

Results of Invitation to Participate: Game Consoles

2013 Appliance Efficiency Rulemaking
California Energy Commission

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Agenda – Game Consoles

- ❑ Purpose
- ❑ Information requested
- ❑ Responses
 - ❑ Test Procedures
 - ❑ Modes
 - ❑ Duty Cycle & Usage Profile
 - ❑ Power Supplies
 - ❑ Installed Base & Market
 - ❑ Costs
- ❑ Next Steps



Purpose

- ❑ The Commission is gathering information to determine how to proceed with products listed in Phase 1 of the OIR.
- ❑ The Invitation to Participate (ITP) is an opportunity for stakeholders to inform the Commission's policy, direction, and process.
- ❑ ITP requests product, market, and other relevant information.
- ❑ During this session, we will discuss the results of the ITP for Game Consoles.



Information Requested

- ❑ Product Definition & Scope
- ❑ Existing Test Procedures
 - ❑ Across all modes
- ❑ Sources of Test Data
- ❑ Existing Standards & Standards in Development
- ❑ Product Lifetime
- ❑ Product Development Trends
 - ❑ Redesign Cycle
- ❑ Operations & Modes
- ❑ Energy-Saving Technologies & Features
- ❑ Costs
- ❑ Hardware
- ❑ Market Characteristics
- ❑ Market Competition



Responses

Responses addressing the information requested:

- ❑ California Investor-owned Utilities
- ❑ Consumer Electronics Association's Appendix:
 - ❑ Energy Consumption of Consumer Electronics in U.S. Homes in 2010 – Final Report to the Consumer Electronics Association (CEA) – December 2011
- ❑ Entertainment Software Association
- ❑ Green Technology Leadership Group (power supplies)
- ❑ Natural Resources Defense Council



Test Procedures

Responses include the following:

- ❑ Draft test procedure via manufacturers
 - ❑ Modal Power:
Navigation, Media playback (DVD, Blu-ray disc, Streaming HD) and Off/Standby (via Off button and Controller)
 - ❑ Auto Power Down:
Navigation, Active Gaming and Media playback (disc and streaming)
- ❑ EPA Recognition Program - Auto power down & modal power
- ❑ NRDC – Active mode
- ❑ EPRI & Ecova – Power supplies



Modes of Operation

Modes of Operation

- ❑ Standby
- ❑ Networked Standby
- ❑ Navigation
- ❑ Streaming Media (also referred to as Media Playback)
- ❑ Game Play (also referred to as Active Gaming)



Power Draw by Mode

Table 4 Game Consoles Power Draw by Mode

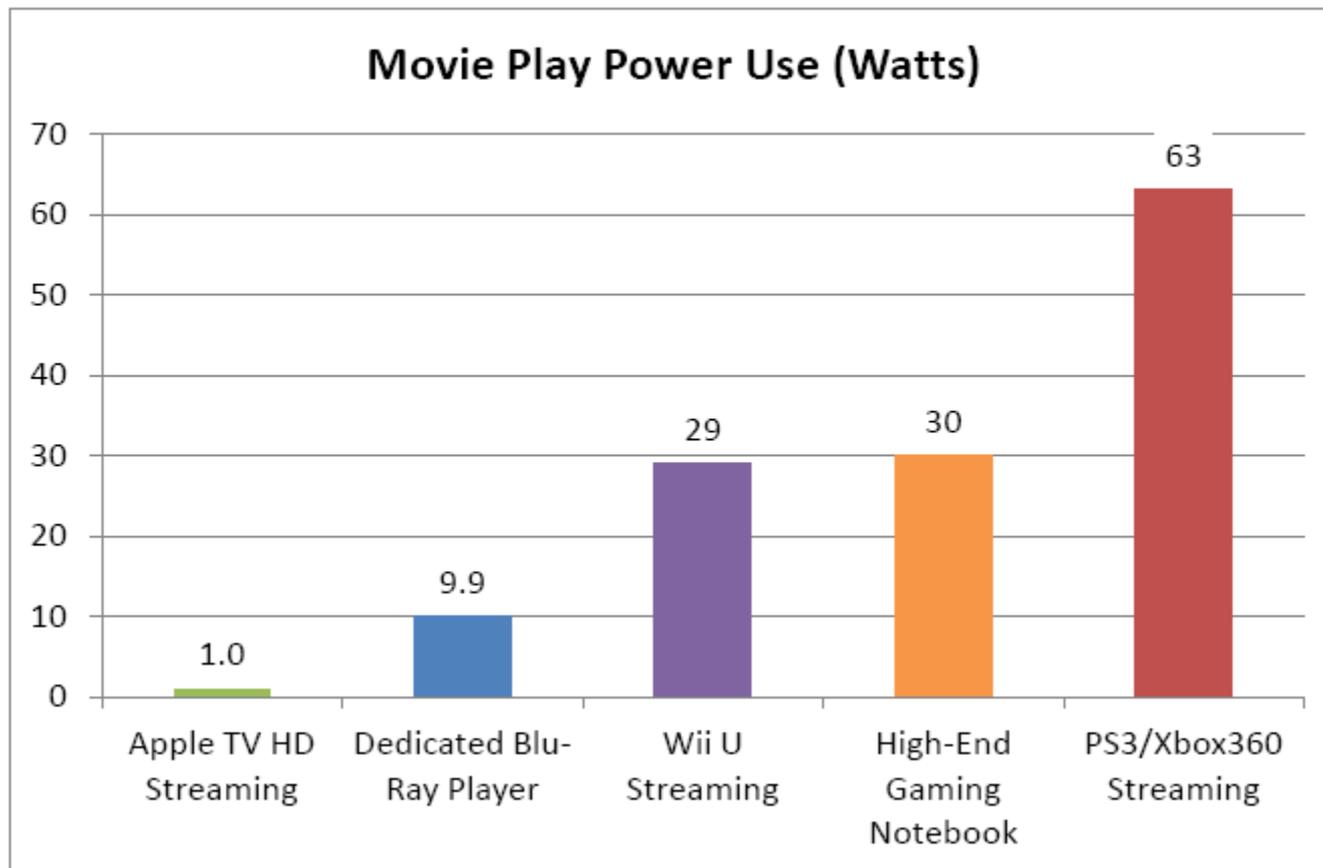
Mode	Power Draw (watts)			
	Wii	Wii U	Xbox 360 S	PlayStation 3
Game Play	14	35	78	71
Media	14	29	63	63
Navigation	12	32	65	68
Standby	1.3	0.5	0.4	0.3
Networked Standby	6	11	none	11

Source: Testing by NRDC, Ecova, and Energy Solutions in 2010 (Wii) November 2012 (Wii U) and April 2013 (Xbox 360 S, PlayStation 3).



Media Play

Figure 2: Comparison of HD Movie Play Power Use on a Range of Devices



NRDC Testing



Duty Cycle

Table 8 Game Console Duty Cycle

Mode	Time Spent in Mode (%)			
	Wii	Wii U	Xbox 360 S	PlayStation 3
Game Play	7%	7%	7%	7%
Media	5%	5%	5%	5%
Navigation	5%	5%	5%	5%
Standby	41.5% ¹	83%	83%	78%
Networked Standby	41.5% ¹	0% ²	0% ³	5% ⁴

Source: Derived from data in survey by the Consumer Electronics Association (CEA 2010; see also Table 2.5).



Usage Profile

Table 7. Game Console Active Uses

Use	Daily Usage (h)	Weekly Usage (h)	% of Active Time	% of Total Time	Bin
Games	1.66	11.6	53.8%	6.9%	Game Play
DVDs	0.37	2.6	12.1%	1.5%	Media
Music	0.26	1.8	8.3%	1.1%	Media
Internet	0.19	1.3	6.0%	0.8%	Media
HD-DVD or Blu-Ray	0.13	0.9	4.2%	0.5%	Media
Streaming Movies-Internet	0.09	0.6	2.8%	0.4%	Media
Streaming Movies-Local	0.09	0.6	2.8%	0.4%	Media
Other Active Uses	0.31	2.2	10.0%	1.3%	Navigation
Total Active Uses	3.08	21.6	100.0%	12.8%	
Inactive, But On	0.95	6.7		4.0%	Navigation
Total On	4.03	28.2		16.8%	
Total Off	20.0	139.8		83.2%	

Source: Compiled and binned by Energy Solutions based on results of survey commissioned by the Consumer Electronics Association (CEA 2010).



Default Power Mgmt Settings

Table 9. Default Power Management (Auto Power Down) Settings

Mode	Wii U	Xbox 360 S	PlayStation 3
Streaming Media	1	Off ¹	4
All Others			2

¹ Microsoft claims that their consoles are shipped with auto power down turned on and that this observation was the result of a temporary and unintentional production glitch.



Power Supplies

Table 13 Game Console Power Supply Summary

	Wii & Wii U	Xbox 360S	PlayStation 3
Power Supply Location	External	External	Internal
Power Supply Type	Class A, Level V	Non-Class A	
Current Regulation	Federal	None ¹	None ²
Game Play Power (watts)	Not measured	78	71
Game Play PS Load (% max)	Not measured	56%	37%
Game Play PS Efficiency (output watts as % of input watts)	Not measured	83.0% ³	78.5% ³

Source: Tested by Ecova, April 2013.

¹ Anticipated to be covered in the upcoming DOE BCEPS rule, initially proposed in March 2012, effective 2015.

² Voluntary certification (80 PLUS®) administered by Ecova [Ecova 2013]).

³ Interpolated linearly from testing data using two nearest load points (Table 3.1)



Power Supply Costs

Table 5-45 Cost and Efficiency Relationship for 203W EPS

	CSL 0	CSL 1	CSL 2	CSL 3
Mfr Unit Efficiency [%]:	82.4	86.4	86.4	88.5
Mfr Unit No Load Power [W]:	12.33	0.400	0.300	0.300
CSL Description:	Market Baseline	Mid-Market	Best-in-Market	Max Tech
Incremental MSP [\$]:	0.00	2.45	2.66	7.71
Test Unit #:	#203	#213	N/A	N/A

DOE, Technical Support Document,
External Power Supplies & Battery Chargers, March 2012

- CSL 0: 80 Plus Bronze
- CSL 1: 80 Plus Silver
- CSL 2: 80 Plus Silver
- CSL 3: 80 Plus Gold



Power Supply Costs

Green Technology Leadership Group comment:

Basic 80 Plus efficiency Bill of Materials (BOM) incremental cost to achieve a Bronze level is approximately \$0.25

Moving to an 80 Plus Gold is an additional \$1.00 to \$1.50.

Jumping to an 80 Plus Platinum could add another \$1.00 to \$2.00.

80 Plus test type	115V internal non-redundant				230V internal redundant				
	Fraction of rated load	10%	20%	50%	100%	10%	20%	50%	100%
80 Plus		80%	80%	80%					
80 Plus Bronze		82%	85%	82%		81%	85%	81%	
80 Plus Silver		85%	88%	85%		85%	89%	85%	
80 Plus Gold		87%	90%	87%		88%	92%	88%	
80 Plus Platinum		90%	92%	89%		90%	94%	91%	
80 Plus Titanium					90%	94%	96%	91%	



U.S. Installed Base

According to CEA market research (CEA 2010a), the installed base of video game systems (excluding portable devices) is 109.4 million units, as shown in Table 3-74, an increase of 70% compared to the estimate 64 million units in the previous study (Roth& McKenney 2007). The average owner household has 1.7 game consoles installed (CEA 2010a).

Table 3-74: Installed base of video game systems

Installed Base [millions]	Penetration	Sources
109	48%	CEA 2010a



U.S. Shipment Information

Table 15 U.S. Game Console Hardware Sales 2005-2012

Year	Wii	Wii U	Xbox 360	PS3	Total
2005			563,282		563,282
2006	1,075,329		3,832,778	667,762	5,575,869
2007	6,444,409		4,389,044	2,450,089	13,283,542
2008	9,826,502		4,881,772	3,477,812	18,186,086
2009	8,989,309		4,787,281	4,172,494	17,949,084
2010	7,398,500		6,999,773	4,737,437	19,135,710
2011	4,878,060		7,693,050	4,486,935	17,058,045
2012	2,042,064	933,131	5,566,035	3,433,720	11,974,950
Total	23,426,249	40,654,173	933,131	38,713,015	103,726,568

Source: <http://www.vgchartz.com>, "USA Hardware By Platform," accessed April 26, 2013.

Year	Total U.S. Home Console Sales (YTD)
2006	11,500,000
2007	17,600,000
2008	21,000,000
2009	20,500,000
2010	19,000,000
2011	17,000,000
2012	11,600,000

Source: The NPD Group/ Retail Tracking Service



Overall Incremental Costs

It's the Commission's understanding that game consoles are typically sold at a loss upon launch.

Efficiency of the Xbox 360 and PS3 improved as those models were retooled and remained in the market.

Based on anecdotal evidence, the purchase price of the Xbox 360 and PS3 decreased as those models were retooled and remained in the market.

What does this mean for incremental costs for improved energy efficiency?



Next Steps

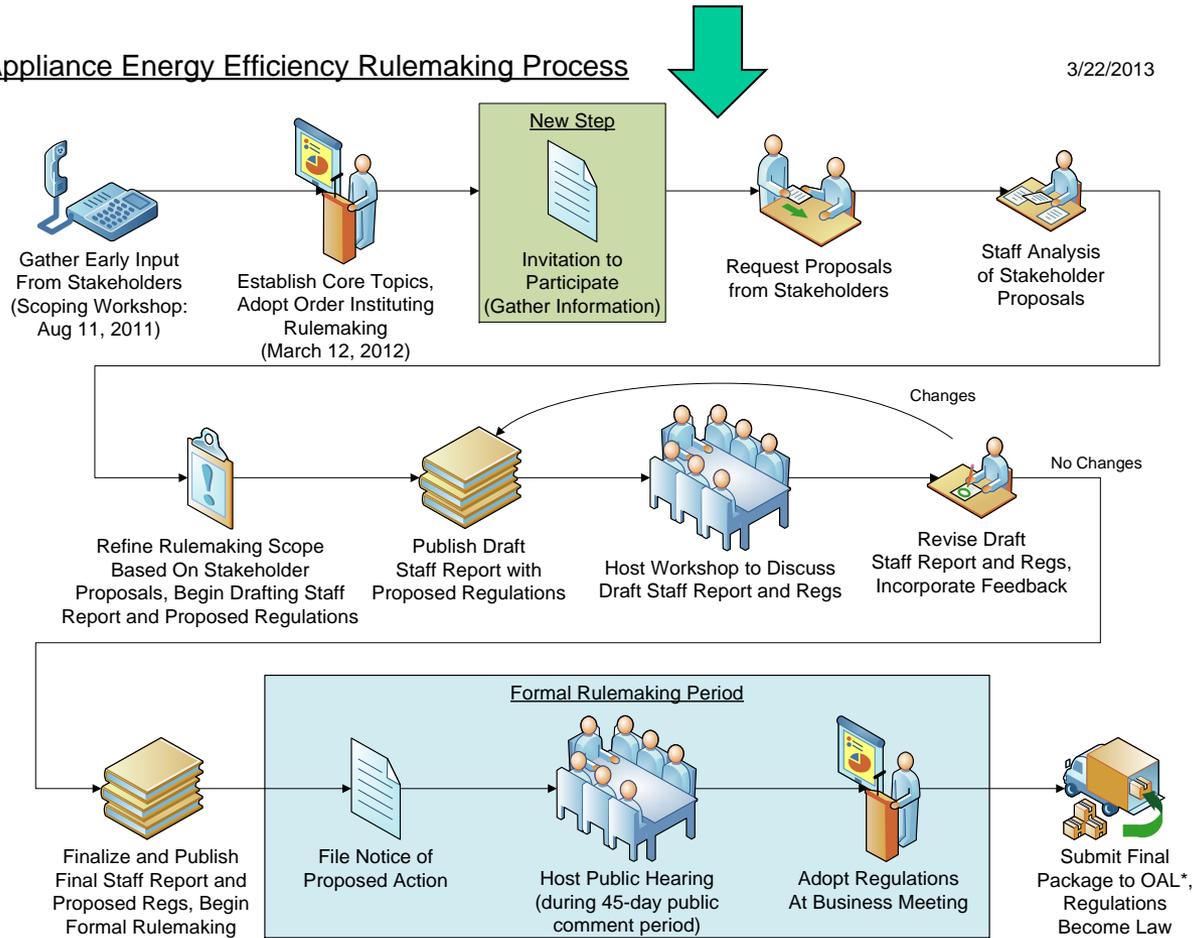
- ❑ Following the ITP workshops, the Commission will request proposals for new/updated efficiency measures.
- ❑ Interested parties may submit proposals from **June 10 to July 25, 2013.**
- ❑ Proposal template and guidance is forthcoming.
- ❑ Commission staff are available to discuss questions and concerns at anytime during the proceeding.



Public Participation

Appliance Energy Efficiency Rulemaking Process

3/22/2013



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Discussion & Comments

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