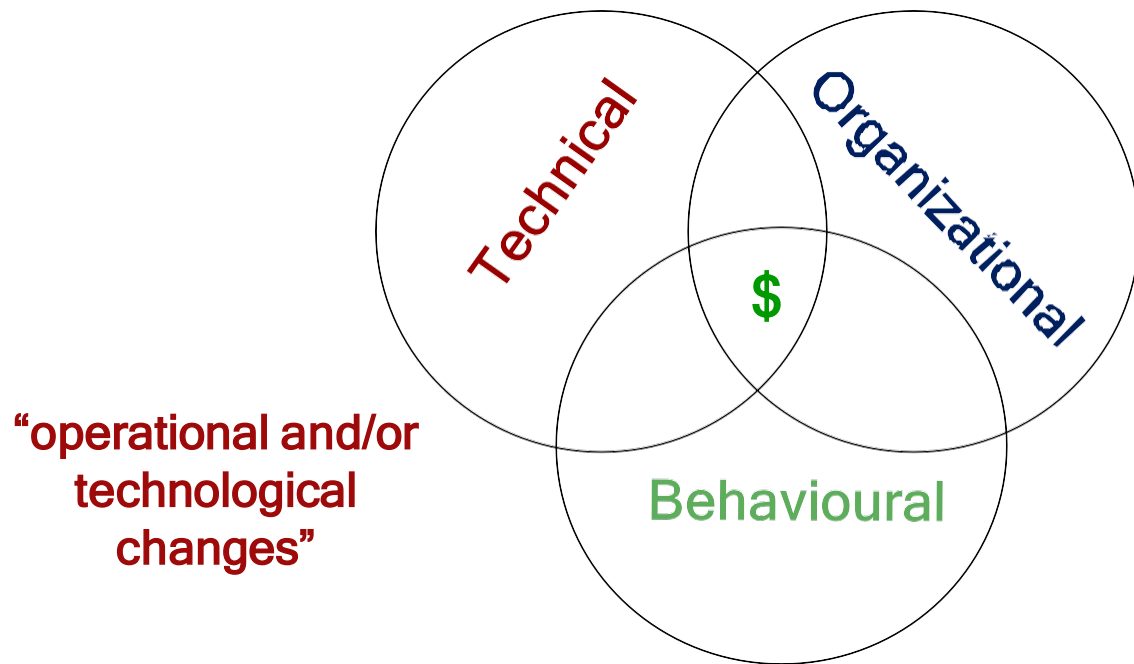


An aerial photograph of a city, likely Chicago, showing a dense grid of streets and green trees. The image is overlaid with a semi-transparent blue gradient that is darker on the left side where the text is located. A solid yellow horizontal bar is positioned in the top left corner.

Spot the Savings

Stephen Dixon
President, Knowenergy

The Challenge of Saving Energy



**“working together to
build an energy
managing business”**

**“awareness,
better habits,
procedures and
feedback”**

Savings Energy Has Other Benefits

**Direct and
Indirect Energy Savings**

**Comfort, productivity and
sales increased**

Asset Renewal

Reduced O&M costs

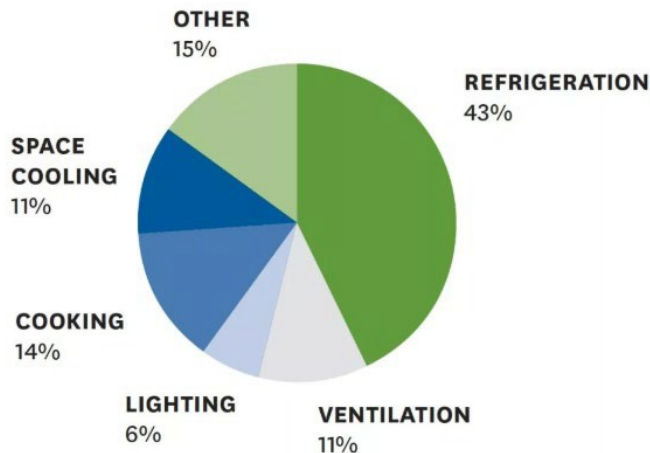
**Environmental impact
reduction**

**Increased
reliability and safety**

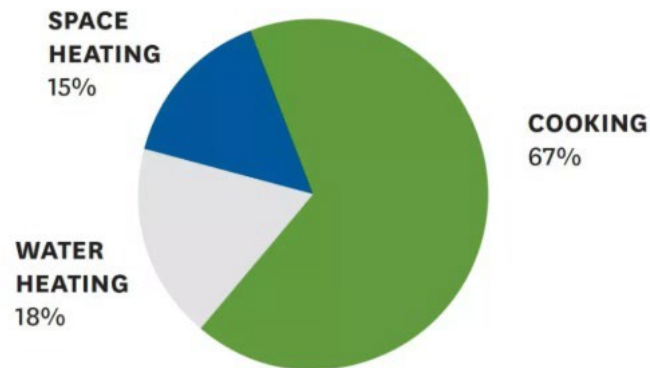


Where Does Your Restaurant Use Energy?

ELECTRICITY CONSUMPTION BY END USE



NATURAL GAS CONSUMPTION BY END USE



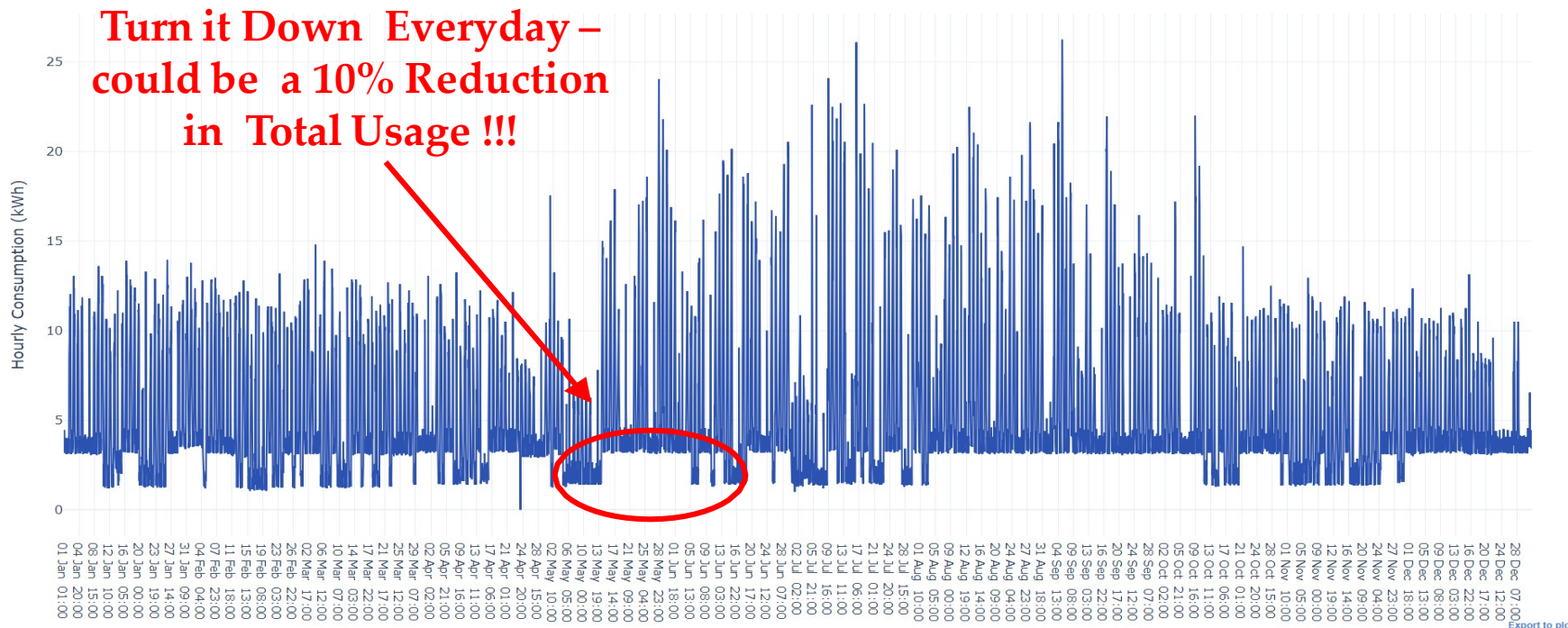
<https://blog.restaurantscanada.org/index.php/2018/08/21/how-to-stop-wasting-and-start-saving-on-energy/>

Quick Restaurant Energy Facts

- 40% energy reduction possible with 1.5 to 3.5-year paybacks
- With a 5% net margin, \$1,000 saved on energy is equivalent to \$20,000 in meal sales.
- Operational/behavioural changes could yield 10 to 30% savings.



Restaurant Electrical (Profile) Heartbeat!





No Cost / Low-Cost Opportunities

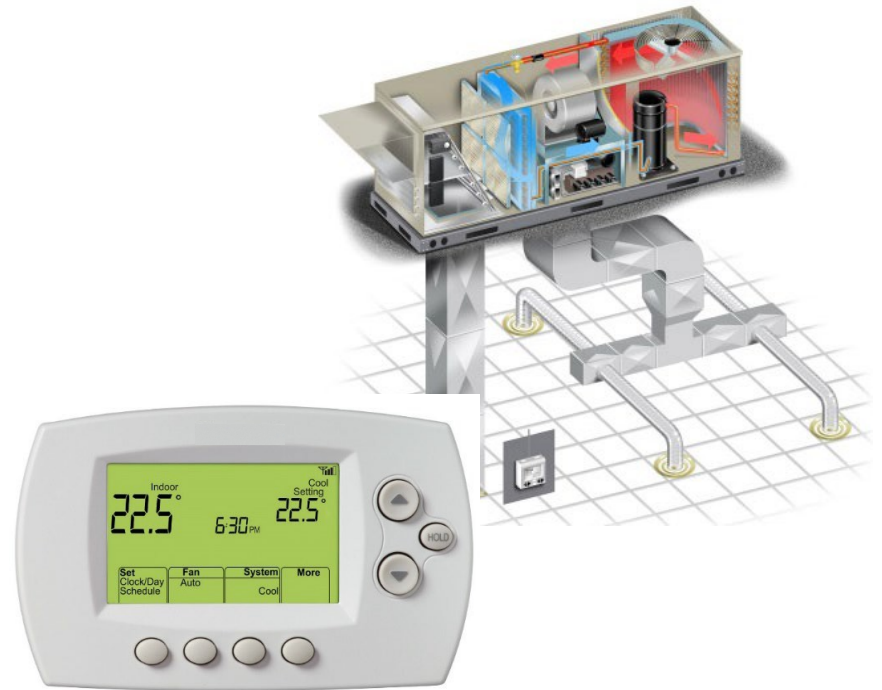
Television and Media Boxes

- Could be a significant load!
 - TVs
 - Media racks
 - Standard 15A circuit could use \$1,900 year!
- Shut it down when not required



Shutdown Fans When Not Required for Heating /Cooling

- Fan On/Off/Auto
- Small Units: \$200/yr
- Larger Units: \$500/yr
- May be required for good air circulation.
- Optimize temperatures



Cooking Equipment - Just Turn it Off!

Annual savings possible		
Turn off ...		
Unused gas burners	100 therms	\$90
Unused electric burners	1,000 kWh	\$100
Gas underfired broiler, 1 hour per day	360 therms	\$330
Electric broiler, 1 hour per day	3,600 kWh	\$370

Notes: kWh = kilowatt-hour.
Energy rates used are \$0.916/therm and \$0.103/kWh.
All money figures are in U.S. dollars.

© E Source; adapted from
Food Service
Technology Center

https://www.mge.com/saving-energy/business/bea/article_detail.htm?nid=1915

Which Uses More Energy?Clocks or Cooking?

It depend how much do you use the oven?



Water Efficient Spray Rinse Nozzles

- Old Nozzle
 - 2 USGPM, 1 hr/day
 - \$1,000 water, \$900 natural gas
- New Nozzle
 - 0.6 USGPM
 - \$300 water, \$270 natural gas
- Saving \$1,330/yr
 - 2-month payback!



<https://fishnick.com/savewater/bestpractices/>

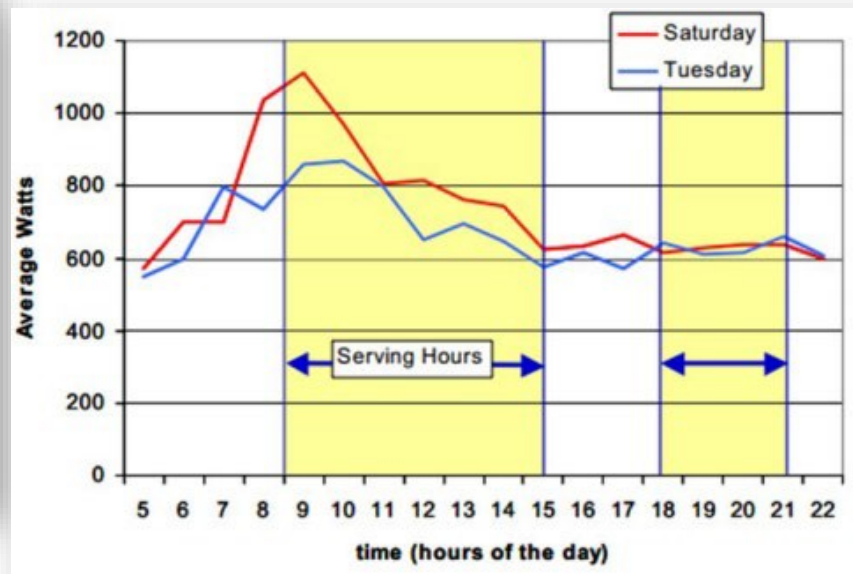
Save 25% on Espresso Machine Shutdown

Power consumption

Stand-by	550 W
Light production	625 W
Heavy production	800 W

Energy consumption

Production hours (17hrs)	11,9 kWh/d
Nighttime (7hrs)	3,9 kWh/d
Total	15,8 kWh/d



http://energycheckup.eu/uploads/media/PL_SoA_BarsRestaurants.pdf



Energy Star

Convection Ovens

- ENERGY STAR typically 20% more efficient
2 USGPM, 1 hr/day
 - \$1,000 water, \$900 natural gas
- TIPS
 - Limit idle
 - Fully load
 - Maintain seals



Refrigerators and Freezers

- ENERGY STAR qualified commercial refrigerators and freezers can reduce energy costs by as much as 35 percent.



Hot Water Heaters

- ENERGY STAR typically 65% more efficient than standard models.
- TIPS
 - Shut off at night
 - Use a timer
 - Ensure tight door gaskets



Hot Water Heaters

- ENERGY STAR qualified commercial dishwashers use ~ 25 % less energy and water than standard models.
- TIPS
 - Turn off at night
 - Replace worn spray heads





HVAC

Exhaust – Turn Off When Not Needed

- Cost is ~ \$2.40 per cubic foot / minute (CFM)
 - 2 USGPM, 1 hr/day
 - \$1,000 water, \$900 natural gas
- Savings of \$0.5 to \$1/hour of shutdown
 - 2-month payback!



Filters! Operational Cost Efficiency



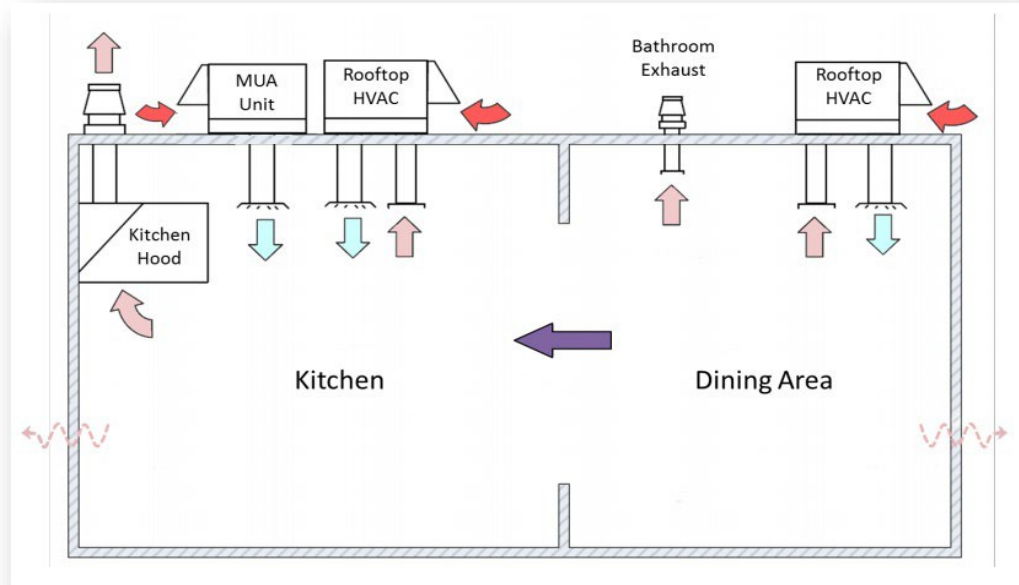
Two weeks more with a dirty filter costs:

$$0.24 \text{ kW} \times 336 \text{ hours} \times \$0.165/\text{kWh} = \$13.30$$



Stay Balanced!

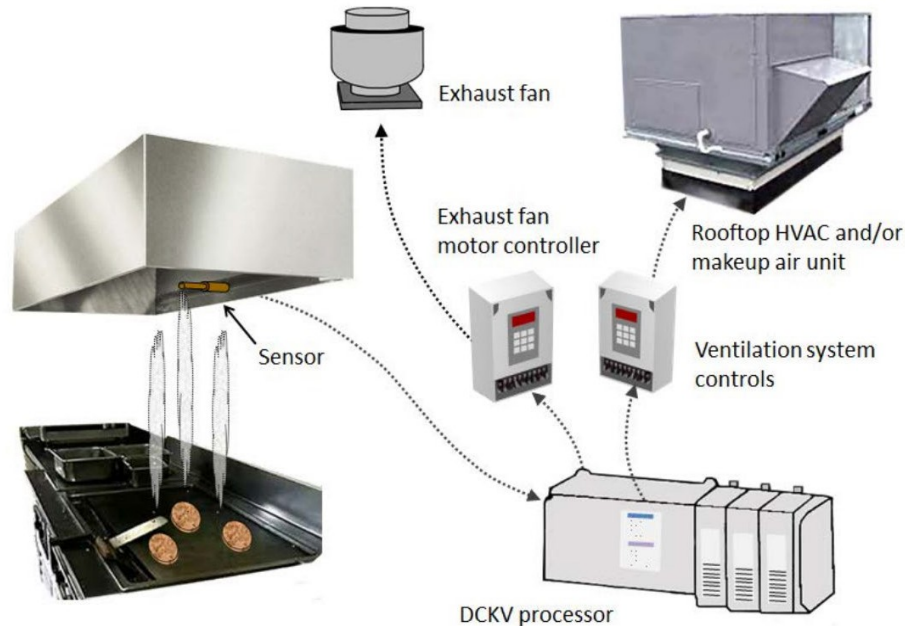
- Less cold feet!
- Doors are easier to open.
- Exhaust is more effective!



<https://betterbuildingsolutioncenter.energy.gov/sites/default/files/attachments/Guidance-on-Demand-Controlled-Kitchen-Ventilation.pdf>

Demand Control Kitchen Ventilation

- Turns down flow
- Saves both gas and electricity
- Maintains air balance
- Payback of 3 to 4 years
- Electricity and natural gas incentives



<https://betterbuildingsolutioncenter.energy.gov/sites/default/files/attachments/Guidance-on-Demand-Controlled-Kitchen-Ventilation.pdf>

Rooftop Unit Replacement

- Reduce energy use by 30 to 50%
 - Electricity and Gas
 - 2 to 3-year payback
- Improve control
 - Better comfort!
- More reliable
- Good incentives





Lighting

Advantages of LED Sign Lighting

- Long life
- Eye-catching brightness
- Better appearance
- Low maintenance
- Thinner
- More options
- 40% to 80% less energy



LEDs - Same Great Effect - at least 75% Less Energy

- Less heat
 - less AC
- Longer life
- Safer
- Many options
- Less heat in coolers



<https://www.businesswire.com/news/home/20170606005596/en/Feit-Electric%20Introduces-Vintage-Style-LED-Lighting-a%20Twist>

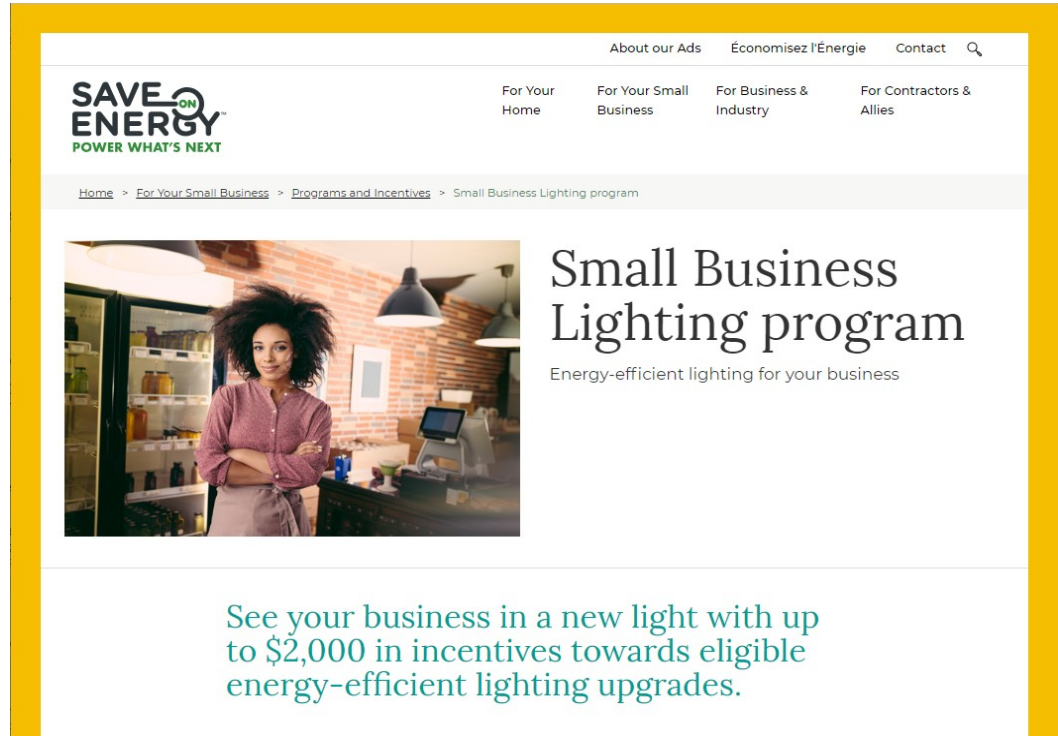
Don't Just Swap Lamps

- Use lighting to enhance the atmosphere
- Integrate daylight
- Safer and more effective kitchen
- Less heat in coolers
- And...save energy!



Good News

There's an Incentive for That!



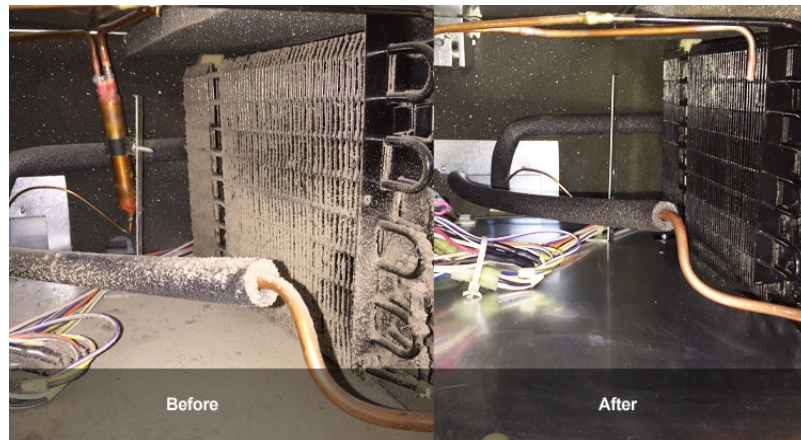
The screenshot shows the Save On Energy website. The header includes navigation links: "About our Ads", "Économisez l'Énergie", "Contact", and a search icon. Below the header, there are four categories: "For Your Home", "For Your Small Business", "For Business & Industry", and "For Contractors & Allies". The main content area features a breadcrumb trail: "Home > For Your Small Business > Programs and Incentives > Small Business Lighting program". A large image of a woman in a shop is on the left. To the right, the title "Small Business Lighting program" is displayed, followed by the subtitle "Energy-efficient lighting for your business". At the bottom, a teal-colored text box contains the message: "See your business in a new light with up to \$2,000 in incentives towards eligible energy-efficient lighting upgrades."



Refrigeration

Clean Condenser/Evaporator Coils

- Could double energy usage
- 50% increase is not uncommon
 - \$150/yr for a new 2-door reach in unit
- Dirty coils damage compressors and fans



Refrigeration Maintenance – A Lesson!

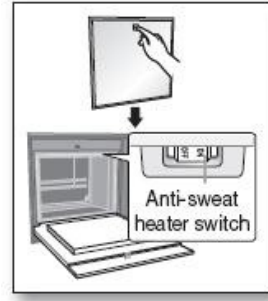
- Preventative maintenance
 - 12 units throughout restaurant
 - Clean condensers etc.
 - Cost ~ \$500
- Condenser fan failure
 - Compressor overheating and tripping
 - Food spoilage – case at 20C
 - Cost ~ \$650
- Additional energy could be easily \$200 to \$400/yr



<https://northeastcooling.com/routine-refrigeration-maintenance-pays/>

Use Door Antisweat Heaters as Required

- \$50 to \$100/yr savings per unit
- Switches may be hidden
- Could use automatic controls



Antisweat Heater Controls

- Humidity controlled
- Reduced electric heat



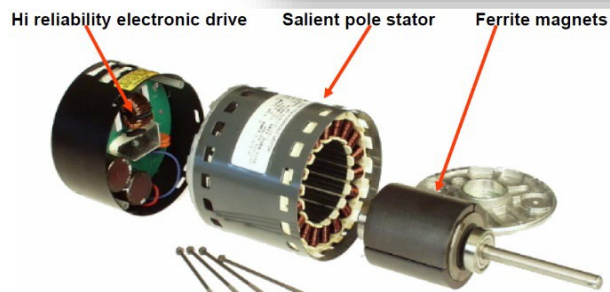
Strip Curtains for Coolers and Freezers

- Maintain cooler temperatures
- Reduce humidity and hence need for defrost
- Lower cooling energy



Electronically Commutated Motors (ECM) for Evaporator Fans

- Higher efficiency motor ($\sim 80\%$)
- Up to 3X higher
- Reduced fan energy and cooling load
- Possible variable speed operation



Evaporator Fan Controls

- Reduce excessive air movement
 - Often 24/7
- Reduced fan energy and cooling load
- Must maintain uniform temperature distribution



Thanks for the Opportunity to
be of Service!

Stephen Dixon
sdixon@knowenergy.com

