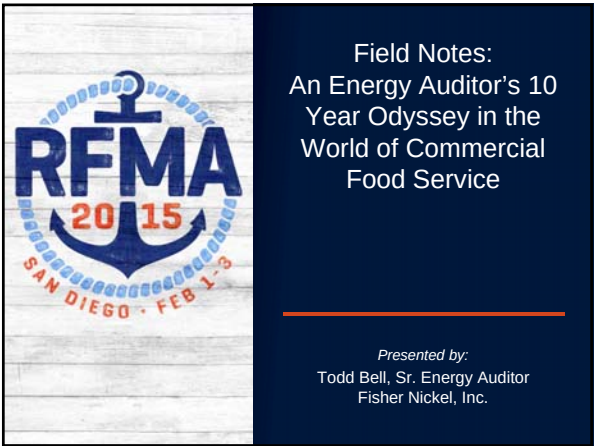




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The Food Service Technology Center (FSTC) program is funded by California utility customers through the public purpose program and administered by the Pacific Gas and Electric Company under the auspices of the California Public Utilities Commission.

Fisher-Nickel Inc. has managed the FSTC for PG&E since 1986.

*Our Mission:*

**Promote Energy Efficiency  
in Commercial Food Service**



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*Every Journey has a first step!*



**Lab Tech - 1998**

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**Why focus on Commercial Food Service?**  
**Because it is VERY energy intensive!**



*Five Times  
Greater/Sq. Ft.!*

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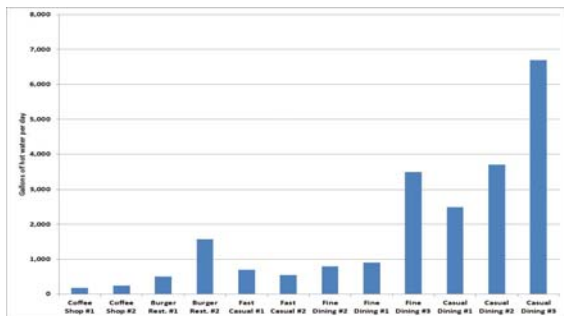
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**And water intensive too!**



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Pacific Gas & Electric Company  
Service Territory

40,000 Restaurants!

Total annual energy bill ~ \$1.8 billion



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How the FSTC helps the industry . . .

- Appliance Testing
- Real World Energy Use Monitoring
- Kitchen Ventilation Laboratory
- Site Survey/Energy Audits
- Equipment Specification Review
- Facility Design Assistance
- LEED
- Publications
- Seminars
- Utility Food Service Equipment Rebates
- Online Resources



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Appliance Testing Laboratory

create standard test methods  
&  
"miles-per-gallon" numbers for appliances



The controlled environment "levels the playing field."

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Food Service Technology Center  
Appliance Test Summary Report

Heavy-Load Cooking Energy Efficiency \*

Food Product: Russet Potatoes 150

Preheat to 340°F

|                          |        |
|--------------------------|--------|
| Duration (min)           | 13.33  |
| Energy Consumption (Btu) | 10,150 |
| Preheat Rate (°F/min)    | 20.19  |

Production Capacity (lb/hr) 89.7 ± 5.5

\* based on a minimum of three test replicates.

Heavy-Load Cooking Energy Efficiency

| Food Product    | Preheat Rate (°F/min) | Duration (min) | Energy Consumption (Btu) | Production Capacity (lb/hr) |
|-----------------|-----------------------|----------------|--------------------------|-----------------------------|
| Russet Potatoes | 20.19                 | 13.33          | 10,150                   | 89.7 ± 5.5                  |

Value Line Corporation  
200 South First Street  
Anaheim, CA 92805  
www.value-line.com

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# What is Efficiency?

Efficiency =  = %

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Standardized Testing is the basis for  
Energy Star and Utility Rebates



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Getting down to the Brass Tacks



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CA Utility Costs for Commercial Food Service



Natural Gas = \$1.05/therm (2015 forecast)  
(One therm = 100,000 btu's)



Electricity = \$0.15 – \$0.21/kWh  
(kWh = 1,000 watt hours)



Water & Sewer = \$5.00 – \$15.00/CCF  
(CCF = 748 gallons)

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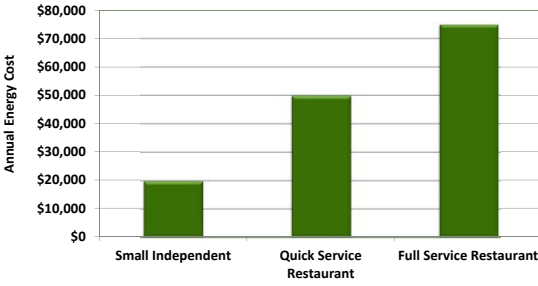
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Running a restaurant isn't cheap!



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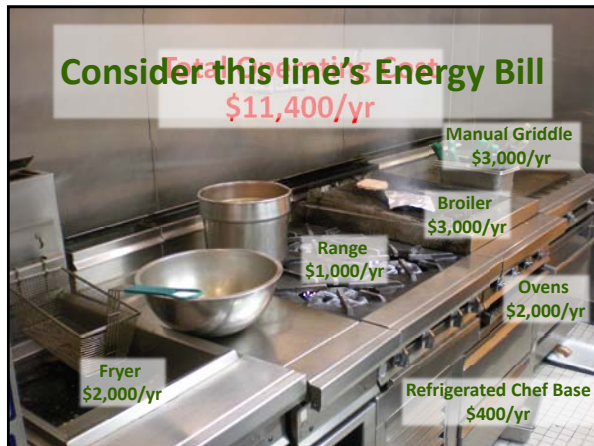
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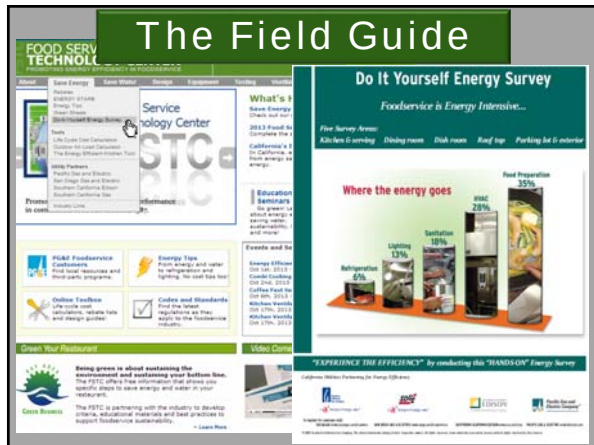
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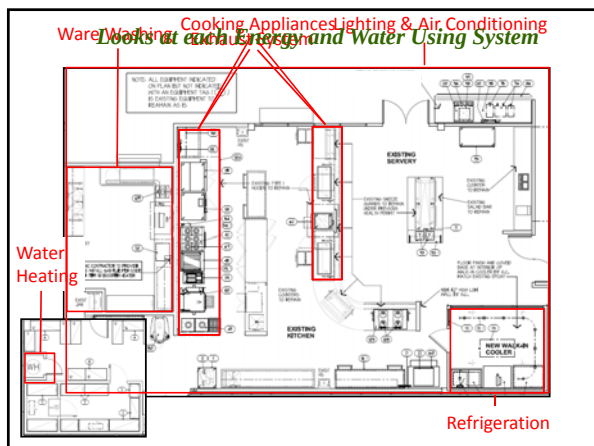
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[illegible][illegible]

## The Find



A photograph showing a bright, glowing 250-watt heat lamp in a walk-in freezer. The lamp is mounted on a metal surface, and its intense light illuminates the surrounding area, which appears to be the interior of a freezer. The background is dark, emphasizing the brightness of the lamp.

*250 Watt heat located in an outdoor Walk-in Freezer  
... located in Bakersfield ... in August!*

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# Solution: LED Lamp

Annual savings

**\$375**

A large, silver, reflective halogen heat lamp with a black base.

250 watt halogen  
heat lamp

A small, white, frosted LED lamp with a standard screw base.

10 watt lamp  
LED

Assumptions: 24/7/365 operation, \$0.18/kWh

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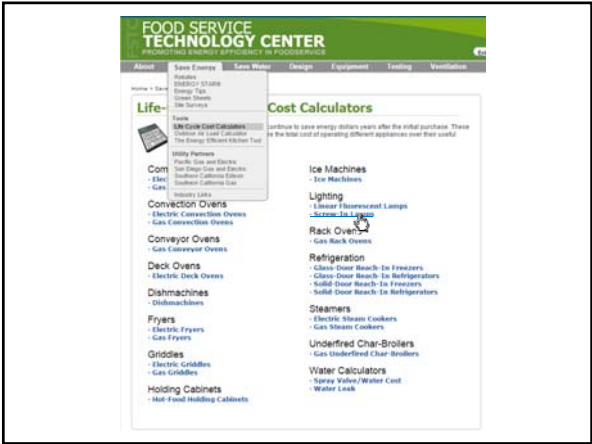
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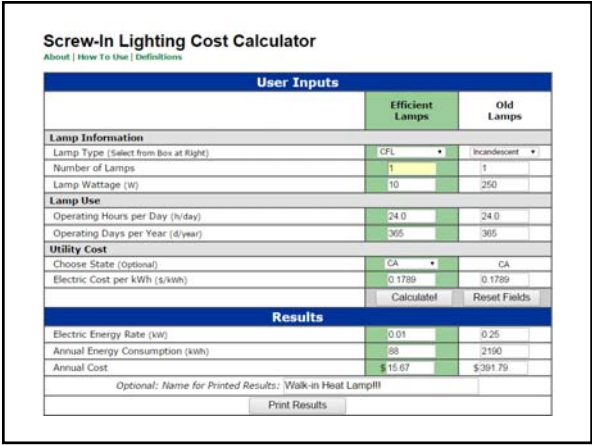
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Another Find . . .

40 X 65 watt PAR 30 halogens



Easy 10 Watt LED retrofit

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Screw-In Lighting Cost Calculator

About | How To Use | Feedback

| User Inputs                          |                 |              |
|--------------------------------------|-----------------|--------------|
|                                      | Efficient Lamps | Old Lamps    |
| Lamp Information                     |                 |              |
| Lamp Type (Select from Box at Right) | 55 W LED        | Incandescent |
| Operating Days per Year (d/year)     | 365             | 365          |
| Electric Cost per kWh (¢/kWh)        | 0.180           | 0.180        |
| Results                              |                 |              |
| Electric Energy Rate (¢/kWh)         | 0.40            | 2.60         |
| Annual Energy Consumption (kWh)      | 2336            | 15184        |
| Annual Cost                          | \$420.48        | \$2733.12    |

Optional: Name for Printed Results: PAR30 halogens (65 W)

Annual Operating Cost Savings: \$2,313

ROI: 0.5 years

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LEDs last 50 times longer too!



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Kitchen & Serving

Lighting (Incandescent)

Air (Ventilation)

Food Prep (Hot Food)

Water (Sanitation)

Refrigeration (Cold Food)

Roof Top

Air (Ventilation)

Refrigeration (Cold Food)

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© 2015 Fisher-Nickel, Inc.



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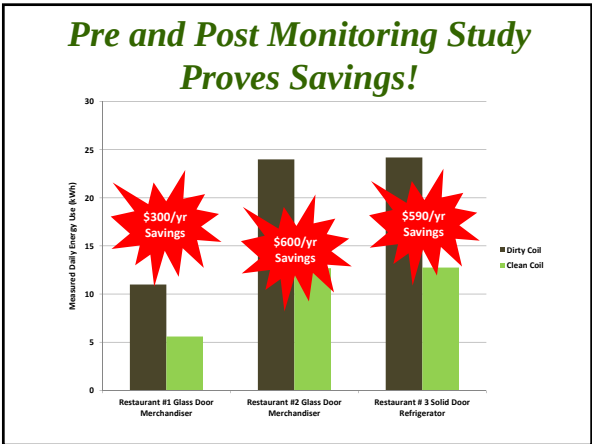
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About

Save Energy

Save Water

Design

Equipment

Testing

Ventilation

Education

Pre-Rinse Spray Valve

About | How To Use | Defaults

Water Cost Calculator

Water Using Appliances

Resources

Inputs

Water Heater Fuel Type (Select from Box at Right)

Water Heater Efficiency (%)

Temperature Rise Through Heater (°F)

Electric Cost per kWh (¢/kWh)

Water/Sewer Cost per CCF

Calculate!

Reset Fields

Results

Annual Water Consumption (gallons)

Annual Water Consumption (units)

Annual Water Heating Energy (kWh)

Annual Water and Sewer Cost

Annual Water Heating Cost

Total Annual Cost

Optional: Name for Printed Results:

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About

How To Use

Defaults

Pre-Rinse Spray Valve and Water Cost Calculator

Annual Operating Cost Increase: \$1,741

Cost of New Sprayer: \$50

ROI: No Brainer . . . Again!

User Inputs

Old Device (Optional)

Water Heater Fuel Type (Select from Box at Right)

Water Heater Efficiency (%)

Temperature Rise Through Heater (°F)

Electric Cost per kWh (¢/kWh)

Water/Sewer Cost per CCF

Calculate!

Reset Fields

Results

Annual Water Consumption (gallons)

Annual Water Consumption (units)

Annual Water Heating Energy (kWh)

Annual Water and Sewer Cost

Annual Water Heating Cost

Total Annual Cost

Optional: Name for Printed Results: Faulty 1.42 gpm sprayer & electric water h

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### The Find

*Leaks just about everywhere!*

Even a small drip adds up:

- 14,000 gallons/yr
- water/sewer: \$150
- gas: \$130
- **Total: \$280!**



\$1.00/therm & \$8.00 per unit water/sewer

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### Another Find . . .



**Failed TPR Valve: 3 gpm**

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Save Energy

Save Water

Design

Equipment

Testing

Ventilation

Education

Water Leak Co

About | How To Use | Details

About the Leak

Water Temperature (°F)

Measured Leak Rate (g/min)

Hours per Day (h/day)

Days per Year (d/year)

Water Heating Performance

Water Temperature (°F)

Water Temperature (°F)

Temperature (°F)

Gas Cost (\$/therm)

Water Cost (\$/gallon)

Water Using Appliances

Combination Ovens

Dishwashing Machines

Ice Machines

Steamers

Resources

ENERGY STAR®

Sealings by Design

WaterSense

puts

Hot

72.0

24.0

365

puts

Hot

72.0

24.0

365

Annual Water Wasted (gallons)

Annual Water Wasted (units)

Annual Water Heating Energy Wasted (therms)

Annual Water and Sewer Cost

Annual Water Heating Cost

Total Annual Cost

Annual Natural Gas Cost: \$486

Annual Electricity Cost: \$125

Total Water & Sewer Cost: \$315

Total Annual Cost: \$926

Optional: Name for Printed Results: (Gas Water Heater (Supply))

ric Booster Heater

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Out of Sight,  
out of mind is  
costly!



TPR Valve Leak: 50 Gallons/day

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The Find

180°F Water Heater Set Point and  
Delivery Temperature!



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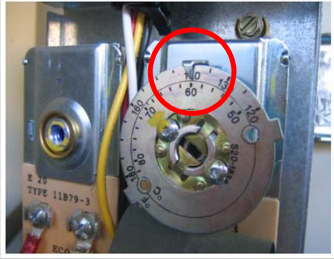
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© 2015 Fisher-Nickel, Inc.

**Solution: Calibrate set point to meet point source requirements**



**40°F Reduction = \$3,000/yr Savings!**

Assumptions: 2,500 g/hot water/day, 70% system eff., \$1.00/therm

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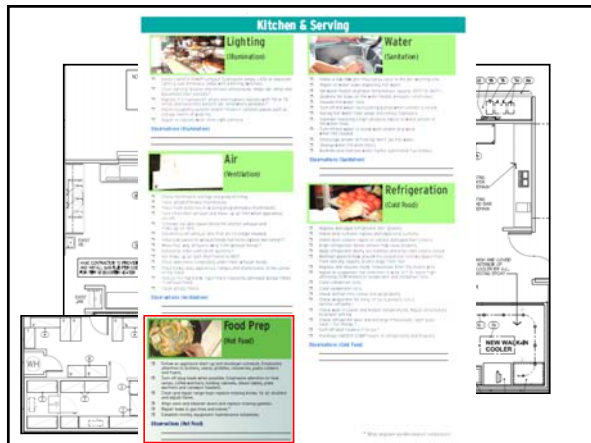
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**The Find**

**Low Efficiency Fryers**



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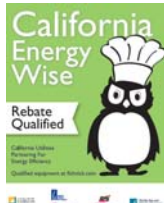
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## Solution: Energy Star & CA Energy Wise Listed Fryer





fishnick.com/saveenergy/rebates/

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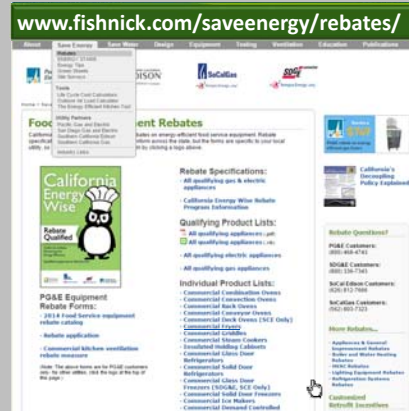
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***Justify the Purchase!***  
**Life Cycle Cost Analysis**

The diagram features an iceberg floating in blue water under a blue sky. The small tip above the water is labeled 'Acquisition Cost' with a green arrow pointing to it. The large submerged portion is labeled 'Sustainability Cost' with a green arrow pointing to it. To the right of the iceberg, there are two green-bordered boxes. The top box contains the text 'Acquisition Cost'. The bottom box contains the text 'Sustainability Cost' followed by a bulleted list: '➤ Energy', '➤ Water', and '➤ Maintenance'. To the right of this list is a small image of a US dollar bill with a flame coming out of it, symbolizing cost.

**Acquisition Cost**

**Sustainability Cost**

- Energy
- Water
- Maintenance

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# Fryer Life Cycle Cost Analysis



Question:

- Is an Energy Star fryer worth the investment?

Assumptions:

- Hrs of Op.: 12 hours/day
- Days of Op: 363 days/year
- Lifespan: 7 yrs
- Utility cost: \$1.00/therm
- Purchase price

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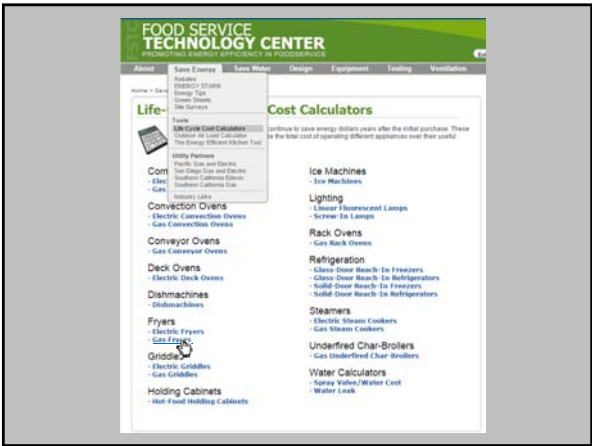
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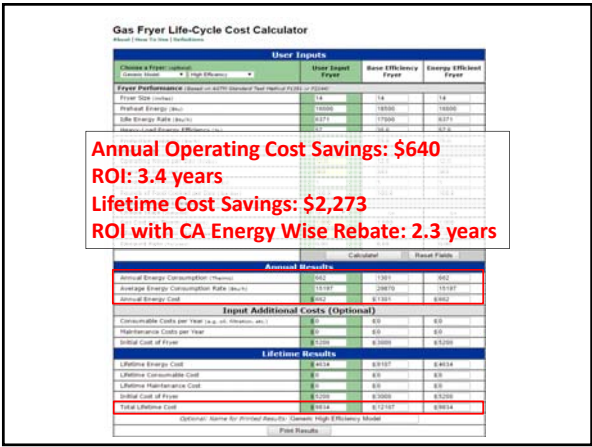
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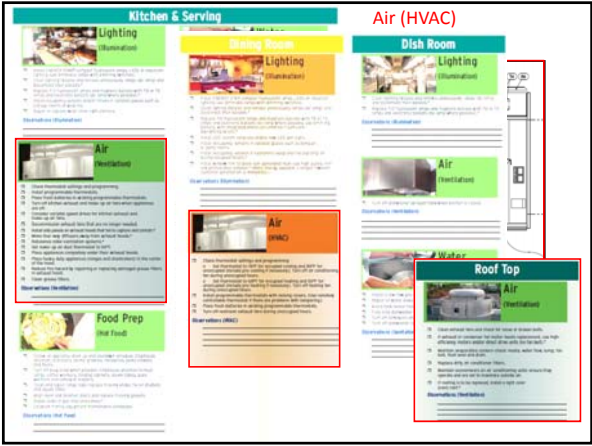
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### The Find

*Hot, Smoky or Steamy Kitchen!*



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### Solution #1: No 4-Way diffusers in front of hood



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Thermal imaging  
shows the  
effects!

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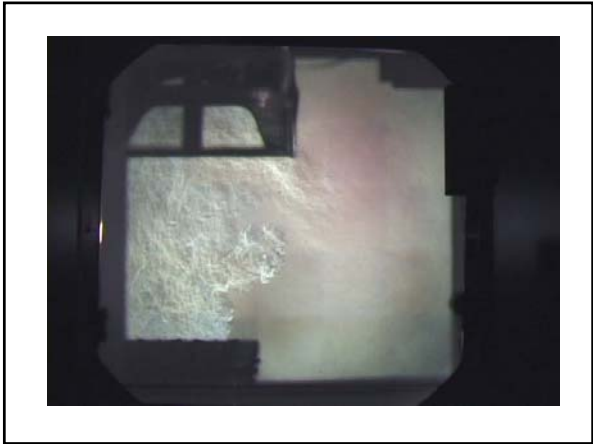
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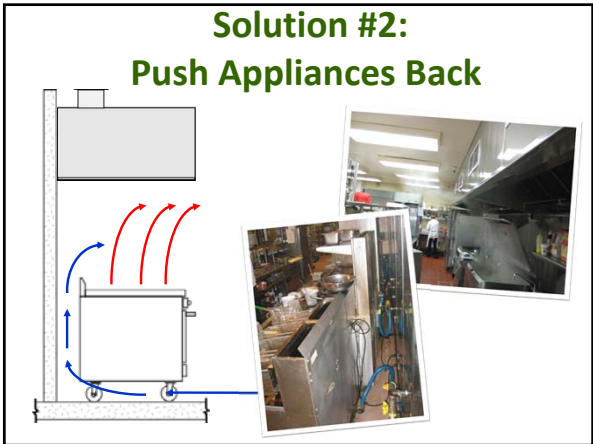
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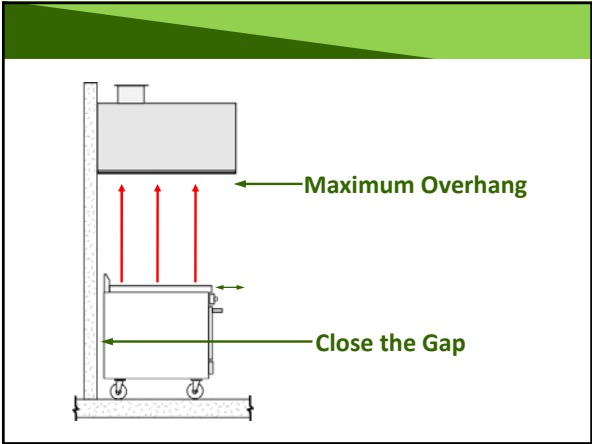
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**Solution #3: Add Side Panels**

See them in action: <http://fishnick.com/ventilation/ventilationlab/video/>

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***Now a quick stroll  
down memory lane!***

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*Force Thaw Overkill!*

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*Comes in Avocado, Harvest Gold and Rust!*

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*Ice Machine Camo!*

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*Ready, Aim, Fire!*

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*Now that's a Big !\$#@\* Bulb!*

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*Smoke Break!?!*

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*Who needs a plumber?!?*

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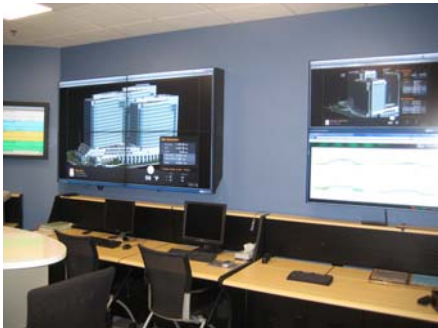
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*Mission control*

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*Those are animal jawbones . . .  
Right?!?*

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*More uses for plastic wrap!*

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*I'm so confused!*

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*No slack’n off in this walk-in!*

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*Ahh . . . Bacon!*

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*Satan’s Oven?!?!*

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***Ban the Bag!***

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***Practice what you preach!?!?***

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*Speaks for itself!*

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*Yikes!*

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*Yuck!*

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***And more Yuck!***

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***And above all . . .***



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***Play Ball!***

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