



CELEBRATING
20 YEARS OF
ENERGY STAR



Product Retrospective: Refrigerated Vending Machines

Scene 1 INTERIOR GYMNASIUM - POST GAME

Click, ka-chunk, aaah—the sound of a soda can being dispensed from a vending machine and opened for enjoyment by star athlete, who relishes icy cold beverage.

Scene 2 INTERIOR GYMNASIUM - LATE, LATE NIGHT

Pan to fully illuminated vending machine—owned, operated and maintained by beverage bottler or independent machine operator anxious to maximize sales and avoid service calls.

Scene 3 INTERIOR OUTDATED SCHOOL ADMINISTRATIVE OFFICE - EARLY MORNING

Close-up of utility bill paid for by the school where the machine is located. A coffee cup is knocked over and coffee spills out and begins to saturate bill. Fade out.

Perhaps not the making of an Academy Award-winning screenplay, but the scenario—all too familiar to the efficiency community—demonstrates that there are often split incentives to greater efficiency. In this case, the star athlete has no reason to think twice about the vending machine she used to purchase her soda, the machine owner is not responsible for paying the utility bill and therefore has little reason to be concerned about its efficiency, and the school administrator who does pay the electric bill has no way of linking energy use to the vending machine.

Behind the scenes, the U.S. Environmental Protection Agency (EPA), U.S. Department of Energy (DOE) and efficiency advocates were working to identify strategies to revise the script. An energy-efficient vending machine working group, consisting of representatives from the Natural Resources Defense Council, EPA, DOE and its national laboratories, the American Council for an Energy-Efficient Economy, the California Energy Commission and the Consortium for Energy Efficiency, was formed with the goal of forging a path to transform the efficiency of refrigerated vending machines.¹ Fortunately, several important foundational elements were already in place:

- The Canadian Standards Association (CSA) had established measurement procedures and voluntary maximum daily energy consumption levels for beverage vending machines.
- The American Society of Heating, Refrigeration and Air Conditioning (ASHRAE) had developed a related test procedure that would allow for comparison of energy performance (though the results were not published in one place or readily available to end users).
- There appeared to be several cost-effective ways for manufacturers to improve the efficiency of their machines. Those changes might appeal to end users if they were aware of operational cost savings, though it was believed that distributors would balk at any improvement that added even minimally to machine costs.²

At the time the working group was formed, lighting, which is important in vending for attracting potential customers, represented about 30–40 percent of the total energy use. Machines were frequently illuminated all day and night, even when no one was around to see the machine or purchase a beverage. More efficient fluorescent lighting was available but not produced in an optimal size for vending machines, partially due to lack of demand. A number of low-cost technologies, such as timers and motion detectors, could be used to turn off lights when they were not needed. Energy waste associated with refrigeration could be addressed using more efficient evaporator and condenser fan motors, compressors and insulation.³

As these various options were considered, it turned out there were some non-energy benefits associated with improved lighting technology that appealed to distributors—the efficient lighting would last longer, reducing the need for service calls. What’s more, brand new machines represented only a slice of the market and the energy efficiency potential. While machines typically lasted 10 years or more, they were often shipped to refurbishment centers for an overhaul within three to four years.⁴ As a result, new machines were built with modular components and were good candidates for upgrades with efficient components.

EPA officially launched the ENERGY STAR label for refrigerated beverage vending machines at the National Automatic Merchandising Association Spring Expo in April 2004. The specification ensured that ENERGY STAR qualified new machines would be 35 percent more efficient than machines that were commonly available at the time,⁵ and would deliver additional savings (50 percent more efficient than commonly available) in less than three years. Once the details were worked out, rebuilt machines became eligible for ENERGY STAR qualification in August 2006.

When the ENERGY STAR specification was first launched, typical refrigerated vending machines were using as much as 13–15 kilowatt-hours (kWh) per day—or about five times the amount of a typical household refrigerator—and those paying the energy bills had no way to easily identify and request more efficient machines in their vending contracts. The ENERGY STAR designation enabled them to say, “We care about the environment and our electric bill and only want ENERGY STAR qualified models installed on our property.” In just a few years, vending-machine manufacturers were introducing ENERGY STAR qualified models that reduced energy consumption by more than 50 percent. Today, ENERGY STAR qualified vending machines use only 3–7 kWh per day,⁶ and commitments by major end users such as Pepsi and Coke to upgrade existing machines quickly, have brought the installed base to more than one million ENERGY STAR qualified machines.⁷

In August 2012, federal minimum efficiency standards take effect for new refrigerated beverage machines, locking in savings of approximately \$150 annually for each vending machine. When all vending machines are performing at this standard, the current ENERGY STAR level, the savings will exceed 5.5 billion kWh per year, preventing four million metric tons of greenhouse gas emissions.

FADE IN AUDIO – APPLAUSE.



ENDNOTES

¹ Horowitz, N., Dolin, J., Suozzo, M., and LaFrance, M. (1998). A Roadmap for Simultaneously Developing the Supply and Demand for Energy-Efficient Beverage Vending Machines. Published in the 1998 *Proceedings of ACEEE Summer Study on Energy Efficiency in Buildings*.

² Kubo, T., and Nadel, S. (2002, May). *Commercial Packaged Refrigeration: An Untapped Lode for Energy Efficiency (Research Report A015)*. American Council for an Energy-Efficient Economy.

³ *Ibid.*, p. 3.

⁴ *Ibid.*, p. 4.

⁵ U.S. EPA. (2004, April 1). Refrigerated Beverage Vending Machines Can Now Earn the ENERGY STAR. Press Advisory. Retrieved from http://www.energystar.gov/ia/news/downloads/vending_machines_pr.pdf.

⁶ U.S. EPA. (2011, March 24). Letter to Vending Machine Manufacturers and Other Interested Parties. Retrieved from http://www.energystar.gov/ia/partners/prod_development/revisions/downloads/vending_machines/Vending_Machine_V2.1_Revision_Memo.pdf.

⁷ U.S. Department of Energy. (2009, August 31). DOE Technical Support for Standard Rulemaking for Refrigerated Beverage Vending Machines (FR 74.44914).



ENERGY STAR®, a program sponsored by the U.S. Environmental Protection Agency, helps us all save money and protect the climate through energy-efficient products and practices. Learn more. Visit www.energystar.gov