



CELEBRATING  
**20** YEARS OF  
ENERGY STAR



## Product Retrospective: Televisions

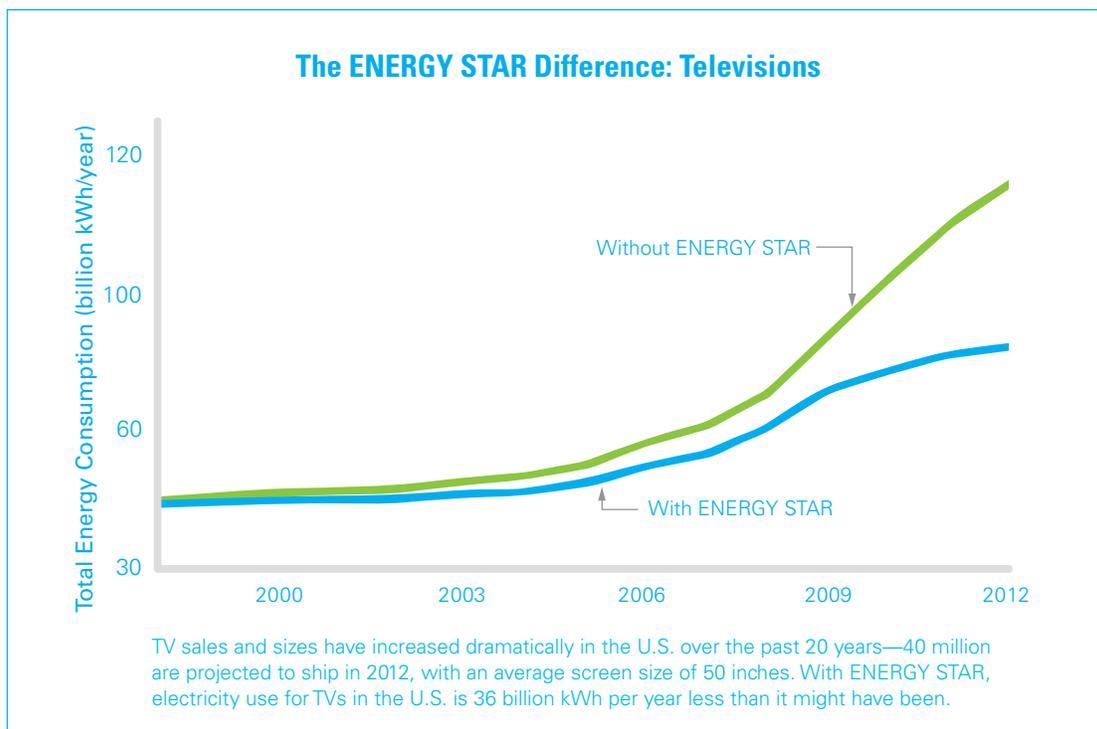
An early ENERGY STAR public service announcement (PSA) shows a family sitting at home with an overflowing bowl of popcorn, discussing who will turn on the TV. The husband reluctantly rises from the couch and begins yanking a starter.

“Don’t flood it,” instructs his wife, as smoke spews from the TV.

This humorous depiction, dubbed “the lawnmower PSA,” drew the important link between home appliances and the air pollution they cause. The majority of U.S. electricity is produced by burning fossil fuels, and as a result of energy use, the average home pollutes more than the average car—a statement that surprises many people to this day.

Another surprise for consumers is that many home electronics use power when they appear to be turned off. Research in the late 1990s indicated that consumers paid an estimated \$3 billion annually for this “leaking” electricity, with \$1 billion of the bill created by TVs and VCRs.<sup>1</sup> Testing by Lawrence Berkeley National Laboratory (LBNL) found that energy use in standby mode varied significantly by model, with TVs using between zero and 12 watts, VCRs using 2–13 watts and TV/VCR combination units using 3–20 watts. It was clear that some products delivered services more efficiently, so the capability was there. It turned out that in many cases the cost of achieving higher efficiencies could be negligible, but it was not a priority for manufacturers. Consumers were not willing to pay more for energy efficiency and it was generally viewed as more profitable to invest design time in improving picture or sound quality.<sup>2</sup> Priorities were about to change.

The U.S. Environmental Protection Agency (EPA), TV and VCR manufacturers, industry trade associations including the Electronics Industry Association and the Consumer Electronics Manufacturers Association<sup>3</sup> and other interested stakeholders began working together to develop and launch an ENERGY STAR specification for TVs and VCRs. Announced in January 1998 at the Consumer Electronics Show in Las Vegas, the ENERGY STAR requirements set the bar at three

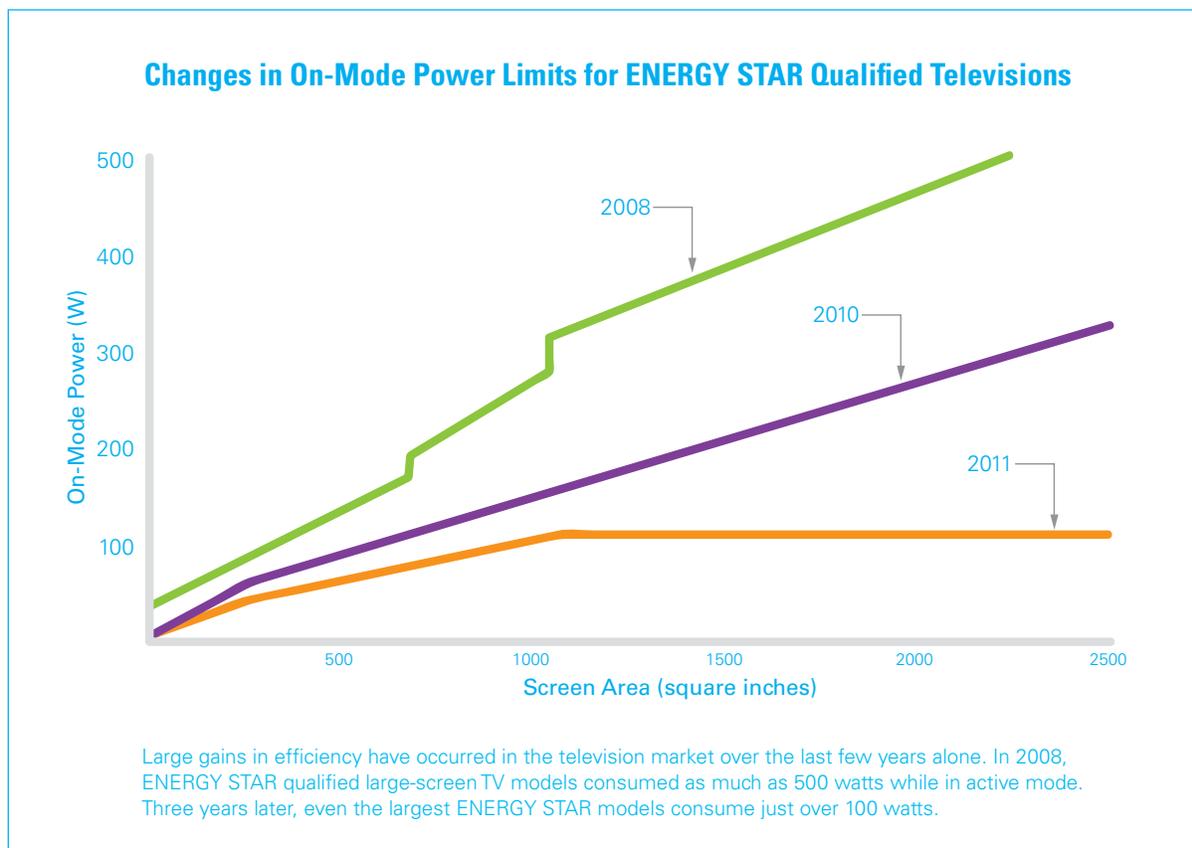


watts in standby mode for TVs, four watts for VCRs, and six watts for combination units. In mid-2005, ENERGY STAR specifications were tightened to require a power draw of less than one watt. By 2008, nearly 80 percent of TVs met these requirements, reducing overall standby consumption by more than seven billion kilowatt-hours (kWh) per year,<sup>4</sup> double the annual energy consumption of Washington, D.C.

Despite this success, major trends were emerging that led advocates such as the Natural Resources Defense Council (NRDC) to conclude that, left unabated, TV energy use in the U.S. could increase by 50 percent in five years. These trends included:

- The number of TVs in operation was growing—shipments were expected to increase from 29 million in 2005 to nearly 38 million in 2009.<sup>5</sup>
- Sales of large TVs were on the rise and larger usually meant higher energy use.
- Sales of TVs that required more energy to operate were on the rise. For example, display technology was changing as CRTs (cathode ray tubes) were being replaced by plasma TVs and digital TVs including HDTVs (high-definition TVs). Digital was replacing analog technology.
- Americans were watching more TV per day due to increased programming and video game and DVD use.<sup>6</sup>

It was clear that the power needed to operate TVs in active use was a significant and growing concern. Analysis conducted by NRDC in 2004, based on off-the-shelf measurements of TV energy consumption, revealed that three key features had a noticeable impact on energy use: screen area, display technology and resolution level.<sup>7</sup> Power consumption was found to vary as much as 40 percent based on the type of image a TV is displaying at a given time,<sup>8</sup> but the test procedure in the U.S. for measuring active power consumption had been developed 30 years prior, for use with black and white, analog TVs.<sup>9</sup> Developing a test procedure that would accommodate new technologies was an essential next step.



EPA began working with the International Electrotechnical Commission (IEC) on a test procedure that addressed active power consumption and could be used as the basis for an updated ENERGY STAR specification. IEC developed the draft international standard in record time and made it available to ENERGY STAR stakeholders ahead of official publication to aid the specification revision process.<sup>10</sup> The standard included a visual test clip for determining average wattage consumed in a simulated real-world setting, when variable dark and bright images are displayed.

Since that time, the ENERGY STAR criteria for televisions have addressed both standby and active mode energy consumption, while accommodating consumer preference for larger screen sizes. Old-fashioned tube televisions have quickly become a thing of the past, replaced by high definition screens powered with LCD (liquid crystal display), plasma, OLED (organic light emitting diode) and other new technologies. The ENERGY STAR specification for TVs has kept pace with technological advances while raising the bar for efficiency three times in the last four years alone, ensuring that TVs offer consumers all the viewing pleasure they seek without exceeding their utility budgets.

Televisions that meet today's ENERGY STAR requirements are, on average, 40 percent more energy efficient than conventional models, saving American viewers and gamers a total of \$3.5 billion per year on their energy bills and preventing greenhouse gas emissions equivalent to those from 4.5 million vehicles.

## ENDNOTES

<sup>1</sup> Suozzo, M., and Thorne, J. (1998, January 8). U.S. EPA Launches First Attack on Leaking Electricity: ENERGY STAR TV/VCR Program Enables Consumers to Identify Products with Low Standby. ACEEE press release. Retrieved from [http://www.oocities.org/southbeach/strand/6116/env\\_eco/greentvuspol4.htm](http://www.oocities.org/southbeach/strand/6116/env_eco/greentvuspol4.htm).

<sup>2</sup> Siderius, H.P. (1998). Standby Consumption of Households State of the Art for Possibilities for Reduction for Home Electronics. Prepared by Van Holsteijn en Kemna BV, Delft, the Netherlands with funding from NOVEM. Retrieved from <http://standby.lbl.gov/pdf/siderius.html>.

<sup>3</sup> Suozzo and Thorne, 1998.

<sup>4</sup> Homan, G., Sanchez, M., Brown, R., and Lai, J. (2010, August). Calendar Year 2008 Program Benefits for ENERGY STAR Labeled Products. Lawrence Berkeley National Laboratory, Environmental Energy Technologies Division, University of California, Berkeley, California.

<sup>5</sup> iSupply Television Systems Market Tracker. Quarter 4, 2005.

<sup>6</sup> Ostendorp, P., Foster, S., and Calwell, C. (2005, March). Televisions: Active Mode Energy Use and Opportunities for Energy Savings. Natural Resources Defense Council. p. 1.

<sup>7</sup> *Ibid.*, p. 11.

<sup>8</sup> Foster, S., Calwell, C., and Horowitz, N. (2004). If We're Only Snoozing, We're Losing: Opportunities to Save Energy by Improving the Active Mode Efficiency of Consumer Electronics and Office Equipment. Published in the 2004 Proceedings of ACEEE Summer Study on Energy Efficiency in Buildings. Retrieved from [http://www.eceee.org/conference\\_proceedings/ACEEE\\_buildings/2004/Panel\\_8](http://www.eceee.org/conference_proceedings/ACEEE_buildings/2004/Panel_8).

<sup>9</sup> Ostendorp et al., 2005, p. 2.

<sup>10</sup> U.S. EPA. ENERGY STAR Program Requirements for Televisions. Retrieved from [http://www.energystar.gov/ia/partners/product\\_specs/eligibility/tv\\_vcr\\_elig.pdf](http://www.energystar.gov/ia/partners/product_specs/eligibility/tv_vcr_elig.pdf).



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