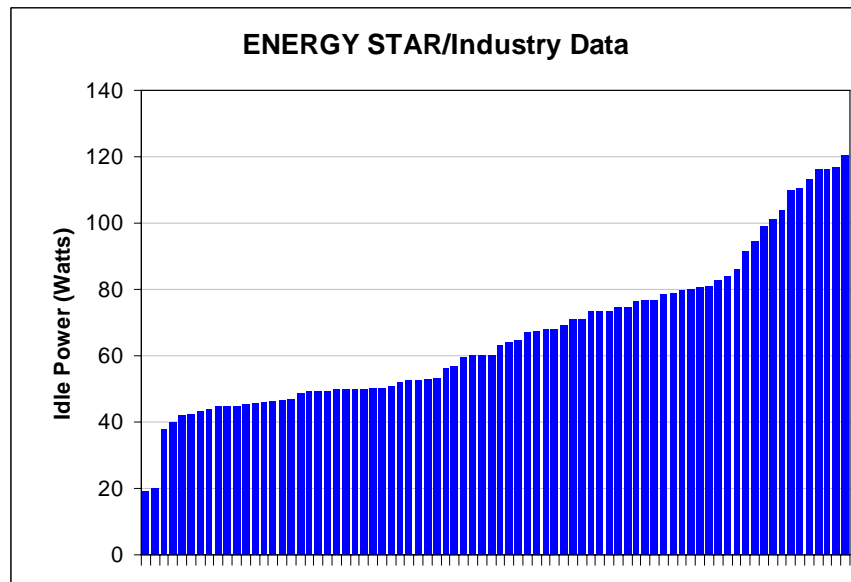




## Rationale for Data Analysis of Idle Power Levels for the Draft 2 ENERGY STAR® (Version 4.0) Computer Specification

EPA has analyzed the Idle power data provided by industry stakeholders and combined this data with the broader data set on Idle power developed for the Draft 1 computer specification analysis. Our overall analysis shows that the current Idle levels specified for desktop computers in the Draft 2 ENERGY STAR (Version 4.0) Computer Specification are well-supported by the current data set. EPA first trimmed and edited the data set in several ways to ensure the data was accurate and current, including:

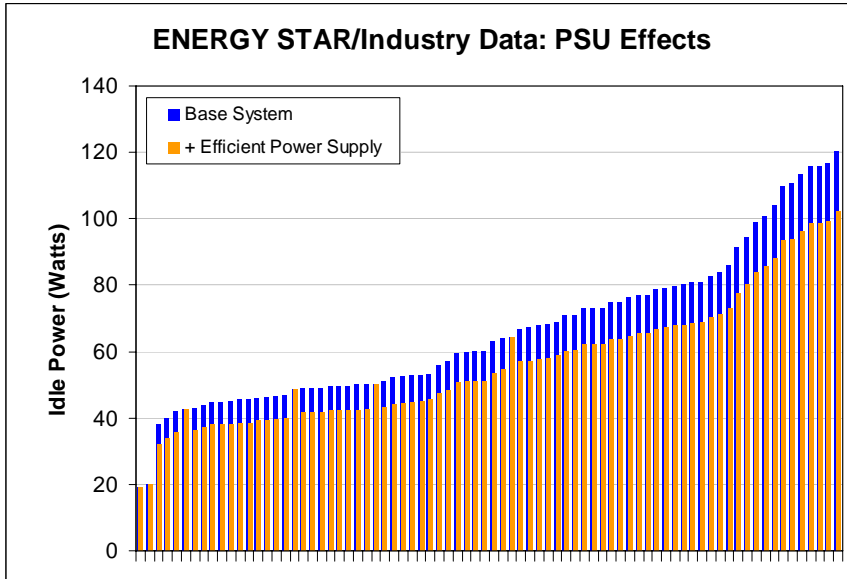
- 1. Data points with little or no configuration information:** Some of the data provided by industry stakeholders and recorded by EPA did not include any configuration information beyond a model number. Furthermore, some of the industry-submitted models are not available in the U.S., and as such, detailed product information could not be found. These data were removed from the set for the purposes of the analysis. The remaining data set, comprised of systems for which we have at least *some* configuration information, is shown below.



- 2. Little accounting for efficient power supplies:** The ENERGY STAR Draft 2 Computer Specification incorporates an 80% power supply efficiency requirement. Improved power supply efficiency has a significant effect on Idle power consumption,<sup>1</sup> but this effect is not captured in the current data set because almost all of the models use conventional power supply technology operating at roughly 65% to 70% efficiency during Idle state (due in part to low operating efficiencies at part load). Below, projected values are shown for the data set assuming the use of efficient power supplies. Idle power values do not drop for six of the test systems, because these six systems already incorporate efficient power supplies. This chart is believed to reflect a conservative estimate.

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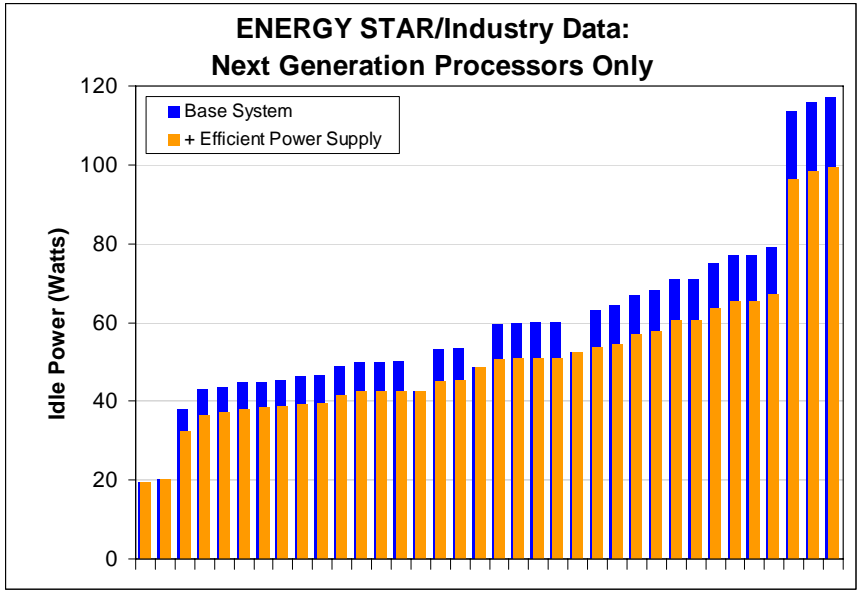
<sup>1</sup> Ecos Consulting's research has shown about a 15% decrease in Idle power using an 80% efficient power supply over a conventional model.



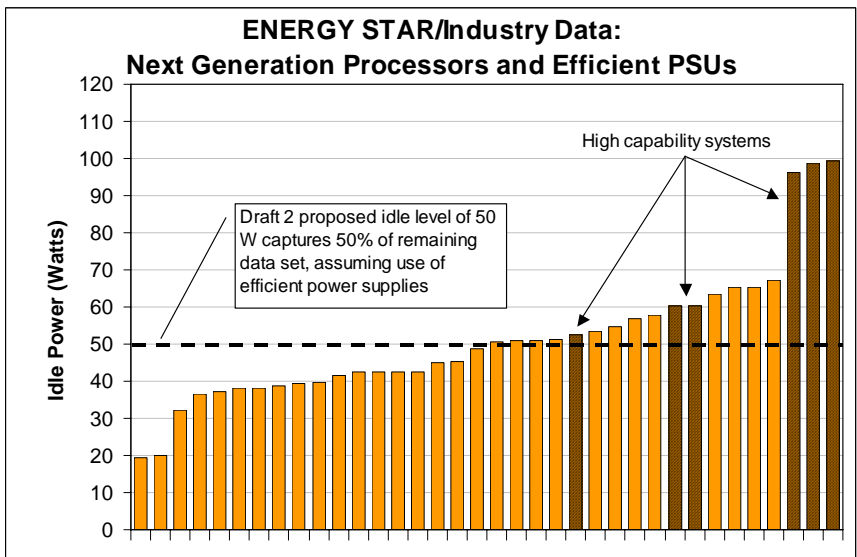
3. **Large amount of data on systems that incorporate processors that will soon be phased out:** A large number of the computer models reflected in the data set use processors that are likely to be slowly phased out as new lines of processors are introduced in the coming months. Manufacturers have relayed in their marketing materials that these chips have significantly lower power consumption than the previous family of processors. Recent testing by SilentPCReview.com<sup>2</sup> confirmed that the most efficient new desktop processors from AMD and Intel consume approximately 1 to 7 dc watts in Idle mode (including losses in their voltage regulator modules). By contrast, less efficient models based on older processor architectures consume 20 to 34 watts dc in Idle mode (including losses in their voltage regulator modules). These technologies are not likely to be widely used in energy efficient computer designs by mid-2007, so were excluded from the analysis. Systems employing Intel Celeron, Pentium M and CoreDuo technology, as well as AMD A64, A64 X2 and Sempron technology have been retained in the data set, and will likely continue to be sold in 2007 systems.<sup>3</sup>

<sup>2</sup> See <http://www.silentpcreview.com/article313-page1.html>

<sup>3</sup> See AMD processor roadmap information at [http://www.amd.com/us-en/Processors/TechnicalResources/0,,30\\_182\\_608,00.html](http://www.amd.com/us-en/Processors/TechnicalResources/0,,30_182_608,00.html).



Although the steps taken to refine the data set limit the number of available data points, they provide a clearer picture of what Idle power consumption in computers might look like *when the revised ENERGY STAR specification goes into effect*. With the exception of the first two data points in the set (small form factor CoreSolo and CoreDuo computers) and the last three points in the set (these are systems that incorporate very powerful, high-performance video cards), most of the computer models Idle in the range of 30 to 60 watts, assuming they have efficient power supplies installed. Of the 30 desktops in the remaining data set without high capability video cards, 60% would be able to meet a 50 watt Idle power level with efficient power supplies installed. Included among the potential qualifiers are computers using various platforms and processors and which represent a number of different manufacturers.



Most of the systems pictured in the chart above are basic capability computers (representing Category B systems) similar to what would be purchased by corporations, schools, and

government agencies in large volumes at affordable price points. There are enough available data points for these systems to support proposing a 50 watt Idle level for Category B systems.

Likewise, a 75 watt Idle level appears to be defensible for higher capability systems (representing Category A systems), though more data are needed on the present Idle consumption of systems that include those features. This would include various multimedia computers, along with other high performance computers whose capabilities fall between basic systems and workstations. After additional data collection, the appropriate Idle level for this category should be further reviewed prior to the release of the Draft 3 specification.