

DRAFT 2 Version 1.1 ENERGY STAR® Imaging Equipment Specification – Data Summary

Introduction

In order to establish proposed Typical Electricity Consumption (TEC) and Operational Mode (OM) requirements for Tier 2 requirements in the Draft 2 Version 1.1 ENERGY STAR Imaging Equipment Specification (“Draft 2”), the U.S. Environmental Protection Agency (EPA) used product data for models qualified as of July 2, 2008 under the current Tier 1 requirements in Version 1.0 ENERGY STAR Imaging Equipment Specification. The qualification percentages noted in the discussions below represent the percentage of ENERGY STAR models, out of all models currently available for sale in the United States.

In order to determine the models available in the current market, EPA recorded individual model information directly from manufacturers’ Web sites. Model information was obtained from Web sites of both partners and non-partners, accessed from May 29 to June 19. Any models listed on manufacturers’ Web sites as available for sale in the United States were counted. The list of product models found on Web sites was distributed to manufacturers on June 20 to: 1) confirm the accuracy and completeness of product listings and 2) provide updates as needed to the product information listed. Manufacturers’ were also invited to provide feedback on product information listed under other manufacturers.

Based on responses from 14 manufacturers, EPA updated products listings as determined from the Web site searches and added or removed products where applicable. EPA then cross-checked the products indicated as ENERGY STAR qualified on the updated product listings with product data from the ENERGY STAR database. Any incomplete product data was not included in the final analysis. The resulting product lists were the basis for which EPA used to determine the market share of ENERGY STAR qualifying products for Draft 2.

The models were grouped by product type, marking technology, size format, and color capability in order to classify by TEC or OM Table. Below are the data summary discussions for each category.

TEC Discussion

The below table is a summary of the TEC data used in preparation of Draft 2 after examining the datasets for completeness and accuracy.

	Market Info	ENERGY STAR Tier 1		ENERGY STAR Proposed Tier 2	
		Total Products	Qualified Products	% Qualified	Products ¹
TEC1	283	151	53%	68	24%
TEC2	171	84	49%	41	24%
TEC3	357	177	50%	93	26%
TEC4	179	95	53%	48	27%
TEC Total	990	507	51%	250	25%

¹ The number of products that *would* qualify under the proposed Tier 2 levels.

² The percent of total products that *would* qualify under the proposed Tier 2 levels.

In proposing the Tier 2 levels, EPA took into account whether more than one manufacturer had qualified products.

The approach to the analysis was to create a line of moving 25% levels for successive “windows” of 10 ipm. That is, the first window was 1-10 ipm, the second 2-11, third 3-12, etc. The 25% level was found for each window. Ideally, each window would have at least 25% of the models being compliant so that the actual values of the non-qualified models would never enter the analysis. While this is the case most of the time, it is not always. When non-qualified models were included in the analysis, since TEC values were not available for these models, EPA used Tier 1 TEC limits in lieu of actual values. In addition, when no units at all were in the window, the value was set to zero. This method used to generate the trend lines in Draft 2 was different than in Tier 1 and provides a better reflection of the data. EPA believes this is a better intermediate step to drawing the actual linear spec lines.

Figure 1 below shows the results of this analysis for models up to 100 ipm, along with the Draft 2 proposed lines. Figure 2 shows the data up to 160 ipm. There are only six units in the dataset with a speed over 160 ipm.

Figure 1.

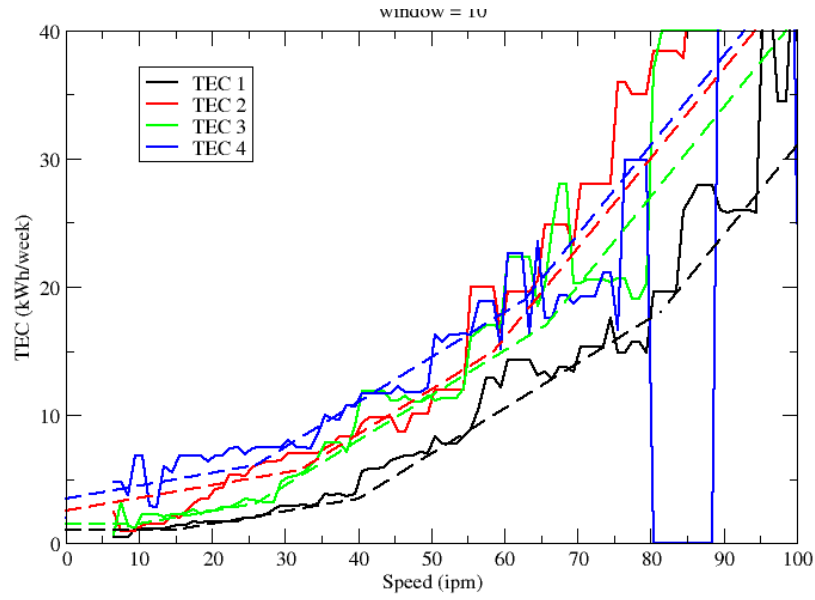
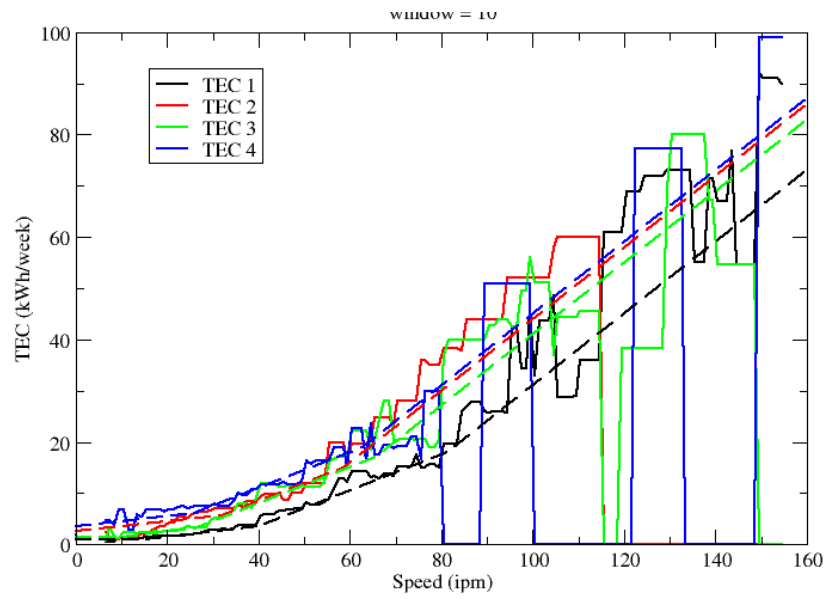
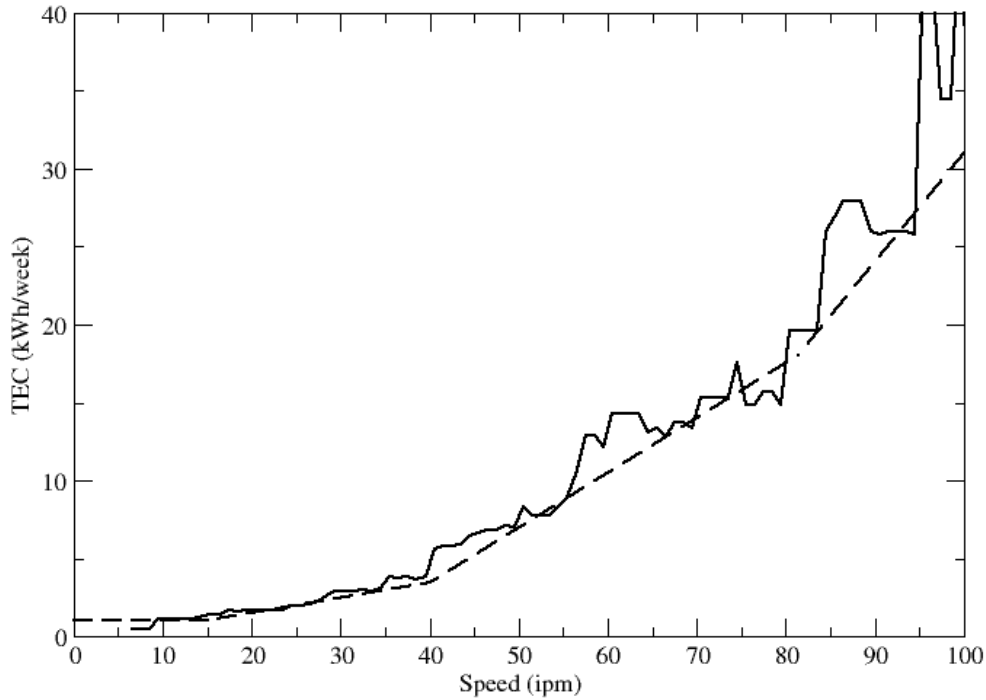


Figure 2.



TEC1

TEC Draft 2 - TEC1



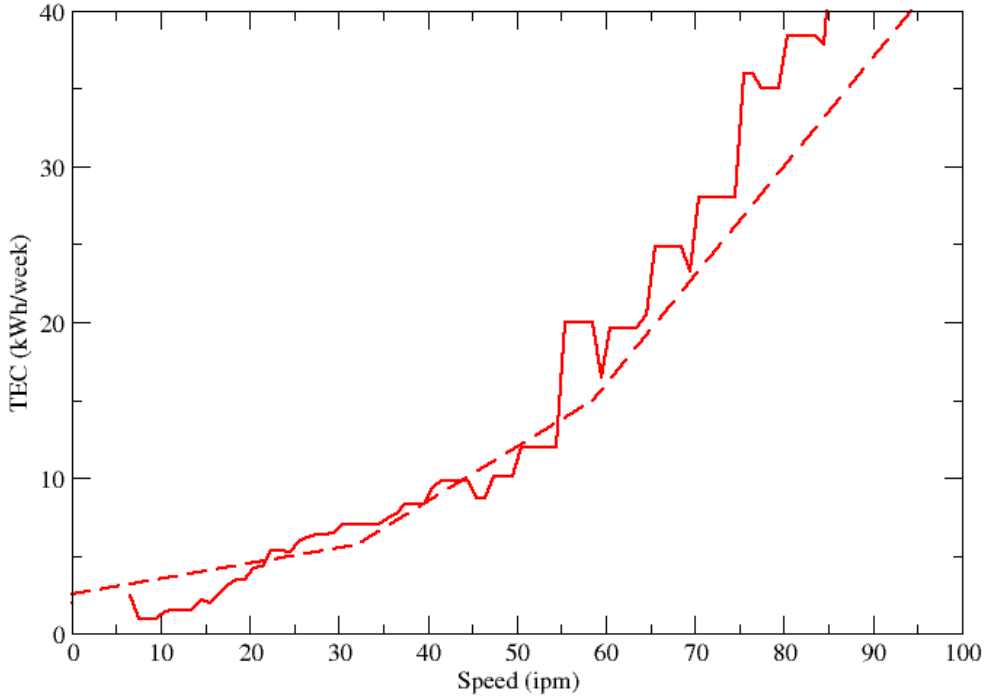
- Products: Copiers, Digital Duplicators, Fax Machines, Printers
- Size Format: Standard-size
- Marking Technology: DT, Mono DS, Mono EP, Mono Stencil, Mono TT, Mono High Performance IJ
- Total Products Available in US: 283
- Tier 1
 - ES Qualified Products: 151 (53%)
- Proposed Tier 2

Tier 2	
Product Speed (ipm)	Maximum TEC (kWh/week)
≤ 15	1.0 kWh
$15 < ipm \leq 40$	$(0.10 \text{ kWh/ipm})x - 0.5 \text{ kWh}$
$40 < ipm \leq 81$	$(0.35 \text{ kWh/ipm})x - 10.5 \text{ kWh}$
> 81	$(0.70 \text{ kWh/ipm})x - 39.0 \text{ kWh}$

- ES Qualified Products: 68 (24%)

TEC2

TEC Draft 2 - TEC2



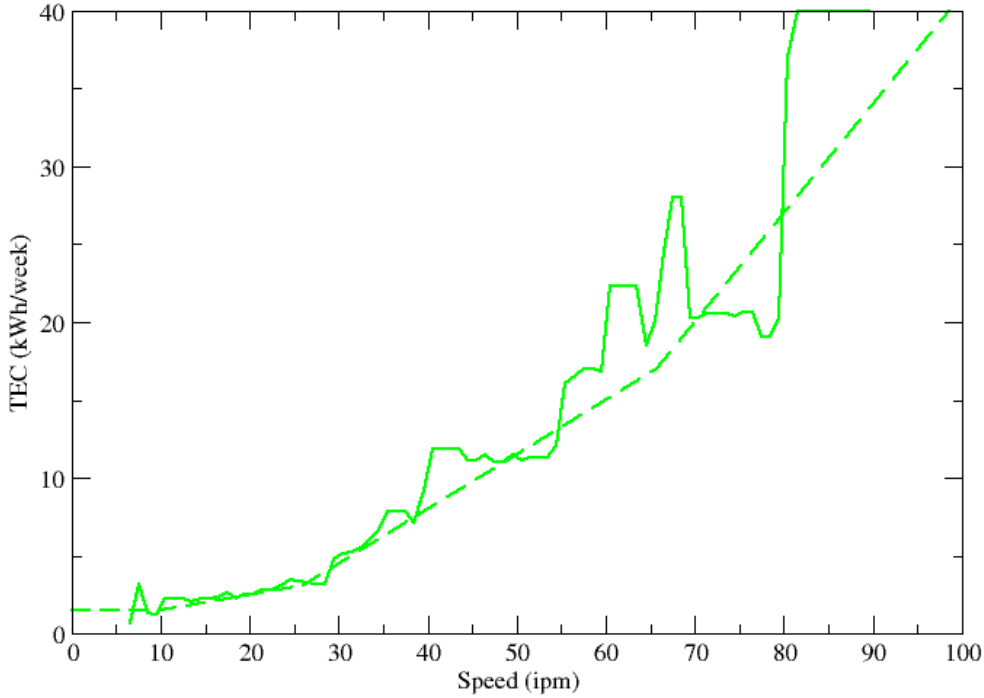
- Products: Copiers, Digital Duplicators, Fax Machines, Printers
- Size Format: Standard-size
- Marking Technology: Color DS, Color Stencil, Color TT, Color EP, SI, Color High Performance IJ
- Total Products Available in US: 171
- Tier 1
 - ES Qualified Products: 84 (49%)
- Proposed Tier 2

Tier 2	
Product Speed (ipm)	Maximum TEC (kWh/week)
≤ 32	$(0.10 \text{ kWh/ipm})x + 2.8 \text{ kWh}$
$32 < ipm \leq 58$	$(0.35 \text{ kWh/ipm})x - 5.2 \text{ kWh}$
> 58	$(0.70 \text{ kWh/ipm})x - 26.0 \text{ kWh}$

- ES Qualified Products: 41 (24%)

TEC3

TEC Draft 2 - TEC3



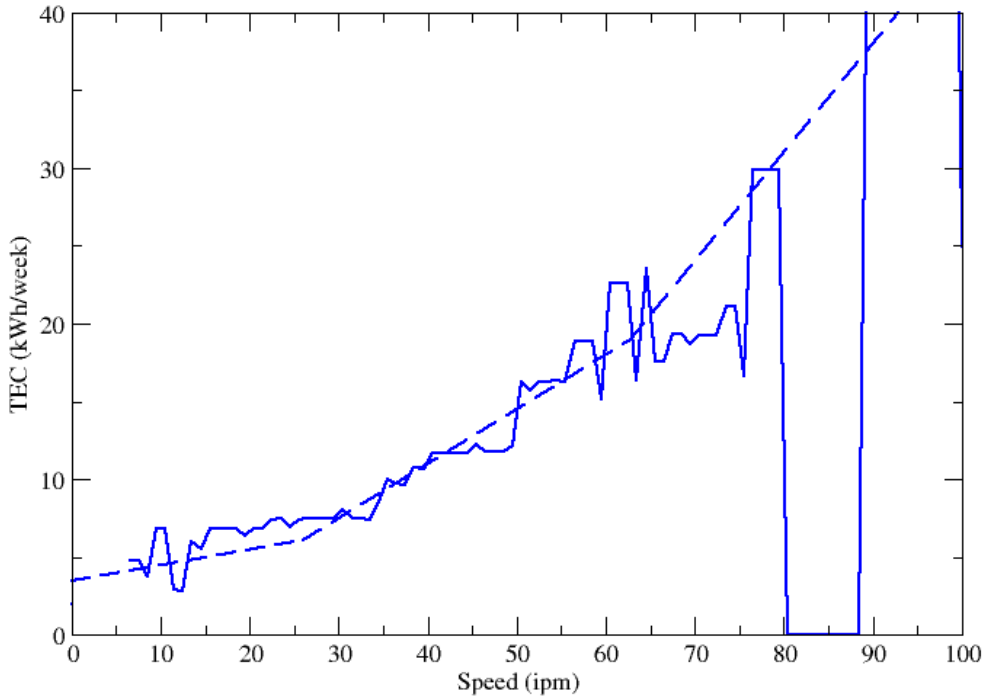
- Products: MFDs
- Size Format: Standard-size
- Marking Technology: DT, Mono DS, Mono EP, Mono TT
- Total Products Available in US: 357
- Tier 1
 - ES Qualified Products: 177 (50%)
- Proposed Tier 2

Tier 2	
Product Speed (ipm)	Maximum TEC (kWh/week)
≤ 10	1.5 kWh
$10 < ipm \leq 26$	$(0.10 \text{ kWh/ipm})x + 0.5 \text{ kWh}$
$26 < ipm \leq 68$	$(0.35 \text{ kWh/ipm})x - 6.0 \text{ kWh}$
> 68	$(0.70 \text{ kWh/ipm})x - 30.0 \text{ kWh}$

- ES Qualified Products: 93 (26%)

TEC4

TEC Draft 2 - TEC4

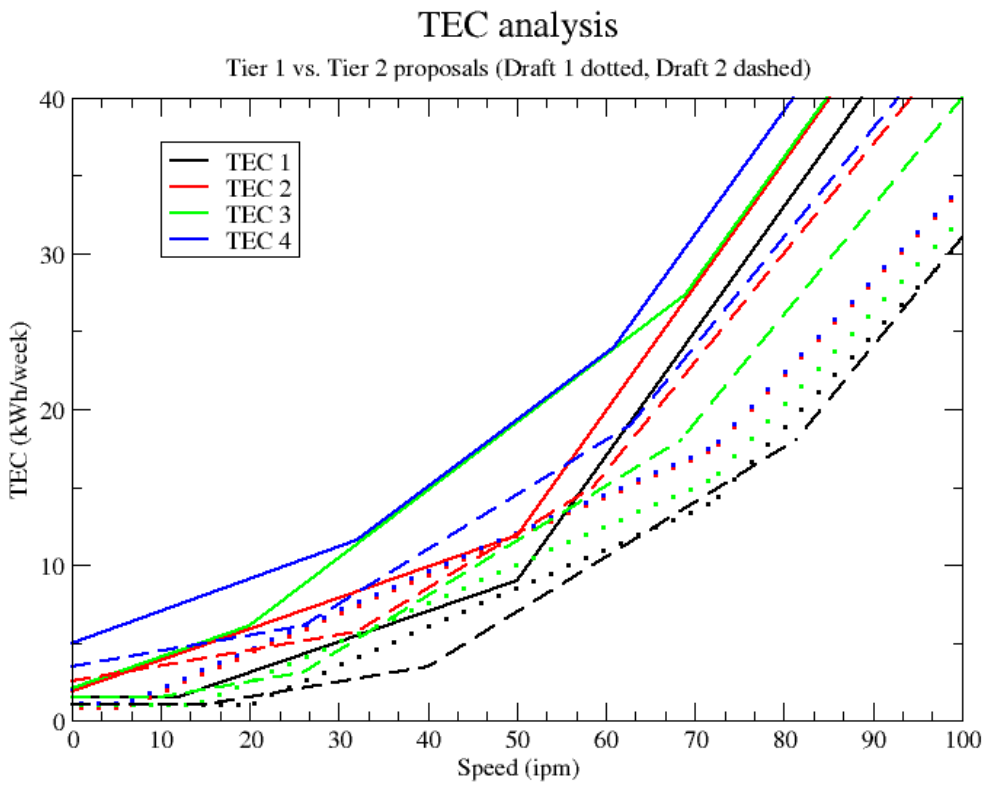


- Products: MFDs
- Size Format: Standard-size
- Marking Technology: Color DS, Color TT, Color EP, SI
- Total Products Available in US: 179
- Tier 1
 - ES Qualified Products: 95 (53%)
- Proposed Tier 2

Tier 2	
Product Speed (ipm)	Maximum TEC (kWh/week)
≤ 26	$(0.10 \text{ kWh/ipm})x + 3.5 \text{ kWh}$
$26 < \text{ipm} \leq 62$	$(0.35 \text{ kWh/ipm})x - 3.0 \text{ kWh}$
> 62	$(0.70 \text{ kWh/ipm})x - 25.0 \text{ kWh}$

- ES Qualified Products: 48 (27%)

Tier 1 v. Tier 2 – All TEC



- All TEC levels displayed in graph
 - Tier 1: solid lines
 - Proposed Tier 2
 - Draft 1: dotted lines
 - Draft 2: dashed lines

OM Discussion

The below table is a summary of the OM data used in the preparation of Draft 2 after examining the datasets for completeness and accuracy. As with the TEC analysis, the qualification rates represent the percentage of ENERGY STAR qualified models, out of all models currently available in the U.S. market.

	Market Info	ENERGY STAR Tier 1		ENERGY STAR Proposed Tier 2 Draft 2	
		Total Products	Qualified Products	% Qualified	Products ¹
OM1	18	6	33.3	3	16.7
OM2	148	66	44.6	38	25.7
OM3	100	48	48.0	20	20.0
OM4	55	15	27.3	15	27.3
OM5	162	9	5.6	9	5.6
OM6	39	17	43.6	10	25.6
OM7	239	74	31	61	25.5
OM8	27	16	59.3	9	33.3
OM Total	788	251	31.9	165	20.9

¹ The number of products that *would* qualify under the proposed Tier 2 levels.

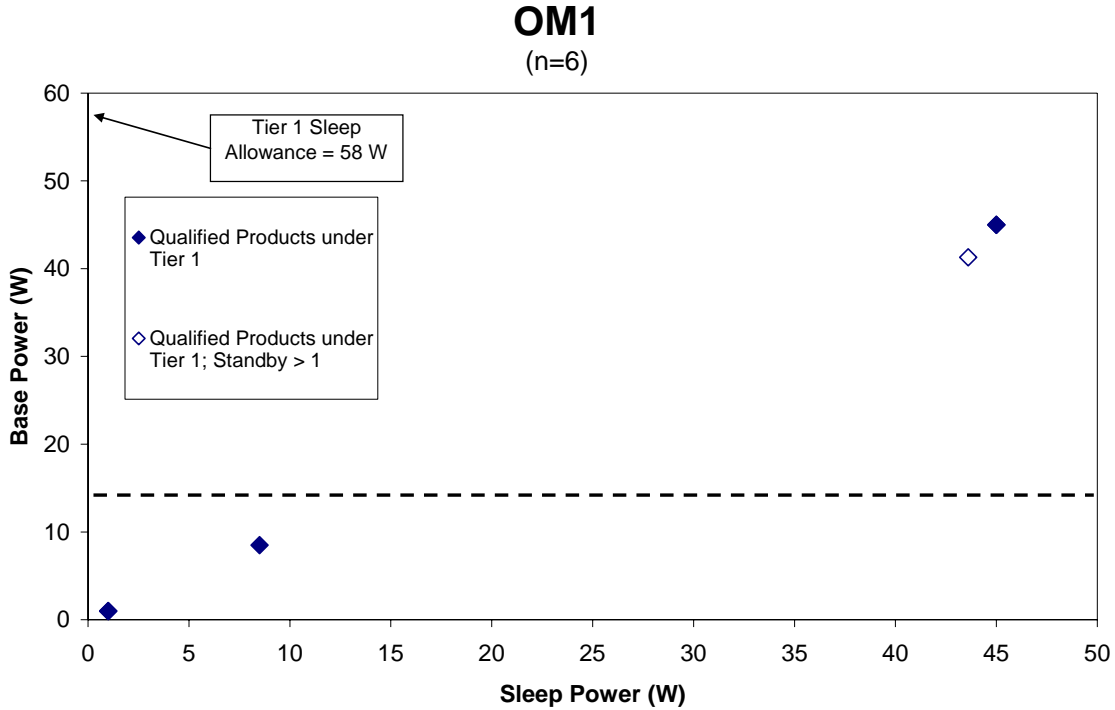
² The percent of total products that *would* qualify under the proposed Tier 2 levels.

In proposing the new requirements for Sleep mode power, EPA took into account whether more than one manufacturer had qualified products. Based on stakeholder feedback on Draft 1, the base power calculated for each product in each OM category was examined against the products' speed and power-supply (PS) size to determine if a functional adder based on PS was necessary.

From the data analysis, EPA is proposing to include the functional adder associated with Sleep levels based on power supply output rating (PSOR) for imaging products which fall under OM Tables 2 and 6. When calculating the base power for all other OM Tables, the PSOR adder was excluded as in Draft 1. As in Draft 1, in some cases in Draft 2 the proposed Sleep allowances are higher than Tier 1 to account for elimination of Power-supply adder for these products.

Due to more limited qualified product availability under Tier 1, the Sleep allowances for some OM tables (OM3, OM4, and OM5) have effectively remained the same in Tier 2 to ensure consumers have access to variety of qualified models.

Below are the graphs and summaries for each OM category. In the graphs below, the Draft 2 Tier 2 proposed Sleep mode power requirements are indicated by a dashed line.

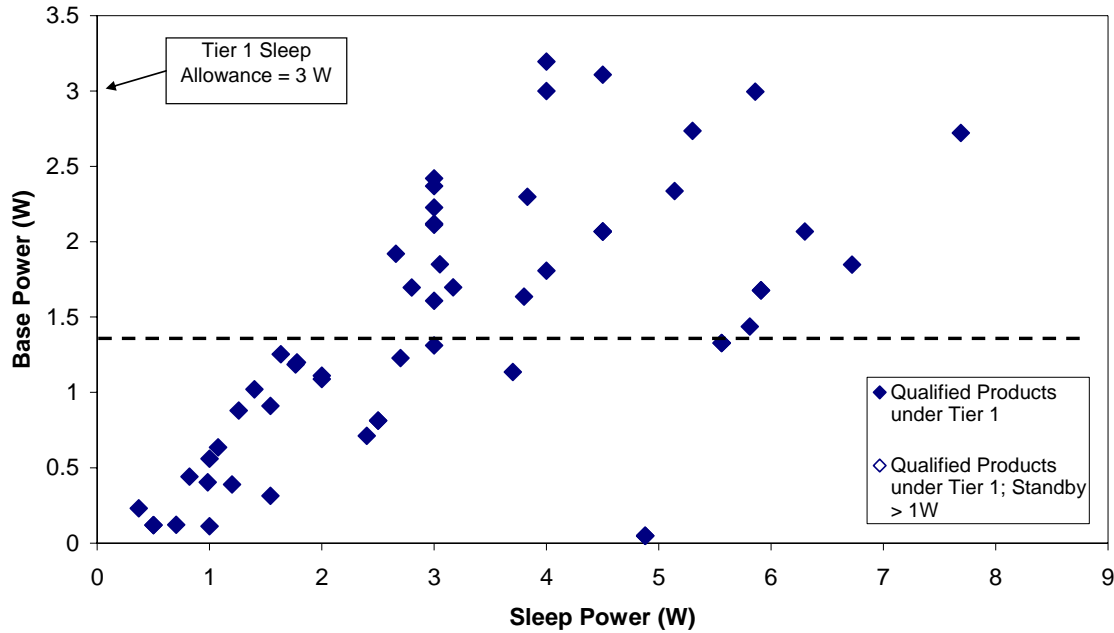


OM1

- Products: Copiers, MFDs
- Size Format: Large
- Marking Technology: Color DS, Color TT, DT, Mono DS, Mono EP, Mono TT, Color EP, SI
- Total Products Available in US: 18
- Tier 1
 - ES Qualified Products: 6 (33.3%)
 - All Qualified products are EP
 - Sleep Allowance (W): 58
- Proposed Tier 2
 - Sleep Allowance (W): 14
 - The current Tier 2 Sleep allowance in Draft 2 set to similar level as OM8 due to the fact that products in OM1 are basically built from a print-engine (including an optional DFE) plus a scanner. EPA intends to increase this allowance by some amount over the OM8 allowance of 14 W. **Note to Stakeholders:** EPA asks stakeholder for input on an appropriate adder for the additional scanning function of OM1 products as compared to OM8.
 - ES Qualified Products: 3 (16.7%)
 - One product was disqualified based on a Standby power greater than 1.0 W.
 - Manufacturers with Qualifying Products: 2

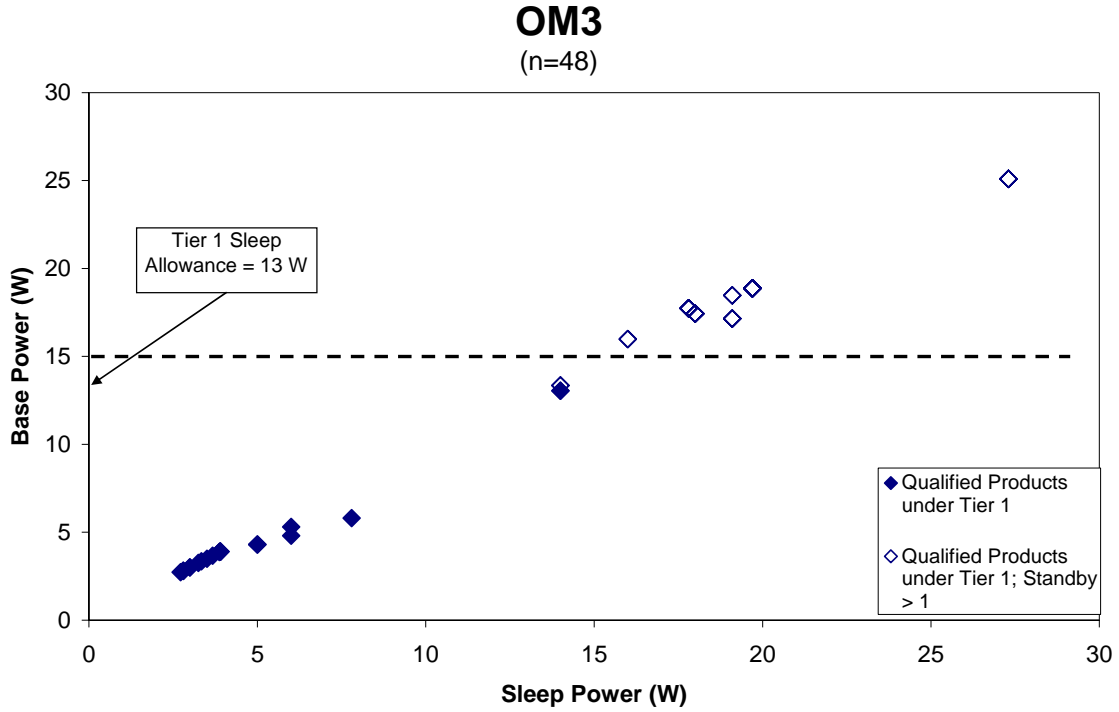
OM2 with Power Supply Adder

(n=66)



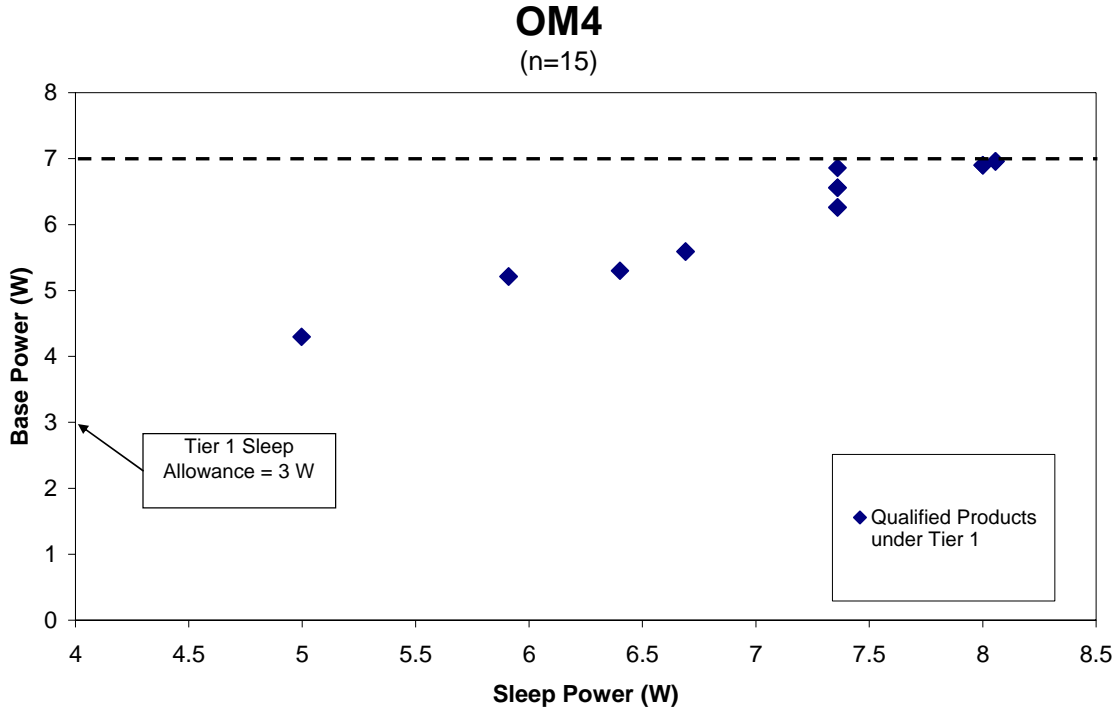
OM2

- Products: Fax Machines, MFDs, Printers
- Size Format: Standard
- Marking Technology: Color IJ, Mono IJ
- Total Products Available in US: 148
- Tier 1
 - ES Qualified Products: 66 (44.6%)
 - 35 MFDs
 - 31 Printers
 - 0 Fax Machine
 - Of all the qualified products there were no monochrome products
 - Sleep Allowance (W): 3
- Proposed Tier 2
 - Sleep Allowance (W): 1.4 with PS adder
 - ES Qualified Products: 38 (25.7%)
 - 16 MFDs
 - 22 Printers
 - One product was disqualified based on a Standby power greater than 1.0 W
 - Manufacturers with Qualifying Products: 5
 - With the inclusion of the PS adder, there were four products with slightly negative base powers; the existence of these four products is not indicative of a problem with the data analysis but a problem with the data entered.



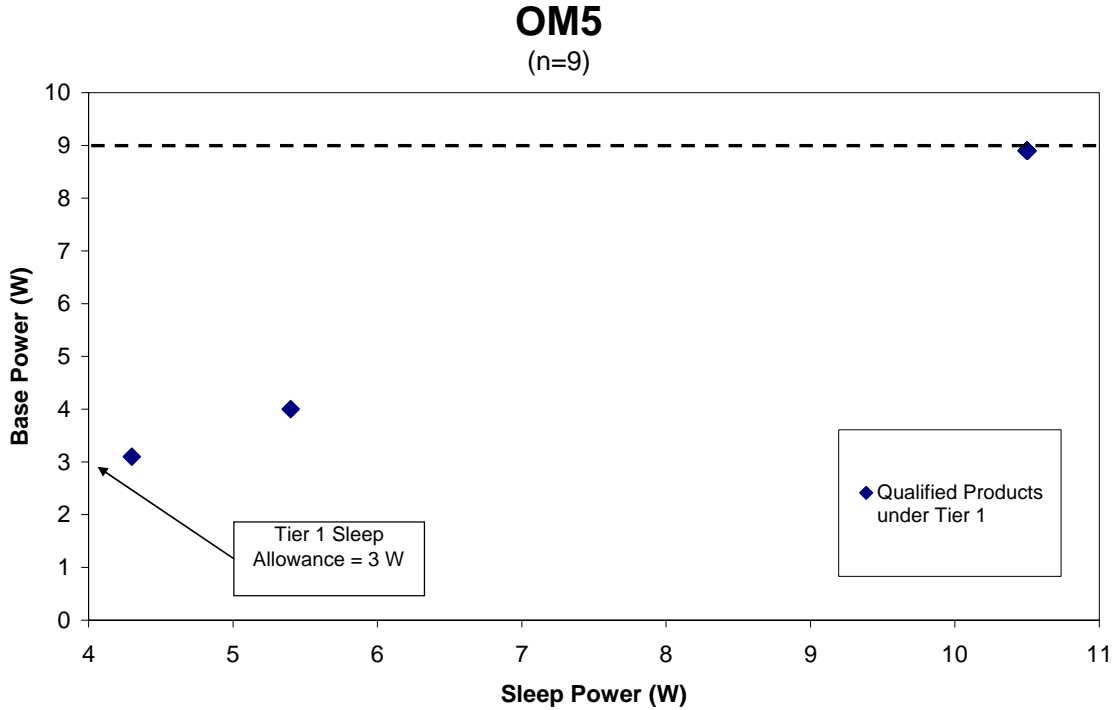
OM3

- Products: MFDs, Printers
- Size Format: Large Format
- Marking Technology: Color IJ, Mono IJ
- Total Products Available in US: 100
- Tier 1
 - ES Qualified Products: 48 (48%)
 - All qualified products are color printers
 - Sleep Allowance (W): 13
- Proposed Tier 2
 - Sleep Allowance (W): 15
 - Tier 2 Sleep allowance higher than Tier 1 to account for elimination of Power-supply adder for these products – effectively remaining the same
 - ES Qualified Products: 20 (20%)
 - All products with a Standby of 1.0 W or less met the proposed Sleep allowance
 - Manufacturers with Qualifying Products: 4



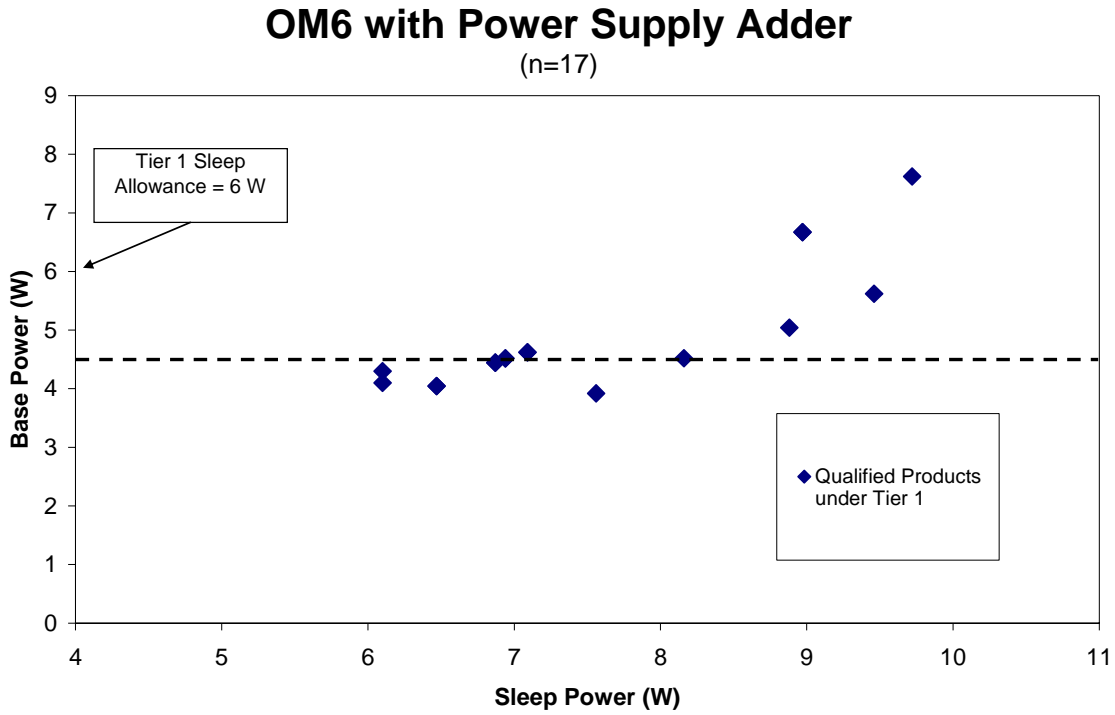
OM4

- Products: Mailing Machines
- Size Format: N/A
- Marking Technology: DT, Mono EP, Mono IJ, Mono TT
- Total Products Available in US: 55
- Tier 1
 - ES Qualified Products: 15 (27.3%)
 - Sleep Allowance (W): 3
- Proposed Tier 2
 - Sleep Allowance (W): 7
 - Tier 2 Sleep allowance higher than Tier 1 to account for elimination of PSOR adder – effectively remaining the same
 - Base power calculated for each product in OM4 was examined against the products' speed and PS size to determine if a secondary adder based on PS was necessary – the data did not suggest inclusion of a PS adder for these products
 - ES Qualified Products: 15 (27.3%) – no change
 - Manufacturers with Qualifying Products: 2



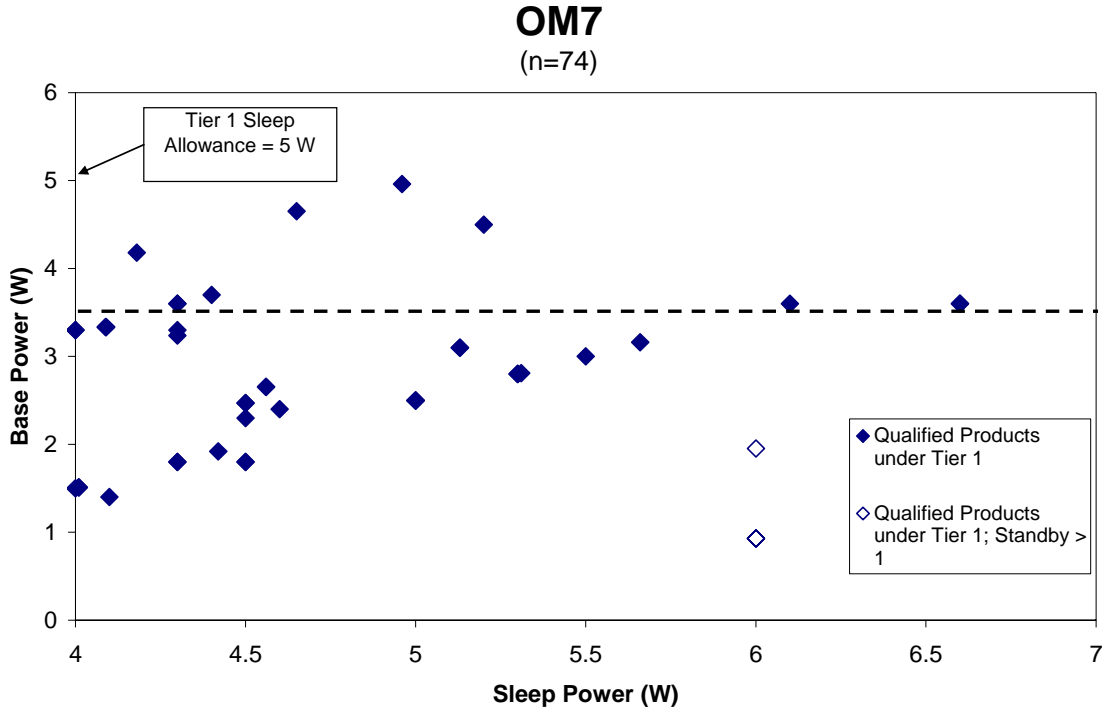
OM5

- Products: Printers
- Size Format: Small Format
- Marking Technology: Color DS, DT, Color IJ, Color Impact, Color TT, Mono DS, Mono EP, Mono IJ, Mono Impact, Mono TT, Color EP, SI
- Total Products Available in US: 162
- Tier 1
 - ES Qualified Products: 9 (5.6%)
 - Sleep Allowance (W): 3
- Proposed Tier 2
 - Sleep Allowance (W): 9
 - Tier 2 Sleep allowance higher than Tier 1 to account for elimination of PSOR adder – effectively remaining the same
 - ES Qualified Products: 15 (5.6%) – no change
 - Manufacturers with Qualifying Products: 2



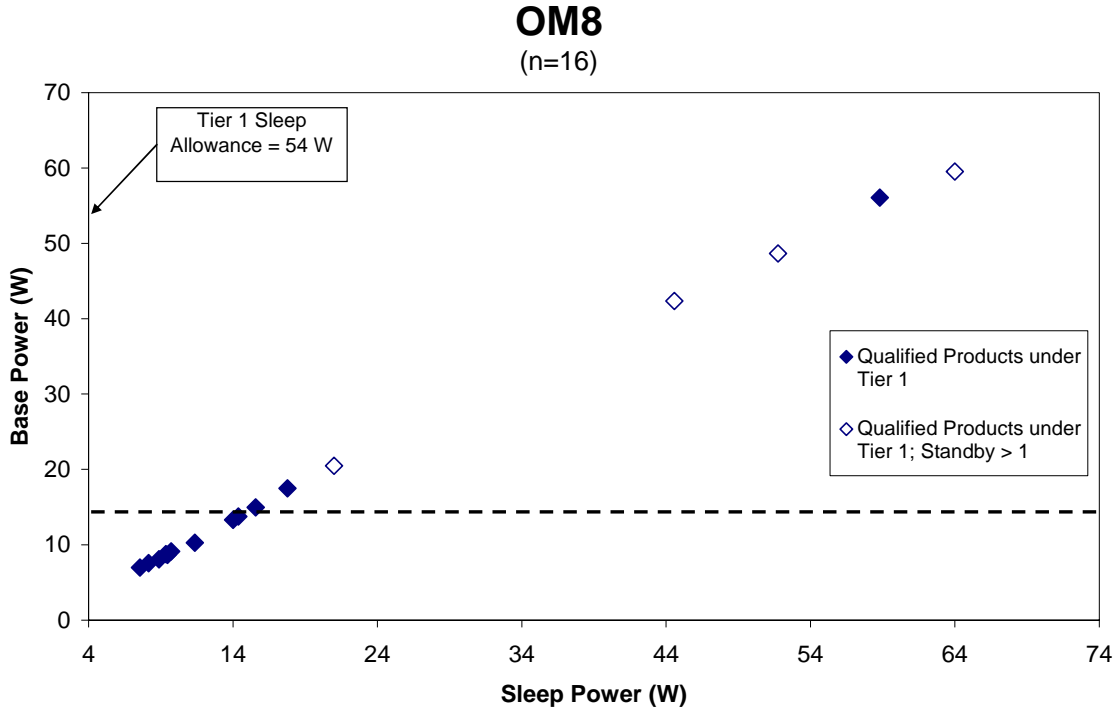
OM6

- Products: Printers
- Size Format: Standard
- Marking Technology: Color Impact, Mono Impact
- Total Products Available in US: 39
- Tier 1
 - ES Qualified Products: 17 (43.6%)
 - Sleep Allowance (W): 6
- Proposed Tier 2
 - Sleep Allowance (W): 4.6 with PS adder
 - ES Qualified Products: 10 (25.6%)
 - Manufacturers with Qualifying Products: 3



OM7

- Products: Scanners
- Size Format: Large, Small, Standard
- Marking Technology: N/A
- Total Products Available in US: 239
- Tier 1
 - ES Qualified Products: 74 (31%)
 - Sleep Allowance (W): 5
- Proposed Tier 2
 - Sleep Allowance (W): 3.5
 - ES Qualified Products: 61 (25.5%)
 - Three products meet the proposed Sleep allowance but do not meet the Standby requirement (1 W)
 - Manufacturers with Qualifying Products: 7



OM8

- Products: Printers
- Size Format: Large
- Marking Technology: Color DS, Color Impact, Color TT, DT, Mono DS, Mono EP, Mono Impact, Mono TT, Color EP, SI
- Total Products Available in US: 27
- Tier 1
 - ES Qualified Products: 16 (59.3%)
 - Sleep Allowance (W): 54
- Proposed Tier 2
 - Sleep Allowance (W): 14
 - Only Impact printers meet proposed Sleep allowance. One EP product did not qualify under the Sleep allowance, and the other products which use non-Impact marking technologies did not meet the Standby requirement.
 - The proposed OM8 Sleep allowance in Draft 2 was used to set to OM1 requirements due to the fact that products in OM1 are basically built from a print-engine (including an optional DFE) plus a scanner. EPA intends to increase the OM1 allowance by some amount over the proposed OM8 allowance of 14 W. **Note to Stakeholders:** EPA asks stakeholder for input on an appropriate adder for the additional scanning function of OM1 products as compared to OM8.
 - ES Qualified Products: 9 (33.3%)
 - Four products do not meet the Standby requirement (1 W)
 - Sleep allowance was set in order to incorporate more than one manufacturer
 - Manufacturers with Qualifying Products: 2