

Energy & Store Development Conference

E+Sd 2014

September 7-10, 2014
St. Louis Union Station Hotel
St. Louis, MO



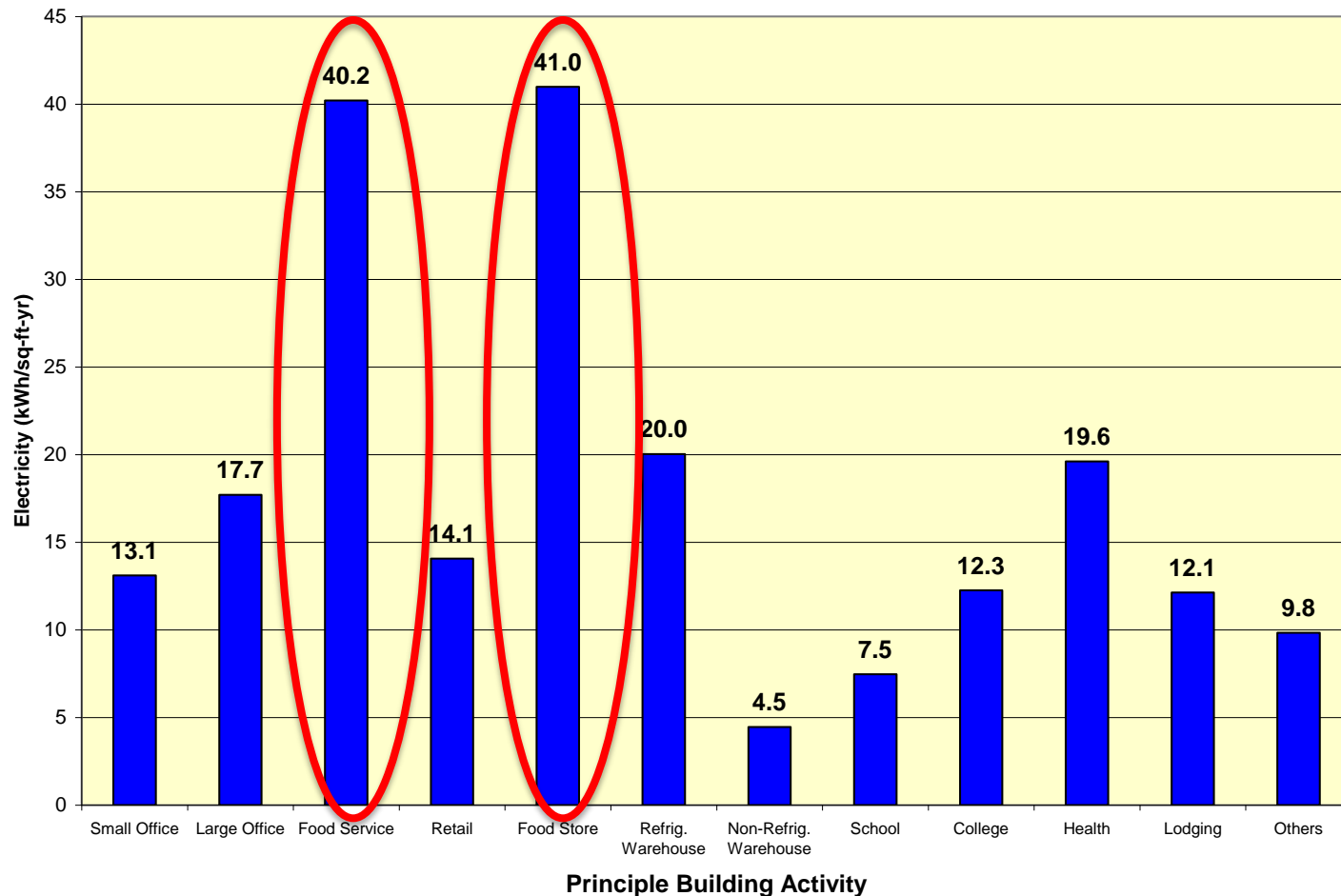
THE VOICE OF FOOD RETAIL 

Energy Usage in the Deli/Food Prep Area

Andre Saldivar

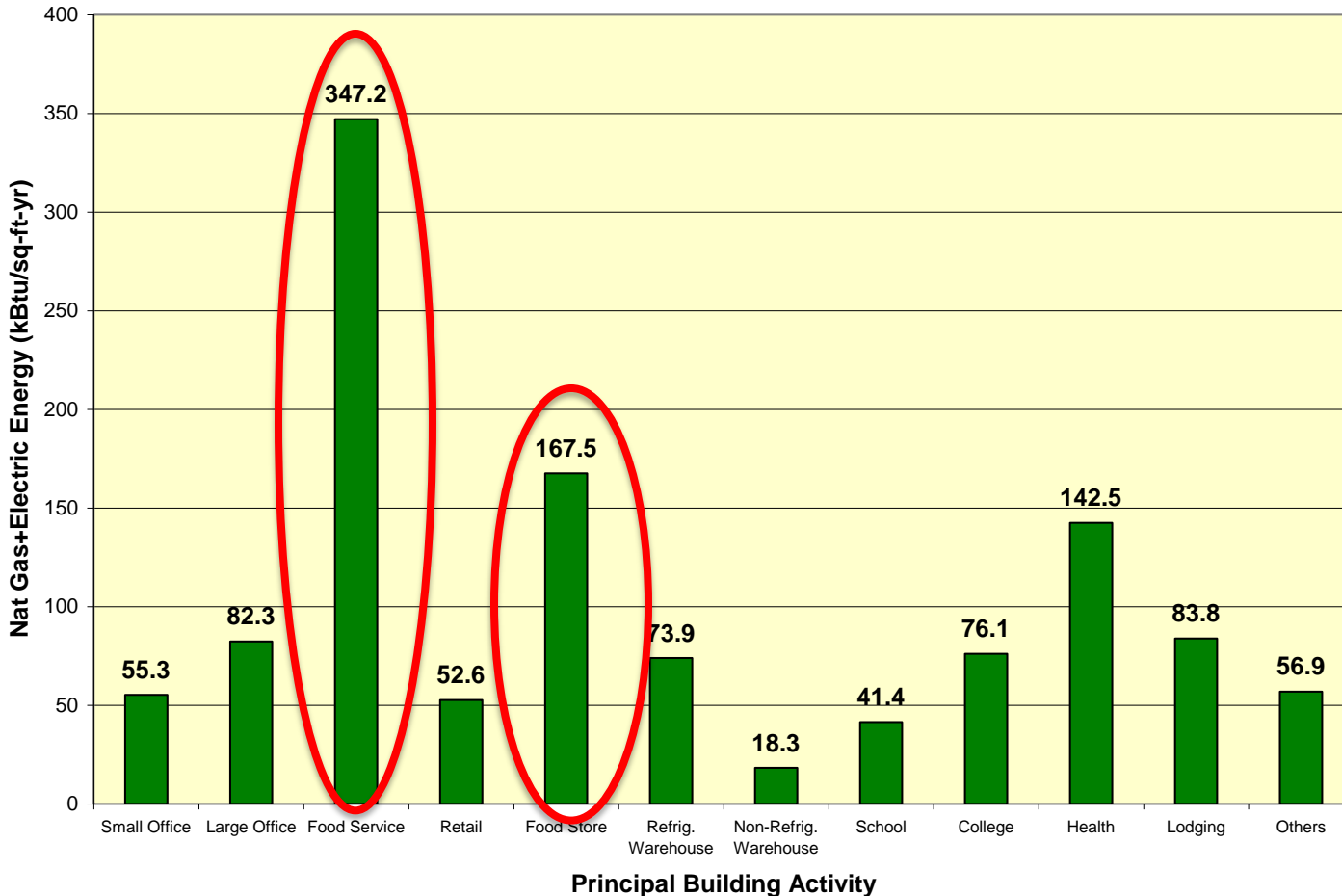
SCE Foodservice Technology Center

Food Service has 2-3 times the energy intensity per square foot of other End Uses



Overview

Electric+Gas Energy Intensity



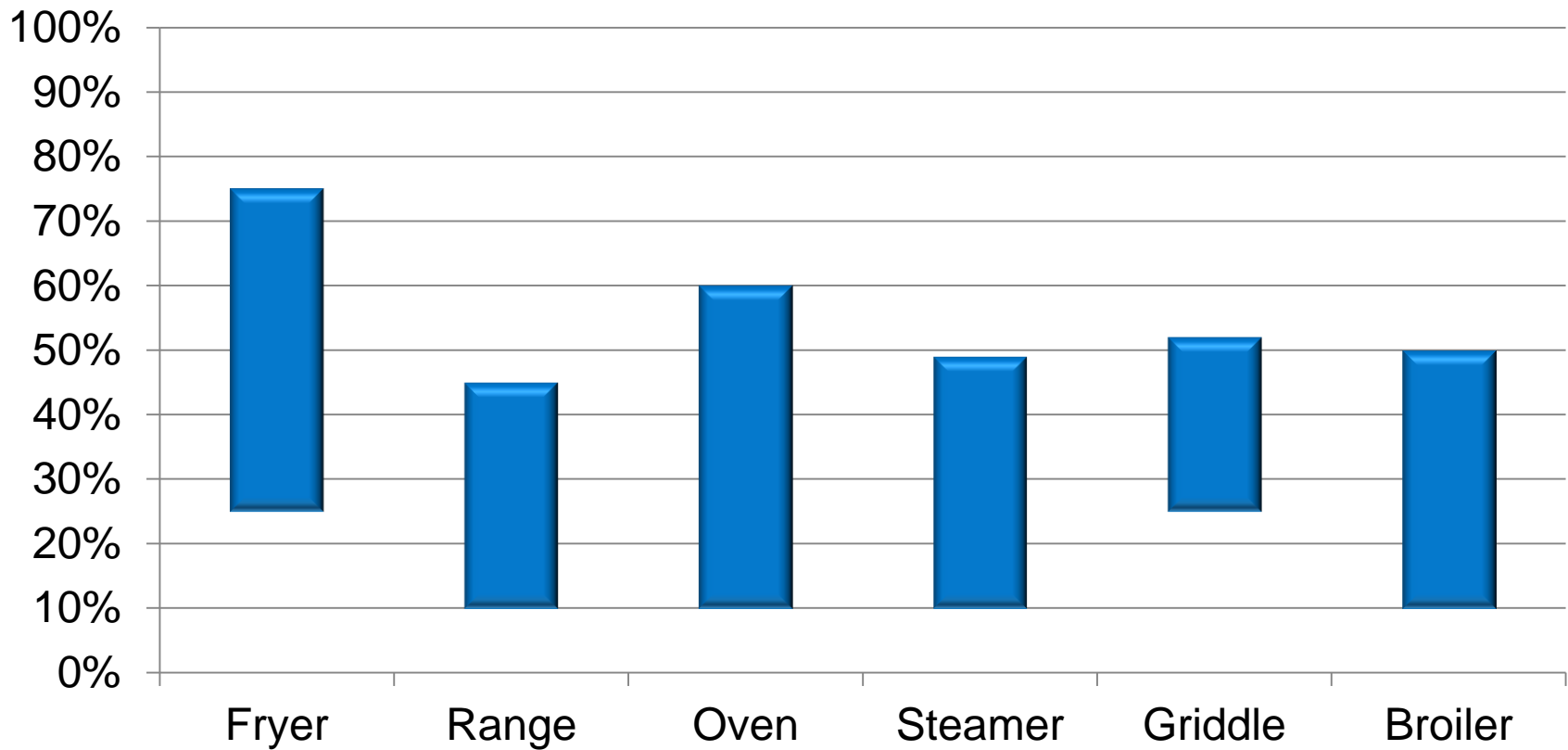
Common Deli Equipment

- ❖ Rack Oven
- ❖ Fryer
- ❖ Ice Machine
- ❖ Reach-in Refrigeration
- ❖ Convection Oven
- ❖ Steamer
- ❖ Combination Oven
- ❖ Wrapper/Sealer
- ❖ Ventilation



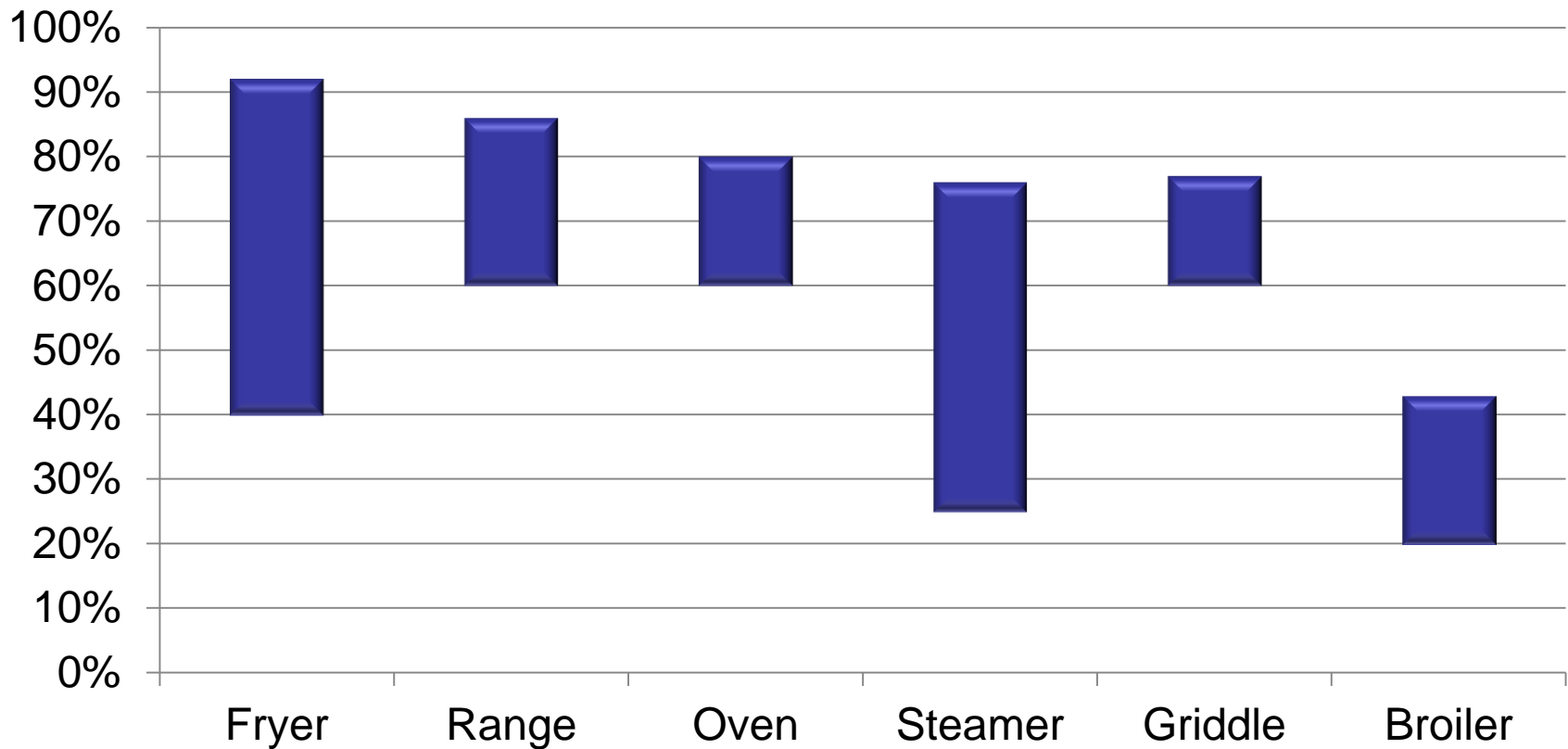
Huge Range in Efficiency!

■ Gas Appliances



Huge Range in Efficiency!

■ Electric Appliances



Determining Efficiencies: *Customers, Manufacturers and Utilities*

❖ ASTM Tests

- Similar to “EPA miles/gal”

❖ Field Tests

- Similar to “your miles/gal”

❖ Tests Help Customers Predict:

- Energy and water consumption
- Utility costs

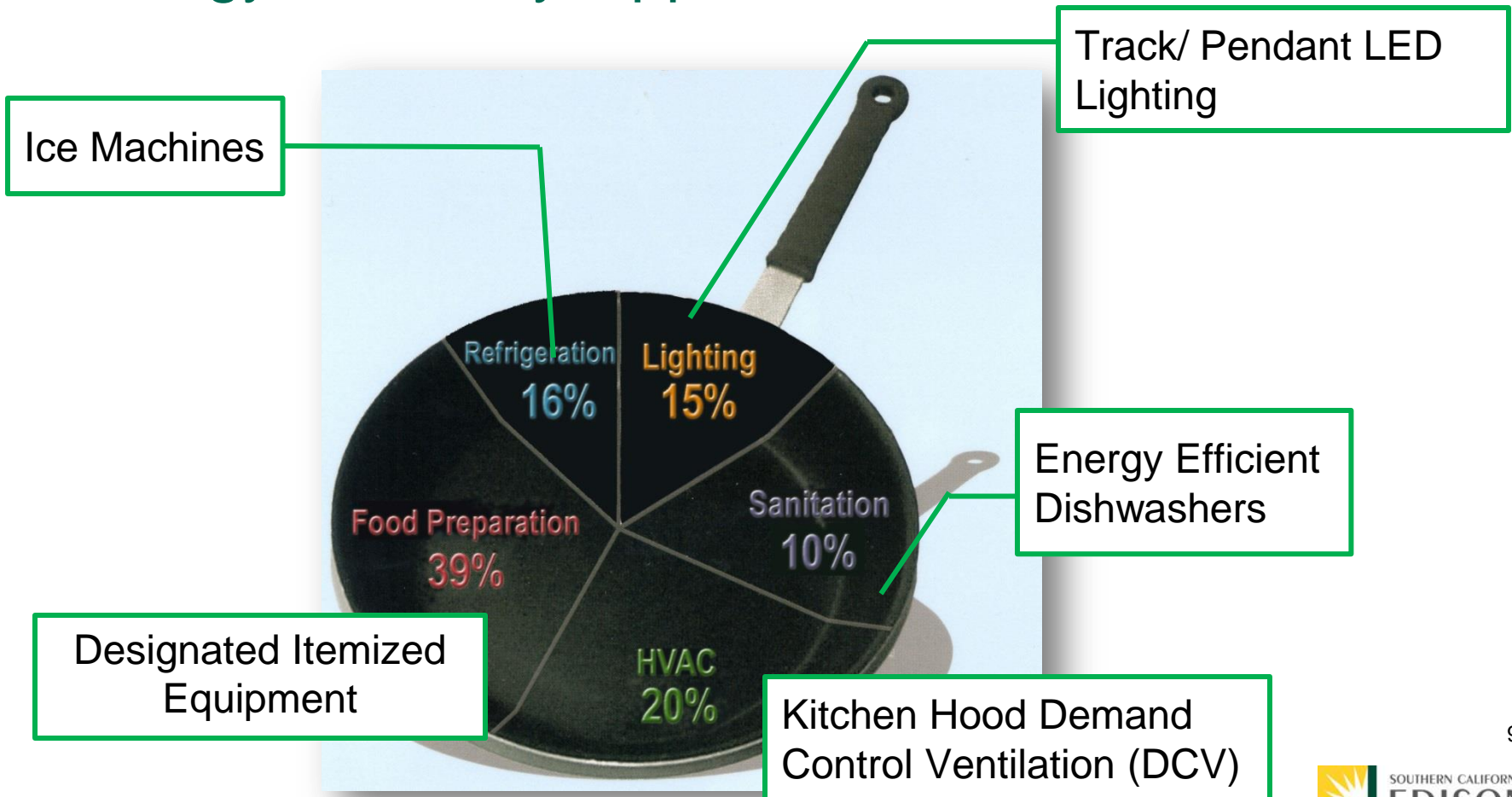
❖ Tests Help Utilities Set Rebate

- Steamer – Energy: \$1,250 + Water: up to \$600



Where Do Your Energy Dollars Go?

❖ Energy Efficiency Opportunities



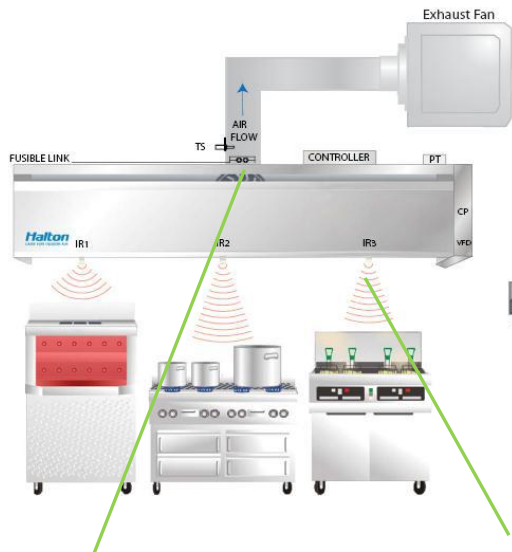
HVAC Strategies

❖ Ventilation System

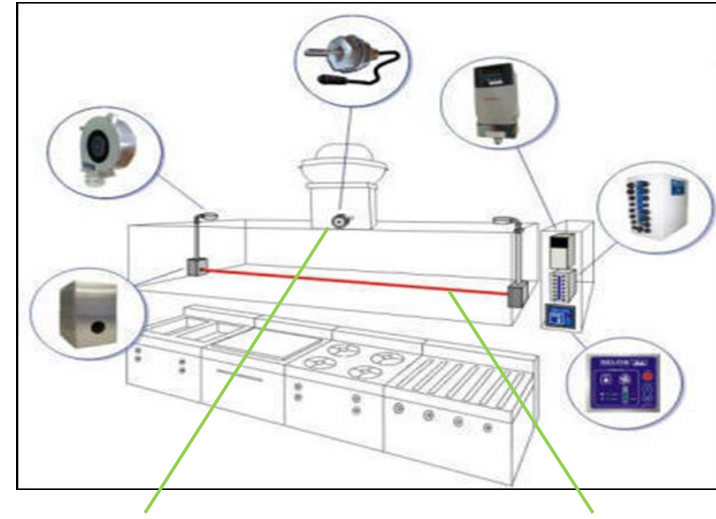
- Hood exhaust & make-up air unit
- Only run the exhaust and make-up air when needed
- Make sure the system is air balanced
- **CKV drives 50 – 75% of HVAC energy!**
- Demand Control Ventilation (DCV) system w/ variable speed drives
 - Save up to 75% on fan (make-up & hood) energy

HVAC Strategies

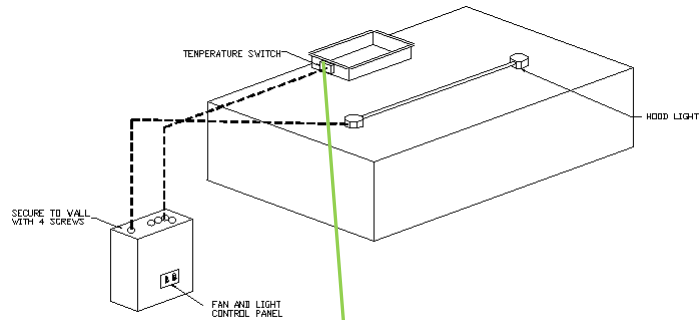
Demand Control Ventilation Technologies



Duct Temperature Sensor & Infrared Sensors



Duct Temperature Sensor & Smoke Detection

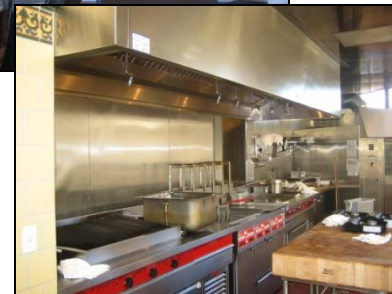


Duct Temperature Sensor

Demand Control Ventilation Test Sites Summary

❖ Results of Commercial Kitchen Demand Control Ventilation Field Tests

	Institutional Cafeteria	Casual Dining Restaurant	Quick Service Restaurant	Hotel Main Kitchen	Supermarket Kitchen	University Dining
Hood Exhaust (cfm)	9,600	6,400	6,000	22,500	23,800	12,000
Exhaust + MAU (kW)	7.3	3.9	5.1	14.0	6.3	12.5
Energy Savings (%)	75	46	62	62	77	55
Annual Energy Savings (kWh/yr)	26,000	9,150	15,330	76,300	20,900	35,600
Annual Cost Savings (\$/yr)	\$4,020	\$1,373	\$2,299	\$11,445	\$3,135	\$5,340



Steamer Field Study



Boiler Based Steamer (low efficiency)
Average Water Usage = 40 gph

Example: Field Testing & Cost Savings Steamers

❖ Boiler-Based

- Casual Dining Restaurant
- Energy = 100 kWh/day
- Water = 810 gal/day
 - 62.3 gal/hr
- Operation = 13 hr/day

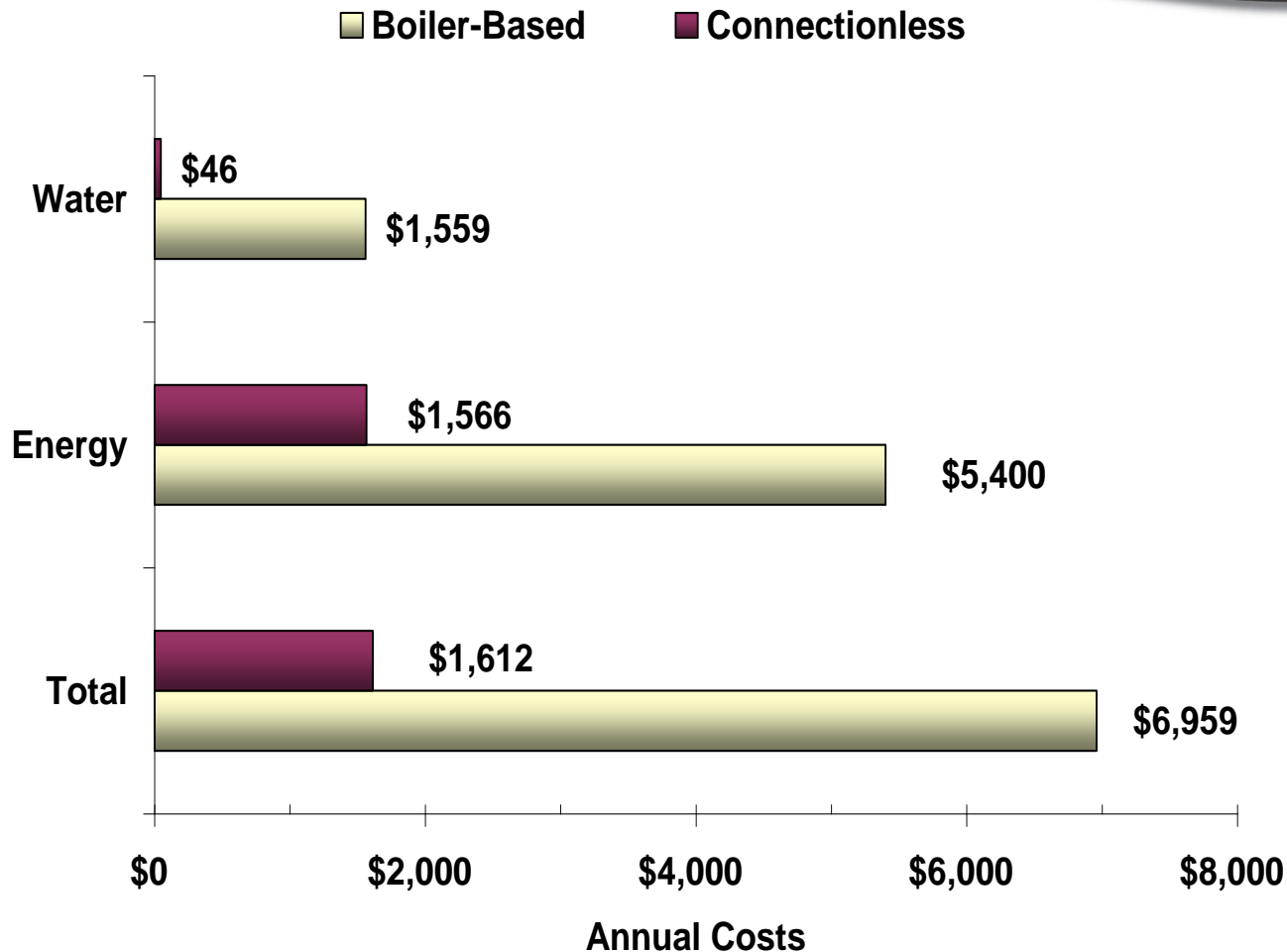


❖ Connectionless

- Casual Dining Restaurant
- Energy = 29 kWh/day
- Water = 24 gal/day
 - 2.0 gal/hr
- Operation = 12 hr/day



Example: Field Testing & Cost Savings *Steamers*



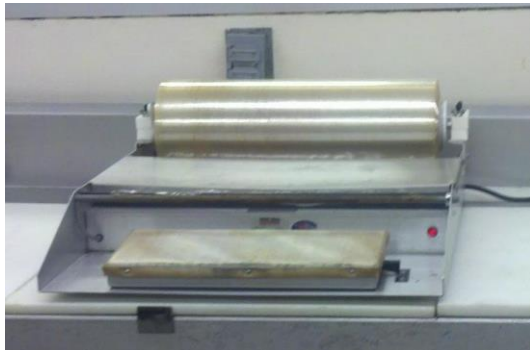
Based on 365 days/yr operation, \$0.15/kWh for energy, and \$4.00/100 cu. ft. water & sewer

Wrapper Field Study

6 Test Sites

❖ Conventional Package Sealer/Wrapper

- 550 Watt Element
- Energy = 2061 kWh/yr
- Demand = .25 kW/yr
- Operation = 18-20 hr/day



❖ SMART Package Sealer/Wrapper

- 2000 Watt Element
- Energy = 404 kWh/yr
- Demand = .045 kW/yr
- Operation = 18-20 hr/day



Wrapper Field Study

6 Test Sites

❖ SMART Package Sealer/Wrapper

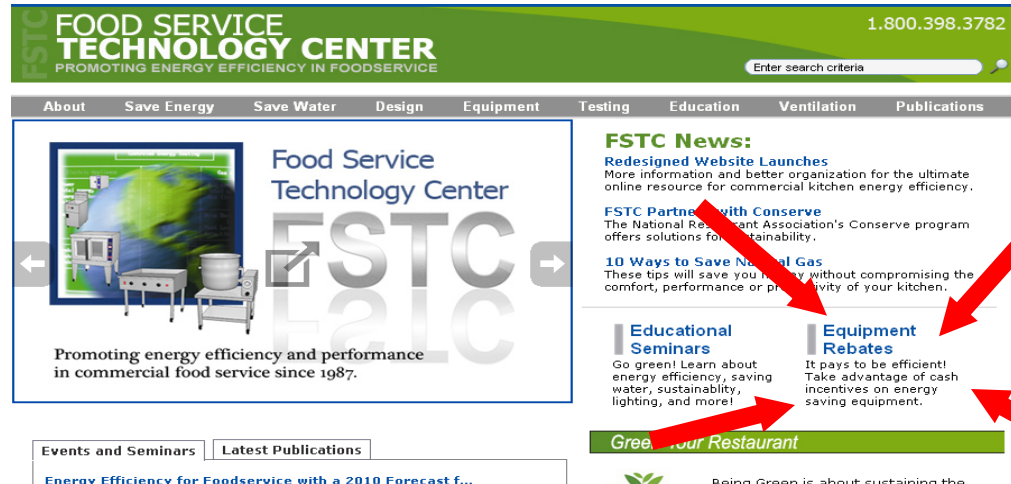
- Annual Savings
- Energy = 1657 kWh/yr
- Demand = .205 kW/yr
- Energy Cost = 255 \$/yr
- SCE Rebate = \$165
- *** Test Sites had 2-4 per units per location ***



Where to Find Foodservice Equipment

Your online toolbox

- Reports
- Energy saving tips
- Design guides
- Cost calculators
- Energy Star
- Rebates



www.Fishnick.com



What About Stores Outside California?



The screenshot shows the Energy Star website interface. At the top left is the Energy Star logo. To its right is a banner with a photo of an elderly couple and the text "BUY PRODUCTS THAT MAKE A DIFFERENCE" and "U.S. Environmental Protection Agency • U.S. Department of Energy". Below the banner is a navigation bar with links: "About ENERGY STAR", "News Room", "FAQs", a search box with a "Go" button, and a menu with "Products", "Home Improvement", "New Homes", "Buildings & Plants", and "Partner Resources". On the left side, under the "Products" heading, is a list of categories: "Appliances", "Heating & Cooling", "Home Electronics", "Lighting", and "Commercial Food Service". The main content area shows the breadcrumb "Home > Products > Locate CFS Incentives" followed by the title "Commercial Food Service Equipment Incentive Finder". Below the title is a description: "This tool provides commercial food service (CFS) equipment manufacturers, dealers, distributors, and purchasers with information about rebates for ENERGY STAR qualified CFS equipment available from utilities and other energy-efficiency program sponsors."

ENERGY STAR

BUY PRODUCTS THAT MAKE A DIFFERENCE
U.S. Environmental Protection Agency • U.S. Department of Energy

About ENERGY STAR • News Room • FAQs

Search Go

Products Home Improvement New Homes Buildings & Plants Partner Resources

Products

- Appliances
- Heating & Cooling
- Home Electronics
- Lighting
- Commercial Food Service

Home > Products > Locate CFS Incentives

Commercial Food Service Equipment Incentive Finder

This tool provides commercial food service (CFS) equipment manufacturers, dealers, distributors, and purchasers with information about rebates for ENERGY STAR qualified CFS equipment available from utilities and other energy-efficiency program sponsors.


www.energystar.gov/cfsrebate_locator



Searchable Database for Renewables & Efficiency

DSIRE™
Database of State Incentives for Renewables & Efficiency

U.S. DEPARTMENT OF
ENERGY | Energy Efficiency & Renewable Energy

 IREC
INTERSTATE RENEWABLE ENERGY COUNCIL

 NORTH CAROLINA
Solar Center

Home | Glossary | Links | FAQs | Contact | About |  



DSIRE is the most comprehensive source of information on incentives and policies that support renewables and energy efficiency in the United States. Established in 1995, DSIRE is currently operated by the N.C. Solar Center at N.C. State University, with support from the Interstate Renewable Energy Council, Inc. DSIRE is funded by the U.S. Department of Energy.

[View Federal Incentives](#)

Resources

[RPS Data](#)[Summary Maps](#)[Summary Tables](#)[Library](#)[What's New?](#)[Search](#)

[Alabama](#)
[Alaska](#)
[American Samoa](#)
[Arizona](#)
[Arkansas](#)
[California](#)
[Colorado](#)
[Connecticut](#)
[Delaware](#)
[District of Columbia](#)
[Federal](#)
[Florida](#)
[Georgia](#)
[Guam](#)
[Hawaii](#)
[Idaho](#)
[Illinois](#)
[Indiana](#)
[Iowa](#)
[Kansas](#)
[Kentucky](#)

Gas & Electric Utilities Offering CFS Energy Efficiency Rebates

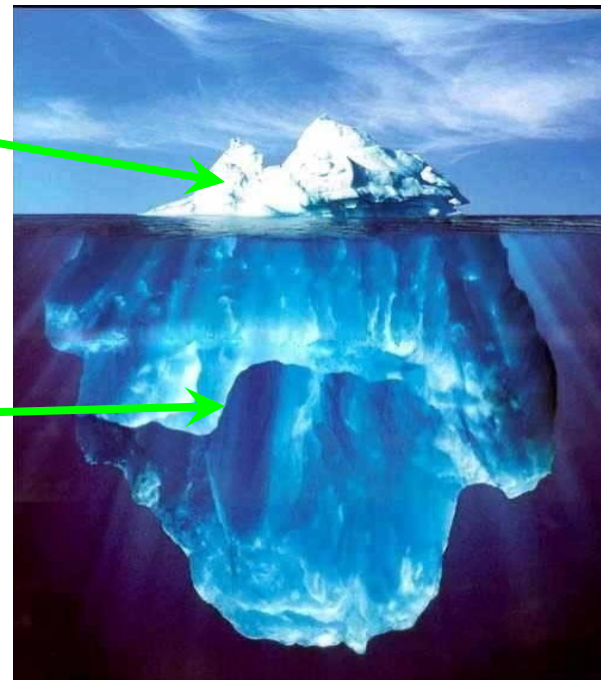
- ❖ Avista Utilities-Washington, Idaho, Montana
- ❖ California Utilities-PG&E, SCE, SCG, SDG&E
- ❖ CenterPoint Energy-Minnesota
- ❖ Duke Energy-Ohio, Kentucky
- ❖ Efficiency Maine
- ❖ Efficiency Vermont
- ❖ Energy Trust of Oregon
- ❖ Focus on Energy-Wisconsin
- ❖ MidAmerican Energy-Iowa
- ❖ National Grid-New York, Maine, New Hampshire
- ❖ NYSERDA-New York
- ❖ Puget Sound Energy-Washington
- ❖ Questar Gas-Utah
- ❖ SMMPA-Minnesota
- ❖ Southwest Gas-Arizona (conservationrebates.com)
- ❖ Tacoma Public Utilities-Washington
- ❖ Vectren Energy Delivery-Indiana
- ❖ WE Energies-Wisconsin, Michigan

More programs coming soon to a utility near you...

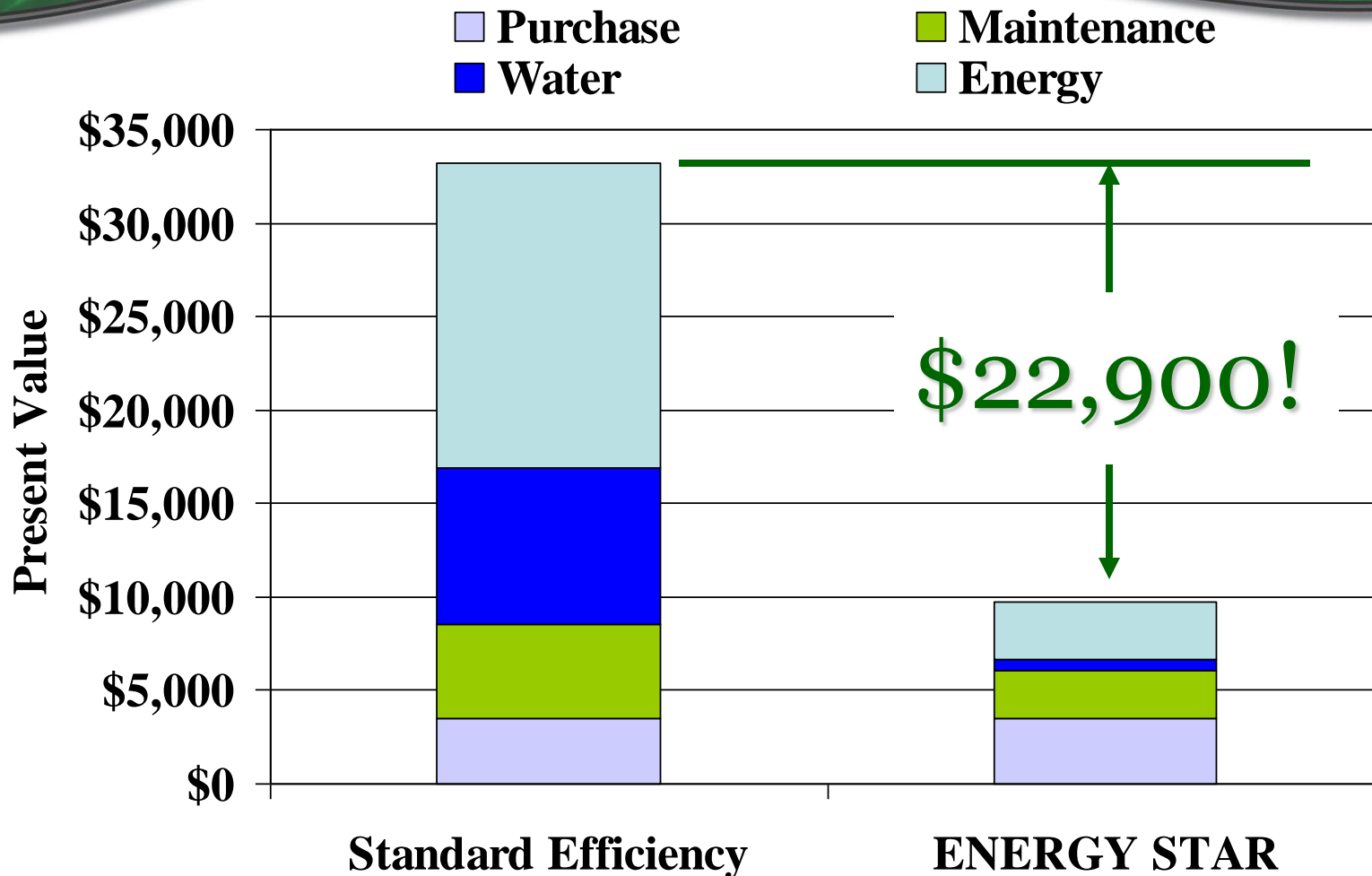
Life Cycle Cost: The Big Picture

Acquisition Costs

Sustaining Costs



Life Cycle Cost *Connectionless Steamers*



8-year life-cycle costs based on 15¢/kWh and 3.1% discount rate

How to Calculate Savings?

FOOD SERVICE TECHNOLOGY CENTER
PROMOTING ENERGY EFFICIENCY IN FOODSERVICE

1.800.398.3782
Certified Green Business

About Save Energy Save Water Design Equipment Testing Ventilation Education Publications

Restaurants consume 5 times more energy per square foot than other commercial buildings.

Explore the various pathways to a greener restaurant

What's Hot:

- Save Up Better Beverages**
Research shows that saving on juice and smoothie bars.
- The Fryer Challenge Recap**
See what a great success the fryer challenge was at the FSTC and SoCal Gas.
- Future of DCV for Commercial Kitchens**
Read the ASHRAE Journal article authored by Don Fisher, Rich Swierczyzna and Angelo Karas.

» More

Educational Seminars
Go green! Learn about energy efficiency, saving water, sustainability, lighting, and more!

Equipment Rebates
It pays to be efficient! Take advantage of cash incentives on energy saving equipment.

Events and Seminars **Latest Publications**

Shanghai International Hospitality Equipment ...
Apr 2nd, 2013 - Shanghai, CA
Refrigeration Fundamentals
Apr 4th, 2013 - Irvine, CA
Energy Efficient Ice Machines
Apr 11th, 2013 - Tule, CA
SCAA Boston Expo (Specialty Coffee Association...
Apr 13th, 2013 - Boston, MA
So Cal Gas Equipment Expo
Apr 16th, 2013 - Downey, CA

» more

Green Your Restaurant

Being green is about sustaining the environment and sustaining your bottom line. The FSTC offers free information that shows you specific steps to save energy and water in your restaurant.

The FSTC is partnering with the industry to develop criteria, educational materials and best practices to support foodservice sustainability.

» Learn More

Video Corner

Upgrade Front-of-House Lighting
See the newest lighting technologies available for your dining room.

» Watch Now

FOOD SERVICE TECHNOLOGY CENTER
PROMOTING ENERGY EFFICIENCY IN FOODSERVICE

About **Save Energy** Save Water

Save Energy **Save Water**

Rebates
ENERGY STAR®
Energy Tips
Green Sheets
Self Site Survey Checklist

Tools

- Life Cycle Cost Calculators
- Outdoor Air Load Calculator
- The Energy Efficient Kitchen Tool

Example Appliance: Electric Combination Oven

Electricity



Water

Qualified Combination Ovens

Updated 5/13/2014

Qualifying gas combination oven/steamer models must have a tested steam mode cooking energy efficiency of $\geq 38\%$ and convection mode cooking energy efficiency of $\geq 44\%$ utilizing ASTM Standard F2861, and meet the idle rate requirements in Table 1. Qualifying electric combination oven/steamer models must have a tested steam mode cooking energy efficiency of $\geq 50\%$ and convection mode cooking energy efficiency of $\geq 70\%$ utilizing ASTM Standard F2861, and meet the idle rate requirements in Table 1. Check your utility rebate application for terms and conditions, and effective program dates.

Company Name	Model Number	Size (Steam Pans)	Fuel Type	Preheat Energy (Btu or kWh)	Convection Mode				Steam Mode				Rebate (per oven)
					Idle Energy Rate (Btu/h or kW)	Energy Efficiency (%)	Production Capacity (lbs/h)	Cooking Water Use (gal/h)	Idle Energy Rate (Btu/h or kW)	Energy Efficiency (%)	Production Capacity (lbs/h)	Cooking Water Use (gal/h)	
BKI	HE061	6	Electric	0.93	1.08	73%	61	0.0	0.98	51%	54	10.8	\$1,000
BKI	HE062R	12	Electric	1.08	1.28	76%	99	0.0	1.13	66%	126	9.1	\$1,000
BKI	HE101	10	Electric	0.98	1.30	76%	111	0.0	1.15	70%	109	11.7	\$1,000
BKI	HE102	20	Electric	1.42	1.60	81%	200	0.0	1.84	68%	220	12.0	\$1,000
Cleveland	OES-10.20	20	Electric	2.30	1.70	80%	200	29.0	2.60	64%	332	2.2	\$1,000
Cleveland	OES-10.10	10	Electric	0.88	1.50	80%	104	0.0	2.00	58%	200	2.0	\$1,000
Cleveland	OES10-10 Mini	5	Electric	0.54	0.73	75%	50	3.9	1.19	65%	80	2.6	\$1,000
Cleveland	OES10.10*	10	Electric	0.97	1.19	78%	104	0.0	0.71	72%	101	0.5	\$1,000
Eloma	T12-21E	24	Electric	2.61	2.01	78%	203	0.0	3.55	67%	313	6.5	\$1,000
Henny Penny	ESC610	6	Electric	0.60	0.59	78%	57	0.0	1.35	63%	78	5.1	\$1,000
Hobart	CE10FD-1	20	Electric	1.56	2.43	71%	166	0.0	3.12	66%	182	3.0	\$1,000
Piper	HME061	6	Electric	0.56	1.13	76%	69	0.0	1.69	58%	88	3.0	\$1,000
Rational	CMP101E	10	Electric	0.86	1.13	79%	106	3.1	2.19	60%	201	9.6	\$1,000
Rational	CMP61E	6	Electric	0.67	0.92	76%	63	2.5	1.69	58%	111	9.0	\$1,000
Rational	SCC102E	20	Electric	1.58	2.00	79%	189	-	3.30	61%	367	-	\$1,000
Rational	SCCWE61E	6	Electric	0.63	0.99	76%	64	10.9	1.88	57%	115	9.5	\$1,000
Rational	SCCWE62E	12	Electric	0.96	1.32	79%	128	11.8	2.00	63%	202	6.7	\$1,000

Find an efficient oven from the manufacturer you like in the size that you want.

Example Appliance: Electric Combination Oven

Electric Combination Oven Life-Cycle Cost Calculator

[About](#) | [How To Use](#) | [Definitions](#)

User Inputs				
Choose a Combi: (optional) Cleveland ▼ OES-10.20 ▼	User Input Oven	Base Efficiency Oven	Energy Efficient Oven	
Oven Performance (Based on ASTM Standard Test Method F2861)				
Number of Steam Pans	20	20	20	
Preheat Energy (kwh)	2.30	3.75	2.00	
Convection Mode Idle Energy Rate (kW)	1.70	3.75	2.50	
Convection Mode Cooking-Energy Efficiency (%)	80	65.0	70.0	
Convection Mode Production Capacity (lbs/h)	200	100.0	125.0	
Steam Mode Idle Energy Rate (kW)	2.60	12.50	6.00	
Steam Mode Cooking-Energy Efficiency (%)	64	40.0	50.0	
Steam Mode Production Capacity (lbs/h)	332	150.0	200.0	
Water Consumption Rate (gal/h)	2.2	70	30	
Oven Usage				
Operating Hours per Day (h/day)	8.0	8.0	8.0	
Operating Days per Year (d/year)	365	365	365	
Number of Preheats per Day (#/day)	1	1	1	
Percentage of Time in Steam Mode (%)	50	50	50	
Pounds of Food Cooked per Day (lbs/day)	250.0	250.0	250.0	
Utility Cost and Lifespan				
Electric Cost per kWh (\$/kWh)	0.110	0.110	0.110	
Electric Demand Charge per kW (\$/kW)	0.00	0.00	0.00	
Water / Sewer Cost per CCF (100 ft³)	7.00	7.00	7.00	
Lifespan of Oven in Years (years)	12.0	12.0	12.0	
Discount Rate (%/year)	0.00	0.00	0.00	
		Calculate!	Reset Fields	

Example Appliance: Electric Combination Oven

Get an Answer

Annual Results			
Annual Energy Consumption (kWh)	12547	27491	18053
Average Energy Consumption Rate (kW)	4.3	9.4	6.2
Annual Water Consumption (gal)	3212	102200	43800
Annual Energy Cost	\$1380	\$3024	\$1986
Annual Water Cost	\$30	\$956	\$410
Total Annual Utility Cost	\$1410	\$3980	\$2396
Input Additional Costs (Optional)			
Maintenance Costs per Year	\$0	\$0	\$0
Initial Cost of Oven	\$0	\$0	\$0
Lifetime Results			
Lifetime Energy Cost	\$16560	\$36288	\$23832
Lifetime Water Cost	\$360	\$11472	\$4920
Lifetime Maintenance Cost	\$0	\$0	\$0
Initial Cost of Oven	\$0	\$0	\$0
Total Lifetime Cost	\$16920	\$47760	\$28752

Compare

Example Appliance: Electric Combination Oven

Electric Combi



- Annual Savings
- Energy = 15,000 kWh/yr
- Demand = 5.0 kW/yr
- Water = 98,000 gal/yr
- Energy Cost = 1,644 \$/yr
- Water Cost = 920 \$/yr
- **** 12 year Life Cycle Savings ****
 - Energy Cost = \$20,000
 - Water Cost = \$11,000



Energy Efficiency Foodservice Rebates

❖ Future Equipment Rebates

- Electric Conveyor Ovens
- Electric Deck Ovens
- Cook n Hold Ovens
- Pressure Fryers
- Any other equipment that we should look into?

Contact Information

- ❖ Manager-Product/Project, Andre Saldivar
 - 626-812-7558
 - andre.saldivar@sce.com
 - EECI-FTC@sce.com

California Energy Wise Program

Thanks!

**be
energy
wise**

**save energy, save money,
save the environment.**

