

STB Stakeholder Meeting NRDC Comments 2/1/08

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Overview

- Where are we?
- What does draft specification really mean?
- How to address remaining concerns/suggestions
- Update on related policy developments

State of Affairs

- Little difference, if any, between on and sleep/standby modes
- STB power use historically not a priority; things starting to change
- Big growth in DVRs. Also HD and multi-tuners
- New CE companies entering this space such as Panasonic, LG, Samsung, Pace, etc (See 1/7/08 WSJ article)

Recent “Nibbles”

- Starting to see hard drive spin down and other modest power saving features (save ~ 7W)
- Attempts to improve power supply efficiency
- But still DVR boxes typically draw 25W-40W power all the time

Reality

For dramatic, cost-effective change:

- Need to redesign boxes and associated middleware; holistic approach needed
- Will require few year lead time due to move towards new silica and head end changes

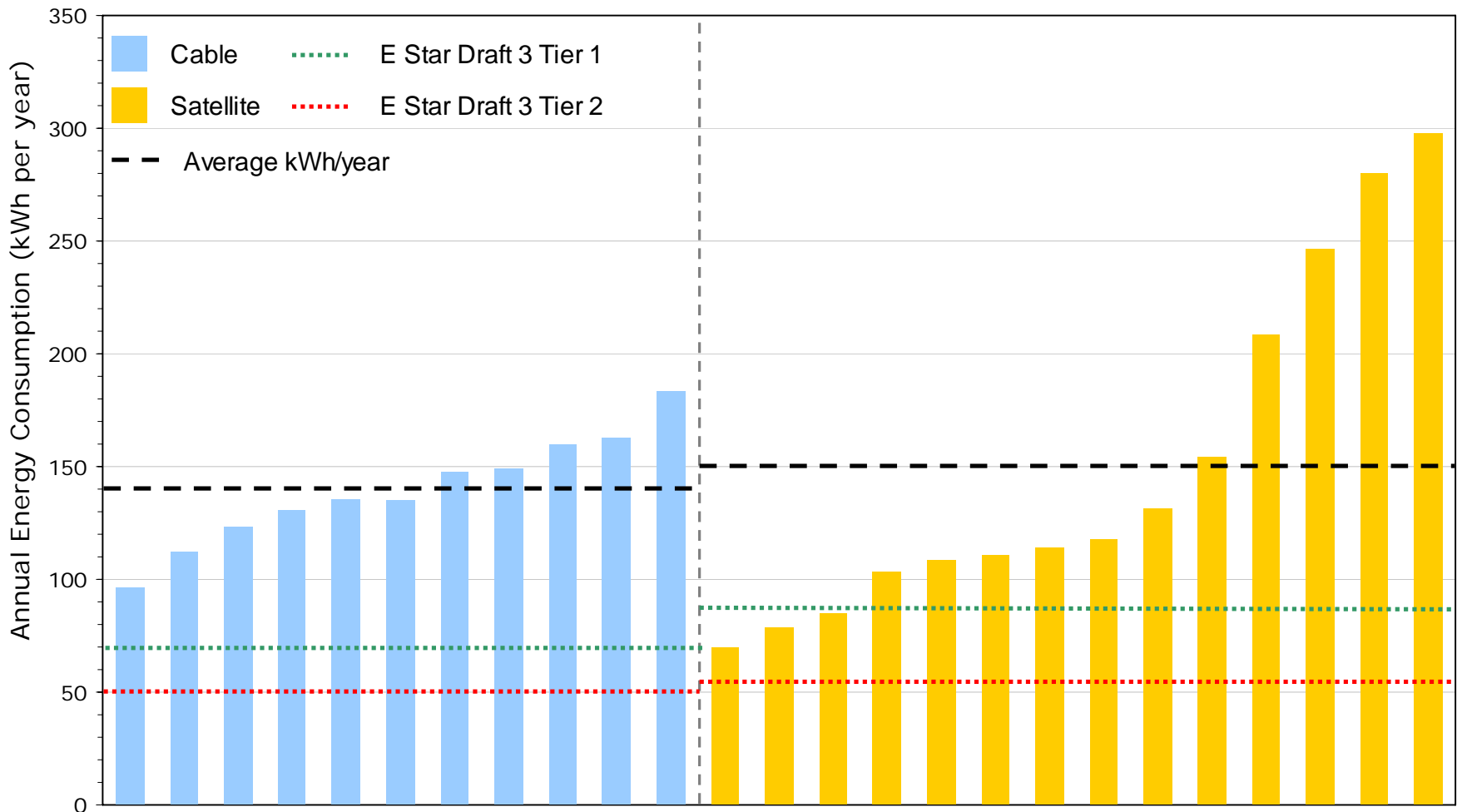
Most Recent E-Star Draft Specification

- Two step approach makes sense to us:
 - Tier 1: Modest savings – relatively easy to get there. Get buy-in from all stakeholders including system operators. Goes into effect soon.
 - Tier 2: Significant savings. Requires major redesigns. Provide multi-yr lead time.

Tier 1 & 2 Annual Energy Levels

Cable & Satellite Boxes with Base Functionality Only

Annual Energy Consumption of Today's Standard Set Top Boxes



Tier 2 Power Level Assumptions (W)

Basic Box, No Add'l Functionality

	ON	STANDBY
Cable Boxes		
Current Base	13	13
Tier 2	9	3
Satellite Boxes		
Current Base	15	13
Tier 2	10	3

Energy Savings Potential

Basic Box, Tier 1

Deployed Cable boxes:	80 million
<u>Deployed Satellite boxes:</u>	<u>70 million</u>
Total US STBs:	150 million

Assuming 50% of installed boxes are basic boxes, move to Tier 1 Spec Saves:

Cable @ 70 kWh/box saved: ~3 billion kWh/yr

Satellite @ 62 kWh/box saved: ~2 billion kWh/yr

Tier 2 Energy Savings Potential

Assuming all basic boxes meet
Tier 2:

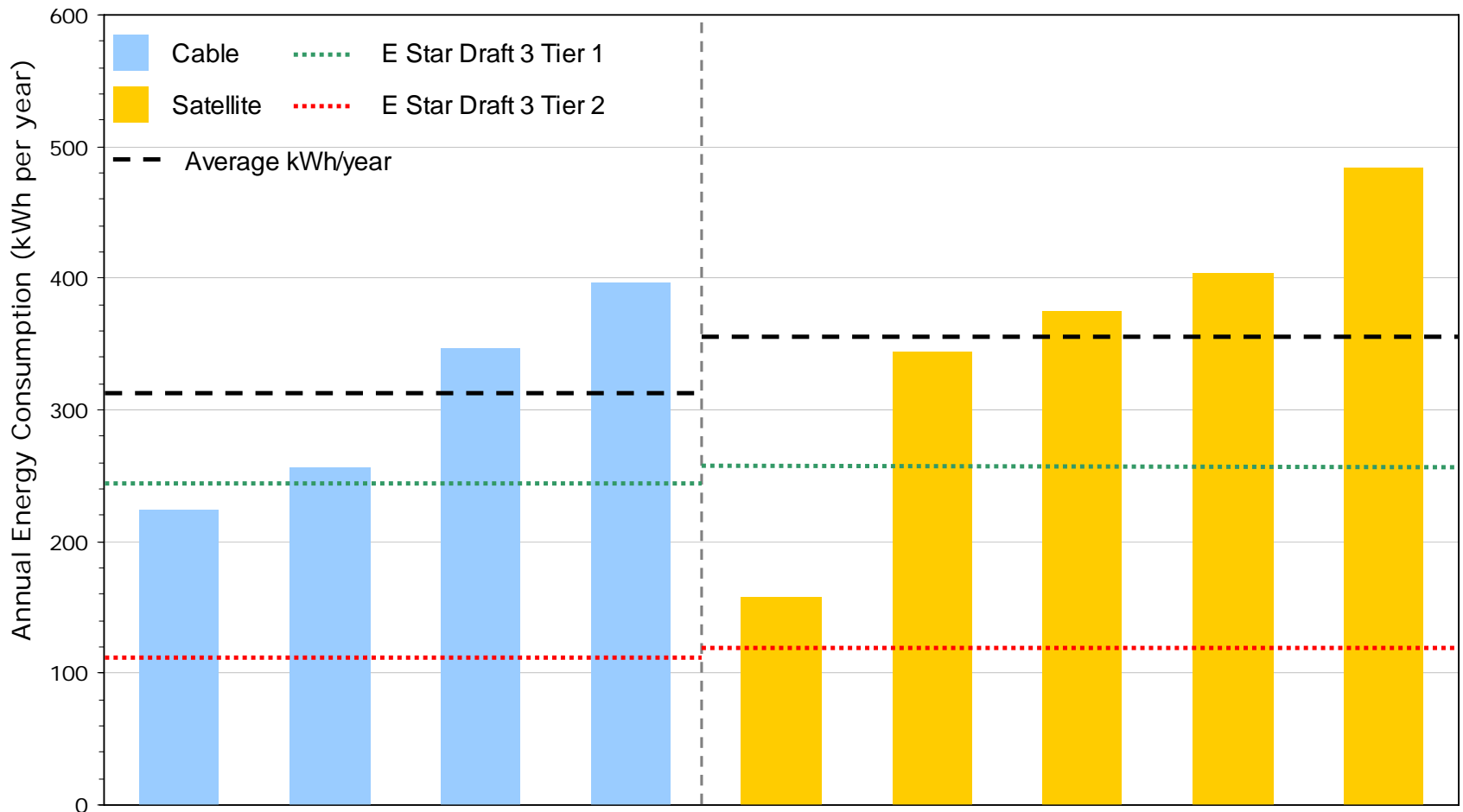
Cable @ 90 kWh/box saved: ~4 billion kWh/yr

Satellite @ 94 kWh/box saved: ~3 billion kWh/yr

Tier 1 & 2 Annual Energy Use

Cable & Satellite Boxes Base Function+Tuner+HD+DVR

Annual Energy Consumption of Today's HD + DVR Set Top Boxes



Boxes tested include Motorola, Pace, Scientific Atlanta, Samsung, DirecTV, & Dish Network

Power Level

Assumptions Complex STB*, Tier 2

Power Levels (W)

	ON	STANDBY
Cable Boxes		
Current Base	41	29
Tier 2	31	4
Satellite Boxes		
Current Base	43	29
Tier 2	32	4

*base + HD + DVR + 1 Add'l Tuner

Tier 2 HD DVR Utility Bill Savings Potential*

- If all HD DVR boxes with dual tuners meet Tier 2, we could save:
 - Cable: ~\$800 million/yr
 - Satellite: ~\$850 million/yr

*Based on average electricity price of \$0.10/kWh and assumes 1/2 of all installed boxes are DVRs.

Additional Impacts

- Once spec is finalized savings estimates for utility bills, tons carbon, and avoided power plants can be determined.

BOTTOM LINE - as boxes deployed for roughly 5 years, looking at cumulative impacts of:

- Billions of dollars in utility bill savings.
- Tens of Millions of tons of CO₂
- Several avoided power plants

Our Concerns

- Speculative Recordings and Unwanted Video Downloads
- Specification would be more useful if it contained a specified duty cycle for use in testing and verification.
- Test not required to be performed on live systems on which deployed.

Unpeeling the Specification

- Based on two measurements: on/active, and sleep (also called standby)
- Credit provided for boxes with auto power down
- Simply plug the “Static” measurements into equation to get annual energy use.
- Test method and test won't necessarily reflect actual duty cycle of the installed box.

Reality

Box may stay in on mode most of the time because:

- a) Speculative recording
- b) Video download
- c) Poor design – box stays on after recording a show
- d) System operator disabled power savings feature and/or head end can't support it

Speculative Recording

- Some designs always recording shows you “might” like based on your viewing habits
- This could cause box to be in active mode most of the time
- Result – box will qualify for ESTAR even though annual energy use will be much higher than ESTAR reqts

Other Questions?

- Satellites – did we properly cover the energy used by the LNBS in all of this?
- IPTV – did we get this right? What about the “other box” that gets installed on the home exterior?

Recommendations

1. Create a real duty cycle test and base qualification and verification on it. **or** simply set maximum allowable on and standby levels, along with auto power down reqt.
2. Require testing on the deployed “live” system to qualify. Link qualification to both box model # and system providers (see attached table)
3. Require boxes to have user friendly feature that allows disabling of: a) prospective video downloads; b) speculative recording.

Hypothetical Example - Potential ESTAR Compliance Scenario

	SP #1	SP #2	SP #3	SP #4
CABLE BOXES				
Motorola model CC	YES	NO	YES	NO
Motorola model YY	NO	YES	NO	NO
S-A model AA	YES	NO	NO	YES
S-A model BB	NO	NO	NO	NO
Panasonic Model Z	YES	YES	YES	YES
SATELLITE BOXES				
RCA model GG	NO	YES	YES	NO
DirectTV model NN	YES	YES	NO	NO
Sony model VV	NO	NO	YES	NO
Dish Network model WW	NO	YES	YES	YES

Policy Developments

1. Green/sustainable and climate change is everywhere. Part of competitive landscape. (See BSkyB's carbon neutral policy and actions)
2. Policy makers/regulators increasingly interested in reducing STB energy use

Policy Development Cont.

3. CEC evaluating stakeholder proposals for mandatory standards for STBs – 10W standby and auto power down. (Note – less stringent than ESTAR.)
4. FTC – per federal energy bill must label STB energy use by mid-2009. Again what is duty cycle?
5. Rising consumer utility costs. Today STB energy use frequently around \$50/yr, especially for home with multiple boxes

Utility Angle

- Utilities being pressured to deliver new energy savings
- Tier 2 could be very interesting to them at roughly 200 kWh/yr savings for HD DVRs. Note currently rebating fridges and dishwashers that provide much lower annual savings.
- NRDC and CEE poised to facilitate rebate conversations
- BIG BUT – the savings must be real not just on paper. (See prior concerns about spec recording and duty cycle.) May require some field measurements.