

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460



OFFICE OF
AIR AND RADIATION

August 29, 2013

Dear ENERGY STAR® Set-top Box Partners and Other Interested Parties:

In response to feedback on Draft 2 of the ENERGY STAR 4.1 Set-top Box specification and the dataset used to develop it, the Environmental Protection Agency (EPA) is seeking further input on a number of contemplated changes, prior to the publication of a Final Draft.

EPA received numerous stakeholder comments specific to a subset of topics in Draft 2. The Agency considered these comments carefully and, in some cases, has re-examined its analysis. This letter outlines the core changes EPA expects to include in the forthcoming Final Draft, as well as the rationale for some requested changes the Agency does not expect to make. Stakeholders are invited to join a call on **Monday, September 16th from 12 PM to 2 PM Eastern Time** to discuss these proposals. Please RSVP by September 10th via email to stbs@energystar.gov. EPA also welcomes written stakeholder feedback **no later than Tuesday, September 10, 2013 via email to stbs@energystar.gov**.

EPA’s Dataset

In response to stakeholder comments, EPA has made minor adjustments to its Version 4.1 specification development dataset, comprised of the Version 3.0 certified product data, including:

- Revised the application of Additional Functionality Allowances for select models which may have been categorized erroneously during the certification process;
- Reclassified client STBs used with IP systems as Thin Clients since they cannot be used independently of a server/gateway; and
- Reclassified a Cable STB that was previously thought to meet the Draft 2 definition of Multi-room after identifying that it is instead a standalone STB that can also receive content via DLNA.

Additional Functionality Allowances

Per EPA’s review of stakeholder comments, its updated dataset and analysis, and STB market information, EPA is considering increases to the Home Network Interface (HNI) and UltraHD (4k) Resolution allowances as noted by the yellow highlighting below.

Table 1: Proposed Additional Functionality Allowances

ADD’L FUNC.	Adv. Video Proc.	Cable CARD	DVR	DOC SIS	HD	HNI	Multi-Stream Cable/Sat	Multi-Stream Terr./IP	Multi-Room	MIMO Wi-Fi	Ultra HD
ES V4.1 Updated (kWh/yr)	0	15	45	20	0	15	16	6	56	2N _{2Ghz} + 7N _{5GHZ}	20

Although some stakeholders requested changes to other Additional Functionality Allowances, EPA continues to expect that a selection of fully featured models will be available, meeting the proposed requirements when they take effect.

Specifically, there were comments seeking to create an allowance for "**robust**" **Wi-Fi implementations** and **DOCSIS 3**. On the former, no specific data were provided, and EPA believes that the MIMO Wi-Fi allowance supports the greater fault tolerance called for in the Draft 2 comments.

With regards to DOCSIS 3, there are two intersecting issues that led to EPA's decision not to provide a separate allowance for DOCSIS 3 or increase the currently proposed adder for DOCSIS, which has remained unchanged from Version 3.0:

- 1) New availability of more efficient wideband DOCSIS tuners coming into the market that will drive down the power required for a given sized band; and
- 2) Presence of EM 1x1 mode in the DOCSIS specification that is designed to save energy and capacity when the system is lightly used. While EPA acknowledges that this functionality has not yet been widely implemented, it is available and can deliver savings.

Additionally, the addition of the Ultra HD allowance is expected to also offset power needs for High Efficiency Video Processing as the two features are very much related to each other.

Multi-room: Several stakeholders also commented that shared DVR functionality (providing recorded video and audio to clients) provides a benefit and should be recognized through a new, smaller adder allowance than that given to multi-room installations. EPA expects to continue to apply the multi-room allowance to only to those STBs that can provide live video and audio to clients.

In the case of Multichannel Video Programming Distributor (MVPD) IP STBs, existing allowances for DVR, multi-stream, and HNI permit shared DVR systems to qualify, while in the case of satellite and cable, the shared DVR systems consume so much more energy that an allowance of 40–65 kWh/yr would be necessary—i.e., approaching that for true multi-room but without the benefit of allowing the use of thin clients. Yet, the expected amount of energy saved through the use of a shared DVR in a two-client system would be small. EPA calculations show savings of 13 and 39 kWh/yr for satellite and cable, respectively, using a shared DVR system versus employing three standalone DVRs. EPA has offered a multi-room allowance with the intention of rewarding the most efficient implementations and yielding larger whole-home energy savings which are achieved through true multi-room systems with thin clients, as shown for satellite (where multi-room is being implemented now) in Table 2.

Table 2: Savings from Shared DVR and Multi-room with Thin Clients Compared to a Baseline of Three Standalone DVRs

	Average AEC of Three Standalone DVRs Meeting V4.1 (kWh/yr)	AEC of Most Efficient Combination of Shared DVR and Two Standalone STB Clients (kWh/yr)	Percentage Savings over Three DVR Case (%)	AEC of Most Efficient Combination of Multi-room STB and Two Thin Clients (kWh/yr)	Percentage Savings over Three DVR Case (%)
Service Provider IP	314	269	14%	-	-
Satellite	365	352	3.6%	243	33%
Cable	432	393	9%	-	-

Base Allowances

In consideration of the updates to EPA's dataset and additional functionality allowances as outlined above, EPA reevaluated previously proposed base levels, ensuring that a selection of STBs of each base type could meet the proposed levels. The allowances under consideration are listed below in Table 3 with changes shown in yellow, with the most significant changes being the increases in the allowance for

Thin Client and Service Provider IP base types. In Attachment 1 at the end of this memo, EPA depicts the data used to determine base levels.

Thin Client: As mentioned above, EPA is proposing to increase the base allowance for Thin Clients to 30 kWh/yr based on the best-in-class models currently on the ENERGY STAR qualified products list. EPA also wishes to clarify the definitions of the IP base type and Service Provider IP base type so that Thin Client models are not inadvertently classified as IP STBs. EPA also proposes to change the Thin Client definition to include Thin Clients that can connect to non-encrypted video services or Thin Clients that have such additional capability, but which is not enabled under normal use.

Lastly, based on stakeholder feedback, EPA proposes to rename the Service Provider IP base type to “MVPD IP”, to better differentiate MVPDs from other online video providers, and the Thin Client/Remote base type to “Thin Client” for simplicity and to reflect typical use. These proposed edits to the specification definitions are shown below.

Internet Protocol (IP): A STB or Displayless Video Gateway that can by default receive encrypted television/video signals encapsulated in IP packets directly from a Service Provider network.

- i) Multichannel Video Programming Distributor (MVPD) Internet Protocol (IP): An IP STB that can receive signals from a MVPD.
- ii) Over-the-top (OTT) Internet Protocol (IP): An IP STB that cannot receive signals from a MVPD.

Thin Client: A STB that can receive content over an HNI from another STB, but cannot under normal use receive encrypted television/video signals encapsulated in IP packets directly from a Service Provider network.

Table 3: Proposed Base Type AEC Allowance Proposal

BASE FUNCTIONALITY	ES V4.1 Updated (kWh/yr)
Cable Digital Transport Adapter (DTA)	40
Cable	60
Satellite	65
MVPD IP	65
Over-the-top IP	10
Terrestrial	18
Thin Client	30

Deep Sleep Incentive

In response to stakeholder comments, EPA has also reviewed various aspects of the Deep Sleep incentive, in particular:

- Scheduled Deep Sleep
- Recovery time

Scheduled Deep Sleep: To ensure that savings from deep sleep are realized, EPA is considering a requirement that models claiming the deep sleep incentive enter deep sleep between 1 am and 5 am by default. Furthermore, EPA proposes that manufacturers or service providers may not prompt the user to disable deep sleep. Rather, users should first be offered an explanation of the deep sleep feature and then be given the opportunity to change the schedule to better suit their needs.

Recovery Time: Several stakeholders recommended allowing recovery times greater than 30 seconds from deep sleep state to on mode. EPA is considering making a clarification in the Final Draft such that recovery time from deep sleep (whether user-initiated or scheduled) may be greater than the 30 seconds during the scheduled sleep period. However, within 5 minutes after the scheduled sleep time ends, the STB must be able to transition to on mode in 30 seconds or less. Further, STBs in deep sleep should be able to wake to record a prescheduled show or receive an update, returning to deep sleep when finished, as noted in Draft 2.

EPA welcomes written comments on these proposed changes to the ENERGY STAR Version 4.1 specification **submitted via email to stbs@energystar.gov by Tuesday, September 10th**. All previous drafts and comments on these drafts can be found at www.energystar.gov/revisedspecs. To participate in the **September 16th 12 – 2 PM Eastern Time** stakeholder call, please RSVP to stbs@energystar.gov by September 10th.

Please direct any specific questions to Katharine Kaplan, at kaplan.katharine@epa.gov, or 202-343-9120, or Matt Malinowski, ICF International, at matt.malinowski@icfi.com or 202-862-2693. Please direct any questions regarding ENERGY STAR testing of set-top boxes to Jeremy Domm, DOE, at jeremy.domm@ee.doe.gov or 202-586-9870.

Thank you for your involvement in this specification development process.

Sincerely,

A handwritten signature in cursive script that reads "Katharine Kaplan".

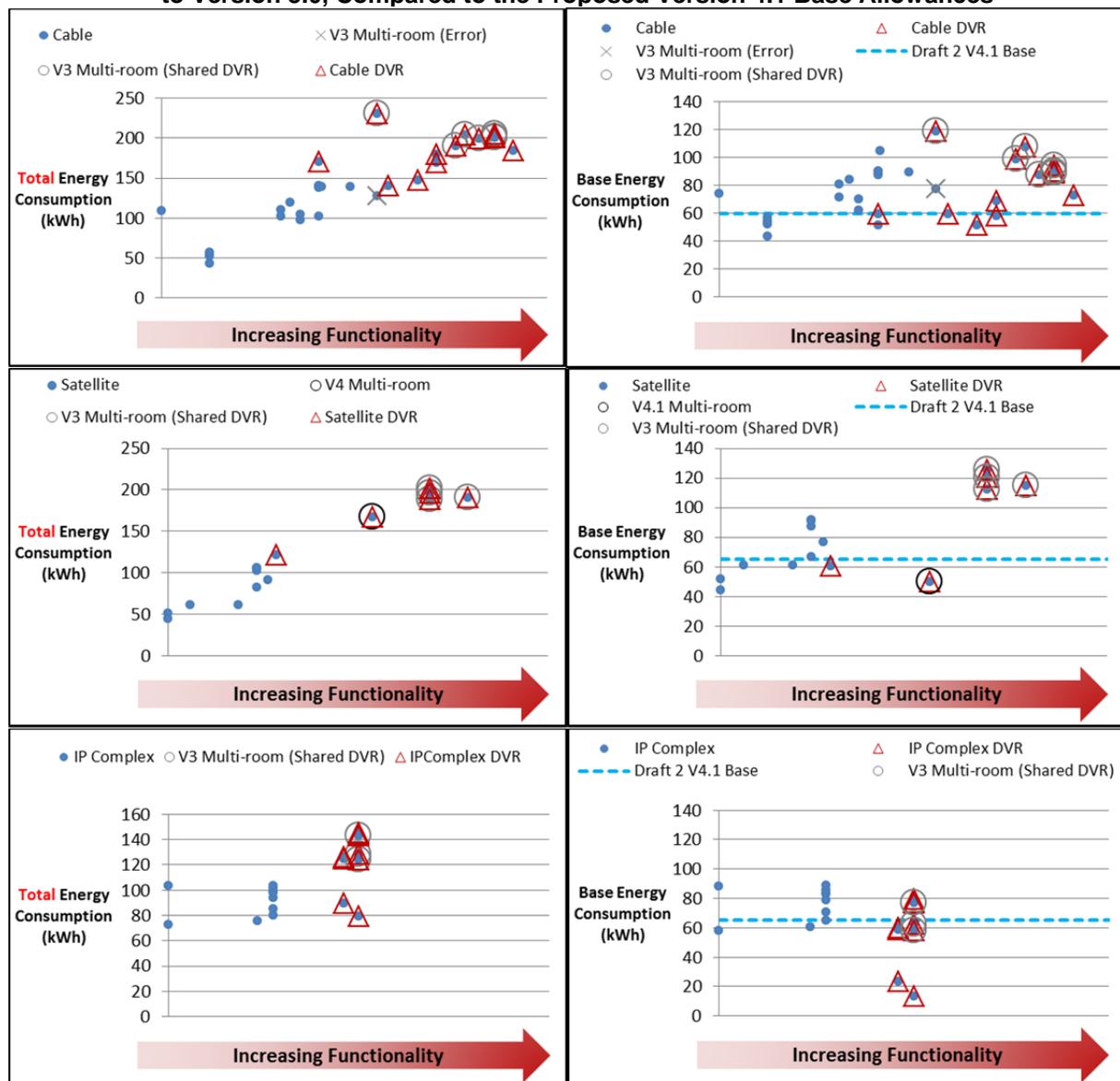
Katharine Kaplan
Manager, ENERGY STAR Product Development and Program Administration

Attachment 1: Data Supporting Proposed Levels for Cable, Satellite, and MVPD IP Base Types

The Figure 1 graphs below plot the data used to develop proposed levels for Cable, Satellite and MVPD IP (labeled “IP Complex”) base types. For each of these base types, the total estimated Annual Energy Consumption (AEC) are plotted in the left graph. These data were derived by crosswalking the Version 3 qualified data to the AEC used in Version 4.1. Individual STB models are displayed along the x-axis according to increasing functionality (i.e. # of applicable Additional Functionality Allowances). The right graph shows the proportion of estimated AEC allocated to base type energy consumption, by subtracting all applicable Additional Functionality Allowances from the total AEC. Distribution of models along the range of functionality indicates effectiveness of Additional Functionality Allowances to recognize a variety of efficient models.

Models below the blue dashed line are estimated to meet the levels proposed in this memo.

Figure 1: Total and Base Energy Consumption for Cable, Satellite, and MVPD IP Models Certified to Version 3.0, Compared to the Proposed Version 4.1 Base Allowances¹



¹ In graphs 1 and 2, “V3 Multi-room (Error)” marked with an X denotes the standalone Cable STB (cannot provide independent live audio/video content to multiple devices) that was previously mislabeled as Multi-room under the Draft 2 specification analysis.