

DRAFT 1 Version 1.1 ENERGY STAR® Imaging Equipment Specification – Data Summary

TEC Discussion

In order to establish proposed TEC levels for Tier 2, the U.S. Environmental Protection Agency (EPA) used data for products qualified under Tier 1. The qualification rates represent the percentage of models, out of all models currently available in the market. In order to determine the models available in the current market, EPA used the information from Better Buys for Business (an independent consumer guide which lists all available imaging equipment models in the United States). For product categories not covered in the buying guides, alternate sources were used. The market data were grouped by product type and color capability (TEC Table 1 – 4).

In order to compare ENERGY STAR qualified products available in the U.S. to the market data obtained, EPA sent a request to stakeholders to identify which of their qualified products should be grouped as a product family and if their qualified products are currently available in the U.S. Data for products from partners who did not respond to the request were (1) grouped as a family if similar products from the same manufacturer had the same TEC values and (2) included in the analysis if the products were available in the U.S.

The below table is a summary of the TEC data.

	Market Info	ENERGY STAR Tier 1		ENERGY STAR Proposed Tier 2	
		Total Products	Qualified Products	% Qualified	Products ¹
TEC1	404	174	43	87	22
TEC2	170	65	38	41	24
TEC3	342	182	53	81	24
TEC4	144	91	63	38	26
TEC Total	1060	512	48	247	23

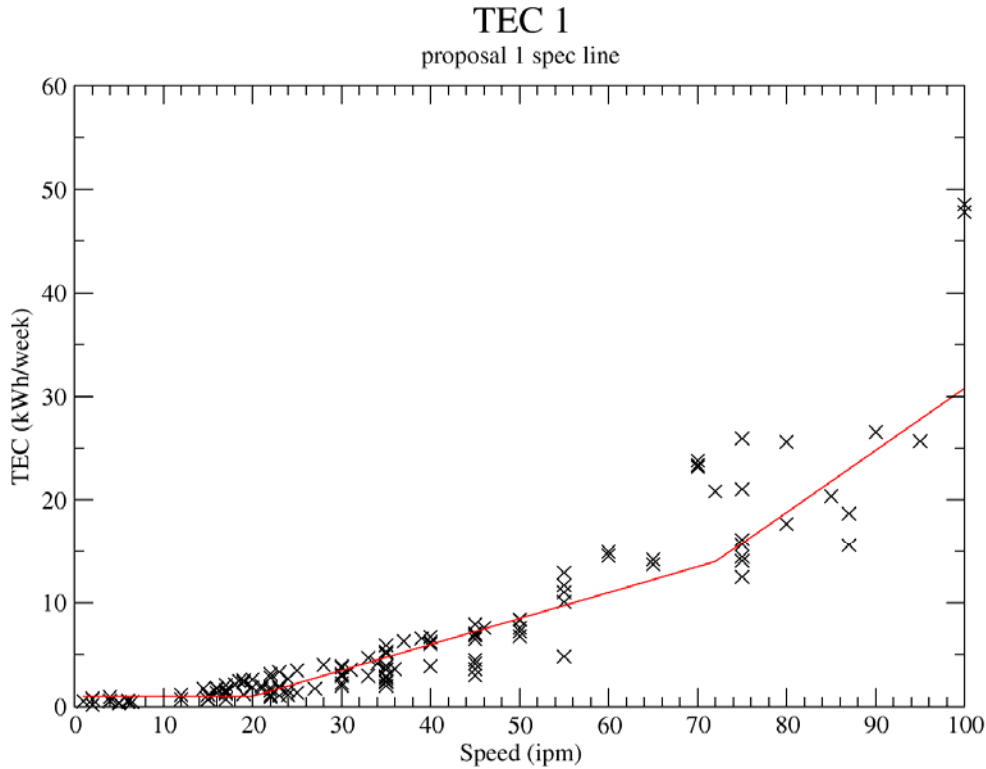
¹ The number of products that *would* qualify under the proposed Tier 2 levels.

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

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

The proposed TEC lines have a slope of 0.25 kWh/ipm, with the upper end a slope of 0.6 kWh/ipm. The intercept of these two lines is at 72 ipm. In all cases, a floor of 1 kWh/week was set, which is most important for TEC1. The 1 kWh/week minimum intercepts at 20 ipm for TEC1, 6 ipm for TEC2, 14 ipm for TEC3, and 6 ipm for TEC4.

For the Tier 1 process, digital duplicators were not considered in setting the 25% pass rate. In this Tier 2 process, EPA has also removed digital duplicators from the dataset used in calculating the pass rates presented here. There is no proposal to change how digital duplicators are treated in the specification, and, as before, all of these products fall well below the proposed spec levels.

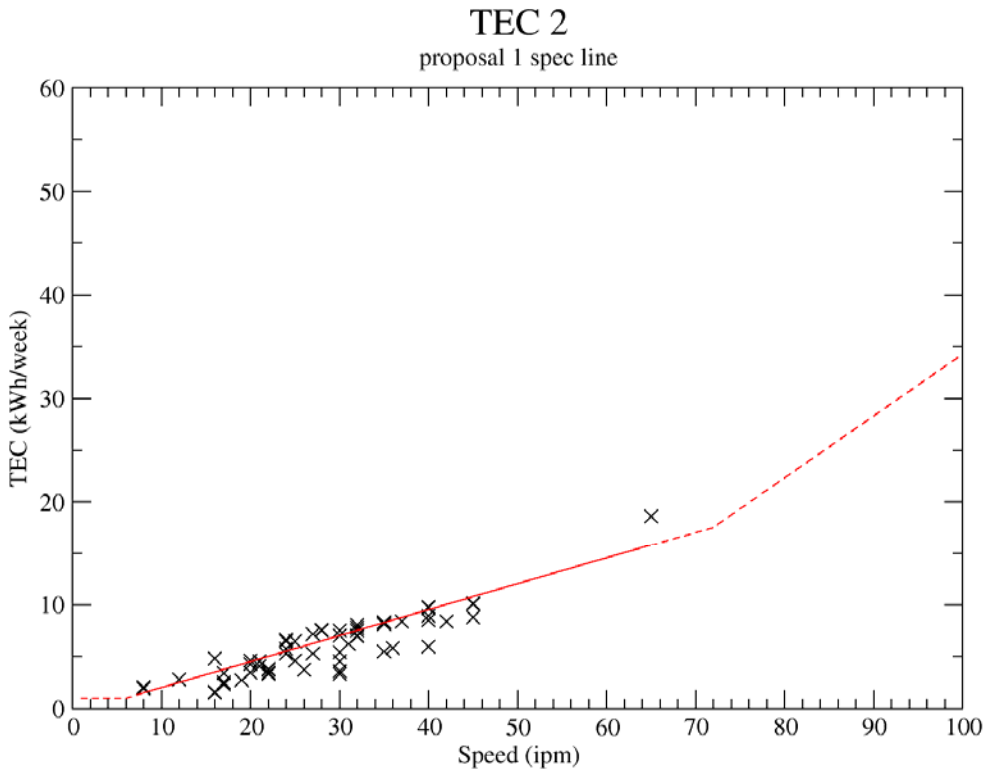


TEC1

- 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: 404 (Better Buys for Business consumer buying guides [BBB])
- Tier 1
 - ES Qualified Products: 174 (43%)
- Proposed Tier 2

Tier 2	
Product Speed (ipm)	Maximum TEC (kWh/week)
≤ 20	1.0
20 < ipm ≤ 72	(speed x 0.25 kWh/ipm) – 4 kWh
> 72 ipm	speed x (0.60 kWh/ipm) – 29.2 kWh

- ES Qualified Products: 87 (22%)
- Manufacturers with Qualifying Products: 16
- Marking Technologies that Qualify: EP, TT

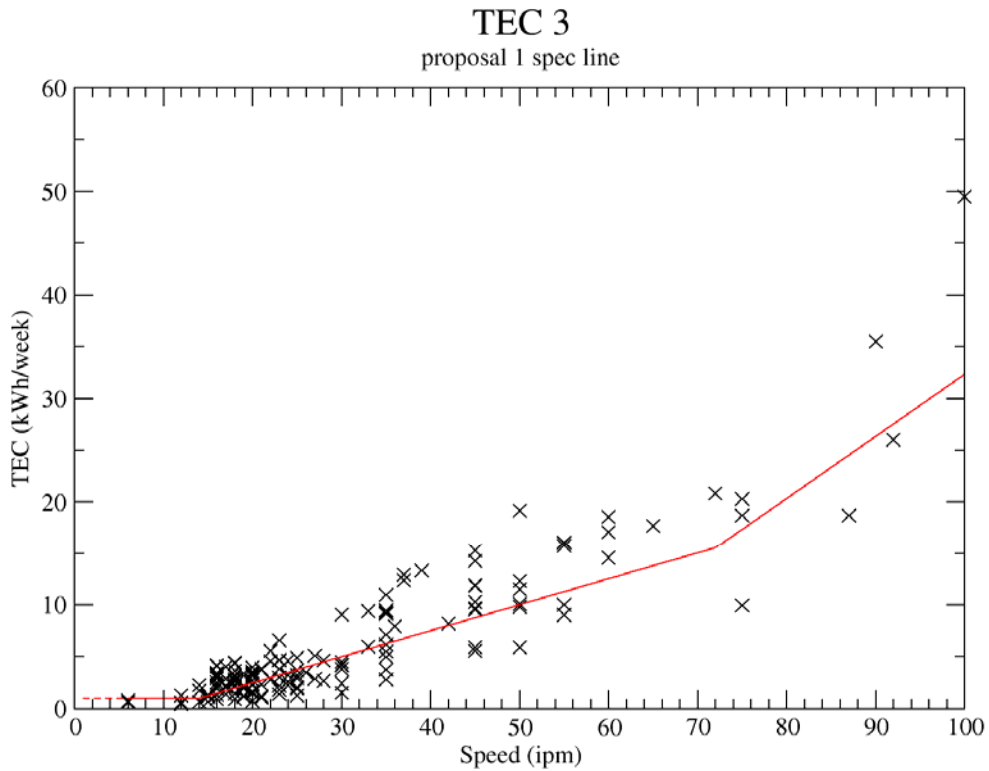


TEC2

- 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: 170 (BBB)
- Tier 1
 - ES Qualified Products: 65 (38%)
- Proposed Tier 2

Tier 2	
Product Speed (ipm)	Maximum TEC (kWh/week)
≤ 6	1.0
$6 < ipm \leq 72$	$(speed \times 0.25 kWh/ipm) - 0.5 kWh$
$> 72 ipm$	$(speed \times 0.60 kWh/ipm) - 25.7 kWh$

- ES Qualified Products: 41 (24%)
- Manufacturers with Qualifying Products: 13
- Marking Technologies that Qualify: EP

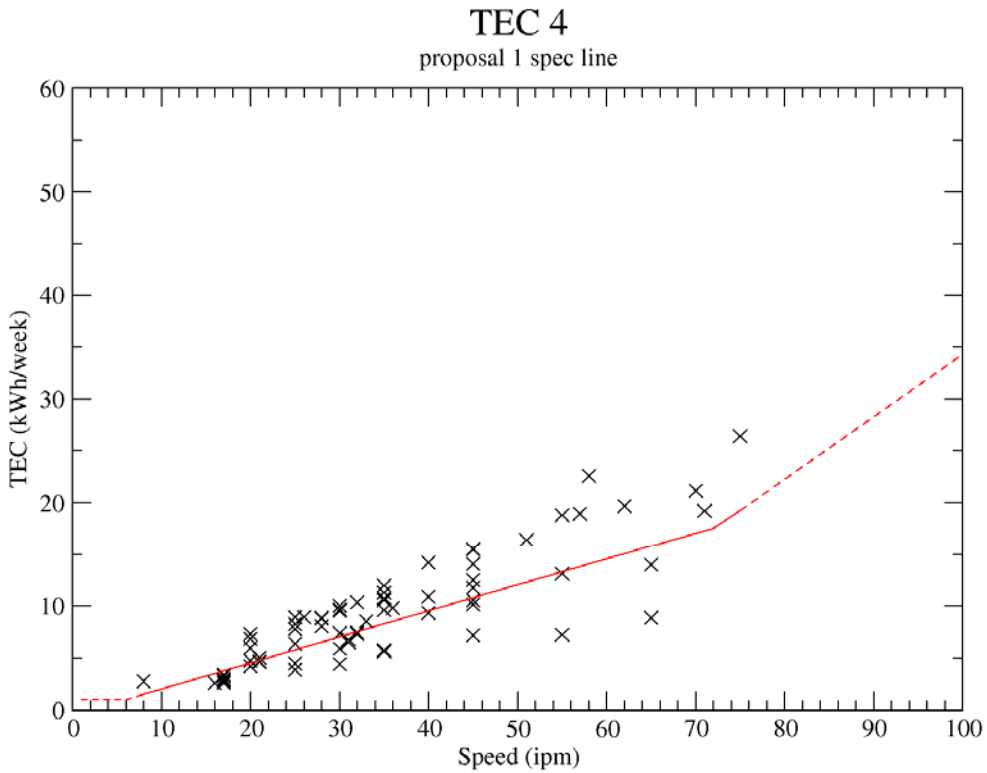


TEC3

- Products: MFDs
- Size Format: Standard-size
- Marking Technology: DT, Mono DS, Mono EP, Mono TT
- Total Products Available in US: 342 (BBB)
- Tier 1
 - ES Qualified Products: 182 (53%)
- Proposed Tier 2

Tier 2	
Product Speed (ipm)	Maximum TEC (kWh/week)
≤ 14	1.0
14 < ipm ≤ 72	(speed x 0.25 kWh/ipm) – 2.5 kWh
> 72 ipm	(speed x 0.60 kWh/ipm) – 27.7 kWh

- ES Qualified Products: 81 (24%)
- Manufacturers with Qualifying Products: 12
- Marking Technologies that Qualify: EP

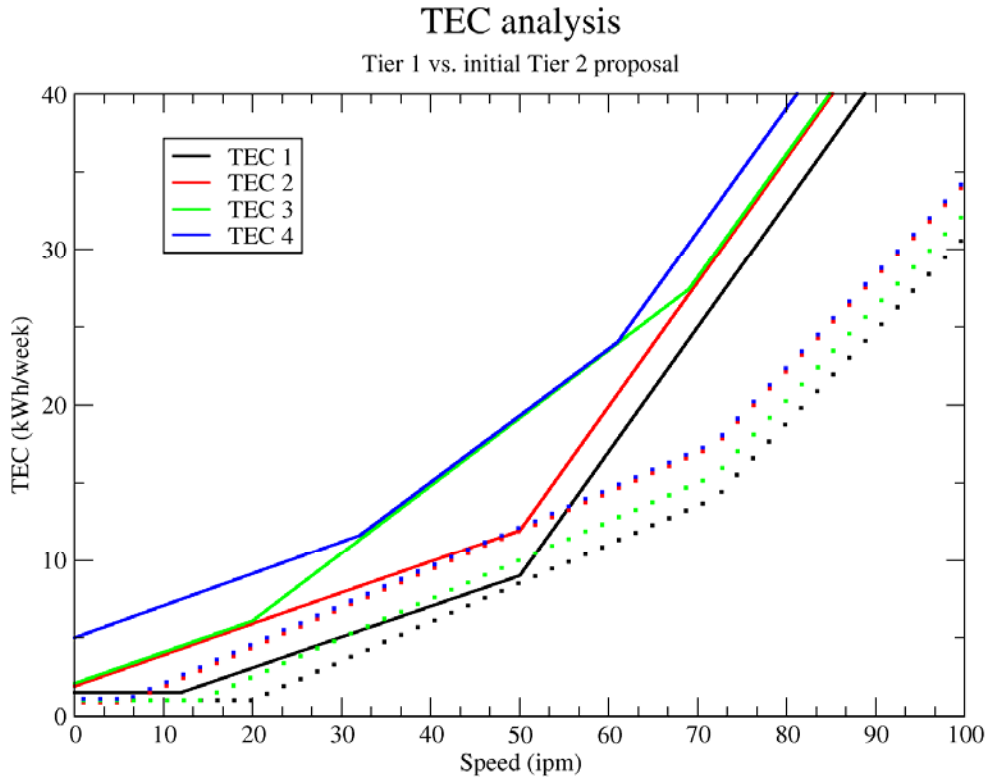


TEC4

- Products: MFDs
- Size Format: Standard-size
- Marking Technology: Color DS, Color TT, Color EP, SI
- Total Products Available in US: 144 (BBB)
- Tier 1
 - ES Qualified Products: 91 (63%)
- Proposed Tier 2

Tier 2	
Product Speed (ipm)	Maximum TEC (kWh/week)
≤ 6	1.0
6 < ipm ≤ 72	(speed x 0.25 kWh/ipm) – 0.5 kWh
> 72 ipm	(speed x 0.60 kWh/ipm) – 25.7 kWh

- ES Qualified Products: 38 (26%)
- Manufacturers with Qualifying Products: 9
- Marking Technologies that Qualify: EP



Tier 1 v. Tier 2 – All TEC

- All TEC levels displayed in graph
 - Tier 1: solid lines
 - Proposed Tier 2: dotted lines
- Tier 2 proposed levels more stringent than Tier 1

OM Discussion

Like the TEC analysis, in order to establish proposed OM Sleep levels for Tier 2, EPA used data for products qualified under Tier 1. The qualification rates represent the percentage of models, out of all models currently available in the market. In order to determine the models available in the current market, EPA used the information from Better Buys for Business (an independent consumer guide which lists all available imaging equipment models in the United States). For product categories not covered in the buying guides, alternate sources were used. The market data were grouped by product type, marking technology, size format, and color capability (OM Table 1 – 8).

In order to compare ENERGY STAR qualified products available in the U.S. to the market data obtained, EPA sent a request to stakeholders to identify which of their qualified products should be grouped as a product family and if their qualified products are currently available in the U.S. Data for products from partners who did not respond to the request were (1) grouped as a family if similar products from the same manufacturer had the same Sleep values and (2) included in the analysis if the products were available in the U.S.

The below table is a summary of the OM data.

	Market Info	ENERGY STAR Tier 1		ENERGY STAR Proposed Tier 2	
		Total Products	Qualified Products	% Qualified	Products ¹
OM1	48	11	23%	7	15%
OM2	72	54	75%	17	24%
OM3	63	39	62%	21	33%
OM4	27	6	22%	6	22%
OM5	75	14	19%	0	0%
OM6	64	14	22%	14	22%
OM7	108	88	81%	26	24%
OM8	27	20	74%	6	22%
OM Total	484	246	51%	97	20%

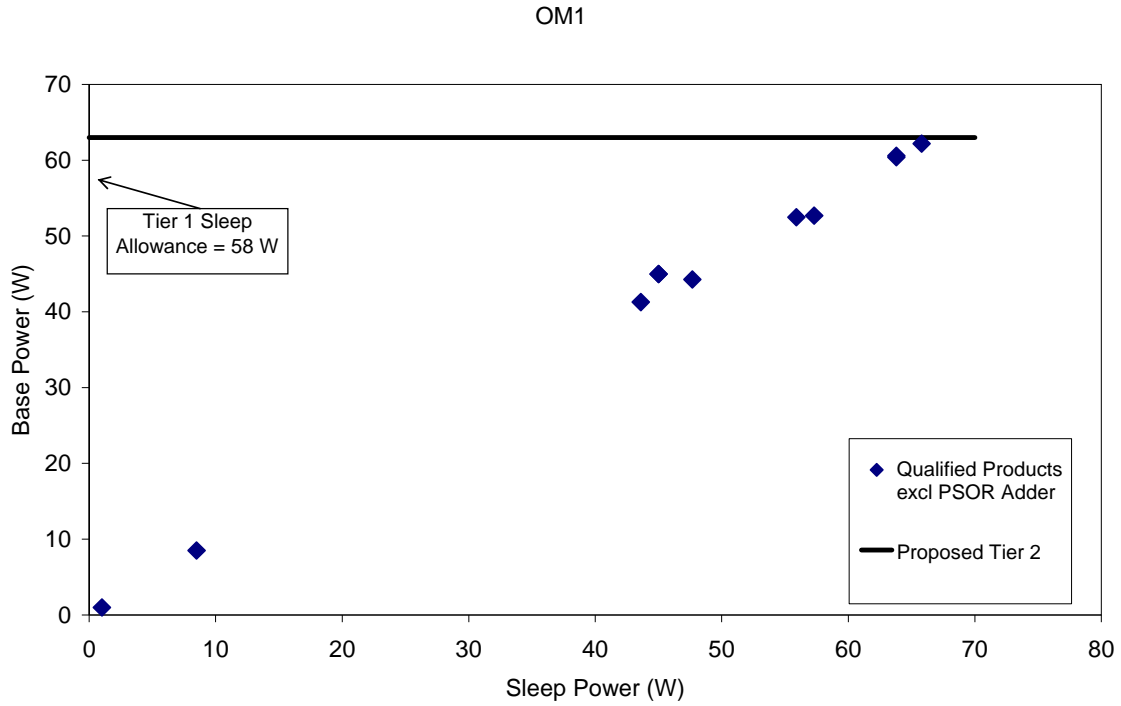
¹ The number of products that *would* qualify under the proposed Tier 2 levels.

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

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

As part of Tier 2, EPA is proposing to eliminate the adder associated with sleep levels based on power supply output rating (PSOR). This decision was made, in part, because the power supply size is not a function that delivers functionality to imaging products. EPA is seeking input from stakeholders on identifying any products in which this secondary adder serves a necessary component. When calculating the base power for all the qualified OM data, the PSOR adder was excluded. When the PSOR adder was eliminated, the base Sleep level increased in the specification. The text box in each chart indicates the Tier I levels that included the PSOR adder.

Due to more limited qualified product availability under Tier 1, some OM tables (OM1, OM4, OM6) have effectively the same Sleep levels in Tier 2 to ensure consumers have access to variety of qualified models.

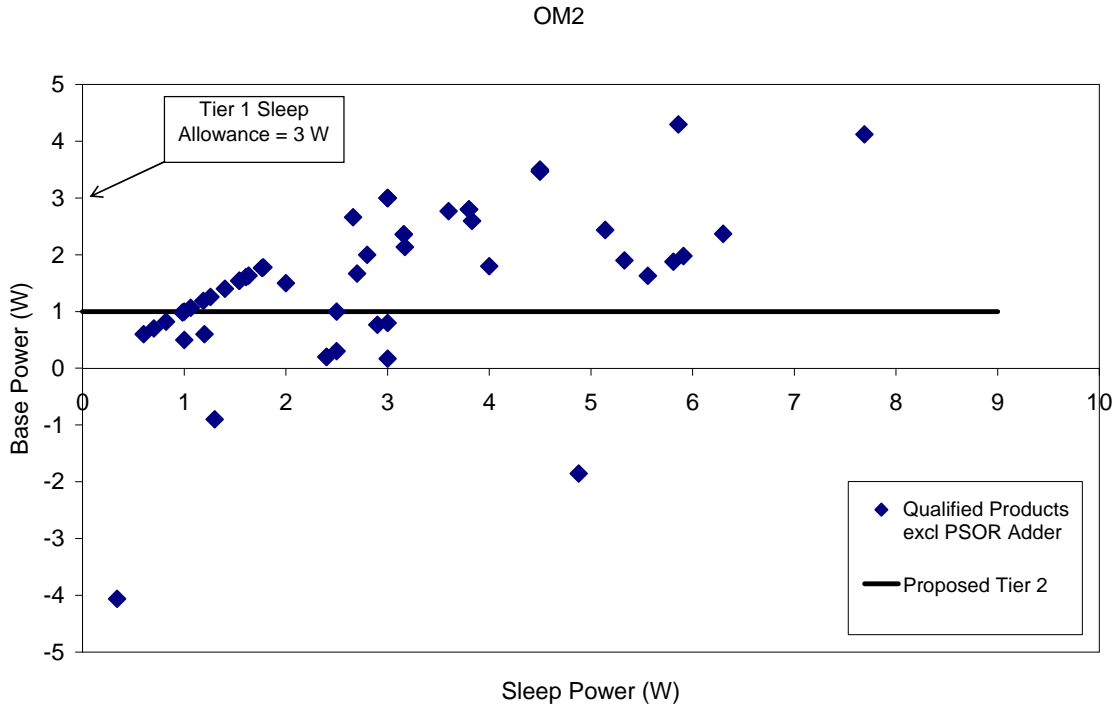


OM1

- 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: 48 (internet research)
- Tier 1
 - ES Qualified Products: 11 (23%)
 - All Qualified products are EP
 - Sleep Allowance (W): 58

PSOR Adder (W)	
n=7	
Min	0.225
Max	239.5
Ave	90.63

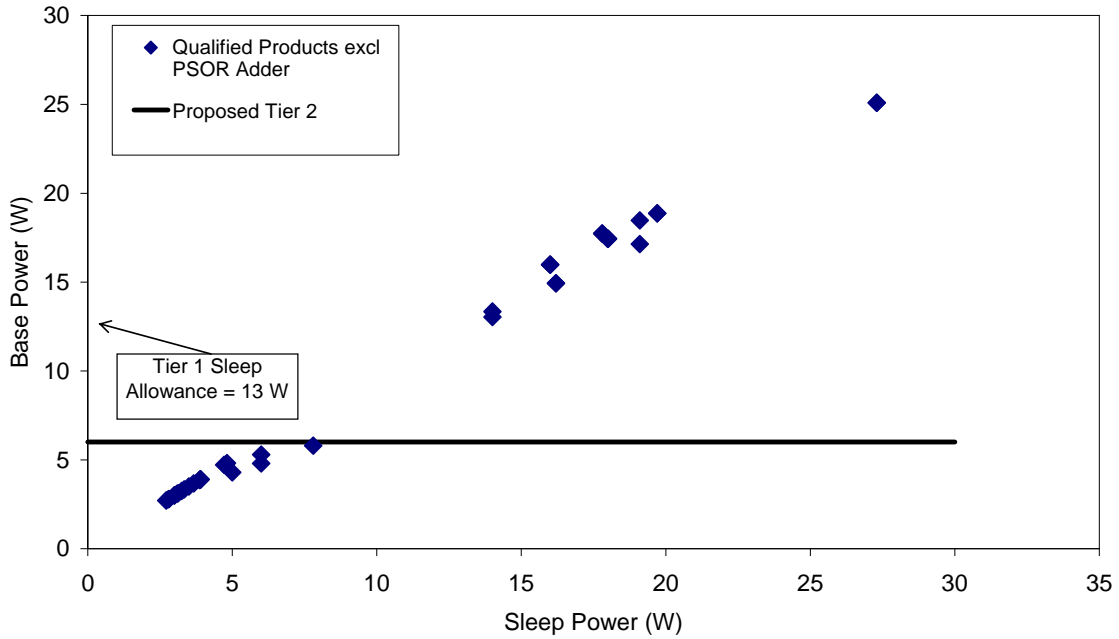
- Proposed Tier 2
 - Because market penetration for Tier 1 is 23%, recommend spec level not changed in order to qualify all currently qualified products
 - ES Qualified Products: 7 (15%)
 - Four products meet the sleep allowance but do not meet the proposed new Standby requirement (1 W). These products were excluded from the count of the number of products that would qualify under the proposed level (7).
 - Manufacturers with Qualifying Products: 2
 - Sleep Allowance (W): 63
 - Tier 2 sleep allowance higher than Tier 1 to account for elimination of PSOR adder



OM2

- Products: Fax Machines, MFDs, Printers
 - Size Format: Standard
 - Marking Technology: Color IJ, Mono IJ
 - Total Products Available in US: 72 (Better Buys for Business consumer buying guides [BBB])
 - Tier 1
 - ES Qualified Products: 54 (75%)
 - 33 MFDs
 - 20 Printers
 - 1 Fax Machine
 - Of all the qualified products only one is monochrome
 - Sleep Allowance (W): 3
- | PSOR Adder (W) | |
|----------------|------|
| n=23 | |
| Min | 0.25 |
| Max | 3.5 |
| Ave | 1.52 |
- Proposed Tier 2
 - ES Qualified Products: 17 (24%)
 - 8 MFDs
 - 9 Printers
 - Manufacturers with Qualifying Products: 4
 - Sleep Allowance (W): 1
 - Even with the exclusion of the PSOR adder, there were three products with negative base powers; the existence of these three products is not indicative of a problem with the data analysis but a problem with the data entered.

OM3

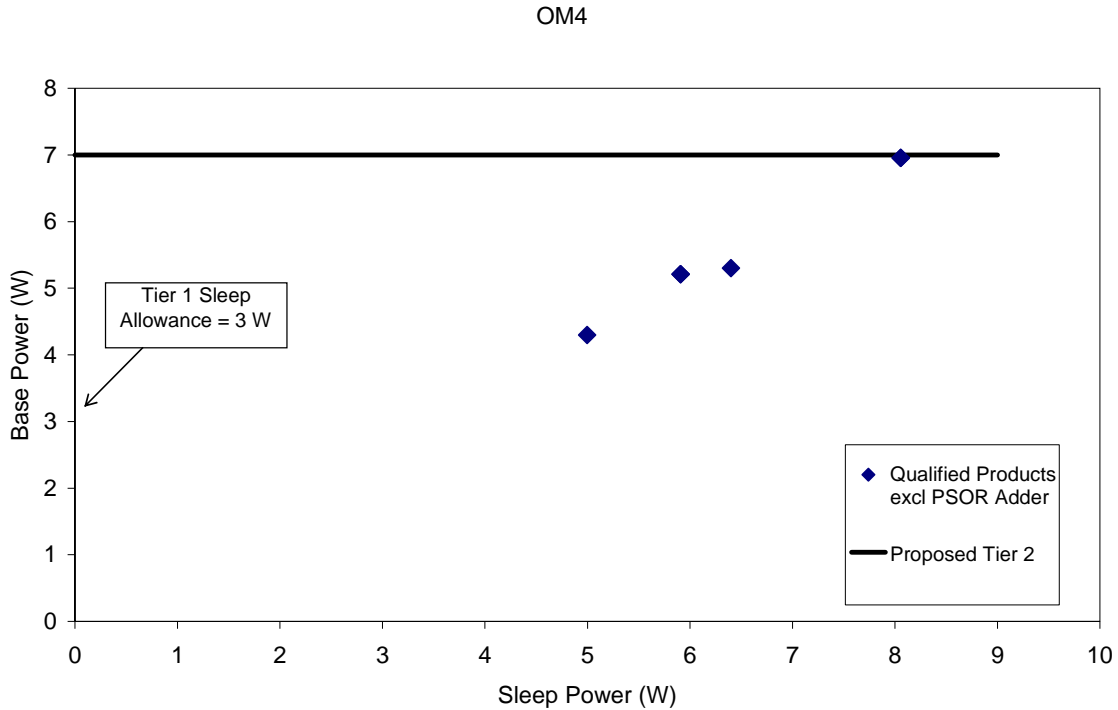


OM3

- Products: MFDs, Printers
- Size Format: Large Format
- Marking Technology: Color IJ, Mono IJ
- Total Products Available in US: 63 (internet research)
- Tier 1
 - ES Qualified Products: 39 (62%)
 - All qualified products are color printers
 - Sleep Allowance (W): 13

PSOR Adder (W)	
n=21	
Min	2.92
Max	18.8
Ave	9.85

- Proposed Tier 2
 - ES Qualified Products: 21 (33%)
 - One product meets the sleep allowance but does not meet the proposed new Standby requirement (1 W). This product was excluded from the count of the number of products that would qualify under the proposed level (21).
 - Manufacturers with Qualifying Products: 3
 - Sleep Allowance (W): 6



OM4

- Products: Mailing Machines
- Size Format: N/A
- Marking Technology: DT, Mono EP, Mono IJ, Mono TT
- Total Products Available in US: 27 (internet research)

• Tier 1

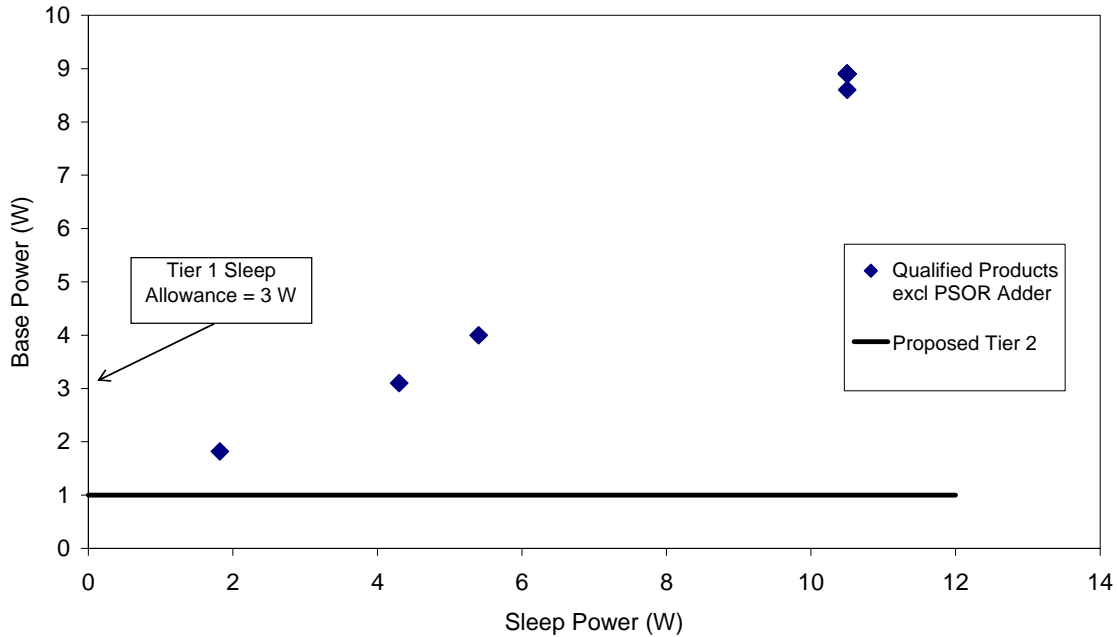
- ES Qualified Products: 6 (22%)
- Sleep Allowance (W): 3

PSOR Adder (W)	
n=6	
Min	1.53
Max	6.055
Ave	3.95

• Proposed Tier 2

- No change recommended
- ES Qualified Products: 6 (22%) – no change
- Manufacturers with Qualifying Products: 1
- Sleep Allowance (W): 7
 - Tier 2 sleep allowance higher than Tier 1 to account for elimination of PSOR adder

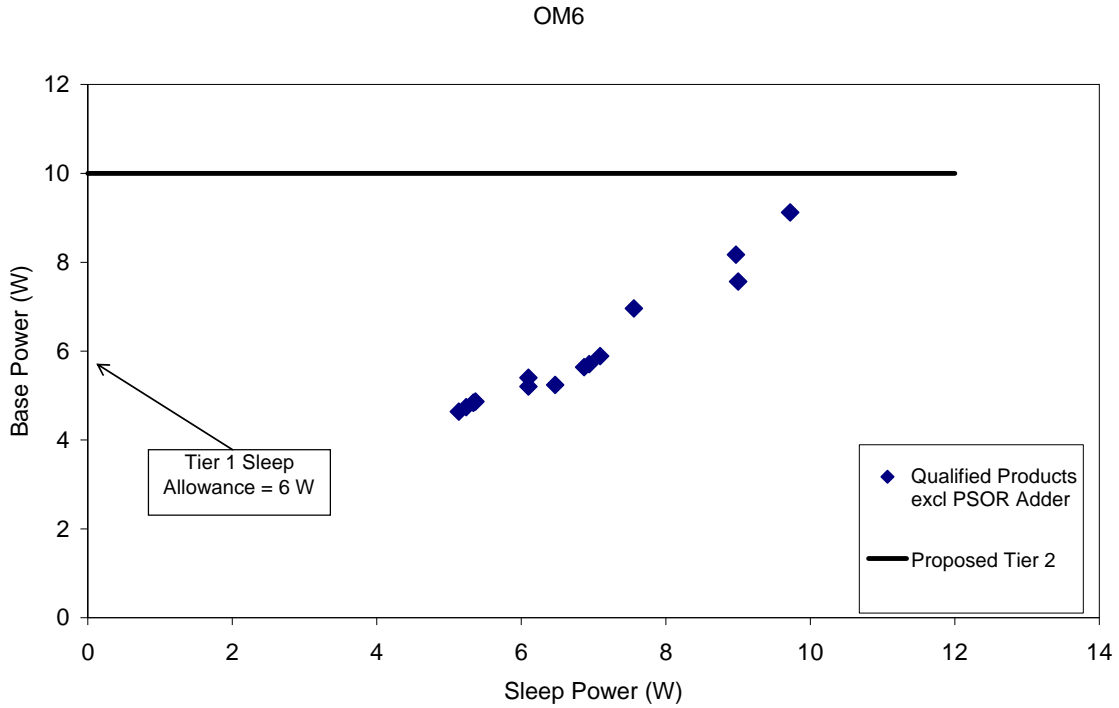
OM5



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: 75 (internet research)
- Tier 1
 - ES Qualified Products: 14 (19%)
 - Sleep Allowance (W): 3
- Proposed Tier 2
 - Sleep Allowance (W): 1.0
 - Because these products are similar in function as those under OM2, only smaller, EPA proposes to set this Sleep level the same as OM2.

PSOR Adder (W)	
n=13	
Min	1.18
Max	7.75
Ave	6.26



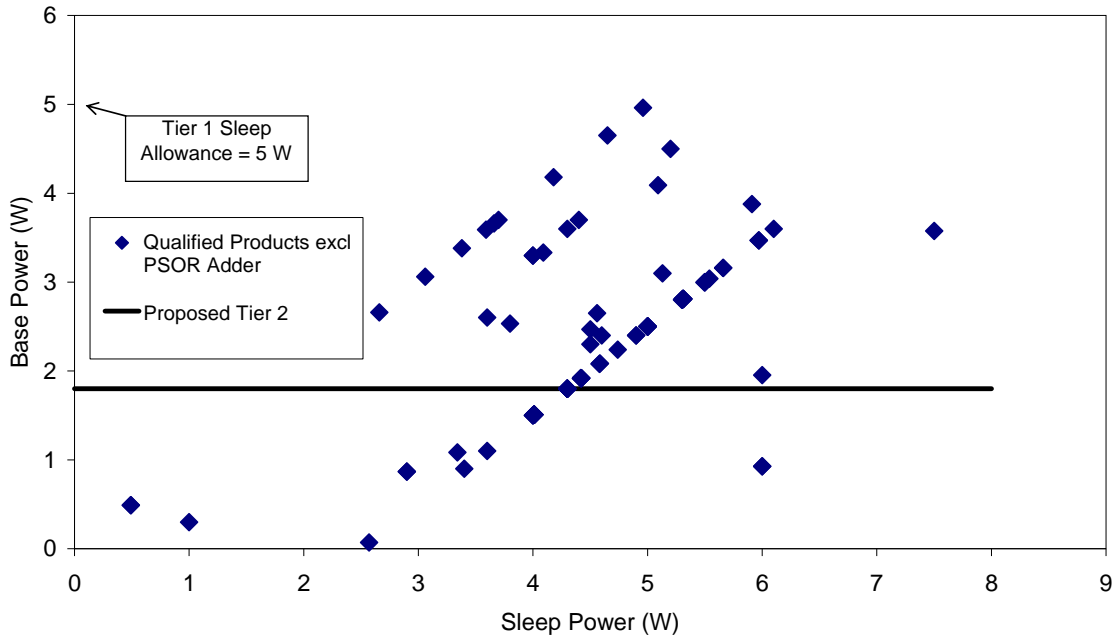
OM6

- Products: Printers
- Size Format: Standard
- Marking Technology: Color Impact, Mono Impact
- Total Products Available in US: 64 (internet research)
- Tier 1
 - ES Qualified Products: 14 (22%)
 - Sleep Allowance (W): 6

PSOR Adder (W)	
n=12	
Min	2.98
Max	7.60
Ave	3.05

- Proposed Tier 2
 - ES Qualified Products: 14 (22%) – possibly no change
 - **QUESTION to stakeholders:** Are the products that fall into this category similar to those that fall under OM2? If so, EPA will consider setting this Sleep level the same as OM2 (1 W).
 - Manufacturers with Qualifying Products: 4
 - Sleep Allowance (W): 10
 - Tier 2 sleep allowance higher than Tier 1 to account for elimination of PSOR adder

OM7

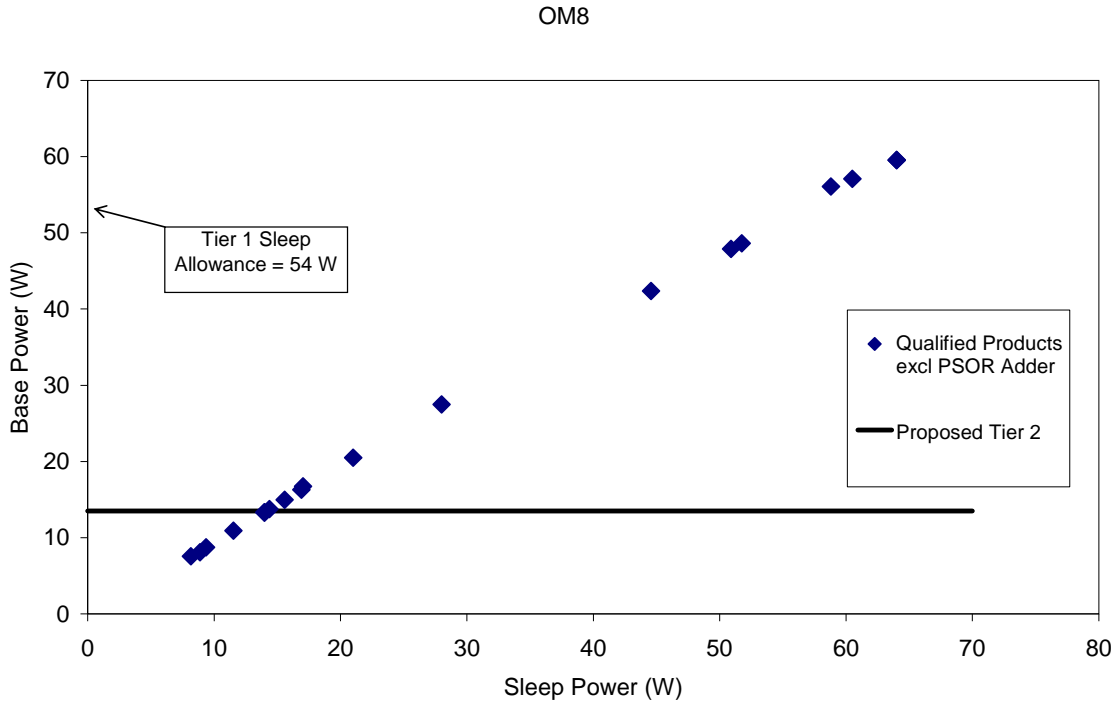


OM7

- Products: Scanners
- Size Format: Large, Small, Standard
- Marking Technology: N/A
- Total Products Available in US: 108 (BBB)
- Tier 1
 - ES Qualified Products: 88 (81%)
 - Sleep Allowance (W): 5

PSOR Adder (W)	
n=5	
Min	2.5
Max	19.5
Ave	16.1

- Proposed Tier 2
 - ES Qualified Products: 26 (24%)
 - Two products meet the sleep allowance but do not meet the proposed new Standby requirement (1 W). These products were excluded from the count of the number of products that would qualify under the proposed level (26).
 - Manufacturers with Qualifying Products: 7
 - Sleep Allowance (W): 1.8



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 (internet research)
- Tier 1
 - ES Qualified Products: 20 (74%)
 - Sleep Allowance (W): 54
- Proposed Tier 2
 - ES Qualified Products: 6 (22%)
 - One product meets the sleep allowance but does not meet the proposed new Standby requirement (1 W). This product was excluded from the count of the number of products that would qualify under the proposed level (6).
 - Manufacturers with Qualifying Products: 3
 - Sleep Allowance (W): 13.5
 - The only 2 color printers (SI) which qualify under Tier 1 would not be able to qualify under Tier 2. These are the two highest consumers of energy on the graph, with base powers of 60 W.

PSOR Adder (W)	
n=15	
Min	3.05
Max	229.5
Ave	39.97