

September 7, 2010

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

Subject: DIRECTV Supplemental Comments on ENERGY STAR® Set-top Box Service Provider Proposal

Dear Katharine:

Thank you for attending the August 20 meeting, hosted by CEA, in which set-top box manufacturers' concerns with draft Versions 3.0 and 4.0 ENERGY STAR® program requirements were discussed. I've attached the charts presented by DIRECTV to this letter and, as requested at the end of the meeting, would like to submit the following comments that supplement those submitted by DIRECTV on July 30.

ENERGY SAVINGS BENEFITS OF MULTI-ROOM ARCHITECTURES

As shown on slide 8, multi-room architectures have an immediate and long-term ability to provide substantial energy savings to consumers.

At DIRECTV, the energy needed to duplicate HD-DVR functionality in a four television household has plummeted by 30% since 2008, primarily due to the introduction this year of upgrades that allow DIRECTV's HD-DVR and (non-DVR) HD set-top boxes to communicate over a digital home network (www.directv.com/multiroom). With DVR capability being extended to DIRECTV's non-DVR set-top boxes, the number of DVRs required in the home has been cut in half.

DIRECTV's Home Media Center product (aka "HMC30") allows the energy needed to plummet by an additional 30% between now and 2012. This energy savings comes not only from further reducing the number of DVRs required in the home to just one, but also from the introduction of thin clients (aka "C30") that no longer require conditional access processing or satellite tuners. With customer trials beginning in the fourth quarter of 2010, DIRECTV expects deployments of this architecture to ramp up through 2011 and for it to be typical of new installations in 2012. While HMC30 and C30 provide a 30% improvement over the current solution, please note that neither product meets the draft Version 3 requirements.

Between 2012 and 2014, the energy needed plummets again by 30% as a result of DIRECTV embracing MoCA (www.mocalliance.org) and RVU (www.rvualliance.org) home networking standards:

- RVU technology allows the thin client functionality to be built into any consumer electronics device such as a connected television. The first products having built-in RVU clients are expected in the market in 2011. While it is too early to predict how successful RVU will be, DIRECTV hopes that in the 2014 time frame there will be hundreds of CE products with integrated RVU clients available for connections from an HMC30 server.
- MoCA technology allowing rapid “wake-up” will be commonly available in set-top box silicon in the 2014 time frame. This sets the stage for thin clients to adopt truly low power standby states without introducing the customer satisfaction issues that long wake-up times represent for service providers.

The table on slide 8 suggests this third consecutive 30% improvement being achieved through the elimination of one client set-top box, a standby-driven TEC reduction of 25% in thin clients (from 80 to 60 kWh/yr) and a nominal TEC reduction of 10% (from 230 to 210 kWh/yr) in the HMC box.

ENCOURAGING MULTI-ROOM ARCHITECTURES

DIRECTV included in its July 30 comments a number of requests for the Draft 2 Set-Top Box Program Requirements:

- Allow both thin client STBs and multi-room STBs to use the “Home Network Interface” allowance
- List thin client and multi-room STBs separately on the QPL, not as “qualifying multi-room configurations”
- Address the lack of an Satellite STB allowance for “Replaceable Conditional Access”
- Harmonize the allowances for DOCSIS and Home Network Interface
- Have an effective date for Version 3.0 in 2012
- Refrain from imposing new annual reporting requirements

Many of these encourage the deployment of energy saving multi-room architectures, and DIRECTV reiterates its request to see each of these addressed in Draft 2. At our August 20 meeting, additional ideas were requested about how the STB program requirements could be structured to encourage multi-room. These additional ideas follow:

Thin-client Allowance. The allowance for thin clients should be increased. If more thin client set-top boxes are able to comply with ENERGY STAR, service providers will be encouraged to deploy multi-room architectures in more of their customers’ homes. As reported earlier, DIRECTV’s own C30 thin client STB (with HD, MPEG4 and MoCA) prototype has a TEC of 79 kWh/yr based on a $P_{tv} = 10.20W$ and $P_{sleep} = 7.25W$. Applying a 5% margin to address “outliers”, the C30 TEC can be up to 83 kWh/yr. This value is 20% higher than the current draft Version 3 limit for this product of 69 kWh/yr.

Multi-room Allowance. Similarly, the multi-room allowance should be increased. If more multi-room capable set-top boxes are able to comply with ENERGY STAR, service providers will be encouraged to deploy multi-room architectures in more of their customers' homes. As reported earlier, DIRECTV's HMC30 multi-room STB (with HD, MPEG4 and MoCA) has a TEC of 227 kWh/yr based on a $P_{tv} = 26.34W$ and $P_{sleep} = 25.31W$. Again applying a 5% margin to address "outliers", the HMC30 TEC increases to 238 kWh/yr. This value is 27% higher than the current draft Version 3 limit for this product of 188 kWh/yr.

Multi-room Fleet Credit. In its "Discussion Guide" document released July 6, EPA proposes a fleet credit for products "with capability for advanced energy efficiency features" to encourage service providers deployments. This fleet credit gives service providers "an additional 50% credit towards annual purchase/fleet requirements for each deployment (e.g., each STB with this capability counts as 1.5 units towards the annual goal)". This same mechanism should be used to encourage multi-room architectures. DIRECTV recommends that a 50% credit be granted for each thin-client STB deployed by the service provider in the Version 3 time frame. As thin-client STBs can only be used with STBs having multi-room functionality enabled, the EPA can be assured that these credits will apply only when a STB's multi-room capability is in fact being put into use.

No "Whole Home" Limits. DIRECTV recommends against limits being applied to the combined energy consumption of STBs deployed in a home (e.g. 1 multi-room DVR plus 3 thin clients, or a weighted sum that factors in the percentage of 2-TV, 3-TV, etc installs that a service provider performs). A whole home limit would give service providers freedom to put the ENERGY STAR logo on a non-compliant STB whenever there was enough TEC margin in the home's other STBs: a practice that is likely to confuse consumers. Other problems with this include:

- A whole home limit will make compliance verification more complex and expensive, as whole home combinations would have to be procured and tested.
- Additional reporting obligations that might be necessary (e.g. percentage of 2-TV, 3-TV etc installs that a service provider performs) will be burdensome for the service provider while not being independently verifiable.
- As service providers typically install a mix of new and refurbished STBs into a customer's home, this whole home calculation will rarely be representative of a customer's actual energy use.

VERSION 3 LIMITS

The table that follows shows how, for DIRECTV's current mix of STB products, the proposed Version 3 TEC limits are on average 43% lower than the Version 2 Tier 1 TEC limits. The TEC limits that would result assuming DIRECTV's July 30 proposals were all accepted are on average 31% lower. By any accounting, this improvement demonstrates very impressive progress indeed!

DIRECTV Set-top Box	Version 2 Tier 1 TEC limit	Version 3 current draft TEC limit	Percentage decrease, %	Version 3 TEC limit (DIRECTV proposals)	Percentage decrease, %
SD	88	50	-43%	61	-31%
SD DVR	201	111	-45%	125	-38%
HD	161	97	-40%	121	-25%
HD DVR	274	158	-42%	185	-32%
		Average:	-43%	Average:	-31%

The Version 3 limits that result from DIRECTV's July 30 proposals remain extremely challenging. Of the 18 DIRECTV products currently on the STB Qualified Products List, only one of these (D12-700) could be re-qualified once the new limits were in effect. All of the remaining products that are still in production will require modifications to comply, and it is for this reason that DIRECTV continues to request a Version 3 effective date in 2012.

Sincerely,

Steve Dulac
Director, Engineering

Cc:
Kathleen Vokes, EPA
Steve Pantano, ICF
Tom Bolioli, Terra Novum

Key DIRECTV Comments



- Home Network Interface allowance should be available for both thin client and multi-room STBs
- Qualified Product List should show thin client & multi-room STBs separately
- Satellite STBs lack an allowance for replaceable Conditional Access
- DOCSIS & Home Network Interface allowances aren't harmonized
- Version 3.0 effective date should be in 2012
- STB specifications must address "Outliers" (as Verification testing procedures will not do so)

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Multi-room & Home Network Interface



- "March Draft" eliminated Home Network Interface by putting it into each product baseline allowance
 - Exclusion for multi-room and thin clients was then removed from the HNI definition as HNI was now in the baseline allowance
- "Discussion Guide" reintroduced Home Network Interface as an additional functionality, noting it "will also be made available for use with the Thin Client base type."
 - The note doesn't also say "...and with Multi-room STBs"
- A device must be able to use both the Multi-room and the Home Network Interface allowances
 - Draft 2 should use the "March draft" HNI definition

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Qualifying Multi-room Configurations



- “Discussion Guide” proposes that the Qualified Product List list multi-room configurations
- Challenge: in a given home, a mix of STB products from a variety of manufacturers is inevitably deployed
 - All servers and all clients used by a Service Provider would have meet ENERGY STAR, if any of the STBs is to have the logo
 - Equivalent to a 100% fleet purchase requirement: an “all or nothing” decision
- Challenge: consumers identify a ENERGY STAR logo with the device it’s on, not by looking at QPL
- QPL should simply list qualified products

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Replaceable Conditional Access



- Making Satellite and Cable STB base allowances equal eliminated from Satellite STBs an allowance for smart card based conditional access
 - Cable has a “CableCard” additional allowance of 15 kWh/year, while Satellite has no additional allowance available
- At the May 13 call, stakeholders explained that a smart card & reader impacted a STB to the tune of 0.5W-1W, while a CableCARD had an impact of 1W-1.5W, higher due to the extra “DFAST scrambling” functionality
- Allowances for Satellite STBs and Cable STBs must be aligned, e.g. by increasing Satellite base allowance by ~1W = ~8 kWh/yr
 - Or rename “CableCard” add-on “Replaceable Conditional Access”

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DOCSIS & Home Network Interface



- The functionality of DOCSIS and that of a home networking technology such as MoCA are similar
 - Both enable 2-way data signaling in coax networks designed to deliver analog television
- However, the allowance for DOCSIS (20 kWh/yr) is twice that of MoCA (only 10 kWh/yr)
 - There is no technical basis for this difference
- For these requirements to be applied impartially, these values should be harmonized
 - HNI allowance should be 20 kWh/yr

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Version 3 Effective Date



- Uncertain STB and service provider requirements
 - Many issues yet to be discussed
- Enhanced Testing & Verification not operational
 - Many issues raised and not yet resolved
- Version 3.0 effective date should occur in 2012
 - Allows time to discuss and finalize requirements
 - Allows time for ET&V to be finalized and deployed
 - Allows time for Service Providers to create STB development plans and purchasing strategies
 - Allows time to develop & launch utility sponsored programs
- Version 4.0 effective date at least 2 years later

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“Outliers” Concern



- Variation in energy usage between DIRECTV STBs shows additional energy consumed by “outliers” can exceed 5%
- A single outlier found during verification testing could result in a delisted product and a service provider unable to meet its partner obligations
- EPA states in its May 2010 Comments Matrix:
 - “EPA is planning to have one process for dispute resolution across all product categories. The issue of ‘outlier’ products should be addressed through the product specifications rather than through the dispute resolution process.”
- The STB product specifications must address this issue, e.g.
 - Increase in the STB limits by at least 5%
 - Establish separate STB verification limits, either based on average measurements or that are at least 5% higher

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Multi-room HD DVR Demo



- HMC30 Home Media Center & C30 Client STBs
 - One local TV and up to 3 remote TVs
 - Customer trials in 4Q10, ramp up through 2011
- Multi-room HD DVR energy consumption trend:



Date	Room 1 TEC	Room 2 TEC	Room 3 TEC	Room 4 TEC	Total TEC	Typical New DIRECTV Customer Installation
2008	250	250	250	250	1000	All “HR” HD-DVR boxes
2010	215	130	215	130	690 (-30%)	2 “HR” & 2 “H” boxes
2012	230	80	80	80	470 (-30%)	“HMC” & 3 “C”
2014	210 (est.)	60 (est.)	60 (est.)	0 (est.)	330 (-30%)	“HMC” & 2 “C” (w/ Wake on LAN) & an RVU TV

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