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Katharine Kaplan
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ENERGY STAR Product Development
US Environmental Protection Agency
1200 Pennsylvania Avenue, N.W.
Washington, DC 20460
stbs@energystar.gov

Re: ENERGY STAR® Specification for Set-top Boxes Version 4.1, Final Draft

Dear Ms. Kaplan:

On behalf of the National Cable & Telecommunications Association ("NCTA"), I am responding to the Environmental Protection Agency's ("EPA") January 23, 2014 request for comment on the ENERGY STAR® Specification for Set-top Boxes Version 4.1, Final Draft ("Final Draft").

We appreciate EPA's work in harmonizing its test procedure in the Final Draft with the Voluntary Agreement for Ongoing Improvement to the Energy Efficiency of Set-Top Boxes ("VA") and otherwise showing support for the VA. As we have detailed in our prior comments, support for voluntary consensus standards and relying upon the CEA-2043 consensus technical standard for testing set-top boxes is consistent with directives from Congress and the Administration and fully supportive of EPA's objectives.

Our key recommendations for changes in the EPA's Final Draft are:

1. EPA should follow the proposed approach for submission of testing data while it gains experience with Voluntary Agreement data.

2. EPA should adjust several provisions of its test procedures to meet its intention to harmonize with CEA 2043.

3. The Ultra HD allowance should apply to a set-top box that outputs in Ultra HD, even if it upscales the content.

4. EPA should permit a Thin Client to qualify for Ultra HD and High Efficiency Video Processing (HEVP) allowances, and to qualify as a WiFi access point, in order to promote energy savings in gateway/whole home architectures.

5. EPA should not sunset the DOCSIS 3.0 allowance.

6. EPA should permit deep sleep allowances for implementations that can meet customer recording requirements without wake to record.

I. EPA SHOULD FOLLOW THE PROPOSED APPROACH FOR SUBMISSION OF TESTING DATA WHILE IT GAINS EXPERIENCE WITH VOLUNTARY AGREEMENT DATA

We support EPA's restoration of the Family Approach for submitting test data, which reduces the testing burden for submitting set-top boxes for Energy Star qualification. There may be additional test results available under the Voluntary Agreement, but it is premature to redesign EPA's requirements based on the prospect of this data. The Voluntary Agreement calls for service providers to test set-top boxes on a live or simulated network as the set-top boxes are normally installed, including software stack (Sections 6.2.1, 6.3). Particular combinations of hardware and software are the results of integration from multiple vendors (for example, a set-top box hardware vendor, a middleware supplier, a guide supplier, and a cable operator's own software development). The configuration may change over time, although the testing information need not be updated for software and/or configuration changes unless changes significantly affect energy use (Sections 7.6.3-7.6.4). A hardware manufacturer submitting a set-top box for qualification will not necessarily have available that test data, particularly for service providers who are not enrolled as Energy Star partners. However, the VA provides that model specific features and test results will be made publicly available as such models are made available to the Service Provider's subscribers (Section 7.6). The typical method is by web posting. In addition, the VA Annual Report will include model specific information across the industry (Section 7.8.6).

Rather than increasing the submission burden for manufacturers who seek to qualify their devices, we recommend that EPA and all parties operate under these procedures and then reevaluate in 2015 whether any changes are necessary for EPA submissions. We believe that this will serve to encourage participation in Energy Star.

II. EPA SHOULD ADJUST SEVERAL PROVISIONS OF ITS TEST PROCEDURES TO MEET ITS INTENTION TO HARMONIZE WITH CEA 2043

There remain a number of adjustments required in order to meet the EPA's intention to harmonize its approach with CEA 2043.

As noted in its January 31, 2014 webinar, there are a number of typographical errors in the mathematical equations set forth in the Final Draft. We refer to CEA 2043 for the correct formula.

Table 12 describes how to test a DVG with 3 clients, with the result being P_{MULTI_STREAM}. Neither CEA 2043 nor the ES TEC calculation defines a P_{MULTI_STREAM} parameter. The Final Draft should use the $P_{WATCH\ TV}$ parameter for testing in the multi-room environment.

The Final Draft provides detailed instructions for testing some parameters, but leaves others vague. Section 4.6.2 states "The devices in the configuration shall concurrently run all of the applicable CEA-2043 tests specified in CEA-2043 section listed in Table 10, with the Thin Client/Remote STBs serving as a background condition for the testing of the Multi-room STB (UUT)." It goes on to describe how to conduct the testing for the Client Only Incentive. But the Final Draft is vague on how to test $P_{WATCH\ TV}$ for a set-top box in a multi-room configuration. EPA should clarify what is meant by "background condition." EPA should clarify whether the clients are streaming live video during the test, recorded content, or inactive.

Table 10 specifies that the client set-top boxes conduct the ON (Play) test, playing out recorded content from the server, instead of streaming live content, which we understood to be required for the multi-stream allowance. EPA should clarify its intent.

The Final Draft should update its reference to the CableLabs DOCSIS specifications to http://www.cablelabs.com/specs/.

In its January 31, 2014 webinar, EPA raised a specific question concerning the appropriate wait time for deep sleep testing. Because there is no implementation to serve as a basis, we would recommend selection of an approximation based on early estimates of a graceful time for transitioning to deep sleep. We would support a uniform 5 minute wait time before measuring deep sleep.

In order to promote continued harmonization between the VA and the EPA's test method, NCTA will update EPA if there are amendments to VA testing procedures.

III. EPA SHOULD APPLY THE ULTRA HD ALLOWANCE BASED ON UHD OUTPUT

EPA has identified certain new features, including Ultra HD, but does not have a new feature process like the VA. It has therefore provided an allowance. However, Section 4.5.1 3) suggests that the allowance may not be claimed unless the set-top box is tested with a UHD input stream. The Ultra HD allowance should apply to a set-top box that outputs in Ultra HD, even if it upscales the content. Upscaling is a likely feature as the market transitions to output UHD to UHD displays even when there is limited 4K content available. The output of the set-top box will call for these additional energy resources, whether the input is HD or UHD. We recommend that the allowance be permitted based upon UltraHD output, and that the test procedure permit use of a HD test stream.

IV. EPA SHOULD ADJUST THE AVAILABLE ALLOWANCES FOR THIN CLIENTS

The final draft has proposed that thin clients should not qualify for Ultra HD or High Efficiency Video Processing (HEVP) allowances. This limitation would not allow thin clients to meet their functional requirements and would undermine the efforts of the EPA to support and promote gateway/whole home architectures.

We previously explained that to meet Service Provider performance requirements, thin clients must perform at the highest rate of resolution rather than the compressed, lower resolution video characteristic of OTT boxes. The EPA accepted this point in revising the base allowance to permit a TC to render HD video. But as the market begins to transition to UHD, thin clients must also have the opportunity to meet the standards for UHD in order for manufacturers and service providers to meet consumer demand. If thin client allowances do not permit a gateway/thin client architecture to deliver UHD to second and third televisions in the home, that limitation will create significant disincentives for the whole home architectures EPA wishes to promote. Consumers and service providers would need to rely upon a fully featured set-top box that is allowed UHD and HEVP allowances, which increases whole home energy use and does not serve the overall goal of energy efficiency, as shown in Figure 1.

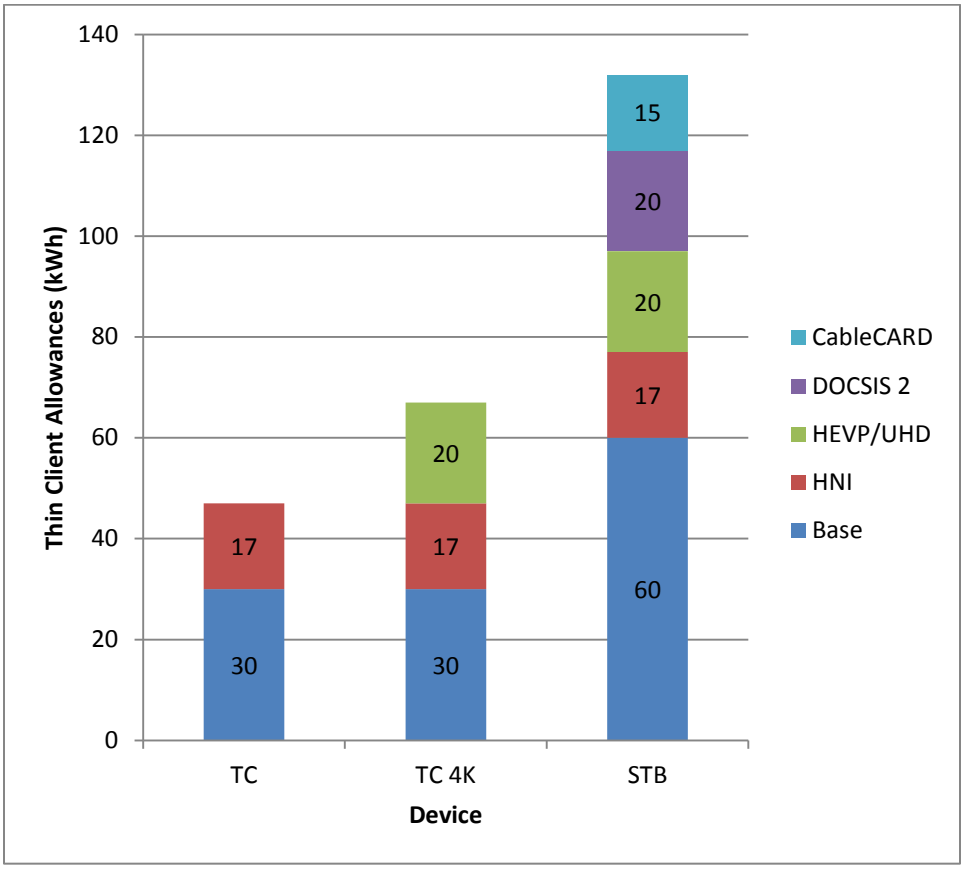

Figure 1: Relative Energy Allowances of UHD Thin Client and UHD STB

We recommend that EPA modify Section 3.3.3 ii to permit Thin Clients to qualify for Ultra HD or High Efficiency Video Processing (HEVP) allowances.

The final draft has also proposed that Thin Clients should not qualify as WiFi access points. Gateway/whole home architectures that support video and that penetrate the whole home need the flexibility to include more than one WiFi access point. Service providers serve a variety of household configurations, and some home configurations—such as premises with internal walls that limit signal penetration—will require some Thin Clients to also serve as a WiFi access point. Although this would not be in all households or even for all Thin Clients in a gateway/whole home architecture, if there is no potential for a Thin Client with WiFi capability, it would require consumers and service providers to rely upon a fully featured set-top box (shown in Figure 1) or an IAD (shown in Figure 2). Those choices increase whole home energy use and do not serve the overall goal of energy efficiency.

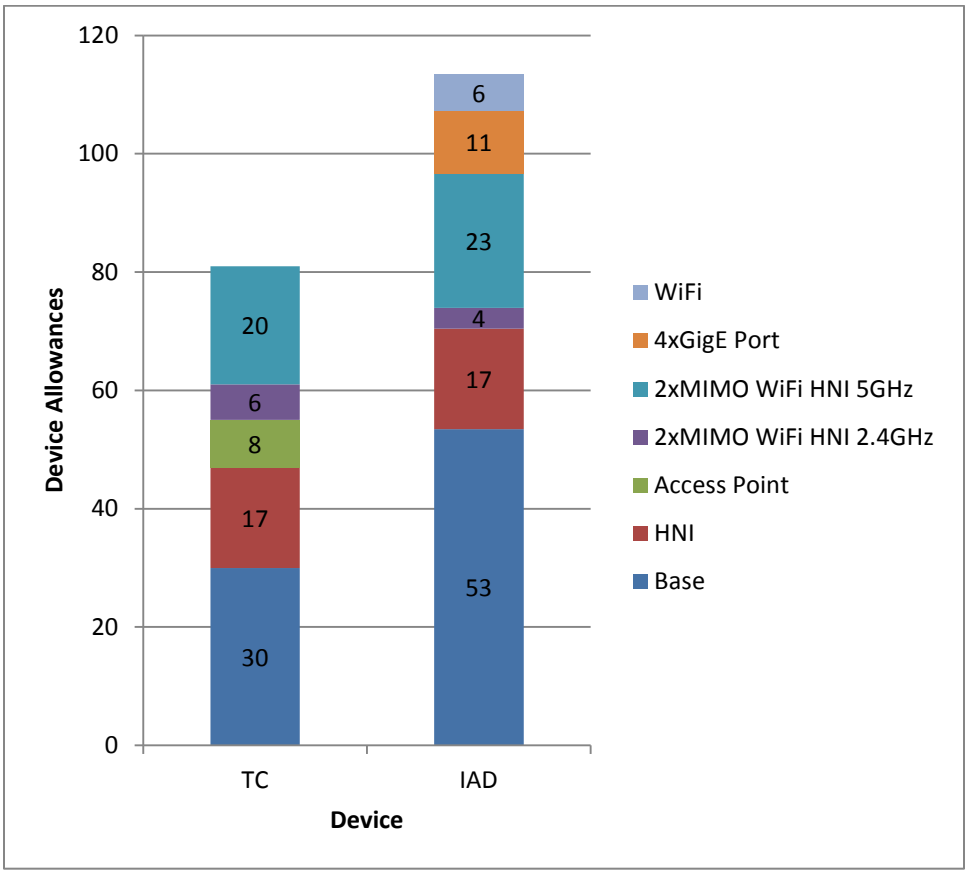

Figure 2: Relative Energy Allowances of WiFi Thin Client and IAD

We recommend that EPA modify Section 3.3.3 ii to permit Thin Clients to qualify as a WiFi access point.

V. EPA SHOULD NOT SUNSET THE DOCSIS 3.0 ALLOWANCE

We appreciate EPA's efforts to adjust its DOCSIS allowances to provide an additional allowance for DOCSIS 3.0. We recommend, however, that the allowance be harmonized with the VA and that it not sunset the allowance in 2015.

The other allowance structures with which we are familiar, including the VA, the European VA, and the European Code of Conduct, recognize that DOCSIS 3.0 (D3) uses channel bonding capabilities that result in higher energy consumption than DOCSIS 2.0 (D2) and requires an additional energy allowance. D3 is the foundation technology for meeting the FCC's goal of expanding the capacity and reach of high speed Internet access. NCTA has previously explained the basis for a 50 kWh D3 allowance in its comments of July 10, 2013 and September 10, 2013. EPA's response has not addressed those comments or offered an appropriate basis for the limited allowance set forth in the Final Draft.

EPA suggests that by December 1, 2015, all systems that deploy set-top boxes with D3 modems will have enabled 1x1 mode, and that 1x1 mode will completely offset any incremental power requirements for D3. We are not aware of any empirical justification for these assumptions. We also are uncertain how a device (or service partner) could be qualified and then lose its qualification if EPA's assumptions are not met in 2015.

Given EPA's plan to move quickly into formulating a successor Energy Star standard, we recommend that the D3 allowance be set at 50 kWh, that the sunset condition be eliminated and that the matter be considered in the context of the next specification.

VI. EPA SHOULD PERMIT DEEP SLEEP ALLOWANCES FOR IMPLEMENTATIONS THAT CAN MEET CUSTOMER RECORDING REQUIREMENTS WITHOUT WAKE TO RECORD

Under the VA, a device is permitted to postpone sleep if a recording event is scheduled, rather than wake to record. This approach was adopted to promote wider adoption of more readily achievable techniques that will conserve energy. The Final Draft provides that a device claiming deep sleep must wake to record. We understand that some parties would prefer that deep sleep be narrowed by EPA, but we are not aware of any data suggesting that an approach that narrows the class of qualifying devices would conserve more energy than an approach that invites more devices to qualify if they can deliver actual deep sleep savings using a different deep sleep mechanism. Either implementation can meet customer recording requirements, and would therefore not likely be disabled by consumers. The data available to us indicates that the overwhelming majority of scheduled DVR recordings occur outside of the overnight hours. Approximately 2% of recordings occur at 2 AM, and 1% at 3, 4, and 5 AM. Permitting a device to postpone scheduled sleep if a recording event is scheduled rather than wake to record would invite earlier adoption of sleep by a broader group of devices, with negligible reduction in sleep and full support of consumer expectations. As in the VA, we recommend the broader approach that would invite greater participation in Energy Star.

VII. RECOMMENDATIONS

For the reasons stated above, NCTA recommends that the ESv4.1 specification be adjusted as recommended above.

Respectfully submitted,

/s/ Neal M. Goldberg

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