



Efficiency Vermont

BBD

BETTER BUILDINGS BY DESIGN

CONFERENCE THEME:

Trends in Cold Climate Construction

Sustainable Savings: How Buying the Right Equipment Can Save Water, Energy, and Money

Hosted By:



February 4th, 2015

PRESENTATION BY:
RICHARD YOUNG
DIRECTOR OF EDUCATION



**Food Service
Technology Center**



Food Service Technology Center: Who? What? Why?

Who?

The Food Service Technology Center (FSTC) is an unbiased energy-efficiency research program funded by California utility customers.

Specializing in commercial food service.
Promoting energy efficiency and performance
Celebrating 27 years of hard work!

What?

Appliance and Kitchen Ventilation (CKV) Testing Labs

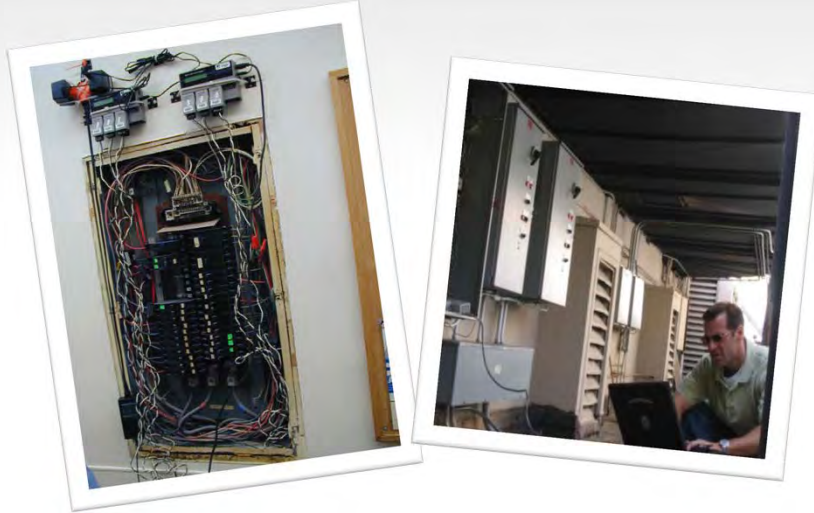


The FSTC Lab and Standard Test Methods (STM)



STMs generate “MPG” numbers
for food service equipment

What? On-site Energy Monitoring



What? Direct Customer Support: Energy Surveys and Design Consultation



What? Outreach, Education and Training



Download Today's Handouts:

www.fishnick.com/handouts/02042014

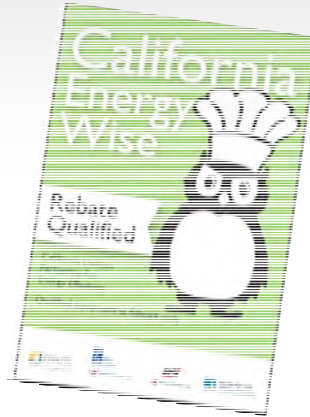


Our Mission is to bring “MPG”
and **Performance** information
to the **entire**
commercial food service world.

We've Had Some Major Success



www.energystar.gov/cfs



www.fishnick.com

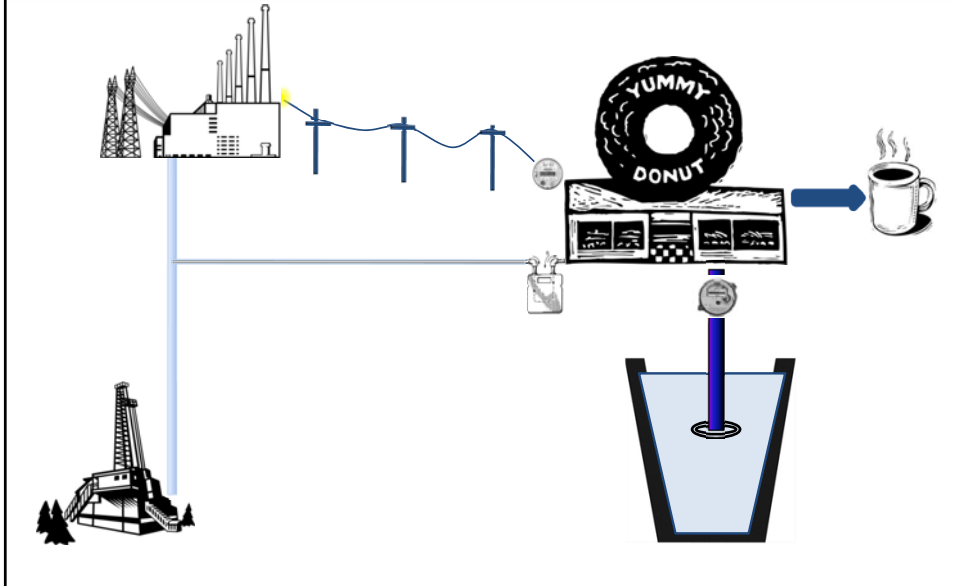
What We Will Learn Today:

- How energy relates to foodservice
- How energy efficient equipment contributes to a profitable and productive kitchen
- How to find energy efficient equipment and dollar incentives
- How to use free on-line calculators to model life-cycle savings for efficient equipment

How does energy relate
to foodservice?

How is a food service operator
like an **energy company**?

Energy is Converted to Hot Food

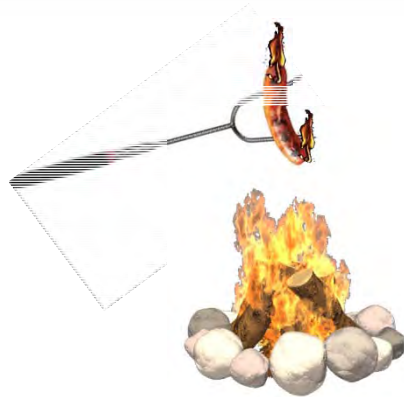


How much energy does the food service industry buy?



Source: NRA 2014 Forecast

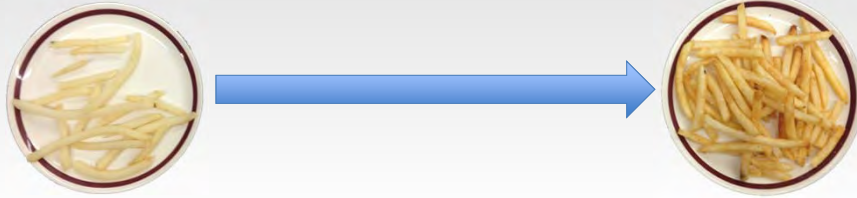
The Story of Energy and Food



What's the Difference?



Energy



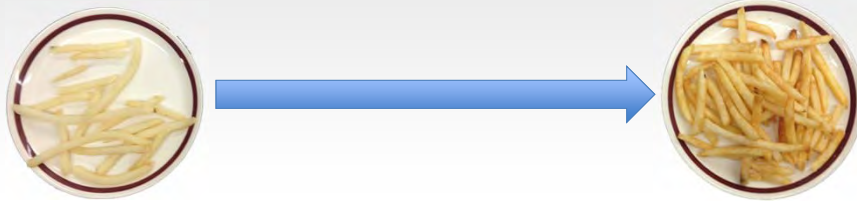
$$E_{\text{fry}} = E_{\text{sense}} + E_{\text{melt}} + E_{\text{thaw}} + E_{\text{vap}}$$

Lots of Energy!

$$E_{\text{fry}} = E_{\text{sense}} + E_{\text{melt}} + E_{\text{thaw}} + E_{\text{vap}}$$

1. Energy to heat fat +
2. Energy to melt fat +
3. Energy to heat ice +
4. Energy to thaw ice +
5. Energy to heat potato +
6. Energy to heat water +
7. Energy to vaporize water

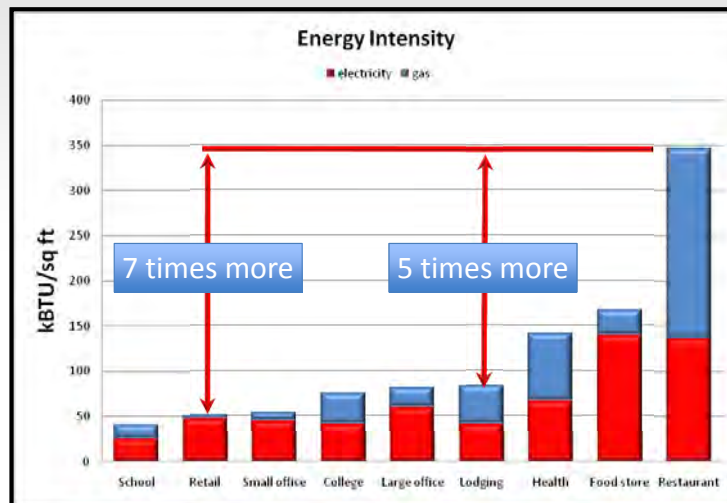
Why should you care?



You only make money on the energy that goes into the fry!

Everything else is Waste!

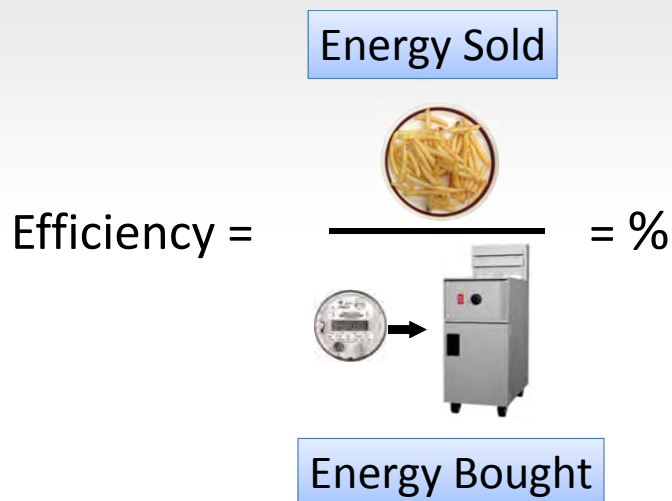
Food Service is Energy Intensive!



Source: www.energy.ca.gov/2006publications/CEC-400-2006-005/CEC-400-2006-005.PDF

How does energy efficient equipment contribute to a profitable and productive kitchen?

What is Energy Efficiency?



Efficiency = Profit



What is Production Capacity?
"Performance"

Food Cooked

Production
Capacity =



= lb/hr



Time

Efficiency = Performance

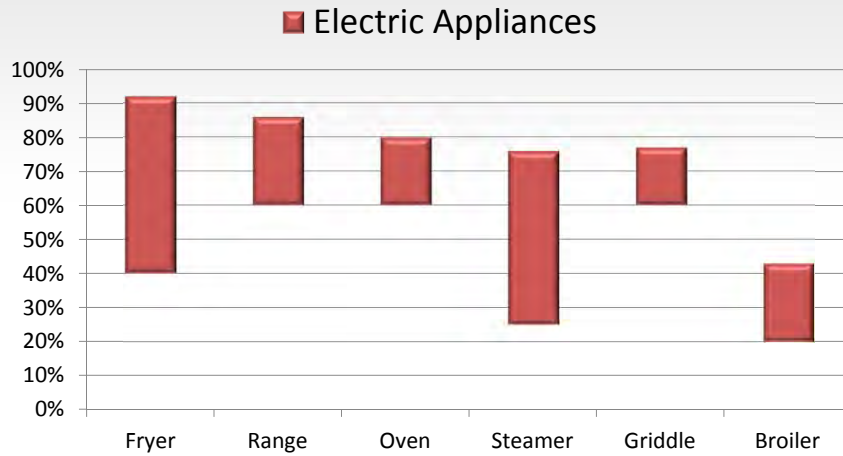


NOT ALL APPLIANCES ARE THE SAME.

PURCHASE YOUR EQUIPMENT WISELY!



Huge Range in Efficiency!



Example: This boiler-based steamer will cost you about \$3,500 a year in energy, water and sewer costs.





How much will this energy and water efficient Energy Star steamer cost?



WATER GUZZLER

\$3,500/YR

Vs.



WATER EFFICIENT

A: \$3,500/YR

B: \$2,500/YR

C: \$1,500/YR

D: \$500/YR

Important Take-Away:

Purchase price is a fraction of the total cost to operate.

Operation is the real cost driver and that includes the fuel.

So, it makes sense to specify the most efficient equipment

How do I find energy efficient equipment and dollar incentives?

Use Energy Star to find efficient equipment and rebates



www.energystar.gov/cfs

<https://www.encyvermont.com/For-My-Business/Ways-To-Save-and-Rebates/Commercial-Kitchens/Rebates>

NEED HELP? CONTACT US TODAY FIND A CONTRACTOR OR RETAILER

Efficiency Vermont

FOR MY HOME **FOR MY BUSINESS** FOR PARTNERS MORE ABOUT US BLOG ENERGY. FORWARD.

Login or Register

Commercial Kitchens

General Info **Rebates** Find a Vendor Success Stories Tips

Rebates

View the [Commercial Kitchen Equipment Rebate Form](#) for details and terms.

Form Section #	Standard Rebates – Commercial Kitchens	Customer Rebate
1	Fryers	\$500 / vat
2	Griddles	\$125 each
3	Convection Ovens	\$750 each
4	Steam Cookers	\$500 each

Qualifying Equipment

- Convection Ovens
- Fryers
- Griddles

FIND A VENDOR OPEN

Efficiency Vermont can partner with you on your project and/or help you find vendors for energy-efficient equipment.

CONTACT US

FINANCING

How do I use free on-line calculators to model life-cycle savings for efficient equipment

How to Calculate Savings? Start at www.fishnick.com

The screenshot shows the Food Service Technology Center website. The main navigation bar includes 'About', 'Save Energy', 'Save Water', and 'Contact Us'. A red circle highlights the 'Save Energy' button, and a red arrow points to a dropdown menu. The dropdown menu lists the following options:

- 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

Electric Combination Oven

Electricity



Water

Qualified Combination Ovens

Page 2 of 3

Updated 5/13/2014

Qualifying [gas combination ovens/steamers](#) 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 ovens/steamers](#) 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 (lb/h)	Cooking Water Use (gal/h)	Idle Energy Rate (Btu/h or kW)	Energy Efficiency (%)	Production Capacity (lb/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	HE400	20	Electric	1.15	1.60	84%	200	0.0	1.24	68%	200	15.6	\$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-6-20	6	Electric	0.90	1.50	73%	100	0.0	0.90	50%	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	CMP061E	6	Electric	0.67	0.92	76%	63	2.5	1.69	58%	111	9.0	\$1,000
Rational	SCC102E	20	Electric	1.59	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.

Electric Combination Oven Life-Cycle Cost Calculator

About | How To Use | Definitions

User Inputs			
Choose a Comb: (optional)	User Input Oven	Base Efficiency Oven	Energy Efficient Oven
Cleveland ▼ OES-10 20 ▼			
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	85.0	70.0
Convection Mode Production Capacity (lbs/h)	200	100.0	125.0
Steam Mode Idle Energy Rate (kw)	2.60	12.50	8.00
Steam Mode Cooking-Energy Efficiency (%)	84	40.0	50.0
Steam Mode Production Capacity (lbs/h)	332	150.0	200.0
Water Consumption Rate (gal/h)	2.2	7.0	5.0
Number of Cycles per Day (cycles)			
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 R ³)	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

Use the Calculator

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

Summarize Your Savings

- \$31,000 over the 12 year lifecycle
 - \$20,000 in electricity
 - \$11,000 in water and sewer
- 180,000 kWh = 124 tCO₂e*
 - \$1,370 @ \$11/ tCO₂e

*www.epa.gov/cleanenergy/energy-resources/calculator.html



Why do restaurants need to be
Sustainable?




The **act** of cooking, holding and
refrigerating food **impacts**
the environment!

Live Exercise

Let's build an efficient restaurant:

1. Find efficient appliances and,
2. Calculate the cost to operate and,
3. Savings for efficient equipment

Our Restaurant has:

- 1 electric fryer 
- 1 electric convection oven 
- 1 electric griddle 

One Last Gift

Commercial Kitchen Ventilation



?



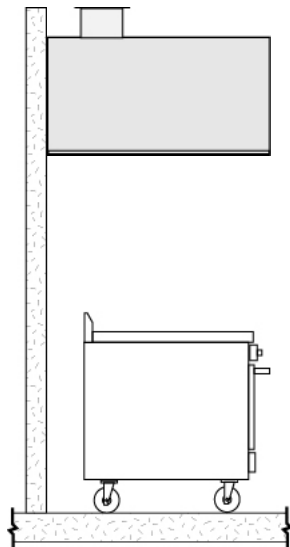


**MAKE SURE APPLIANCES ARE
ALL THE WAY UNDER THE HOOD.**

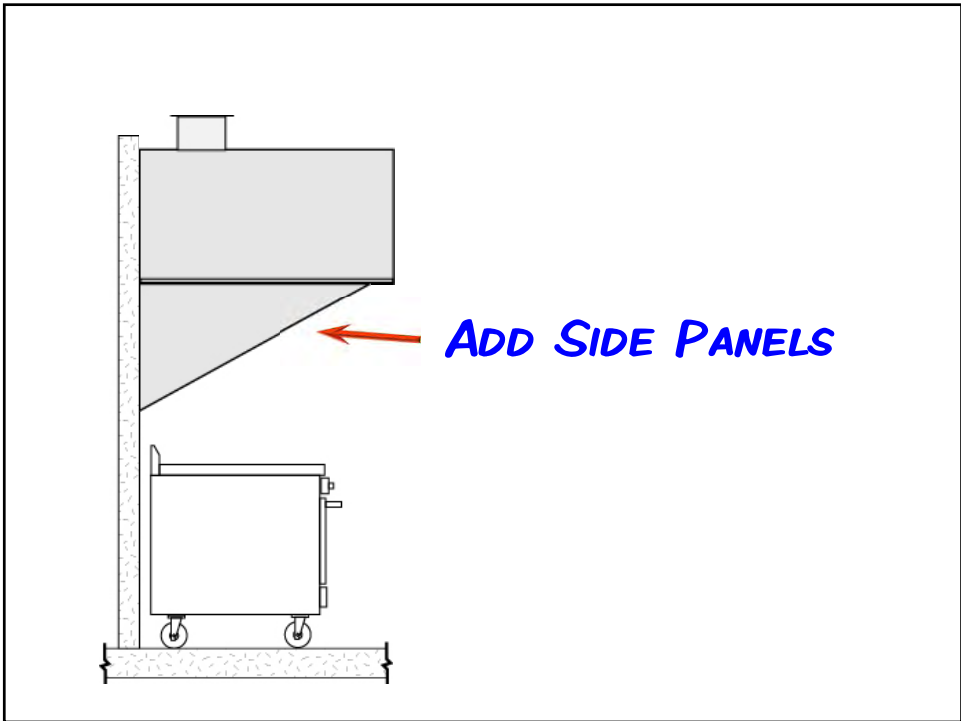
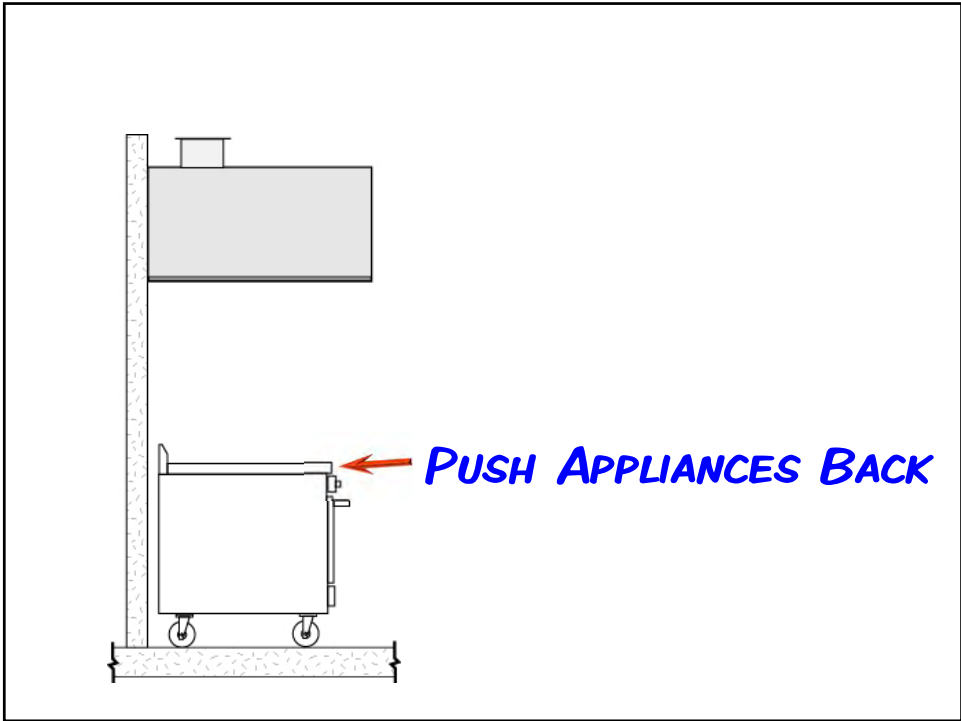
**DON'T FILL YOUR KITCHEN WITH
HEAT AND SMOKE**



OPTIMIZE THE KITCHEN EXHAUST HOOD



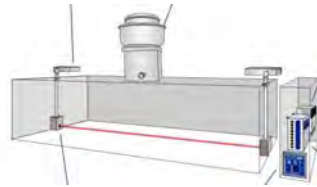
TWO NUGGETS
**HOW TO KEEP THE SMOKE
AND HEAT IN THE HOOD.**



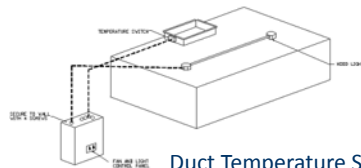
Exhaust Hood: DCKV



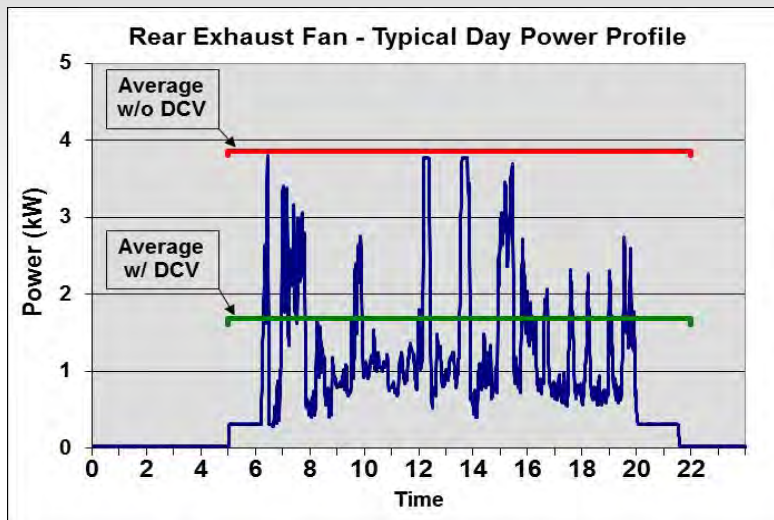
Duct Temperature Sensor & Infrared Sensors



Duct Temperature Sensor & Vapor Detection



Duct Temperature Sensor



Possible 50% reduction of fan energy

Today's standard commercial kitchen is based on post war (1940's) equipment and design

Step One: Adopt Best in Class

STANDARD COOKLINE



ENERGY WISE COOKLINE



Specifying and Purchasing Efficient
Equipment is the Best Thing you
can do
to create a
Sustainable Kitchen!

Summary:

You can use
Online Calculators and Efficiency Vermont Rebates
to make more \$\$ and be more sustainable!

GO FORTH AND PROSPER



**FOOD SERVICE
TECHNOLOGY CENTER**
PROMOTING ENERGY EFFICIENCY IN FOODSERVICE

Thanks!

**be
energy
wise**

save energy, save money,
save the environment.



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