	$0.01	$0.10–0.11

Source: EPA 2009

Certifying the Whole Restaurant: A New Incentive Approach?

There is potential to further promote energy and water efficiency and capture additional savings by working with green-business recognition programs. Examples of these programs include Green Wisconsin, Virginia Green and the National Restaurant Association's *Greener Restaurants*. Typically, these programs take a whole-business approach that includes: energy, water, and waste reduction; sustainable materials procurement; toxic cleaning supplies elimination; and integrated pest management implementation. These recognition programs operate based on user self-certification, which allows the operator to achieve sustainability one step at a time. Self-certification also allows the program to reach a much wider audience than they could if every facility required a "certification" site visit. These programs' general philosophy is to develop a virtual working relationship with the operators by offering an online, self-guided, education program. These programs will be able to achieve significant energy and water savings by educating operators about low-cost/no-cost operational measures, rewarding them for their efforts with "Green Business Recognition," and then moving them towards more capital intensive actions such as retrofitting their kitchen with ENERGY STAR qualified CFS equipment.

A green business recognition program that includes a strong food service component would be an excellent mechanism for utility outreach and could deliver energy and water savings that the utility might not otherwise gain. Partnering with a utility provides these green business recognition programs with valuable energy efficiency expertise and, if utility incentives were included, a monetary means of incenting customer participation. In order to qualify for the utility incentive, end users participating in the program would share useful data with the utility that could help the utility company understand the efficiency-status and future intentions of their customers (i.e., CFS purchasing decisions, future remodeling/expansion plans, verification for energy and water savings). Currently, the main reason for customers to participate in these

[6] Levelized Cost of Conserved of Conserved Energy (LCCE) estimates using the Program Administrator Cost Test.
[7] LCCE is presented using a range for discount rates of 7% and 9%.

programs include: energy and water savings, reduced garbage bills, and public recognition of their green efforts.

The National Restaurant Association's *Greener Restaurants* promises to be the most universally applicable and best developed green recognition program for restaurants. There is a small annual subscriber fee to participate in this program, which includes online video training and an "active checklist" that allows the user to record and manage their sustainable actions over time. This program is heavily weighted towards energy and water savings, including equipment that earns the ENERGY STAR. A utility incentive that covered the cost of the annual subscription fee for a utility client would be represent a very small investment for the utility, but one that could produce a very high return in the form of widespread energy and water savings as well as expedited adoption of ENERGY STAR qualified CFS equipment in the utility's service territory. The utility would also benefit by receiving information and metrics (useful data) that "track" the level of energy saving activities or investments. These metrics could be used to estimate the energy saved as a result of the program.

One concern for self-certification programs is governance or how does the utility ensure the end-user is taking the actions they profess to be taking (e.g., buying and installing an ENERGY STAR qualified fryer). This should be taken into consideration if utilities choose to incentivize a restaurant self-certification program like *Greener Restaurants*, possibly incorporating a random audit program to assist with oversight. The issue of oversight and governance is an excellent topic for additional research and further study.

Conclusions

Restaurant equipment purchases are often made with little or no knowledge of their annual or lifetime energy usage cost (much less their potential to save energy) and are driven primarily by price and the need for immediate replacement. Combined with heavy competition among manufacturers for market share within a first-cost-centered industry, the [generally] more expensive energy-efficient models have demonstrated some success in market transformation. ENERGY STAR for CFS equipment is in its infancy though and the market needs stimulus to further the adoption of the current ENERGY STAR equipment categories and overcome the knowledge gap. When properly designed, utility incentive programs play a key role in bridging the gap between energy efficiency theory and energy-efficient practices in commercial kitchens and restaurants. Successful CFS programs overcome a number of barriers to program uptake while capitalizing upon the significant energy- and water-savings opportunities in the CFS market. Market uptake within this sector can be slow to start and it is very important that utilities introducing incentives for the CFS market commit to a multi-year program. They should also ensure that a suite of energy-efficient product incentives are offered to the target group (market segment approach). Finally, while CFS incentive programs may cost more than other demand-side management programs, the current and future savings opportunities are enormous. ENERGY STAR and PG&E FSTC are at your service with a wide-range of free resources to help reduce program cost and improve program uptake.

References

Abadir, E. M. Dare, A. Dietemann, A. Doeschot, K. Erickson, M. Guifoyle. A. Khan, K. Lewis. 2008. "**Cooking Up a New Approach for Program Design II: A Recipe for Success**." *Proceedings of the ACEEE 2006 Summer Study on Energy Efficiency in Buildings*, 6:721-733. Washington, D.C.: American Council for an Energy-Efficient Economy.

Andrews, S., M. Bramfitt, R. Carwright, A. Dietemann, T. Jones, A. Khan, K. Lewis, S. Loucks, M. Marks. 2006. "**Cooking-Up a New Approach for Commercial Program Design**." *Proceedings of the ACEEE 2006 Summer Study on Energy Efficiency in Buildings*, 6:112-124. Washington, D.C.: American Council for an Energy-Efficient Economy.

[BLS] Bureau of Labor Statistics, U.S. Department of Labor. 2009. **Number of Establishments by Restaurant Industry Segment: NAICS 7221**.Washington, D.C.; Bureau of Labor Statistics.

Cherry Tree. 2003. **Research report: Foodservice Equipment.**

[CEC] California Energy Commission. 2006. ***California Commercial End-Use Survey*****.** www.energy.ca.gov/2006publications/CEC-400-2006-005/CEC-400-2006-005.PDF. Sacramento, C.A.: California Energy Commission.

[CEE] Consortium for Energy Efficiency. 2010.CEE Commercial Kitchens Newsletter. May 4.

Fisher, D., T. Bell, C. Bohlig, D. Cowen, V. Kong, J. Nickel, G. Sorensen, R. Young, F. Wong, D. Zabrowski. 2002. **Commercial Cooking Appliance Technology Assessment**. www.fishnick.com/equipment/techassessment/Appliance_Tech_Assessment.pdf. San Ramon, C.A.: PG&E Food Service Technology Center

ICF International. 2008. *Water and Energy:* **Leveraging Voluntary Programs to Save Both Water and Energy.** www.energystar.gov/ia/partners/publications/pubdocs/-Final%20Report%20Mar%202008.pdf. Washington, D.C.: U.S. Environmental Protection Agency.

[NRA] National Restaurant Association. 2009. *2009* **Restaurant Industry Forecast**. Washington, D.C.: National Restaurant Association.

[NRA] National Restaurant Association. 2010. *2010* **Restaurant Industry Forecast**. Washington, D.C.: National Restaurant Association.

[NUS] NUS Consulting Group. 2009. *2009* **Water Cost Survey**. Park Ridge, N.J.: NUS Consulting Group.

[PG&E FSTC] PG&E Food Service Technology Center. 2010a. **Pre-Rinse Spray Valve/Water Cost Calculator**. www.fishnick.com/savewater/tools/watercalculator. San Ramon, C.A.: PG&E Food Service Technology Center.

[PG&E FSTC] PG&E Food Service Technology Center. 2010b. **Life-Cycle and Energy Cost Calculator: Electric Combination Ovens; Gas Combination Ovens**. www.fishnick.com/saveenergy/tools/calculators. San Ramon, C.A.: PG&E Food Service Technology Center.

[EPA] U.S. Environmental Protection Agency. 2009. **ENERGY STAR for Commercial Kitchens: Helping Customers Manage Costs.** www.energystar.gov/ia/products/-commercial_food_service/downloads/ES-CFS_Guide_508.pdf. Washington, D.C.: U.S. Environmental Protection Agency.

[EPA] U.S. Environmental Protection Agency. 2010a. **Greenhouse Gas Equivalency Calculator.** www.epa.gov/cleanenergy/energy-resources/calculator.html#results. Washington, D.C.: U.S. Environmental Protection Agency.

[EPA] U.S. Environmental Protection Agency. 2010b. **How a Product Earns the ENERGY STAR Label**. www.energystar.gov/index.cfm?c=products.pr_how_earn. Washington, D.C.: U.S. Environmental Protection Agency.

[EPA] U.S. Environmental Protection Agency. 2010c. **ENERGY STAR Commercial Food Service Program, Product Pages, & Lifecycle Cost Calculators**. www.energystar.gov/cfs. Washington, D.C.: U.S. Environmental Protection Agency.

[EPA] U.S. Environmental Protection Agency. 2010d. *2010* **ENERGY STAR Commercial Food Service Incentive Guide**. Available upon request (commercialfoodservice@energstar.gov) Washington, D.C.: U.S. Environmental Protection Agency.

Young, R. 2010 (PG&E Food Service Technology Center). Personal communication. May 6.