April 15, 2013

Ms. Katharine Kaplan, EPA
ENERGY STAR Set Top Box Program
U.S. Environmental Protection Agency
1310 L Street, NW
Washington, DC 20460

Subject: Comments on ENERGY STAR V4.1 Set-Top Box Programs

Dear Katharine,

Thank you for the opportunity to review and submit comments for the DRAFT ENERGY STAR V4.1 Product Specification for Set-top Boxes and the related DRAFT 4.1 STB Manufacturer Partner Commitments. We appreciate the effort that the EPA has invested to inform stakeholders of future plans and to create opportunities for open dialogue about the issues related to increased energy savings for set-top box products. The comments we provide represent the collective views of EchoStar Technologies L.L.C., EchoStar Global B.V., and DISH Network L.L.C., all current ENERGY STAR Set-top Box Partners. Attached to this letter is a commented version of the V4.1 Product Specification document capturing our detailed comments to the EPA. We have provided additional comment on the important issues we would like to bring to your attention:

A. DRAFT ENERGY STAR V4.1 Product Specification

1. Definition of "Displayless Video Gateway"

EPA should not introduce the term "Gateway" into the STB program documents. Despite the fact that several MVPDs and Manufacturers may have used this term in marketing material to describe a set-top box without a video connection, the industry's VOLUNTARY AGREEMENT FOR ONGOING IMPROVEMENT TO THE ENERGY EFFICIENCY OF SET-TOP BOXES[1] defines a Gateway device as follows (emphasis added): "…Gateway, which for purposes of this Voluntary Agreement is a device that is capable of *joining multiple Service Provider delivery protocols* or provisioning *at least two of video, voice, or broadband services* from a Service Provider." A device that solely supports a video service without the use of a direct video connection should be defined as a "Headless Set-top Box". "Headless" is a term long used by industry to describe a device without display capability. "Set-top Box" describes the product family that the specification is currently capable of rating energy consumption. Additionally the current V4.1 gateway description does not accurately describe a Gateway or Set-top Box properly and is limited to QAM or MoCA technologies which will not cover all devices that should be covered by the specification (e.g. Wi-Fi).

[1] see Section 13E here: http://www.ce.org/CorporateSite/media/ce_news/FINAL-PUBLIC-VOLUNTARY-AGREEMENT-%2812-6-2012%29.pdf

We recommend the following name and definition change:
Headless Set-top Box (HSTB): A device combining hardware components with software programing designed for the primary purpose of receiving television and related services from terrestrial, cable, satellite, broadband, or local networks, providing video output without using a direct video connection.

2. **Home Network Interface (HNI)**
V4.1 lowers the HNI additional functionality allowance to 8 kWh/y. Although this may be sufficient for HPNA and Wi-Fi (non-MIMO a/b/g/n) it is insufficient for either MoCA 1.x or MoCA 2.x implementations. Our estimate of the energy use attributable to a MoCA node, including RF and silicon components, and adjusted for the duty cycle indicated is:

HNI	Power/node	Duty Cycle	AEC
MoCA 1.x	2.5W	Always ON	21.9 kWh/y
MoCA 2.x	3.5W ON 1W SLEEP	7h ON/17h SLEEP	15.2 kWh/y

We recommend a specific allowance be created for MoCA HNI and be set at 15 kWh/y.

3. **Wi-Fi Allowance**
A recent review[2] of wireless routers indicated that recently introduced standalone MIMO 802.11ac routers used 9.7W (Netgear R6300) and 9.8W (Buffalo WZR-D1800H) when in idle mode. This indicates an average power consumption of 9.75W for an 802.11ac Wi-Fi router using a 3X3:3 configuration with simultaneous 2.4GHz and 5 GHz channel support. If we assume that the function is put into a 0.5W Sleep mode when not in use and we apply the ENERGY STAR STB 7h ON/17h OFF duty cycle it appears that a reasonable allowance for this capability is about 28 kWh/y. The DRAFT V4.1 proposed an allowance for this exact capability of 17 kWh/y (HNI base + 3 spatial streams supported at both 2.4 and 5 GHz), which is a little more than half of what is required. We would request that ENERGY STAR reexamine the formula used to calculate the MIMO Wi-Fi HNI allowance along with the HNI base allowance to better approximate the actual energy usage of a MIMO Wi-Fi capability. If ENERGY STAR created an analysis that lead to the current allowance, including projections of energy reductions attributed to future technology, it should consider sharing this with partners. It is likely that a future Whole-Home MR STB that uses a wireless HNI to connect to wireless clients would be required to use this exact capability (3X3:3) to achieve reliable whole-home coverage. Set-top boxes that implement Wi-Fi as the only HNI available will not have an option to test with the Wi-Fi function disabled and therefore the allowance needs to be representative of what can be achieved with available technology, using the best energy management techniques, over the life of the V4.1 program. The additional energy use of wireless technology, despite a potential increase to STB energy use, should be encouraged. Wireless technology support will result in a significant reduction in truck rolls (technician visits) since a customer is not able to self-install clients and other MVPD devices.

[2] see http://www.legitreviews.com/article/2011/6/

4. **"Additional Functionality AEC Allowances"**

As discussed in the March 29th V4.1 public review meeting, the EPA must either allow partners to subtract the energy use of emerging energy consuming STB features not covered by the current specification or provide allowances and test procedures for emerging energy consuming features. It is clear that UltraHD display support, HEVC decoding, multiple Transcoders for mobile device support, and home network functions such as routing, switching and bridging exist or will soon exist as new functionality available in set-top boxes. All of these functions are dedicated to the primary purpose of delivering video to a variety of devices and are not shared with a subscriber's home network as general resources. For instance a multi-room STB that supports client mobile devices, client STBs, and client Smart TVs must include a complete IP routing/switching function and if the client devices also require internet access then the multi-room STB must also provide bridging services to those clients from the client network to the customers broadband router. We recommend the following "Additional Functionality AEC Allowances" be added to V4.1:

Network Routing – A MR STB that supports clients must embed an IP Network Router (with DHCP) to assign IP addresses to the connected devices (e.g. Client STBs).

Proposed allowance: 5 kWh/y

Network Switch – Some MR STBs also may contain a network bridge function. For instance, an MR STB using a MoCA home network may manage the IP traffic between the MoCA network and the customer's broadband router. A MR STB that offers bridging eliminates the need for an additional network bridge Ethernet-to-Coax (or other) Bridge product (e.g. MoCA-to-Ethernet) thereby saving total household energy.

Proposed allowance: 5 kWh/y

Transcoding – Transcoding of MVPD content is required for each mobile or non-TV device concurrently supported by a set-top box. A transcoder function may be provided as; a feature of a System-on-Chip (SOC) product, an independent Transcoder IC product, or even done by a general purpose processor. Transcoding actually involves transcoding (e.g. MPEG2 to H.264), transrating (e.g. HD bitrate to Mobile bitrate), transcaling (e.g. HD resolution to Mobile resolution), and audio conversions required for each device. An STB that includes transcoding eliminates the need for an external transcoder device thereby saving total household energy.

Proposed allowance: 13 kWh/y (per transcoder)

Ultra High Definition –An STB capable of minimum output resolution of 3840×2160 pixels in progressive scan mode at minimum frame rate of 24 fps (abbreviated 2160p24).

Proposed allowance: 30 kWh/y

High Efficiency Video Processing (HEVP) – High efficiency methods for video decoding, giving compression efficiency significantly beyond H.264/AVC. This includes, but is not limited to, the example of HEVC, also known as H.265.

Proposed allowance: 20 kWh/y

5. **Deep Sleep accessibility**
   EPA should not dictate user interface behavior by specifying that "a product respond to a Deep Sleep request by the user within 2 seconds of being commanded to do so". The amount of time that a device requires to transition from ON or SLEEP mode into a Deep Sleep mode will vary based on the current state of the device (e.g. in the middle of a software or EPG download, or in the middle of a user requested recording). It is common practice to confirm, through a multi-step process, any request made by a user that will result in the disruption of a running or scheduled task or a loss of recording. As long as the user instructions clearly identify the process for entering Deep Sleep mode and it is not burdensome for a user then the EPA should be satisfied.

B. DRAFT 4.1 STB Manufacturer Partner Commitments

1. **Product Material Requirement (RoHS)**
   DISH Network LLC recycles over 90% of set-top boxes. Recovered materials include circuit boards, memory drives, smart chips, and batteries. This is possible since set-top boxes are leased by subscribers and must be returned to DISH for reasons such as device failures, changes in service type, or a termination in service. All DISH materials are professionally recycled. The guaranteed high level of recycling of STBs is unprecedented when compared to the general consumer electronics industry[3] and should be accepted by the EPA in lieu of the RoHS compliance requirement. We would like EPA to make this requirement optional for MVPDs (and their manufacturers) who are able to guarantee a high rate of STB recycling.

2. **Generally accepted attributes of a recyclable product**
   We adhere to good practices for recyclability due to the fact that we recycle over 90% of our own set-top boxes. However we cannot guarantee this will consistently be the case due to security requirements included in our contractual agreements with content providers. In some cases it may be necessary to use tamper proof screws and fasteners and other piracy prevention techniques for set-top box enclosures and thereby not be in compliance with the proposed ENERGY STAR Partner Commitments. We do not think that this requirement should apply to MVPDs.

3. **Existing Partnership Agreement**
   EchoStar Technologies L.L.C., EchoStar Global B.V., and DISH Network L.L.C. are existing ENERGY STAR Partners and have reviewed, signed and have committed to meet our existing partnership agreements. We believe that the EPA should honor the current agreements and not expect existing partners to accept additional conditions in order to remain a partner in good standing. EPA should consider "grandfathering" existing partners under their current partnership agreements.

[3] See http://www.epa.gov/osw/conserve/materials/ecycling/manage.htm. Rate of Collection for Recycling (By weight): Computers - 38%, Televisions – 17%, Mobile Devices – 8%.

I am available to answer any questions you may have about our comments and requests. We look forward to continuing our ENERGY STAR partnership with the EPA.

Sincerely,

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cc:
Tom Bolioli, Terranovum
Matt Malinowski, ICF International
Rachel Unger, ICF International

Attachment –
File Name: Draft 1 Version 4-1 STB Specification_ECHO_DISH_Comments_120415.pdf