



ENERGY STAR® for Commercial Dishwashers:
Sizing up the Savings Opportunity

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ENERGY STAR Support Activities



ENERGY STAR is:

- Currently offering 4 qualified CFSE
- Developing on-line tools to increase awareness of and access to existing utility rebates.
- Fostering greater cooperation and coordination between utilities and manufacturers.
- Developing specifications for new CFS equipment types.
- Working with manufacturers to add new models to existing qualified products lists.

Current ENERGY STAR Qualified Food Service Equipment



Equipment Types:

- Steam Cookers
- Fryers
- Hot Food Holding Cabinets
- Solid-door Refrigerators and Freezers

ENERGY STAR qualified commercial food service equipment improves kitchen performance through*:

- Shorter cook times
- Higher production rates
- Improved insulation
- High-efficiency compressors

*Source: Food Service Technology Center

Status of Existing CFS Programs

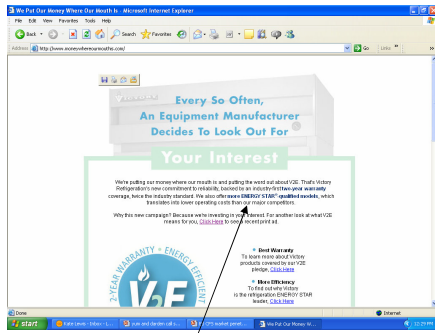


	Number of ENERGY STAR Partners	Number of ENERGY STAR Qualified Models*
Fryers	6	33
Hot Food Holding Cabinets	12	44
Solid Door Refrigerators and Freezers	19	1080
Steam Cookers	7	56
<small>*As of May 1, 2006</small>		

Victory Refrigeration – 2006 CFS Partner of the Year



www.moneywhereourmouthis.com



“...we also offer more ENERGY STAR® qualified models, which translates into lower operating costs...”

Choose A Victory For The Planet

ENERGY STAR® has named Victory the first foodservice equipment maker ever to be selected as a **Manufacturing Partner of the Year**.

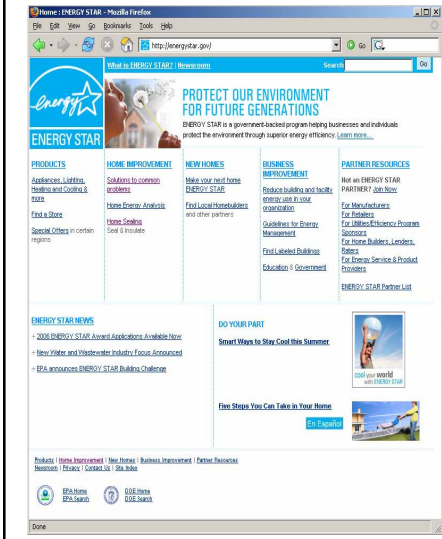
Why did the Environmental Protection Agency and Department of Energy recognize Victory with this ENERGY STAR award?

- Victory Refrigeration is the first leader in the Foodservice Industry with more ENERGY STAR qualified models – more than 300 – than any other company. Since the EPA created a category for commercial refrigerators and freezers, Victory has demonstrated the ability to offering a broad range of energy efficient products designed to meet the rigorous demands of the market.
- Because Victory has become an industry leader in reducing overall power and emissions, there are multiple benefits provided by ENERGY STAR qualified foodservice equipment.
- Because Victory's V2E pledge exceeds that of all of the company's equipment, it has earned 1 of the most difficult medals in their category, generating hundreds of dollars in annual energy savings for operators compared to competing refrigeration and freezers.
- Because Victory recognizes that helping operators and energy consumers is not only good for the bottom line, it is also good for the future of our shared environment.

Victory Builds Refrigeration Equipment
With End-Users' Best Interests In Mind

To learn more about Victory Refrigeration, please call 866.628.6280 or visit www.victory-ref.com.

ENERGY STAR Resources



Consumer and Partner resources

- Rebate Finder
- Store Locator
- Qualified product lists

Special Restaurant Web Page

- *Putting Energy into Profits* Guide
- Annual awards program
- Free, unbiased tech support
- Monthly “E-Newsletter”

ENERGY STAR/CEE Collaboration



ENERGY STAR is currently working with the Consortium for Energy Efficiency (CEE) to promote and assist in the implementation of commercial kitchen equipment packages.

Relevant CEE Equipment*:

- Ice Makers
- Glass Door Refrigerators and Freezers
- Pre Rinse Spray Valves
- Fryers

*Source: www.cee1.org

The Commercial Kitchen Package



Commercial Kitchens Committee



- Market Strategy Group
 - Paper for ACEEE summer study 2006
 - Program guidance templates
 - PR strategy and press outreach
- Technology Assessment Group
 - Product evaluation: steamers and commercial DW

Interest in Commercial Dishwashers



- Dishwashers are considered to be one of the biggest energy users in the kitchen.
- Dishwasher operation in a typical restaurant consumes over 2/3 of all water.
- A number of manufacturers and end users have shown interest in ENERGY STAR
- Non-proprietary, high efficiency technologies are currently available due to increasing demand for improved performance from end users
- Industry accepted test method currently available
- EPA interest in energy and water efficiency – agency wide

4 Main Types of Dishwashers



- Under Counter
- Door-type
- Conveyor-type
- Flight-type



Strategies for washing and sterilizing dishes



- Low-temperature
 - Use hot water supplied by existing water heater (typically 140°F)
 - Use a chemical sanitizing agent in final rinse
 - Sometimes also use a drying agent
- High-Temperature
 - Use a booster heater to raise rinse water to 180°F, hot enough to sterilize the dishes and assist in drying.
- Many models are available as either high or low temperature units

Installed Base and Unit Sales



	FSTC 2001 Est. Installed Base	2003 Unit Sales*
Under Counter	60,000 (12%)	12,206 (33%)
Door Type	325,000 (65%)	17,949 (48%)
Conveyor Type	90,000 (18%)	6,700 (18%)
Flight Type	25,000 (5%)	465 (1%)
Total	505,000	37,320

*NAFEM 2004 Size and Shape of the Industry Study, N. American Sales

Sales and Distribution Channels



- 18 manufacturers
- Manufacturers typically work through regional sales offices or mfr sales reps.
- Many are leased for free contingent on leasee using the distributor/mfr to purchase dishwashing agents (detergent, rinse agent, and sanitizer).
- Direct sales to larger chains and end users.
- Direct sales to chemical companies that then offer lease packages that include machines and chemicals for one price.
- Mfrs use direct marketing (mail, ads, training) and rely heavily on trade shows such as NAFEM and NRA.

Testing methods



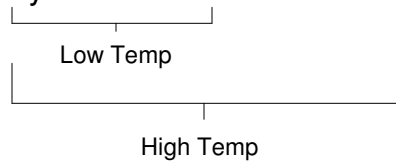
- NSF Standard 3
 - Measures water used in rinse cycle
 - No direct energy measurement
 - Test applicable for all types and sub-types
 - Data publicly available
- ASTM F1696 and F1920
 - Measures energy used during preheat, idle, and washing and water use
 - Tests exist only for hi-temp door-type and hi-temp conveyor-type
 - Slow test cycle does not reflect real world operation
 - Standards are being overhauled
 - Test methods underutilized by industry; no database from which to develop a spec.
- ENERGY STAR draft spec is based on NSF test
 - Water is a good surrogate for energy consumption

Dishwasher Energy Consumption

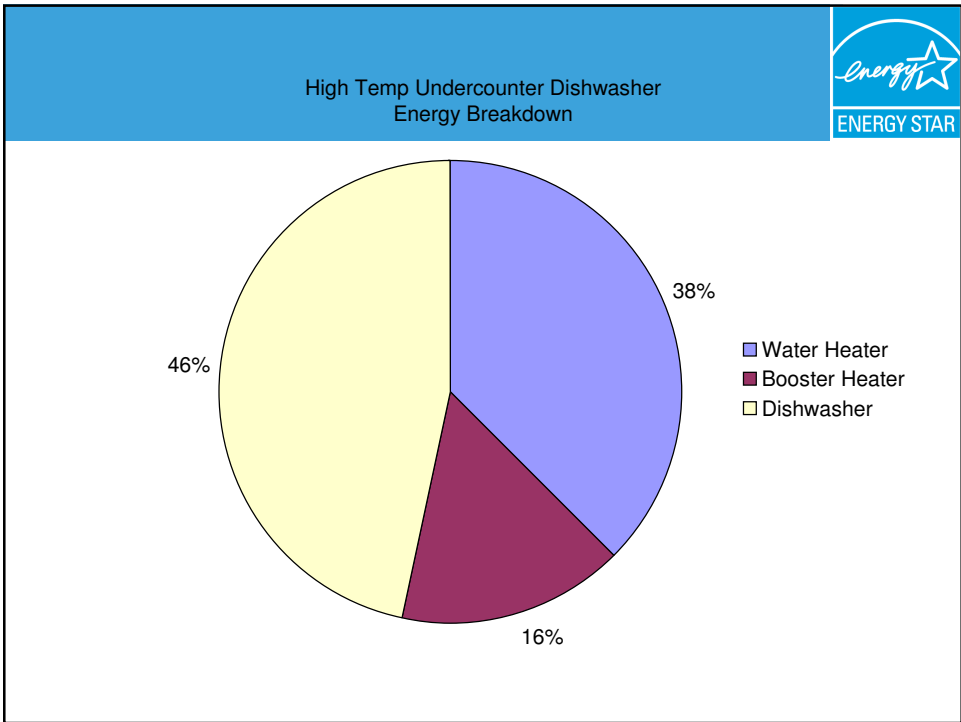
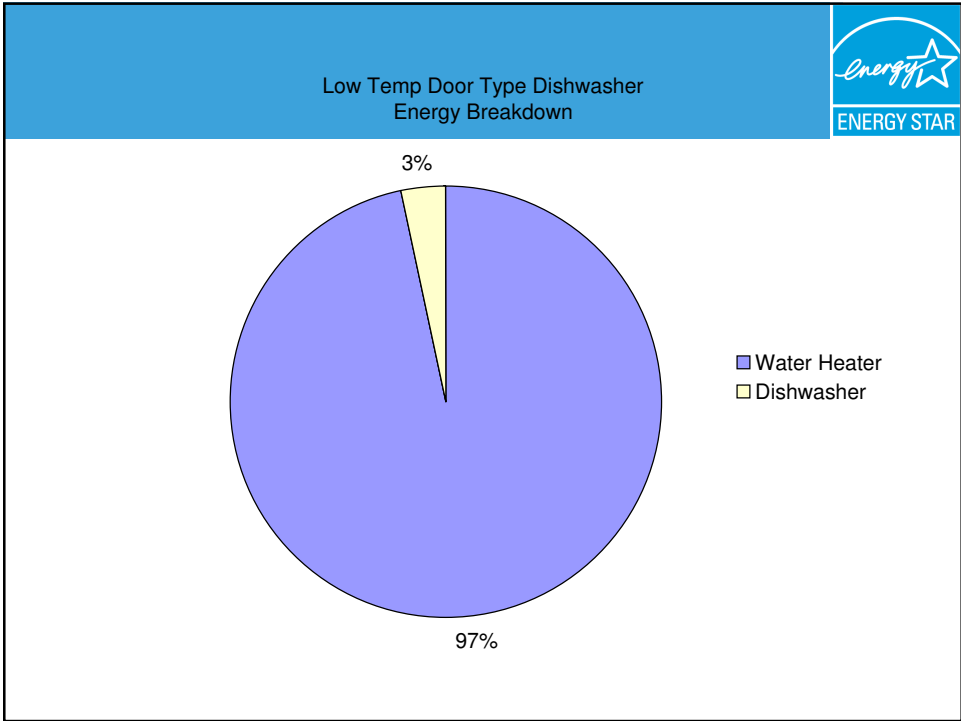


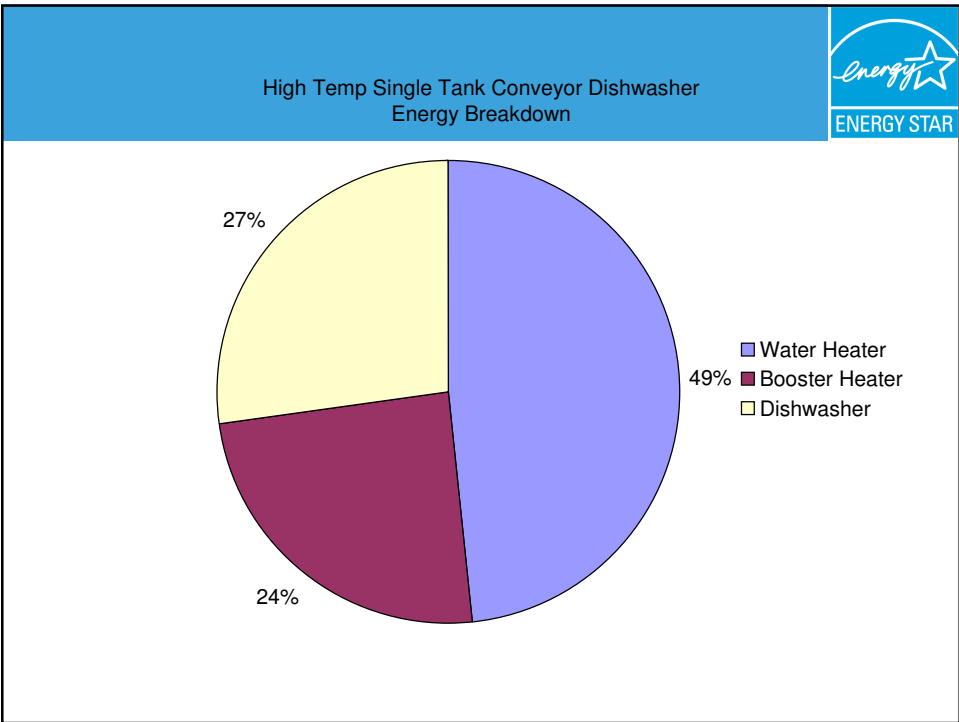
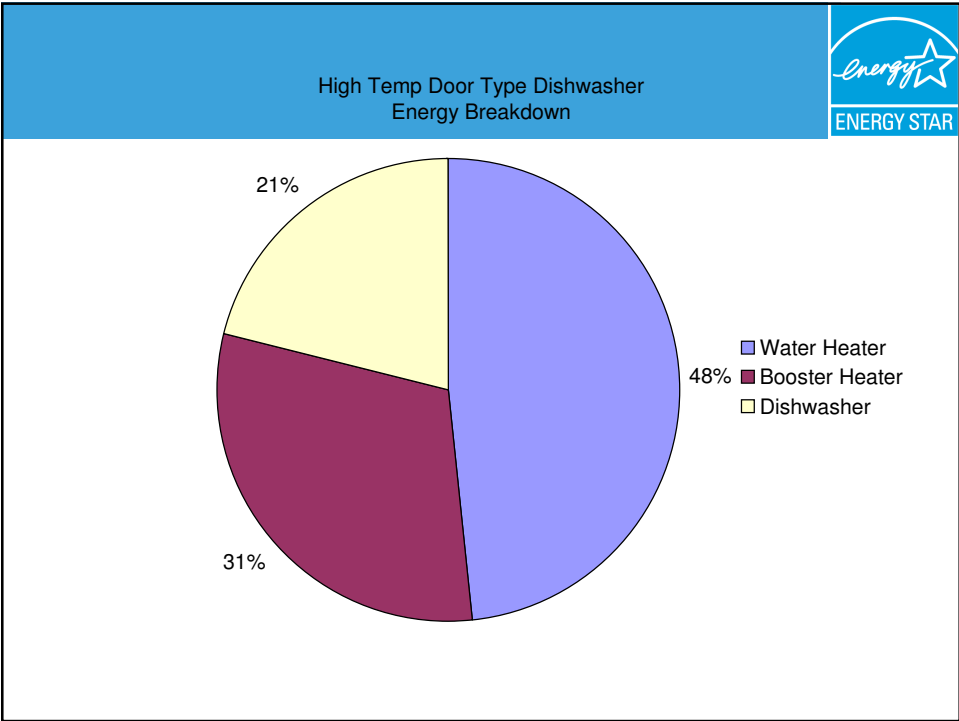
Total E-cons = Water Heating + Motor/Electronics

Water Heating = Primary WH + Tank WH + Booster WH



NSF data accounts for Primary WH and Booster WH, which are 55 – 95% of total energy consumption.





Draft Spec



Efficiency Requirements for Commercial Dishwashers		
Category	High Temp Efficiency Requirements	Low Temp Efficiency Requirements
Under Counter	1.0 gal/rack	1.70 gal/rack
Stationary Single Tank Door	0.95 gal/rack	1.16 gal/rack
Single Tank Conveyor	0.70 gal/rack	0.62 gal/rack

Preliminary Energy Savings Potential



- ENERGY STAR qualified commercial dishwashers* save on average: 79 MBtu/yr and \$613/yr
- Annual savings due to ENERGY STAR (in 2010)
 - 1.7 Trillion Btu
 - 438M gallons of water
 - Number of Cars off the road: 18,535
- Assumptions
 - Equipment Lifetime: 20 years
 - 39,000 units shipped, 475,000 units in stock (2006)
 - 13% initial market penetration of ENERGY STAR (2007)
 - Energy Consumption: conventional (225 Mbtu/yr) vs. ENERGY STAR (146 Mbtu/yr)
 - Gas price: \$9.31/Mbtu and Water price: \$0.004/gallon

* Average of high and low temp machines: under counter, door type, and conveyor

Next Steps



- Draft 1 released May 5, 2006 for stakeholder review
 - Stakeholder Comments due June 2, 2006 to canderson@icfi.com
 - Unofficially extended to June 9.
 - Stakeholder meeting May 22 in conjunction with NRA
 - Post all written comments and meeting notes to the Web site
- Compile and review industry comments
 - Obtain more data
 - Conduct further research
- Disseminate additional Draft(s)
 - Anticipate Draft 2 in late summer
- Target to finalize specification and launch – late 2006/early 2007

Other CFSE for future specs



- Ice makers
- Griddles
- Ovens
- Ventilation hoods
- Glass door refrigerators and freezers

For More Information



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- ENERGY STAR Product Development Web site
www.energystar.gov/productdevelopment