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:

Efficiency Vermont

February 4th, 2015

PRESENTATION BY:

RICHARD YOUNG

DIRECTOR OF EDUCATION

Food Service Technology Center

fishnick.com

ConServe
National Restaurant Association

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!

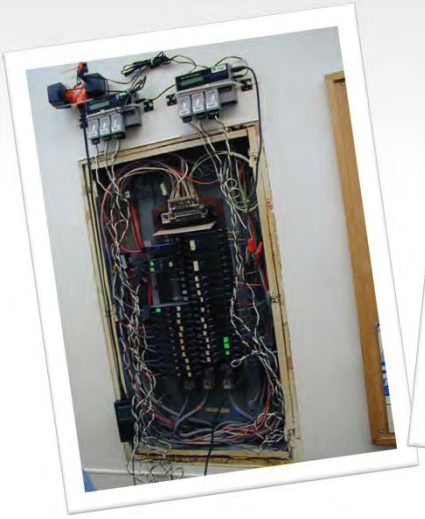
What?

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

fishnick.com

16

Download Today's Handouts:

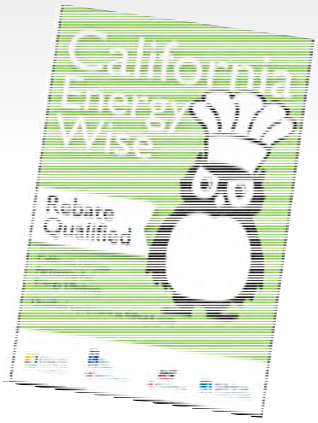
www.fishnick.com/handouts/02042014

fishnick.com

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

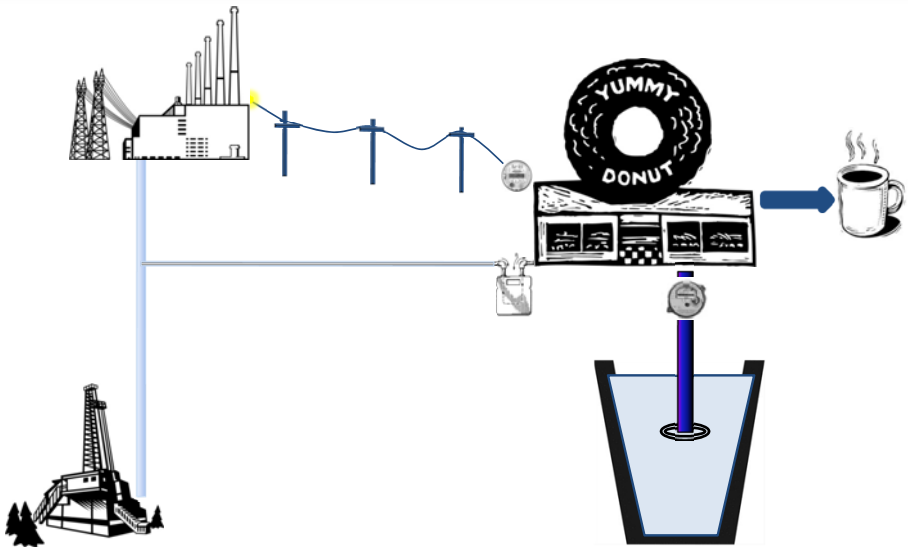
What We Will Learn Today:

- 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?

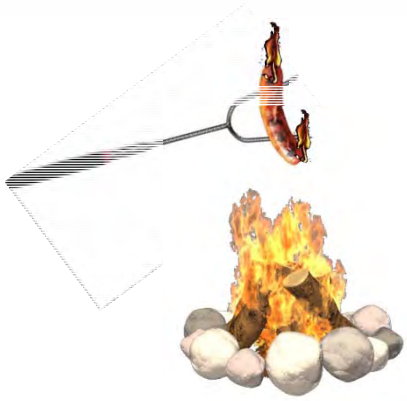
Energy is Converted to Hot Food



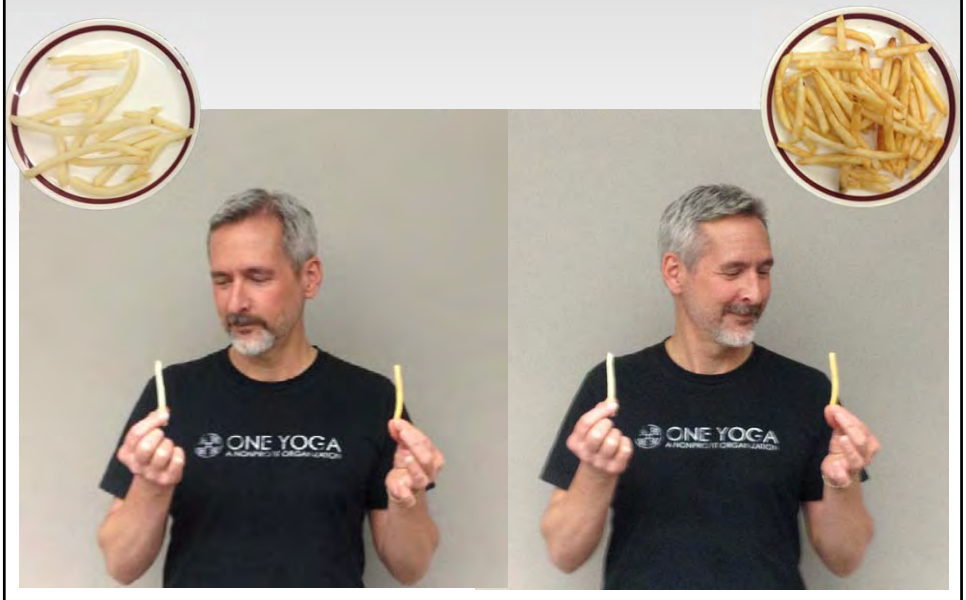
How much energy does the food service industry buy?

Source: NRA 2014 Forecast

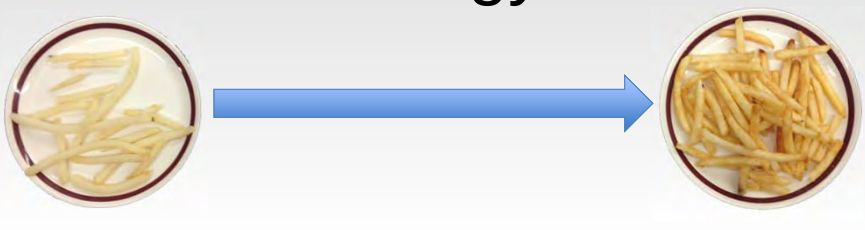
The Story of Energy and Food



What's the Difference?



Energy



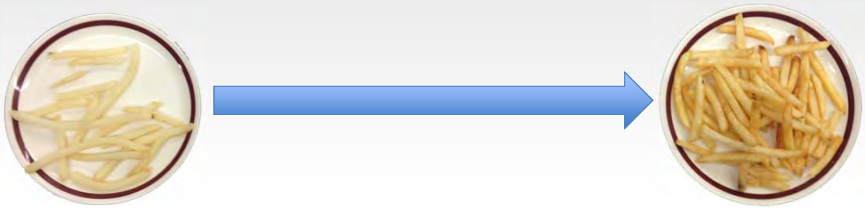
$E_{fry} = E_{sense} + E_{melt} + E_{thaw} + E_{vap}$

Lots of Energy!

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

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**

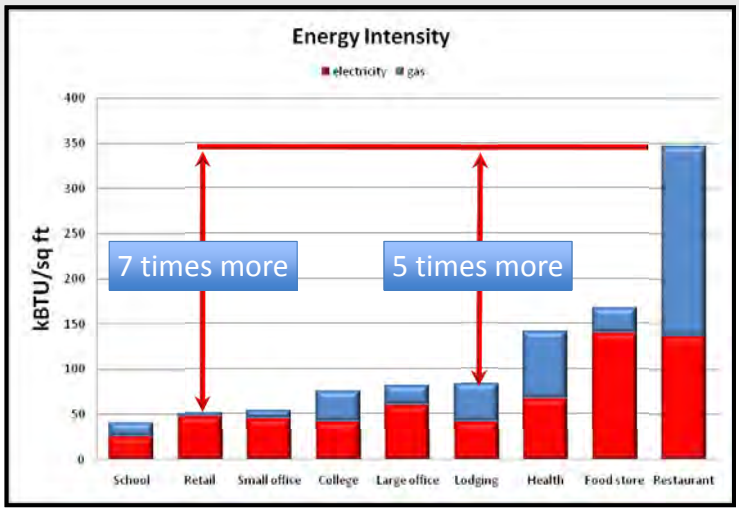
Why should you care?



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 = Energy Sold / Energy Bought = %

Efficiency = Profit

What is Production Capacity?
"Performance"

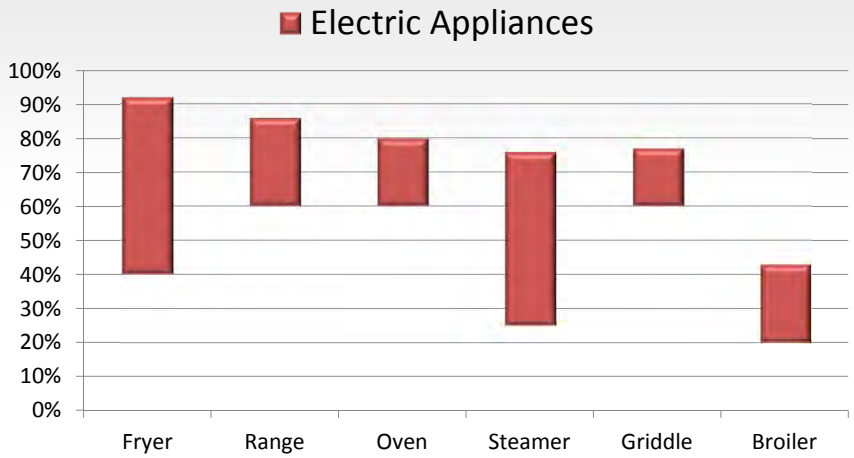
Production Capacity = $\frac{\text{Food Cooked}}{\text{Time}}$ = lb/hr

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 Vs. **WATER EFFICIENT**

$3,500/YR

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.

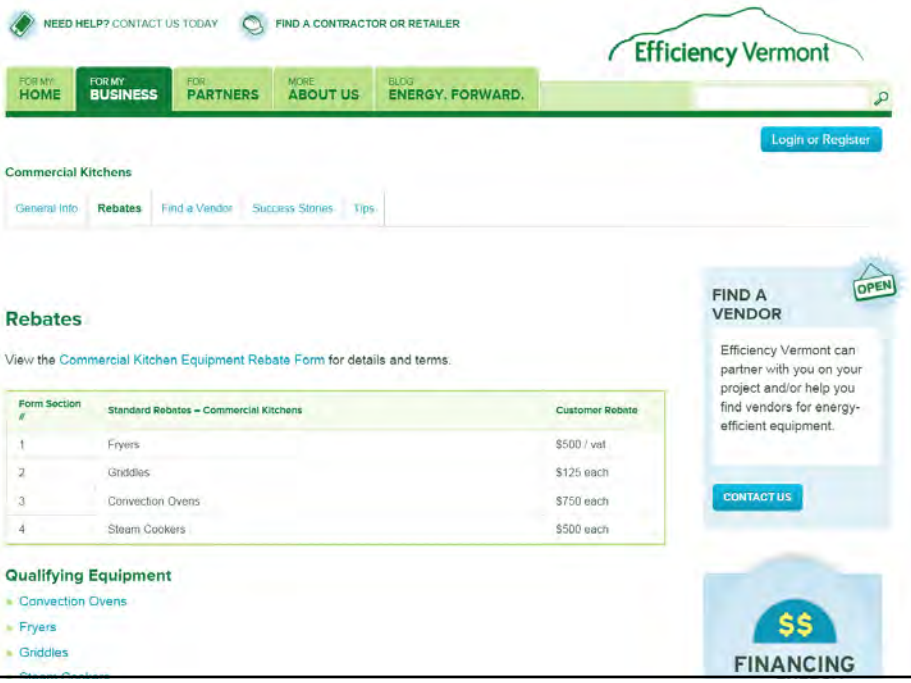
So, it makes sense to specify the most efficient equipment

How do I find energy efficient equipment and dollar incentives?

Use Energy Star to find efficient equipment and rebates

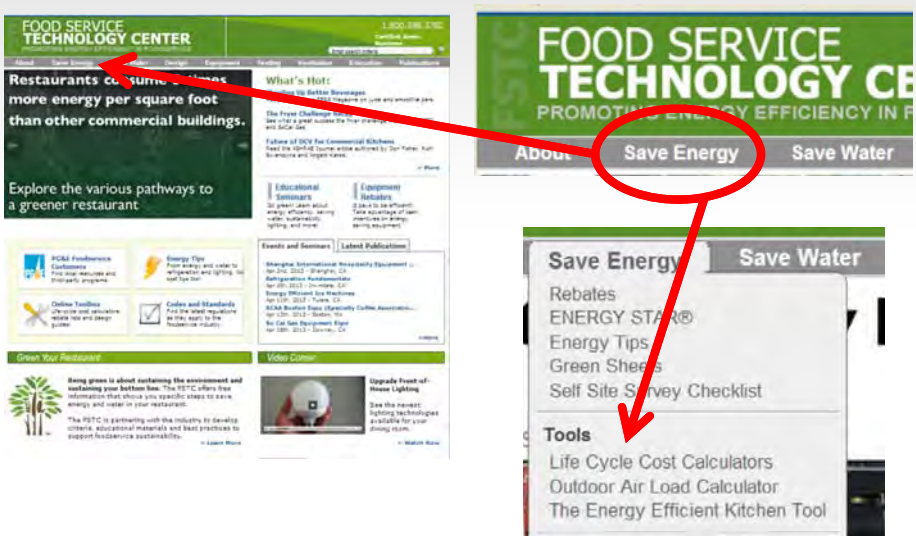
www.energystar.gov/cfs

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



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



Electric Combination Oven

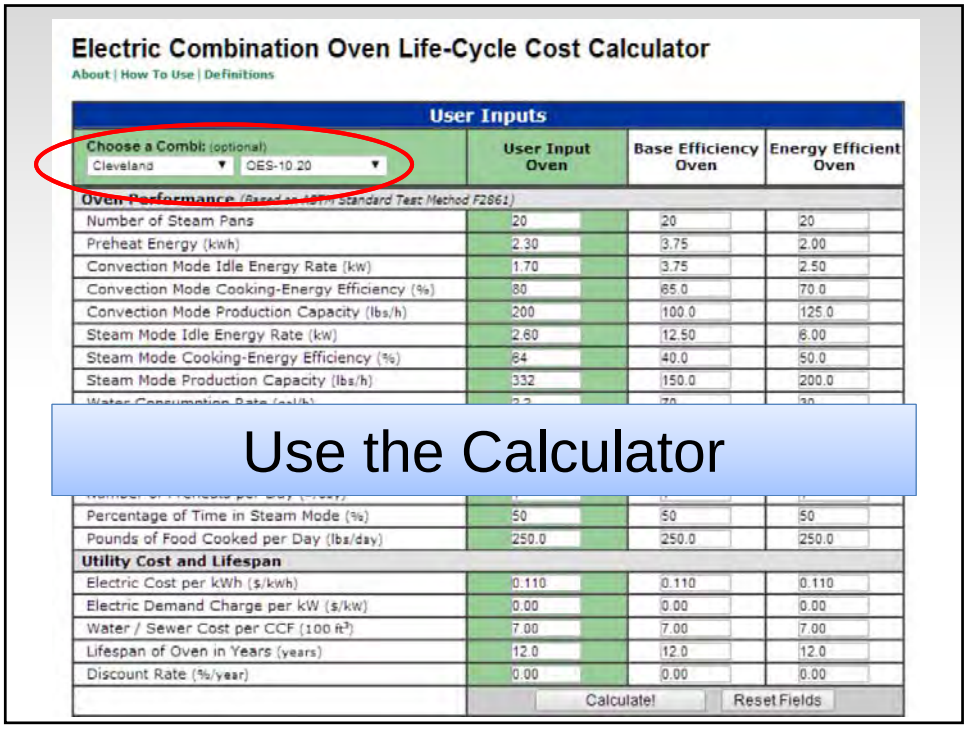
Qualified Combination Ovens

Updated 5/13/2014

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

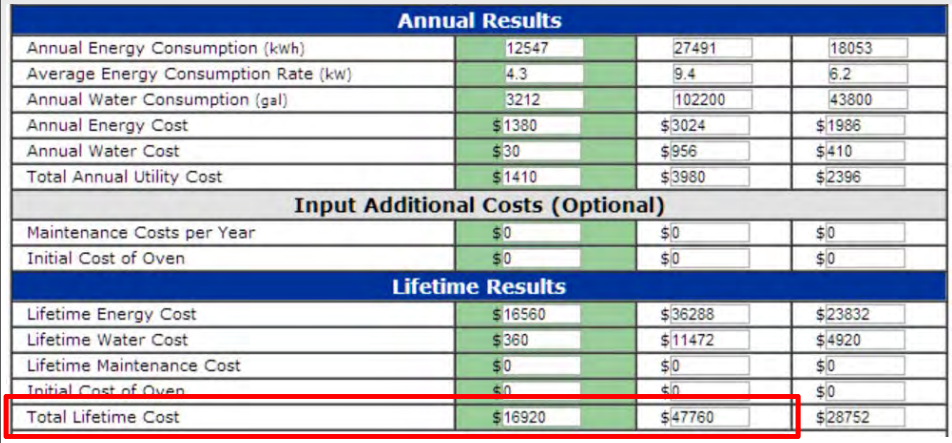
Company Name	Model Number	Size (Steam Pans)	Fuel Type	Preheat Energy (Btu or kWh)	Convection Mode				Steam Mode				Rebate (per oven)
					Idle Energy Rate (Btu/h or kW)	Energy Efficiency (%)	Production Capacity (lbs/h)	Cooking Water Use (gal/h)	Idle Energy Rate (Btu/h or kW)	Energy Efficiency (%)	Production 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
Cleveland	OES-10.20	20	Electric	2.30	1.70	80%	200	29.0	2.60	64%	332	2.2	$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.



Use the Calculator

Get an Answer



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 $tC0_2e$*
  - –$1,370 @ $11/ $tC0_2e$

*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

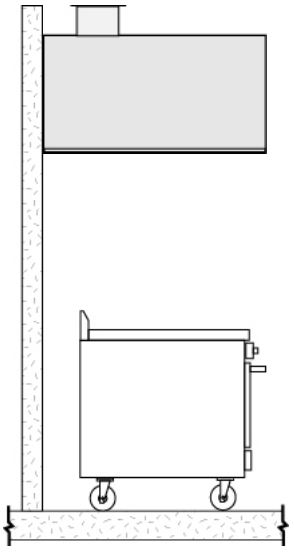
Commercial Kitchen Ventilation

?

Make sure appliances are all the way under the hood.

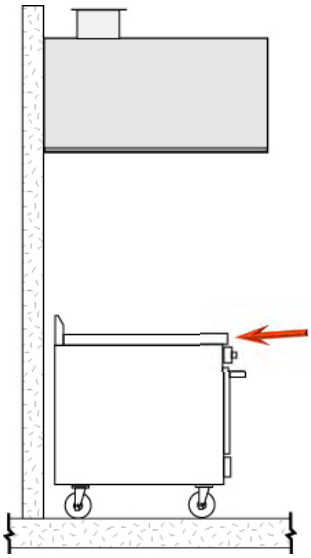
Don't fill your kitchen with heat and smoke

Optimize the Kitchen Exhaust Hood

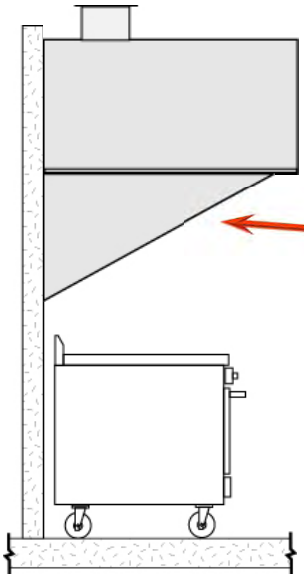


Two Nuggets

How to keep the smoke and heat in the hood.



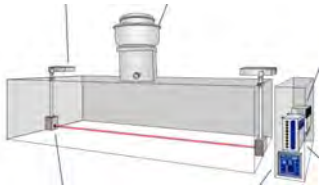
PUSH APPLIANCES BACK



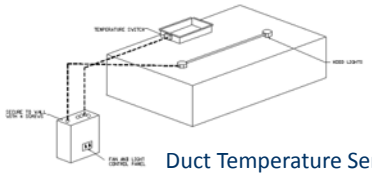
ADD SIDE PANELS

Exhaust Hood: DCKV

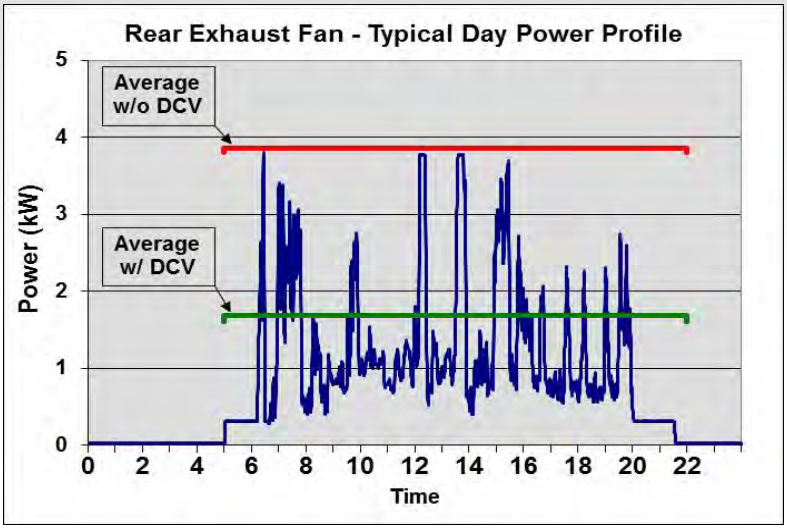
Duct Temperature Sensor & Infrared Sensors



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