

326
327
328
329
330

Note: After reviewing stakeholder comments, EPA has determined that the current 30 minute time requirement for System Sleep Mode is appropriate for ensuring energy savings while avoiding prematurely entering Sleep Mode and disrupting product usability. EPA welcomes any information or feedback that highlights user experiences at different sleep mode timer settings for future revisions of this specification.

331

3.4 User Information Requirements

332

3.4.1 Products shall be shipped with informational materials to notify customers of the following:

333

i. A description of power management settings that have been enabled by default,

334

ii. A description of the timing settings for various power management features, and

335

iii. Instructions for properly waking the product from Sleep Mode.

336

3.4.2 Products shall be shipped with one or more of the following:

337

i. A list of default power management settings.

338

ii. A note stating that default power management settings have been selected for compliance

339

with ENERGY STAR (within 15 min of user inactivity for the display, within 30 min for the

340

computer, if applicable per Table 2), and are recommended by the ENERGY STAR program

341

for optimal energy savings.

342

iii. Information about ENERGY STAR and the benefits of power management, to be located at

343

or near the beginning of the hard copy or electronic user manual, or in a package or box

344

insert.

345

3.4.3 Provisions 3.4.1 and 3.4.2 may be met through use of either electronic or printed product

346

documentation, provided it adheres to all of the following:

347

i. Documentation is shipped with the product (e.g., in a printed manual or insert, on included

348

optical media, in a file installed with the software load shipped to the customer); and

349

ii. Documentation is included either (a) only with ENERGY STAR qualified Computers; or (b) as

350

part of the standard documentation if and only if accompanied by EPA-approved customer

351

guidance on how to identify if their computer configuration is ENERGY STAR qualified.

352

3.5 Requirements for Desktop, Integrated Desktop, and Notebook Computers

353

3.5.1 Categories for TEC Criteria: Desktops and Integrated Desktops shall be evaluated according to

354

the categories described in Table 3, and Notebook Computers shall be evaluated in the

355

categories described in Table 4.

356

Table 3: Categorization of Desktop and Integrated Desktop Computers

| Category | DT 0 | DT I1 | DT I2 | DT I3 | DT D1 | DT D2 |
|--------------------------------|----------------|---------------------|----------------|---------|-------------------|---------|
| Performance Score, P^i | $P \leq 3$ | $3 < P \leq 6$ | $6 < P \leq 7$ | $P > 7$ | $3 < P \leq 9$ | $P > 9$ |
| Base Memory | None | None | | | None | |
| Base Graphics ⁱⁱⁱ | Any Graphics | Integrated Graphics | | | Discrete Graphics | |
| Graphics Adders ⁱⁱⁱ | $dGfx \leq G7$ | N/A | | | $dGfx \leq G7$ | |

357

ii $P = [\# \text{ of CPU cores}] * [\text{CPU clock speed (GHz)}]$.

iii Graphics capability is categorized based on frame buffer bandwidth, as shown in Table 10.

358

Table 4: Categorization of Notebook Computers

| Category | NB 0 | NB I1 | NB I2 | NB I3 | NB D1 | NB D2 |
|--------------------------------|----------------|---------------------|------------------|-------------------|----------------|---------|
| Performance Score, P^i | $P \leq 2$ | $2 < P \leq 5.2$ | $5.2 < P \leq 8$ | $P > 8$ | $2 < P \leq 9$ | $P > 9$ |
| Base Memory | None | None | | None | | |
| Base Graphics ⁱⁱⁱ | Any Graphics | Integrated Graphics | | Discrete Graphics | | |
| Graphics Adders ⁱⁱⁱ | dGfx \leq G7 | N/A | | dGfx \leq G7 | | |

359
360
361

Note: After a detailed analysis of both the new ECMA categories and the proposed ITI categorization system, EPA proposes to use the ITI categorization for Notebooks and Desktops (while keeping Integrated Desktops in the Desktop category).

362
363
364
365
366
367
368
369

After discussions with stakeholders and further analysis, EPA has added a new DT/NB I3 category to the ITI approach. This category is intended to contain most switchable graphics notebooks, as EPA has specified that they are to be tested with their discrete graphics turned off and therefore subject to the integrated graphics levels. However, notebooks with switchable graphics are often designed with more powerful hardware to support the discrete portion of their graphics capabilities, so putting them into a category that is dominated by integrated-only graphics systems would result in misleading efficiency comparisons. The new NB I3 category enables them to compete with similar systems that have similar end uses and the same target market segment of customers.

370

371
372
373

3.5.2 Calculated Typical Energy Consumption (E_{TEC}) per Equation 1 shall be less than or equal to the maximum TEC requirement (E_{TEC_MAX}), as calculated per Equation 2, subject to the following requirements:

374
375
376

i. The Additional Internal Storage adder allowance ($TEC_{STORAGE}$) shall be applied if there are more than one internal storage devices present in the product, in which case it shall only be applied once.

377
378
379

ii. The Integrated Display adder allowance ($TEC_{INT_DISPLAY}$) applies only for Integrated Desktops and Notebooks. For Enhanced-performance Integrated Displays, the adder is calculated as presented in Table 10.

380
381

iii. For a product to qualify for the Full Network Connectivity weightings, the following criteria shall be satisfied:

382
383
384
385

- Products shall meet a non-proprietary Full Network Connectivity standard such as ECMA 393 or another standard that has been approved by EPA as meeting the goals of ENERGY STAR. Such approval must be in place prior to submittal of product data for qualification.

386
387
388

- Products shall have the applied level of functionality enabled and configured by default upon shipment. If Full Network Connectivity features are not enabled by default, the system shall be tested and reported with Conventional TEC weightings.

389
390
391
392

iv. For Desktops that lack a discrete System Sleep Mode but have a Long Idle State power level less than or equal to 10.0 W, power in Long Idle (P_{LONG_IDLE}) may be used in place of power in Sleep (P_{SLEEP}) in Equation 1. In such instances, ($P_{SLEEP} \times T_{SLEEP}$), is replaced by ($P_{LONG_IDLE} \times T_{SLEEP}$); Equation 1 remains otherwise unchanged.

439

Table 7: Mode Weightings for Notebook Computers

| Mode Weighting | Conventional | Full Network Connectivity | | | |
|-------------------------|--------------|---------------------------|-------------|-----------------------------------|-----------------|
| | | Base Capability | Remote Wake | Service Discovery / Name Services | Full Capability |
| T _{OFF} | 25% | 34% | 38% | 46% | 50% |
| T _{SLEEP} | 35% | 30% | 28% | 22% | 20% |
| T _{LONG_IDLE} | 10% | 8% | 7% | 6% | 5% |
| T _{SHORT_IDLE} | 30% | 28% | 27% | 26% | 25% |

440

Note: EPA has reviewed the TEC Weightings and believes that the foundation of the TEC model remains consistent with the data used in development of Version 5, which was drawn from a study of power state transitions in over 70,000 computers. The table below compares TEC weighting methods for Desktops and Notebooks in both Version 5 and Version 6. For Desktops, Version 6 gives slightly more emphasis to Idle States based on a smaller study done to determine the appropriate split for Long and Short Idle. For Notebooks, where power levels in Off and Sleep are similar, increased emphasis is also placed on higher power Idle States.

| Desktop Computers | | |
|--------------------|--------|-----------------|
| | V5 (1) | V6, Draft 3 (2) |
| Off | 55 % | 45% |
| Sleep | 5 % | 5% |
| Long Idle | 40 % | 15% |
| Short Idle | | 35 % |
| Notebook Computers | | |
| Off | 60 % | 25% |
| Sleep | 10 % | 35% |
| Long Idle | 30 % | 10% |
| Short Idle | | 30 % |

Sources:

- (1) http://www.energystar.gov/ia/partners/prod_development/revisions/downloads/computer/Microsoft_PowerTransitionReport.pdf?f0fe-40d2
- (2) Ecma-383, 3rd Edition, Annex B.

441

442

Table 8: Base TEC Allowances for Desktop and Integrated Desktop Computers

| Product Category | TEC _{BASE} (kWh) |
|------------------|---------------------------|
| DT 0 | 69 |
| DT I1 | 112 |
| DT I2 | 120 |
| DT I3 | 135 |
| DT D1 | 118 |
| DT D2 | 137 |