Game Consoles Self-Regulatory Initiative 4th Steering Committee Meeting

13 July 2017
Brussels

Microsoft Nintendo Sony Interactive Entertainment

Agenda

1.	Welcome and introductions	10:00 – 10:10
2.	3rd Steering Committee meeting (December 2016) • Approval or minutes • Review of actions	10:10 – 10:30
3.	Update from the Signatories • The 2017 Game Console SRI Review report	10:30 – 12:00
4.	The Annual Compliance Report (Intertek)	12:00 – 12:30
5.	Lunch	12:30 – 13:00
6.	Update from the European Commission • Feedback on the 2017 Consoles SRI Review • Other relevant updates	13:00 – 13:50
7.	AOB and date of next Steering Committee meeting	13:50 – 14:00
8.	End of meeting	14:00

10:00 – 10:10

Welcome and Introductions

10:10 – 10:30

3rd Steering Committee meeting

- Meeting minutes approval
- Review actions

VA Administrator to circulate a copy of the Commission's finalised VA Guidelines	***Completed***
EC policy officer will inform the Consultation Forum about the minor amendments made to the console VA in November 2016 and the upcoming 2017 VA review	***Completed***
EC policy officer will inform the Consultation Forum about the upcoming 2017 VA review	***TBC***
VA Administrator to prepare and share minutes of the current meeting	***Completed***

Update from the Signatories

3. Update from the Signatories • The 2017 Game Consoles SRI Review report	10:30 – 12:00

Update from the Signatories

The game console industry carried out a thorough review of the SRI and produced a report with the conclusions

The 2017 Game Console SRI Review Report covers the following topics

- Industry Compliance with the SRI
- Calculations of Energy Savings
- Future Technologies
- Review of Benchmarking
- Review of Material Efficiency
- Future Commitments and Proposals
- Alignment with the Commission's SRI Guidelines

Industry Compliance with the SRI

Process

European Commission attends all meetings

Key stakeholders also invited to participate

Independent Inspector

SRI Steering Committee

PlayStation

Nintendo

XBOX

- All console manufacturers represented (100%)
- Meetings at least half-yearly
- Costs shared by manufacturers

Committee votes for chairman

Minutes & product reports made public via Internet

Independent Inspector checks compliance

Third party administrator organises activities

Industry Compliance with the SRI

Reporting update

- Each Signatory is required to submit an annual Product Compliance Report (PCR) to the Independent Inspector
- Signatories have undergone two reporting cycles (2015 and 2016)
- Improvements to the reporting procedure were made in 2016, resulting in a clearer and smoother process
- Last reporting period resulted in compliance from all 3 manufacturers (more from Intertek in later slides)

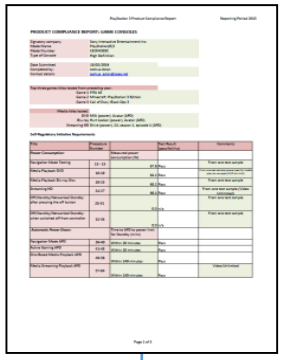
Industry Compliance with the SRI

Timelines

April 2015:
Voluntary agreement approved

November 2015:
Independent Inspector & Administrator selected

Dec 15 & 16:
Steering Committee meeting



Feb 16 & 17:
Annual product compliance reports submitted by members

May 16 & 17:
Independent Inspector declares all producers compliant & website launched (2016)

Games Consoles Self-Regulatory Initiative

Independent Inspector Annual Compliance Report

Reporting Period 2016

www.efficientgaming.eu

May/June 17:
Initial feedback from EC and NGO received

Jun /Jul 16 &17:
Steering Committee meeting

Calculation of Energy Savings

Consoles use several energy saving technologies

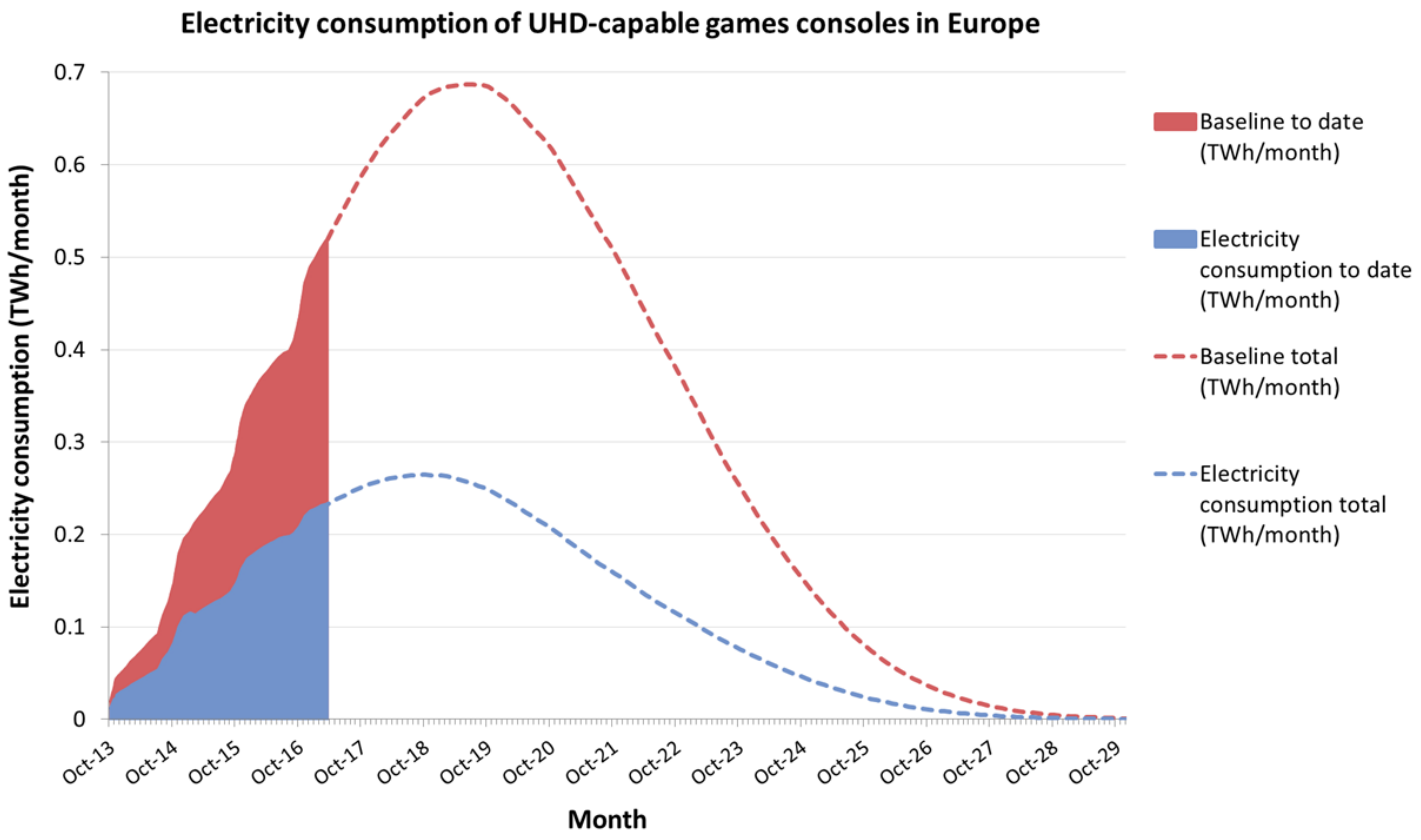
Technology	Study reference							Adopted today?
	AEA (2010)	ECOS (2011)	Hittinger (2012)	Energy Star (2012)	NRDC (2014)	LBNL (2015)	US EPA (2015)	
Separate/additional components to run non-gaming applications (separate video architecture)	✓				✓		✓	No
Efficient power supplies	✓						✓	Yes
Power supply output power reduction							✓	Yes
CPUs based on 32nm architecture	✓							Yes
Die shrink (based on predicted trends in efficiency / performance of PCs per transistor)							✓	Yes
System on a Chip architecture	✓							Yes
Power scaling of CPU and GPU		✓				✓		Yes
Processor performance scaling and power management techniques	✓							Yes
Advanced power management technologies to reduce on-idle power to less than 20% of active mode power	✓							Yes
Default Automatic Power Down features	✓		✓	✓		✓		Yes
APD with saving of in-game progression						✓		Yes

Assessment of technology adoption is based upon ultra-high definition capable console models

Opportunities for further power savings for current consoles are limited

Calculation of Energy Savings

SRI avoided 5.4 TWh to date (Nov. 2013- Apr. 2017)



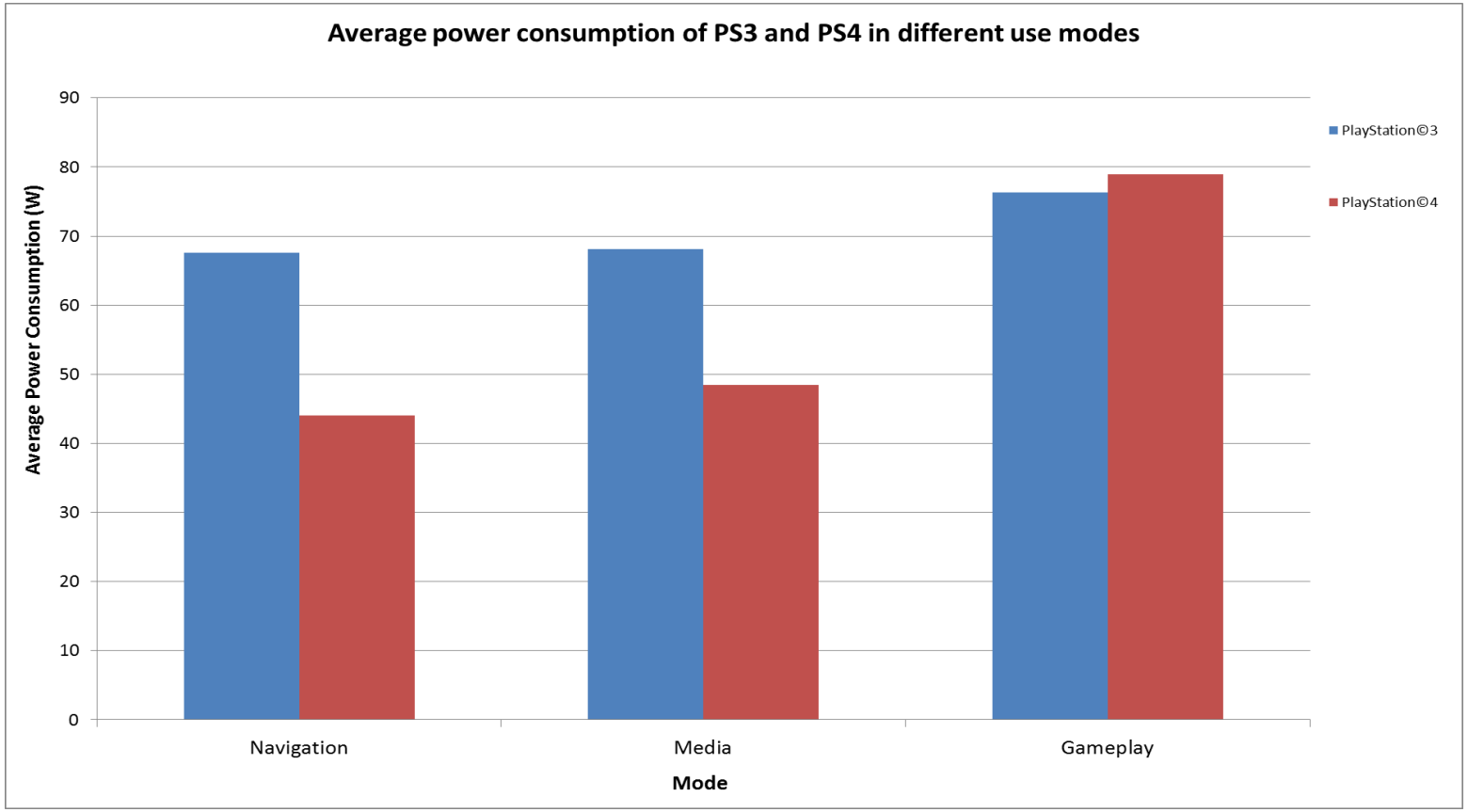
Projected at least 5.1 TWh saving for consoles under SRI in the year 2020, vs target of 1.1 TWh

Savings equivalent to ~ 850 MW power station

36.3 TWh estimated savings over complete lifetime – 30% higher than the annual electricity production of Denmark (2014).

Calculation of Energy Savings

PS4 power consumption < PS3



PS4 navigation & media power consumption now lower than the last, most efficient PS3 model.

Reduction is through deliberate steps to reduce energy use.

PS3 VS PS4

Calculation of Energy Savings

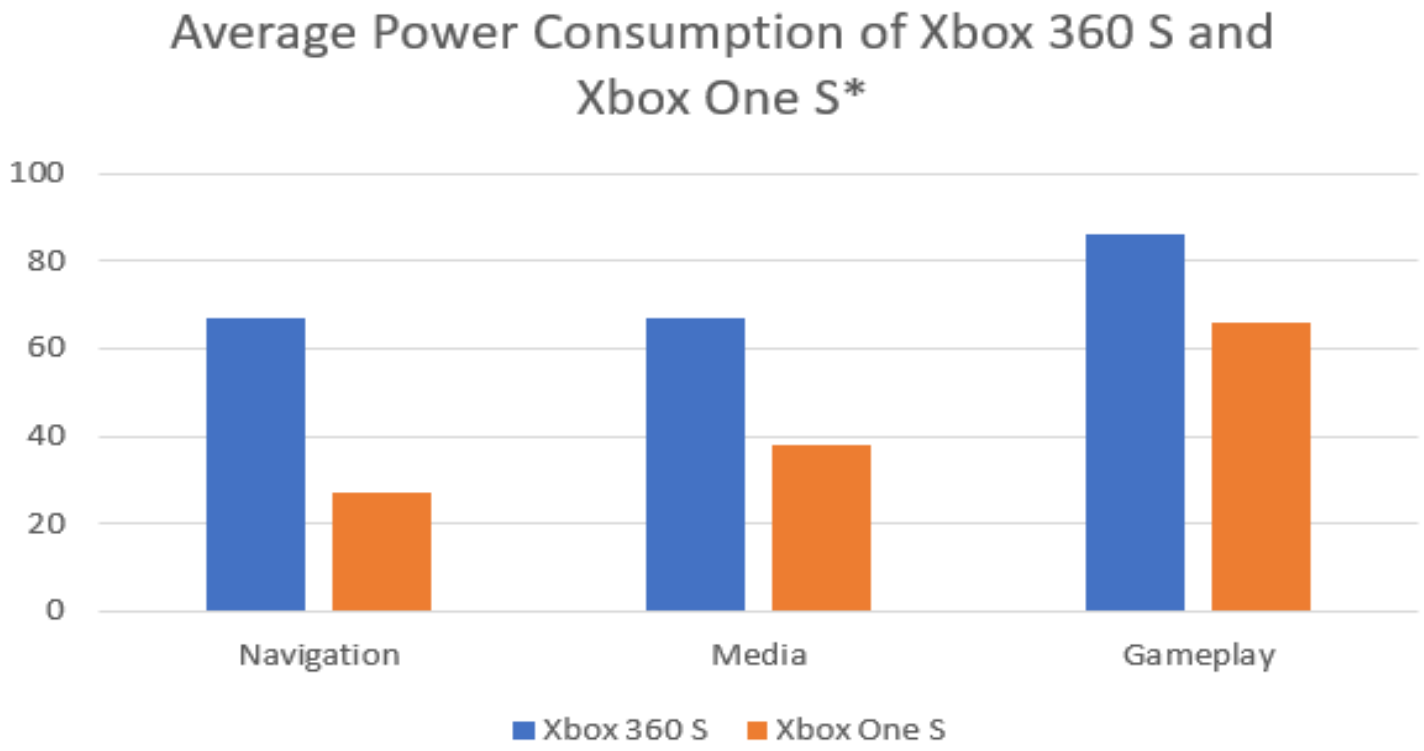
UHD gaming capable consoles power consumption

Power consumption of PlayStation®4 Pro

Mode	Power consumption	
	HD	UHD
Navigation	*60.4*	*66.7*
Blu ray media play	*59.5*	*78.7*
Streaming media play	*59.3*	*89.4* *(YouTube)*
DVD media play	*54.1*	*N/A*
Average game play	*126.1*	*148.1*

Calculation of Energy Savings

Xbox One S power consumption < Xbox 360 S for similar functions

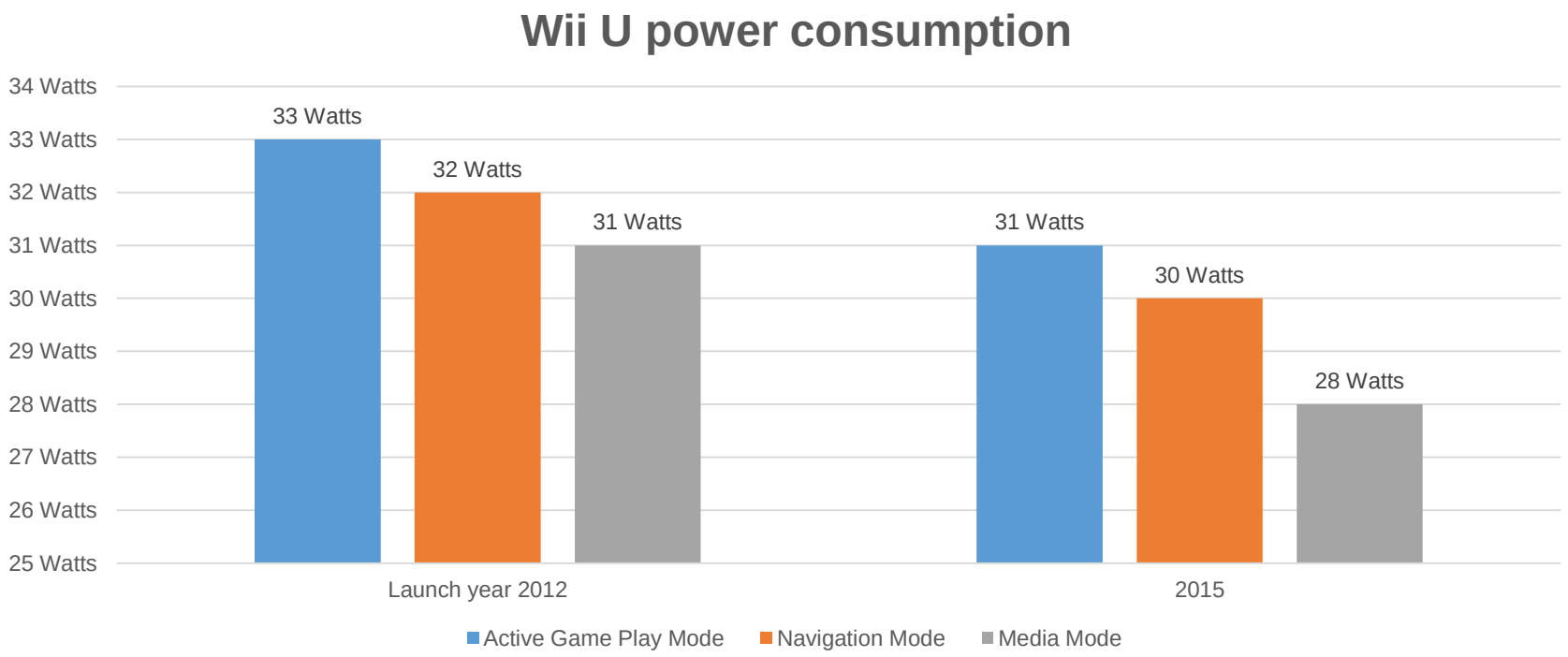


*Compares most efficient Xbox 360 with Xbox One S

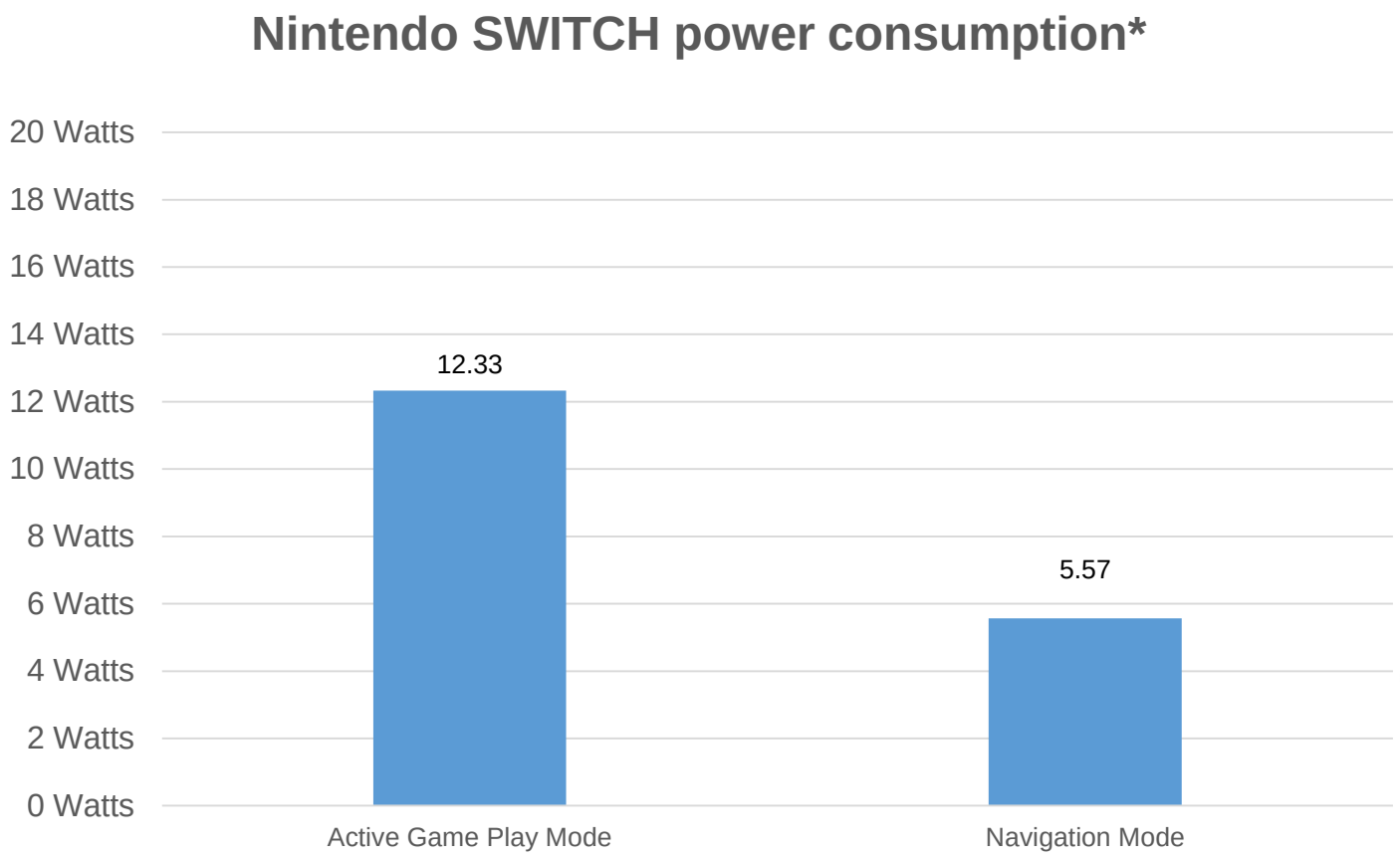
VS

Calculation of Energy Savings

Nintendo Wii U power consumption



Calculation of Energy Savings



*Based on preliminary tests conducted by Nintendo

Calculation of Energy Savings

Power caps were sufficiently ambitious

- Higher performing UHD consoles (PS4 Pro) are just under current power caps
- Current UHD consoles (PS4 & Xbox One) met tiers 1 & 2 power caps but did not exceed expectations
- With statistical variation in samples, in the peak case some consoles may still be close to power caps

Calculation of Energy Savings

2017 power caps for Navigation Mode => 70W

	HD Consoles (Watts)	UHD Consoles (Watts)
Tier 1 Effective from 1st Jan 2014	90	90
Tier 2 Effective from 1st Jan 2016		
Tier 3 Effective from 1st Jan 2017	70	70
Tier 4 Effective from 1st Jan 2019		

UHD consoles are those with a technical capability to output UHD media.

Calculation of Energy Savings

2017 power caps for HD Media Playback => 70W & 90W

	HD Consoles (Watts)	UHD Consoles (Watts)
Tier 1 Effective from 1st Jan 2014	90	
Tier 2 Effective from 1st Jan 2016		90
Tier 3 Effective from 1st Jan 2017	70	
Tier 4 Effective from 1st Jan 2019		70

HD Media Playback cap for UHD consoles is reduced to 70W in 2019

UHD consoles are those with a technical capability to output UHD media.

Calculation of Energy Savings

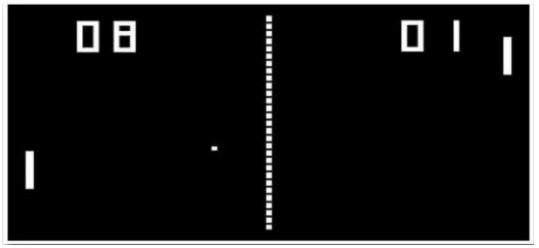
The SRI includes power management requirements

- By default console must automatically power down to standby mode after a period of inactivity:
  - 4h or less for media modes
  - 1h or less for gaming or other modes

Future Technologies

- From Pong to Xbox One X and PS4 Pro, where the video experience evolved from small-screen black-and-white CRTs to high-frame-rate, high-dynamic response and ultra-high definition, the computational performance of games consoles has increased exponentially.

Pong, one of the earliest video games



- The advances in computerized simulations and video rendering have combined to provide an extremely immersive and lifelike gaming experience inconceivable back in the days of Pong

Future Technologies

Review of Benchmarking

Feasibility of benchmarking consoles Game Play computational performance has been reviewed, in accordance to the SRI

Energy Efficiency of Games Consoles: Self-Regulatory Initiative to further Improve the energy efficiency of Games Consoles:

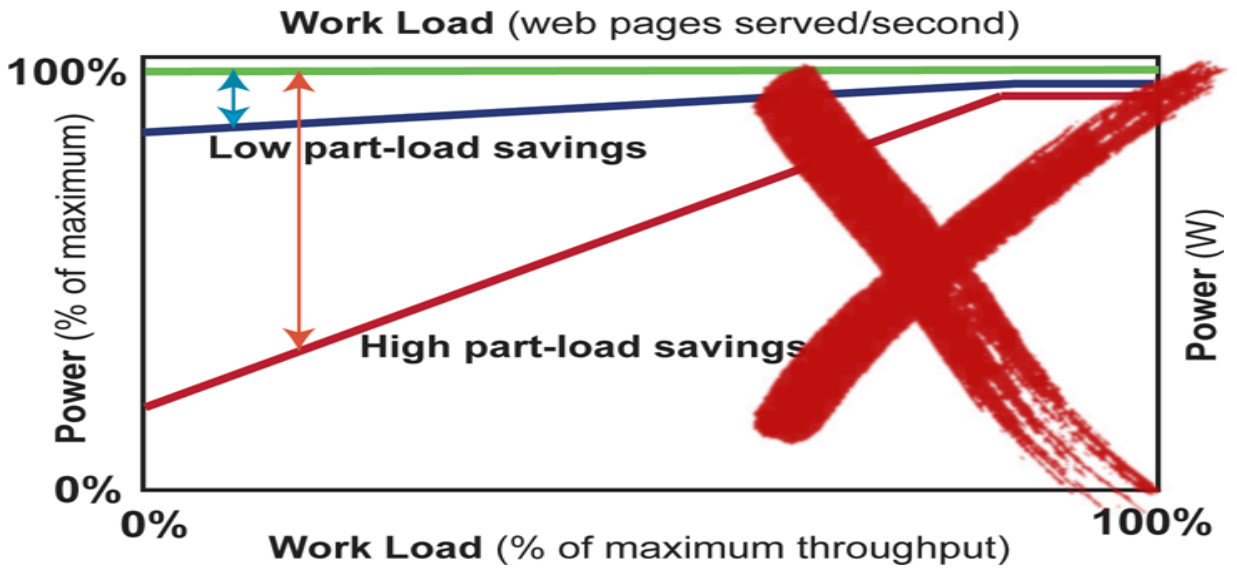
"*…the feasibility of including computation performance in console efficiency benchmarks, where applicable and comparable across devices performing gaming, will be reviewed during the 2017 review of the Self Regulatory Agreement*"

Review of Benchmarking

Many factors influence power use

Including

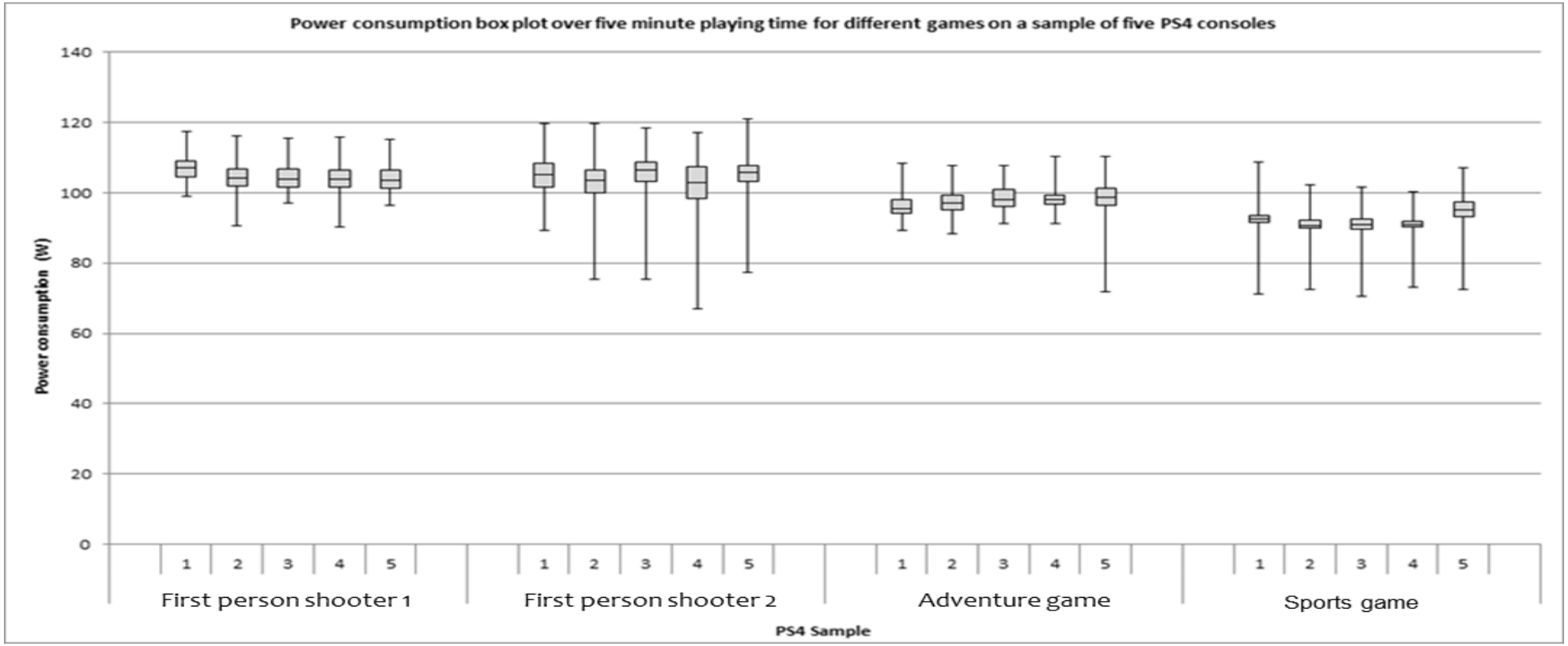
- Frame rate
- Resolution
- Anti-aliasing
- Tone mapping
- Rendering
- Special effects
- Procedural texturing
- Scene complexity
- Graphical fidelity
- Dynamic reflections
- Visual density



Consequently, workload cannot be standardised, and benchmarks are not applicable across different console platforms.

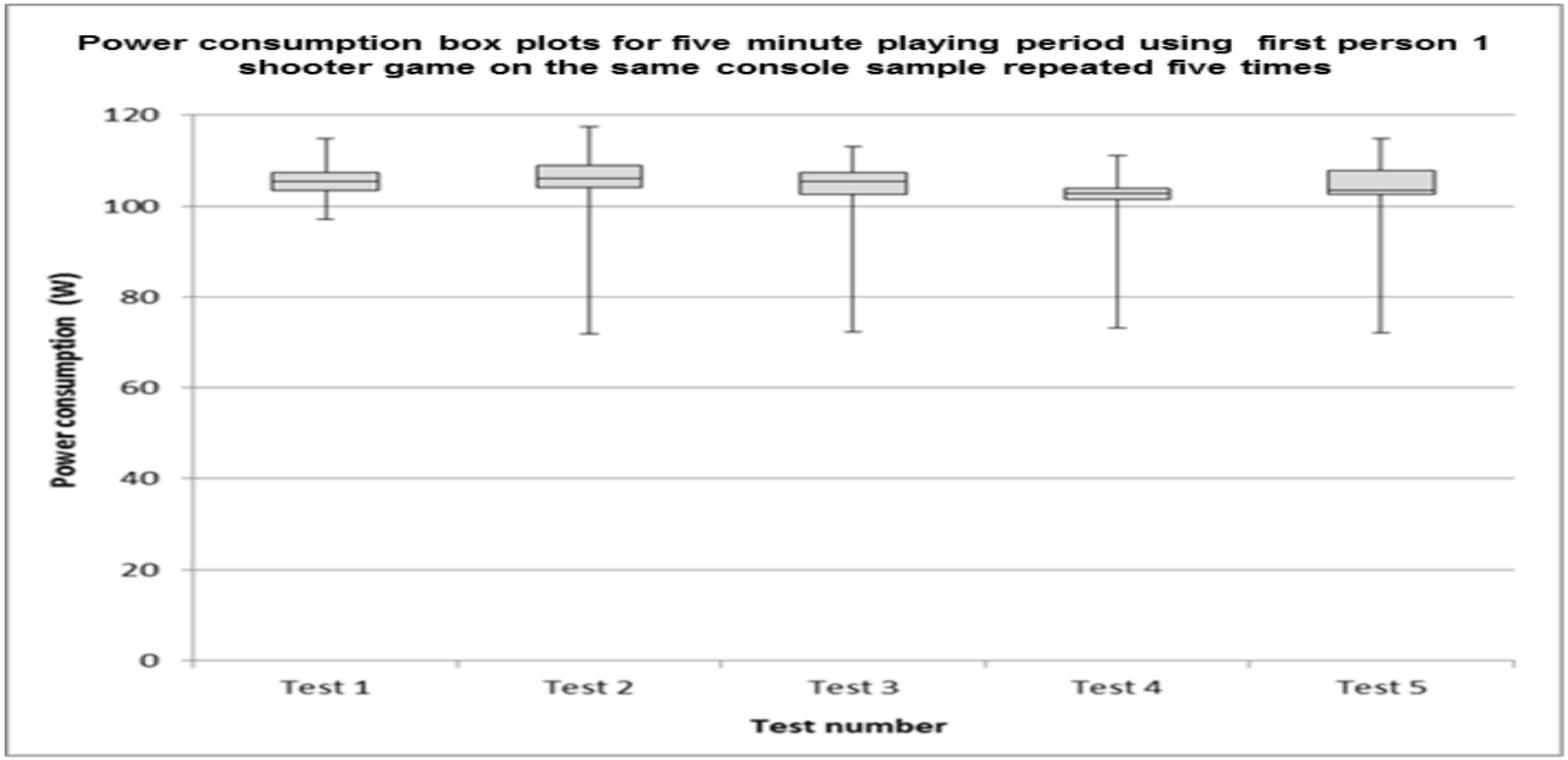
Review of Benchmarking

Power varies widely between games



Review of Benchmarking

Power even varies for same game played on same console



Review of Benchmarking

"It's unlikely that a benchmark for active gaming will ever be good enough"

- × **Repeatable**
- × **Representative**
- × **Normalized**
- × **Comparable**
- ✓ **Stable**
- ? **Neutral**
- ✓ **Publicly disclosed**

"PERFORMANCE BENCHMARKS FOR CONSOLES"
Paper by: Jonathan Koomey, Kieren Mayers, Joshua Aslan, and James Hendy

PRESENTENTED TO GREEN ICT WORKSHOP, IEEE, Paris, May 25th 2017

"The dynamic nature of consoles creates extreme complexity. It is unlikely that meaningful metrics for comparing gaming performance can ever be developed for game consoles and gaming PCs. ***The complexity of these devices makes it difficult to define computational output in a way that can be accurately, consistently, and correctly compared*** *across game consoles or between consoles and PC gaming machines. Without consistent computational benchmarks, it's unlikely that a benchmark for active gaming will ever be good enough on which to base efficiency regulations or utility incentives to promote more efficient products."*

Review of Material Efficiency

The SRI already includes material efficiency requirements

Out of warranty repair service must be available to consumers

- Technical documentation available to authorised repair centres
- Spare parts shall be made available to authorised repair centres

Maintenance of consoles must be possible by non-destructive disassembly (parts must be removable)

Inform consumers of end-of-life processing and out-of-warranty repair options available within the operating instructions

>ABS<

Plastics parts >25g must be marked showing their composition

Exceptions:

- *The part has <1cm2 level surface available for marking*
- *The performance or function of a part is compromised e.g. buttons with tactile surface, plastic lenses, or display screens.*
- *External transparent parts*
- *Marking is not technically possible due to the specific production method of the plastics used in the part e.g. extrusion moulding.*

Review of Material Efficiency

Many material efficiency standards & initiatives were reviewed

JRC Technical Report: Feasibility study for setting-up reference values to support the calculation of recyclability / recoverability rates of electr(on)ic products – DRAFT REPORT	Technical report: Application of environmental contribution modulation criteria
NL Ministry Environment/Eco-design - Marking requirements for EEE items (relevance and feasibility)- Recycled content- Strategic metal recycling	EuroVAprint: Industry voluntary agreement to improve the environmental performance of imaging equipment placed on the European market, SRI V.5.2, April 2015
CEN-CENELEC-ETSI work programme in response to M/543 on material efficiency - BT154/DG10216/INF	JRC Technical Report: Analysis of durability, reusability and reparability -Application to dishwashers and washing machines
Communication from the commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions - Closing the loop - An EU action plan for the Circular Economy	EU GPP guidance for the purchase of Computers and Monitors
IEEE1680.1, 4.3.1.6 JRC Science and Policy Report: Environmental Footprint and Material Efficiency Support for product policy	Directive 2009/125/EC of the European Parliament and of the Council with regard to eco-design requirements for electronic displays
Draft Commission Regulation (EU) Implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to eco-design requirements for electronic displays and repealing Regulation 642/2009 with regard to eco-design requirements for televisions	Austrian Standard ONR 192102 Label of excellence for durable, easy to repair electrical and electronic equipment
OCAD3E Waste Electrical and Electronic Equipment Authorised Coordinator Agency	Working Document: Potential Eco-design requirements for servers and data storage products

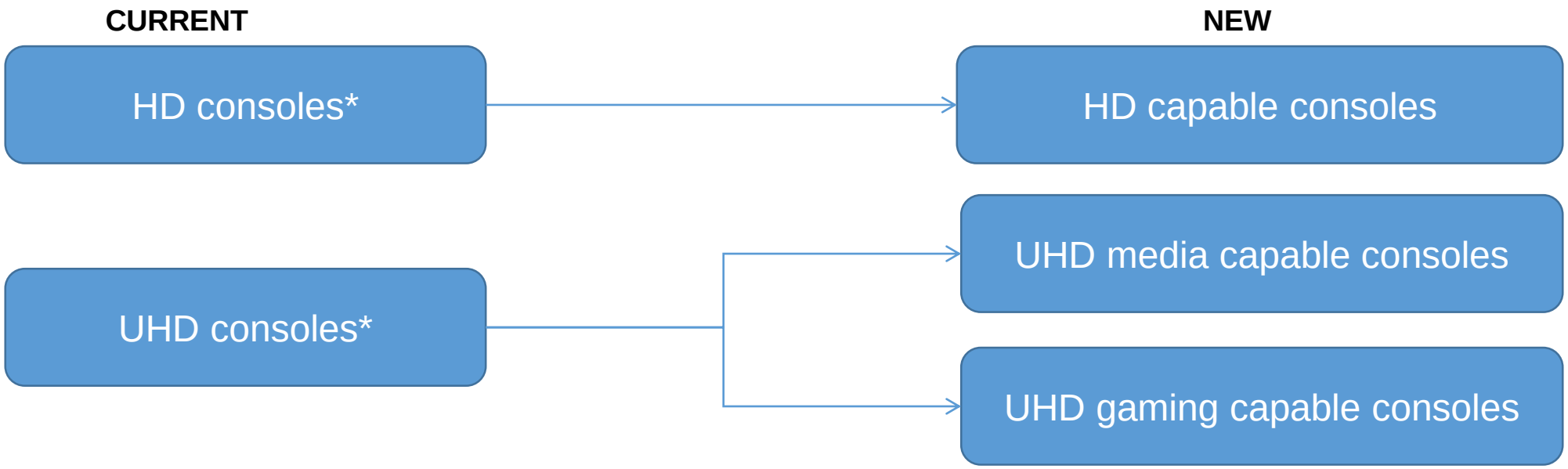
Future Commitments and Proposals

For the updated SRI, the consoles industry proposes the following main modifications

- New categories for UHD consoles
- New Tier 4 (2019) requirements
- New removability requirements
- New recyclability / durability rules
- Options for material efficiency requirements
- New timescales for the next SRI review

Future Commitments and Proposals

New category for UHD Consoles



* Based on technical capability to render media

Future Commitments and Proposals

New Tier 4 (2019) requirements HD capable consoles

HD CAPABLE CONSOLES

Mode	CURRENT SRI	NEW PROPOSED SRI
Navigation	70 W	50 W
HD media play	70 W	60 W

Reflects improvements achieved in hardware and firmware

All feasible energy efficient technologies have already been implemented limiting any further reduction in energy use. The situation will be kept under constant review.

Future Commitments and Proposals

New Tier 4 (2019) requirements for UHD media capable consoles

UHD MEDIA CAPABLE CONSOLES

Around **10 times** more performance than HD consoles

Mode	CURRENT SRI	NEW PROPOSED SRI
HD navigation	70 W	50 W
UHD navigation	70 W	50 W
HD media play	70 W	60 W
UHD media play	Not in scope	60 W

Reflects improvements achieved in hardware and firmware

All feasible energy efficient technologies have already been implemented limiting any further reduction in energy use. The situation will be kept under constant review.

Future Commitments and Proposals

New Tier 4 (2019) requirements for UHD gaming capable consoles

UHD GAMING CAPABLE CONSOLES

2-6 times more performance than UHD media capable consoles

Mode	CURRENT SRI	NEW PROPOSED SRI
HD navigation	70 W	70 W
UHD navigation	70 W	70 W
HD media play	70 W	70 W
UHD media play	Not in scope	110 W

Reflects improvements achieved in hardware and firmware

- All feasible energy efficient technologies have already been implemented limiting any further reduction in energy use. The situation will be kept under constant review.
- On average the most common 4K media play options on PlayStation®4 Pro consumes on average between 79-89 W. In peak cases, however, it is possible that some samples may consume up to 110 W.

Future Commitments and Proposals

New removability requirements

- Signatories shall ensure that joining or sealing techniques do not prevent the removal of the components, applicable to games consoles, listed in point 1 of Annex VII of Directive 2012/19/EU, when present
- Exemptions apply where non-removable joining and sealing techniques may be used to ensure either user safety necessary to comply with safety-related EU legislation or product quality necessary to avoid wear and tear that would otherwise shorten the product's useful life. For batteries, exemptions in the Battery Directive 2006/66/EC amended by Directive 2013/EC/EU apply
- Accessing components shall be enabled by documenting the dismantling operations needed to access the targeted components,* including for each of these operations: type of operation, type of fastening technique(s) to be undone, and tool(s) required

** Components, applicable to games consoles, listed in point 1 of Annex VII of Directive 2012/19/EU.*

MAIN CHANGES:

- Align with Lot 3, 5, & 9 proposals
- More specific list of 'removable' components
- New information requirement added

Future Commitments and Proposals

New recyclability and durability rules

Additional information provided for manual disassembly to improve recyclability:

- Whether plastic casing contains brominated flame retardants;
- Whether LCD displays contain mercury*

Additional information to consumers to extend product life:

- Information on how to keep products in good working condition e.g. how to keep the product dust free, how to install system updates, how to remove trapped disks?
- How to delete personal data before selling second hand
- Options available (if any) to upgrade the performance of their console e.g. installing a bigger hard drive

* 'Mercury Free' means a product in which concentration values of mercury (Hg) by weight in homogeneous materials do not exceed 0.1% as defined in Directive 2011/65/EU of June 8, 2011

MAIN CHANGES:

- Additional proposals unique for games consoles

Future Commitments and Proposals

Various material efficiency options considered

Additional product design option:

OPTION: ***Use standardised plastics polymer to facilitate recycling***

CONCLUSION: *Different polymers used for high quality design and finish*

We already mark plastic components by polymer type

We will consider whether plastic components > 100g can be removable and made from recycling compatible polymers during the next SRI review

Future Commitments and Proposals

Various material efficiency options considered

Additional repair options:

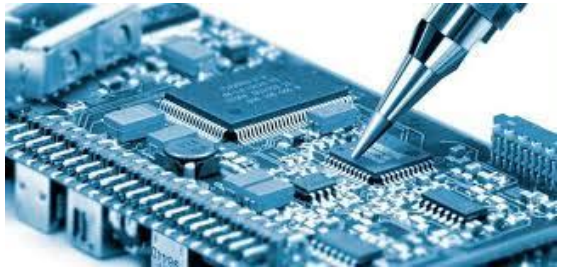
OPTION: ***Providing access to system software 'service modes'***

CONCLUSION: *Highly specialised & proprietary technology – real risk of hacking / piracy*

OPTION: ***Making spare parts available to third party repair companies***

CONCLUSION: *Most parts are proprietary design and controlled to avoid counterfeiting*

We receive no requests for spare parts; but we do provide out-of-warranty repair



95% of repair cafes do not receive any consoles for repair (+4% not frequently), whereas, for example, Sony report around 1 in 10 consoles received for repair are out-of-warranty.

Future Commitments and Proposals

Various material efficiency options considered

Information options:

OPTION: ***Provide schematics and repair instructions on request***

CONCLUSION: *Complex product: how to ensure quality of repair?*
We will provide FAQ instructions to consumers for minor faults

OPTION: ***Providing consumer information on average product life span***

CONCLUSION: *There is no way to measure lifetime of PCB or to accelerate duty cycle for testing*
Quality improves with feedback from repair over lifecycle of each generation

Many previous generation consoles are still in use / collector items: WEEE surveys find consoles are usually more than 5 years old when disposed (new console generations launched around every 5 years).

Repair model is environmentally efficient: Before production of any model ends, we will try to predict stock of spare parts needed based on past experience, and avoid overstocking and wasting materials. If parts run low, in many cases, we salvage and refurbish parts from models beyond recovery, or replace broken units with refurbished models.

Future Commitments and Proposals

Various material efficiency options considered

Information option:

OPTION:

Provide information on location and amount of critical metals to recyclers

Provide information on location and amount of brominated flame retardants to recyclers

Providing 'recyclability indexes' to recyclers

CONCLUSION:

Recycling companies confirm this level of detail is not useful for recycling

We will provide information on brominated flame retardants, type of plastic polymer, Hg in screens used in games consoles.

Future Commitments and Proposals

New timescales for the next SRI review

- Agreement would be reviewed again in 2019, or
- After new console announced with significant improvement in computing performance (future improvement may not be due to higher resolution)

MAIN CHANGES TO ENSURE TIMELY REVIEW OF THE SRI

- SRI Signatory can request for a new category of console to be added based on performance
- Proposal to be presented to SRI Steering Committee
- If accepted by the Commission, new category is added and review starts
- Once accepted, a new category of console with new requirements will be created within the SRI
- The aim is for the review process not to exceed one year

Alignment with the Commission's SRI Guidelines

Modifications made to meet the new SRI Guidelines

New responsibilities for the Independent Inspector	Triggering product testing Triggering onsite inspections Receiving & reporting allegations to the Steering Committee
Stakeholders have a number of options to participate	Raising complaints directly to Independent Inspector Possibility to speak at Steering Committee meetings Member States may request technical compliance documentation
Changes to deadlines and schedules	Signatories must address non-compliance within six months, other than in exceptional circumstances where substantial redesign of product hardware or firmware is required, in which case non-compliance must be resolved within 12 months

Stakeholder engagement

Suggestions	Status
Standby power levels and targets	
How EU standby regulation applies to MSFT Instant On option	N/A to SRI
Inform users of additional standby capabilities and their power consumption	Agreed
Include power limits for additional standby capabilities within SRI	Not feasible*
Include standby and network standby in scope of SRI	Not feasible*
Ensure consumers are not incentivised to disable APD	Already included in SRI
Gaming Power Use / Benchmarking	
Gaming power consumption can be measured and should be reported	Already included in SRI
Power Levels for Latest Devices	
Provide power consumption of PS4 Pro UHD modes	Done

* Explained in NGO response

Stakeholder engagement

Suggestions	Status
Tier 4 Limits	
Why can't power consumption be reduced further	Not feasible**
Why can't the power caps for UHD gaming capable consoles be lower	Not feasible**
Peripherals	
Include additional peripherals in scope of SRI	Not feasible*
Include requirements for peripherals to have APD	N/A - Done already
Ensure peripherals do not disable console APD	N/A - Done already
Resource Use Aspects	
Make spare parts available to 3rd party repair companies	Not feasible**
Provide dismantling information to recyclers	Already included in SRI

*Explained in NGO response
** As explained in this presentation and the NGO response

Stakeholder engagement

Suggestions	Status
Resource Use Aspects	
Mark plastics with flame retardants	Under consideration
Plastic parts >100g to be removable and made of compatible polymers for recycling	Under consideration
Provide information on critical raw material information and location	Not feasible**
Provide information on personal data deletion	Agreed
Ensure key components can be removed non-destructively	Agreed
Additional requests	
Is there public information on overall console sales	Confirmed*
What is the market share of UHD gaming capable consoles	TBC*
Can we produce versions of new games for old and new console generations	Not feasible*

*Explained in NGO response
** As explained in this presentation and the NGO response

Stakeholder engagement

Suggestions	Status
Additional requests	
Can we report proportion of users enabling different standby capabilities	Not feasible*
How do we ensure a software update does not cause failure to comply with SRI power caps	Already included in SRI

*Explained in NGO response
** As explained in this presentation and the NGO response

Review process (phase 1) on-track

Apr
- 1st Draft review report completed
- Initial presentation to European Commission (25th)

May
- Draft review report completed
- Second presentation to European Commission (30th)

June
- Meetings to get feedback from NGOs
- Draft review report updated
- Updated draft SRI distributed to SC

July
- Final draft report and SRI published (5th)
- SRI Steering Committee meeting (13th)

Timescales
- Spans over 12 months
- Process started in January 17, estimating completion December 17

Deliverables
- 2017 Review Report
- SRI revised

Revision process (phase 2)

Sep/Oct 17

- Finalise proposal
- Present proposal to EU Consultation Forum (TBC)

Nov/Dec 17

- Review all stakeholder comments & update SRI agreement
- Fifth Steering Committee meeting

2018

- Submission for final decision by the Commission
- New agreement implemented during 2018 compliance year

Completion of 2017 compliance year under current SRI

The Annual Compliance Report (Intertek)

4.	**The Annual Compliance Report (Intertek)**	**12:00 – 12:30**

Lunch

5.	**Lunch**	**12:30 – 13:00**
6.	**Update from the European Commission** • Feedback on the 2017 Game Consoles SRI Review • Other relevant updates	**13:00 – 13:50**
7.	**AOB and date of next Steering Committee meeting**	**13:50 – 14:00**
8.	**End of meeting**	**14:00**

Update from the European Commission

- Feedback to industry on Game Consoles SRI 2017 review
- Other relevant updates

AOB and date of next Steering Committee meeting

- Any other business?
- Next Steering Committee meeting – November 2017 (?)

14:00

End of meeting