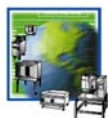


Energy and Water Efficiency in Your Green Dining Facility

Presented by: Richard Young



Food Service
Technology Center



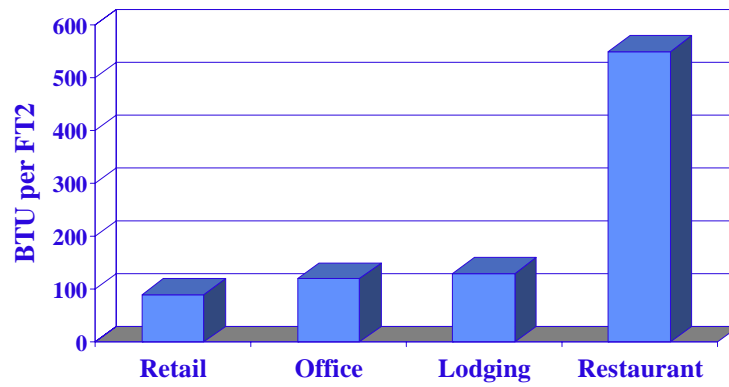
The Food Service Technology Center (FSTC) program is funded by California utility customers and administered by the Pacific Gas and Electric Company under the auspices of the California Public Utilities Commission.

Promoting:

Energy Efficiency in Commercial Food Service



Foodservice is energy intensive ...



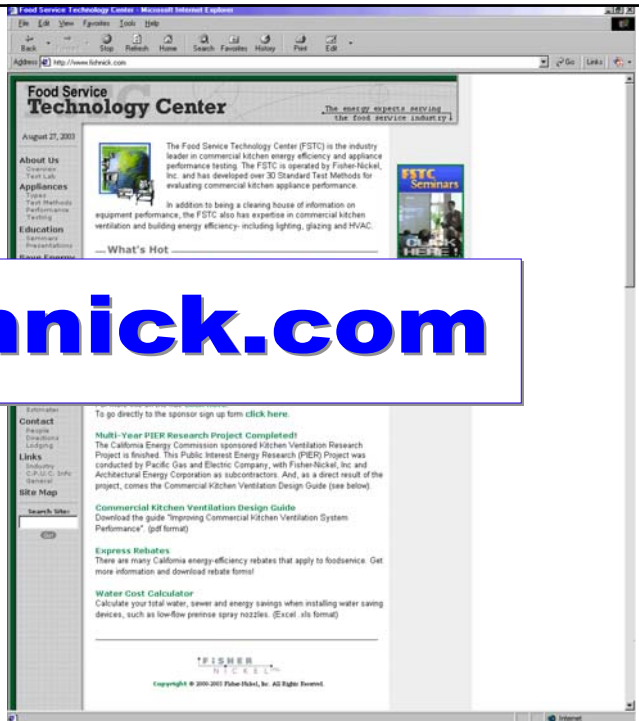
...and Water Intensive!

On-line Toolbox...



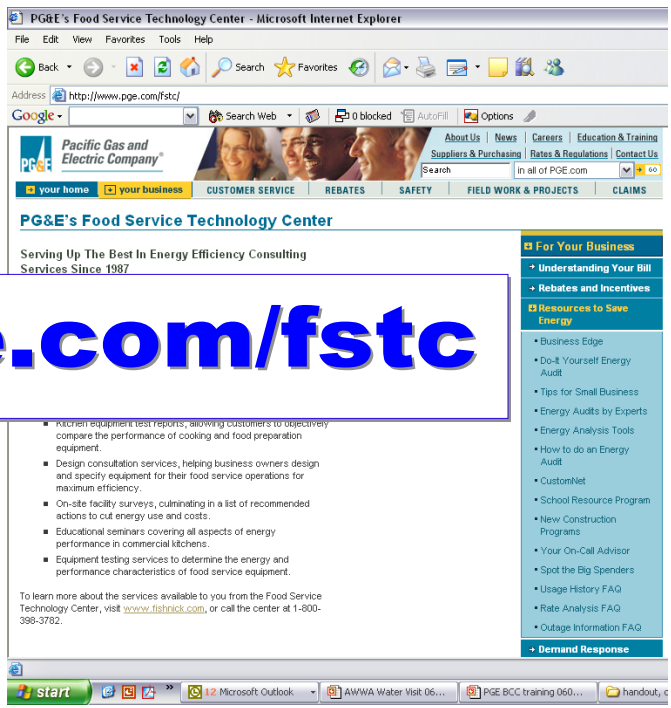
Check our
Web Site

fishnick.com



Check our
Web Site

pge.com/fstc



A quick intro to the Food Service Technology Center

How We Learn How We Can Help You!

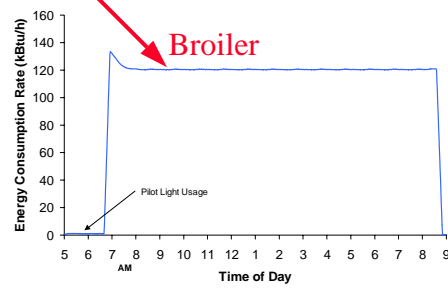
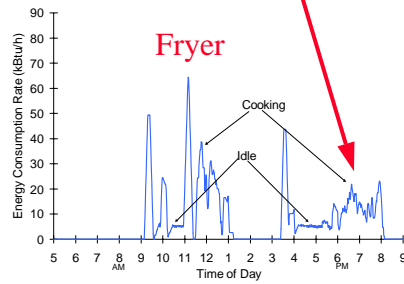
What is the FSTC ?
Where do we get our info?

Production Test Kitchen

– study real world energy use



Appliance Energy Profiles



Appliance Testing Laboratory

- create standard test methods
- and “miles-per-gallon” numbers for appliances



The controlled environment “levels the playing field.”

All appliances are not created equal!



Field Research



Site Visits and Analysis

“Where the rubber meets the road!”



Design Consultations



Seminars and Publications



Working with the Government, Utilities, and Other Industry Groups

Some Examples...

California Energy Commission



A Sempra Energy utility™



Water Utilities





Refrigeration



Fryers



Holding
Cabinets



Steamers

Specify **ENERGY STAR** Appliances

www.energystar.gov



Refrigeration



Fryers



Holding
Cabinets



Steamers

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Home > Products > Commercial Fryers

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Commercial Fryers

Fryers that have earned the ENERGY STAR are up to 25% more energy-efficient than standard models.

Earning the ENERGY STAR

ENERGY STAR qualified fryers include both gas and electric open-deep fat models. Fryers that earn the ENERGY STAR must meet a minimum cooking efficiency* of 50% (gas) and 80% (electric) while also meeting a maximum idle energy rate of 9,000 Btu/hr (gas) and 1,000 watts (electric).

Energy-efficient fryers that have earned the ENERGY STAR offer shorter cook times and higher production rates through advanced burner and heat exchanger designs. Frypot insulation reduces standby losses resulting in a lower idle energy rate.

Where can I get one?

Contact the manufacturers directly or speak with your food equipment supplier.

What can ENERGY STAR qualified fryers save me?

Each ENERGY STAR qualified gas fryer can save businesses 28 MBtu annually, or average of \$185/year on utility bills. Each ENERGY STAR qualified electric fryer can save 879 kWh annually, or an average of \$60/year on utility bills.

* Under heavy-load conditions

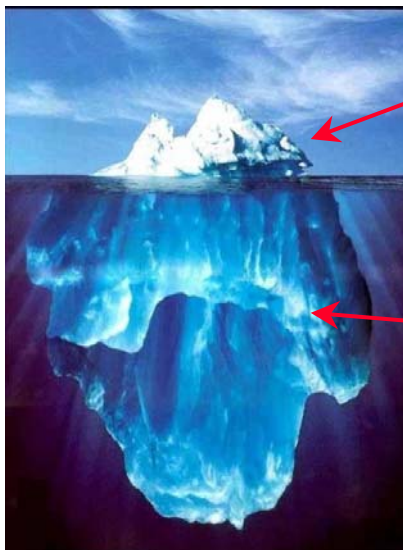
For Consumers
+ Savings Product Calculator (GAS) (Excel)
+ Savings Product Calculator (Electric) (Excel)
+ Product List Excel PDF
+ Manufacturer List Excel PDF

For Business
+ Purchasing & Procurement

For Partners
+ Partner Comments
+ QLI Form
+ Products in Development
+ Partner Resources

Done Internet

Life Cycle Cost – The Big Picture



Acquisition Costs

Sustaining Costs

can be
2 to 20 times greater

Food Service Technology Center Promoting Energy Efficiency in Commercial Food Service

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ENERGY STAR®
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Valve Calculator
Life-Cycle &
Energy Cost
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Life-cycle and Energy Cost Calculators

 High-efficiency equipment will continue to save energy dollars years after the initial purchase. These calculators allow you to compare the total cost of operating different appliances over their useful service lives.

Calculators for additional appliance categories continue to be developed, so check back often!

Fryers
[Electric Fryer Life-Cycle Energy Cost Calculator](#)
[Gas Fryer Life-Cycle Energy Cost Calculator](#)

Griddles
[Electric Griddle Life-Cycle Energy Cost Calculator](#)
[Gas Griddle Life-Cycle Energy Cost Calculator](#)

Ovens
[Electric Convection Oven Life-Cycle Energy Cost Calculator](#)
[Gas Convection Oven Life-Cycle Energy Cost Calculator](#)
[Gas Rack Oven Life-Cycle Energy Cost Calculator](#)

Steamers
[Electric Steam Cooker Life-Cycle Energy Cost Calculator](#)
[Gas Steam Cooker Life-Cycle Energy Cost Calculator](#)

Underfired Char-Broilers
[Gas Underfired Char-Broiler Life-Cycle Energy Cost Calculator](#)

Refrigeration
[Reach-In Refrigerator/Freezer Life-Cycle Energy Cost Calculator](#)
[Hot Food Holding Cabinet Life-Cycle Energy Cost Calculator](#)




Insulated Energy Star Hot Food Holding Cabinets



Holding Cabinet Cost Calculator

ASTM Data

User Data

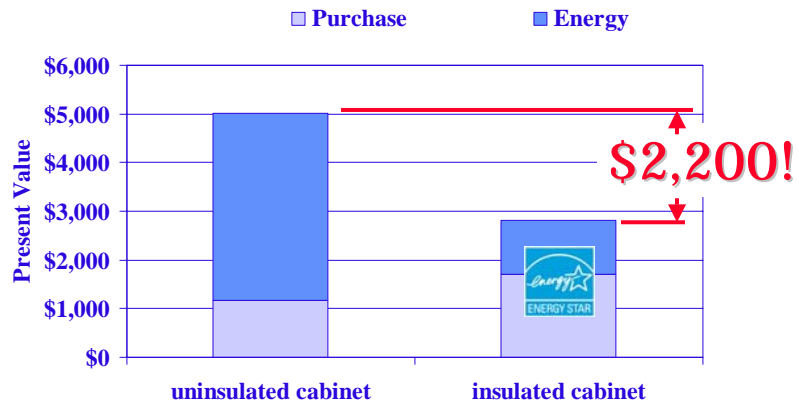
User Inputs			
Holding Cabinet Performance <small>(Based on ASTM Standard Test Method F 2140-01)</small>			
Cabinet Volume	20.0	Cu Ft	[Default] [Help]
Idle Energy Rate	400	Watts	[Default] [Help]
Holding Cabinet Usage			
Operating Hours per Day	16.0	h/day	[Default] [Help]
Operating Days per Year	365	d/year	[Default] [Help]
Utility Cost and Lifespan			
Electric Cost per kWh	0.100	\$/kWh	[Default] [Help]
Electric Demand Charge per kW	0.00	\$/kW	[Default] [Help]
Lifespan of Holding Cabinet in Years	5.0	years	[Default] [Help]
Discount Rate	3.10	%/year	[Default] [Help]
			[Calculate] [Default All]

Sample Results



Results: Energy Cost			
	Base Model Holding Cabinet <small>[About]</small>	User Input Holding Cabinet <small>[About]</small>	Energy Star® Holding Cabinet <small>[About]</small>
Idle Energy Rate by Volume (W/Cu Ft)	70.0	20.0	40.0
Annual Energy Consumption (kWh)	8176	2336	4672
Probable Contribution to Demand (kW) <small>[Help]</small>	1.4	0.4	0.8
Annual Energy Cost	\$ 818	\$ 234	\$ 467
Lifetime Energy Cost <small>(Discounted)</small>	\$ 3851	\$ 1102	\$ 2199
Input Additional Costs (Optional)			
Maintenance Costs per Year <small>[Help]</small>	\$ 0	\$ 0	\$ 0
Initial Cost of Holding Cabinet	\$ 1164	\$ 1705	\$ 0
Results: Total Cost			
Lifetime Energy Cost <small>(Discounted)</small>	\$ 3851	\$ 1102	\$ 2199
Lifetime Maintenance Cost <small>(Discounted)</small>	\$ 0	\$ 0	\$ 0
Initial Cost of Holding Cabinet	\$ 1164	\$ 1705	\$ 0
Total Cost	\$ 5015	\$ 2807	\$ 2199

Life-Cycle Costs* Hot Food Holding Cabinets

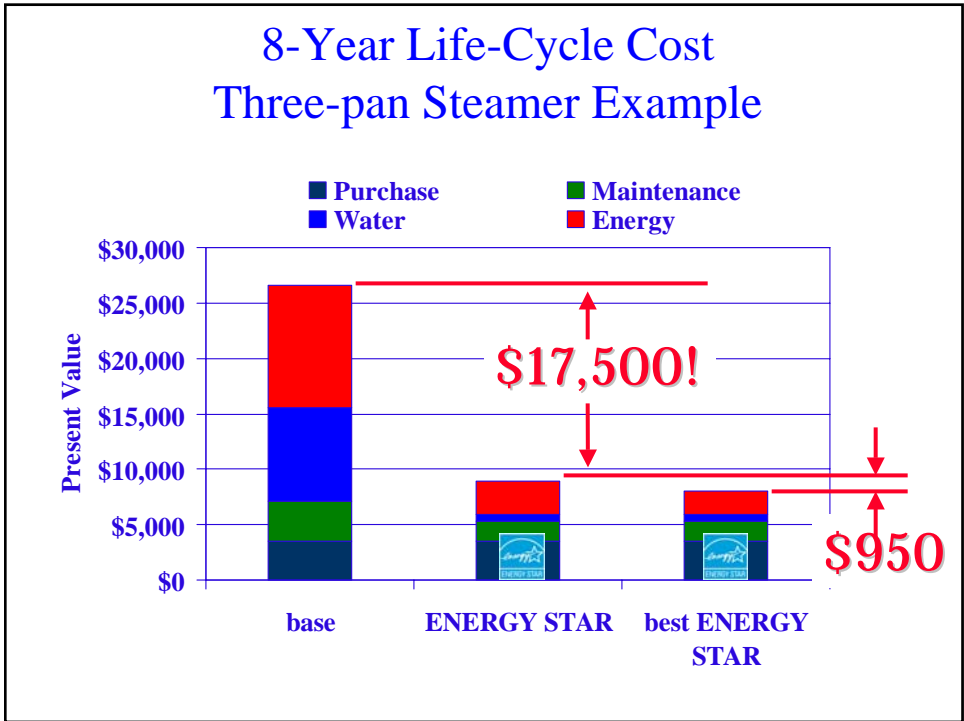
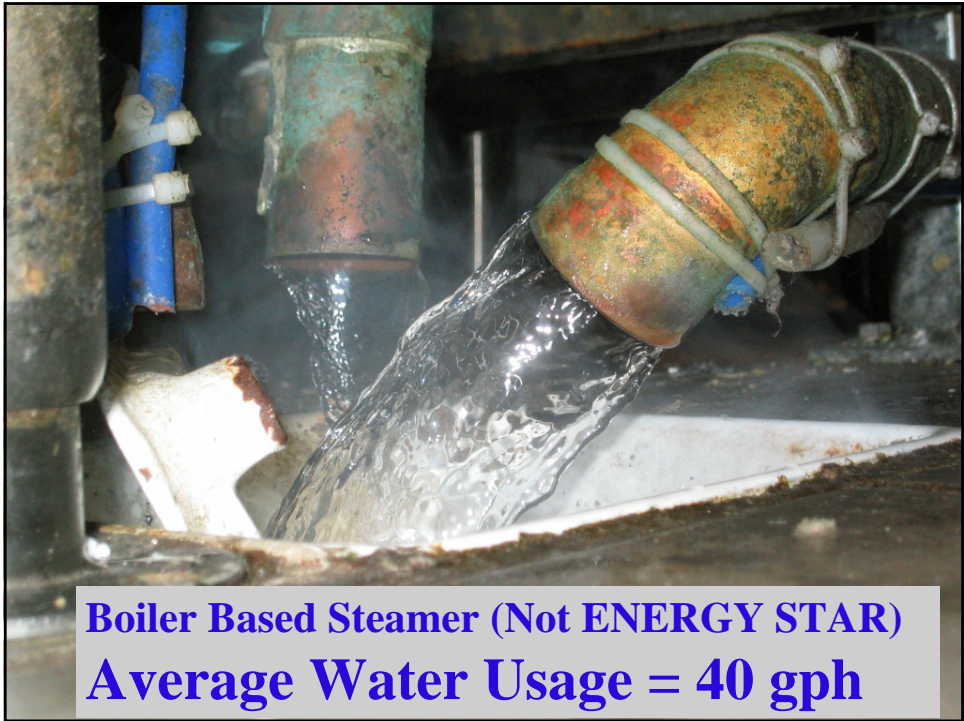


*Based on 10¢/kWh, a 5-year life expectancy and a 3.1% discount rate

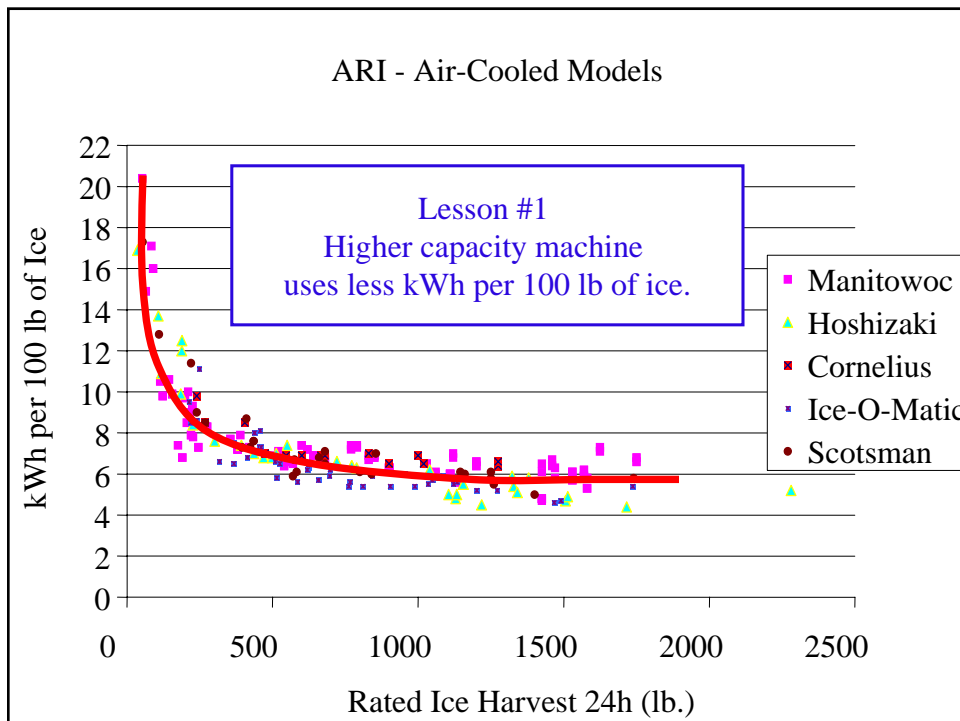


Energy Star Steamer Saves Big on Water and Energy

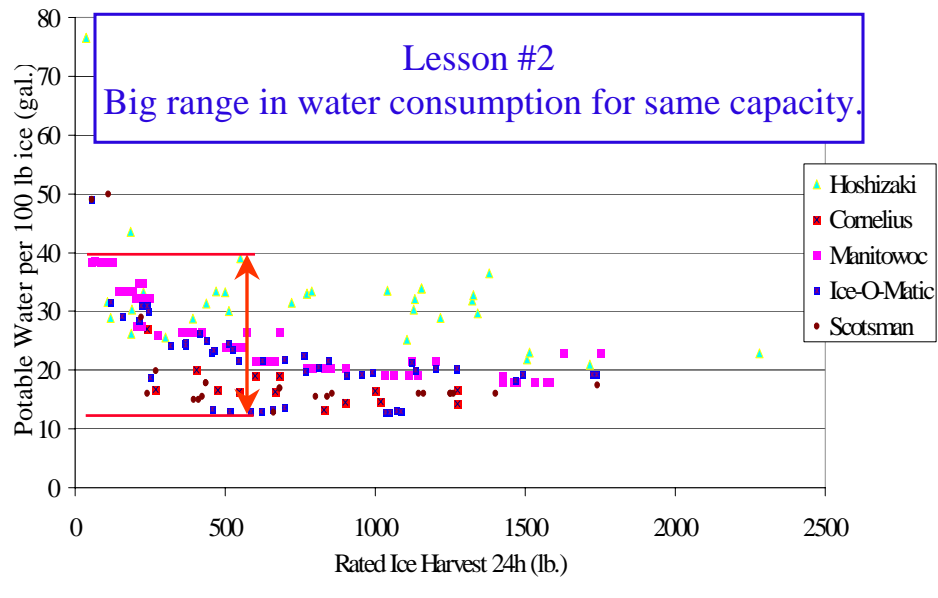




Ice Machines Tips/Tools



Water Use of Air Cooled Ice Machines



Ice Machines

- Choose high-efficiency air-cooled machines.
- Choose the most water-efficient machines.
- “Remote” the condenser (put it outside)
- Oversize the bins.
- Run the machines at night only.



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Energy Efficiency and Renewable Energy *Bringing you a prosperous future where energy is clean, abundant, reliable, and affordable* **FEMP** EERE Home

Federal Energy Management Program

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Energy-Efficient Products

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Energy Efficiency Recommendations

Energy Cost Calculators

Resources

Related Technologies:

- New Technologies
- Renewable Energy
- Distributed Energy Resources / Combined Heat & Power
- Water Efficiency
- Operations & Maintenance
- Sustainable Design & Operations
- Industrial Facilities
- Laboratories for the 21st Century

How to Buy an Energy-Efficient Commercial Ice Machine

[Efficiency Recommendation](#) [Buyer Tips](#)
[Cost-Effectiveness Example](#) [Sizing](#)
[Calculate Costs](#) [For More Information](#)
[Where to Find](#)

Also provided is a portable document format version of *How to Buy an Energy-Efficient Commercial Ice Machine* (PDF 71 KB, 2 pp). [Download Acrobat Reader.](#)

Efficiency Recommendation*			
Product Type	Ice Harvest Rate ^b (lbs per 24 hrs.)	Recommended	Best Available
Ice-Making Head^d			
Air-Cooled	101-200	9.4 kWh or less	8.6 kWh
Air-Cooled	201-300	8.5 kWh or less	7.9 kWh
Air-Cooled	301-400	7.2 kWh or less	6.5 kWh
Air-Cooled	401-500	6.1 kWh or less	5.8 kWh
Air-Cooled	501-1000	5.8 kWh or less	5.4 kWh
Air-Cooled	1001-1500	5.5 kWh or less	5.0 kWh
Water-Cooled	201-300	6.7 kWh or less	5.9 kWh
Water-Cooled	301-500	5.5 kWh or less	4.7 kWh
Water-Cooled	501-1000	4.6 kWh or less	3.8 kWh
Water-Cooled	1001-1500	4.3 kWh or less	4.0 kWh
Water-Cooled	> 1500	4.0 kWh or less	3.5 kWh
Self-Contained^e			
Air-Cooled	101-200	10.7 kWh or less	9.7 kWh
Water-Cooled	101-200	9.5 kWh or less	6.8 kWh
Water-Cooled	201-300	7.6 kWh or less	7.3 kWh

http://www.eere.energy.gov/femp/technologies/eep_ice_makers.cfm

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Energy Cost Calculator for Commercial Ice Cube Machines

Vary capacity size, energy cost, hours of operation, and / or efficiency level.

INPUT SECTION

Input the following data (if any parameter is missing, calculator will set to default value). Defaults

Type of Ice Cube Machine	Ice Making Head	Ice Making Head
Type of Condenser	Air Cooled	Air Cooled
Ice Harvest Rate (lbs. ice per 24 hrs.)	lbs. per 24 hrs.	500 lbs. per 24 hrs.
Energy Consumption (per 100 lbs. of ice)	kWh	5.5 kWh
Quantity of ice machines to be purchased		1
Energy Cost	\$/kWh	0.06 \$/kWh
Annual Hours of Operation	hrs.	3000 hrs.

Calculate Reset

OUTPUT SECTION

Performance per Ice Cube Machine	Your Choice	Base Model	FEMP Recommended Level	Best Available
Energy Consumption (per 100 lbs. of ice)	kWh			
Annual Ice Production	lbs.			
Annual Energy Use	kWh			
Annual Energy Costs	\$	\$	\$	\$
Lifetime Energy Costs	\$	\$	\$	\$
Lifetime Energy Cost Savings	\$	\$	\$	\$
Lifetime Energy Cost Savings for Ice Cube Machine(s)	\$	\$	\$	\$

Your selection of a _____ ice cube machine with a capacity of _____ lbs./24 hrs., produces _____ lbs. of ice per year, will have a _____ energy cost savings per ice

Lowest Hanging Fruit



Pre-rinse Spray Valves: Not Created Equal!



1.6 gpm
\$1400/yr

1.6 gpm

2.6 gpm

4.5 gpm
\$4000/yr

→ @ 3 hr per day usage



In 2003-04 the CUWCC, in partnership with water utilities, installed more than 17,000 spray valves in California food service facilities under a CPUC funded program



California Public Utilities Commission

Who Wouldn't Like a New Sprayer?



Conclusion?

- Plenty of opportunity to save energy and water!
- The resources are available to you.
- Positive design and purchasing decisions have a long lasting impact!



THANK YOU!

www.fishnick.com