

**EuP Lot 3
Third Stakeholder Meeting**

Task 6 – Improvement Potential

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Purpose

Identify design options

Evaluate Life Cycle Costs (LCC) of options

Evaluate LCC of combinations of options

Determine the Least Life Cycle Cost (LLCC) and BAT

Design options

1. **Auto Power Down (APD) feature**
2. **Operational mode requirements (efficiency improvement of active/idle/quick start mode)**
3. **Hard On/Off switch**
4. **Product Lightweighting**
5. **PVC-free products**
6. **BFR-free products**
7. **Improved recyclability**
8. **Increased product durability (lifetime)**
9. **Reusable components**
10. **Minimum recycled content requirement for plastics**

Assessment of options

Assumptions for each option – stakeholder comment invited

**Ranked importance of options for total environmental impact –
relative to Base Cases**

Normalisation to derive ‘scores’

Total scores – sum of the scores for each impact

Scoring

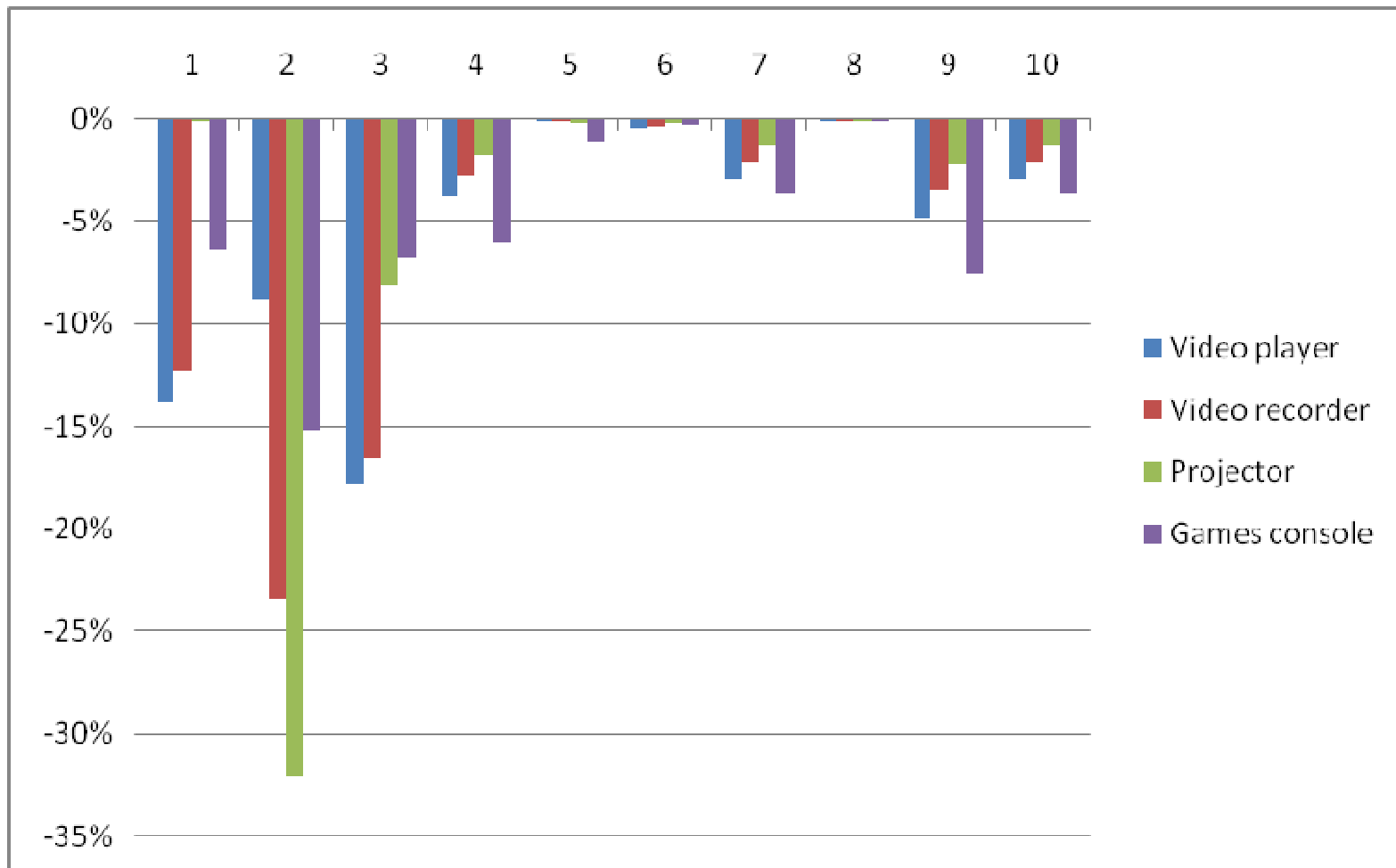
Total score for option j = $\text{SUM}_{i=1 \text{ to } n} (W_{ij} / T_i)$

Where W_{ij} is the impact for the i^{th} impact category for option j, and T_i is the total European impact for the particular i^{th} impact category.

Relative Importance of Impact Categories (Normalised)

	Video players	Video recorders	Projectors	Games consoles
Materials	5.01%	3.66%	2.13%	6.45%
Total Energy (GER)	0.02%	0.02%	0.02%	0.02%
of which, electricity	34.48%	40.13%	45.31%	26.18%
Water (process)*	0.50%	0.49%	0.47%	0.87%
Waste, non-haz./ landfill*	1.76%	1.46%	1.28%	2.15%
Waste, hazardous/ incinerated*	3.67%	2.81%	3.40%	3.80%
Greenhouse Gases in GWP100	13.75%	13.91%	13.79%	13.48%
Acidifying agents (AP)	23.57%	24.07%	24.32%	24.63%
Volatile Org. Compounds (VOC)	0.30%	0.24%	0.19%	0.45%
Persistent Org. Pollutants (POP)	5.99%	4.90%	3.01%	4.71%
Heavy Metals (HM), air	0.65%	0.54%	0.38%	0.74%
PAHs	0.60%	0.47%	0.45%	1.89%
Particulate Matter (PM, dust)	9.18%	6.87%	4.83%	11.73%
Heavy Metals (HM), water	0.51%	0.44%	0.43%	2.92%
Eutrophication (EP)	0.00%	0.00%	0.00%	0.00%
TOTAL:	100.00%	100.00%	100.00%	100.00%

Total scores for each option



Relative to Base Case (zero). Negative values = savings

Most promising options

1 - (auto power down),

2 - (Operational mode requirements),

3 (off switch),

4 (product lightweighting),

7 (improved recyclability),

9 (reusable components) and

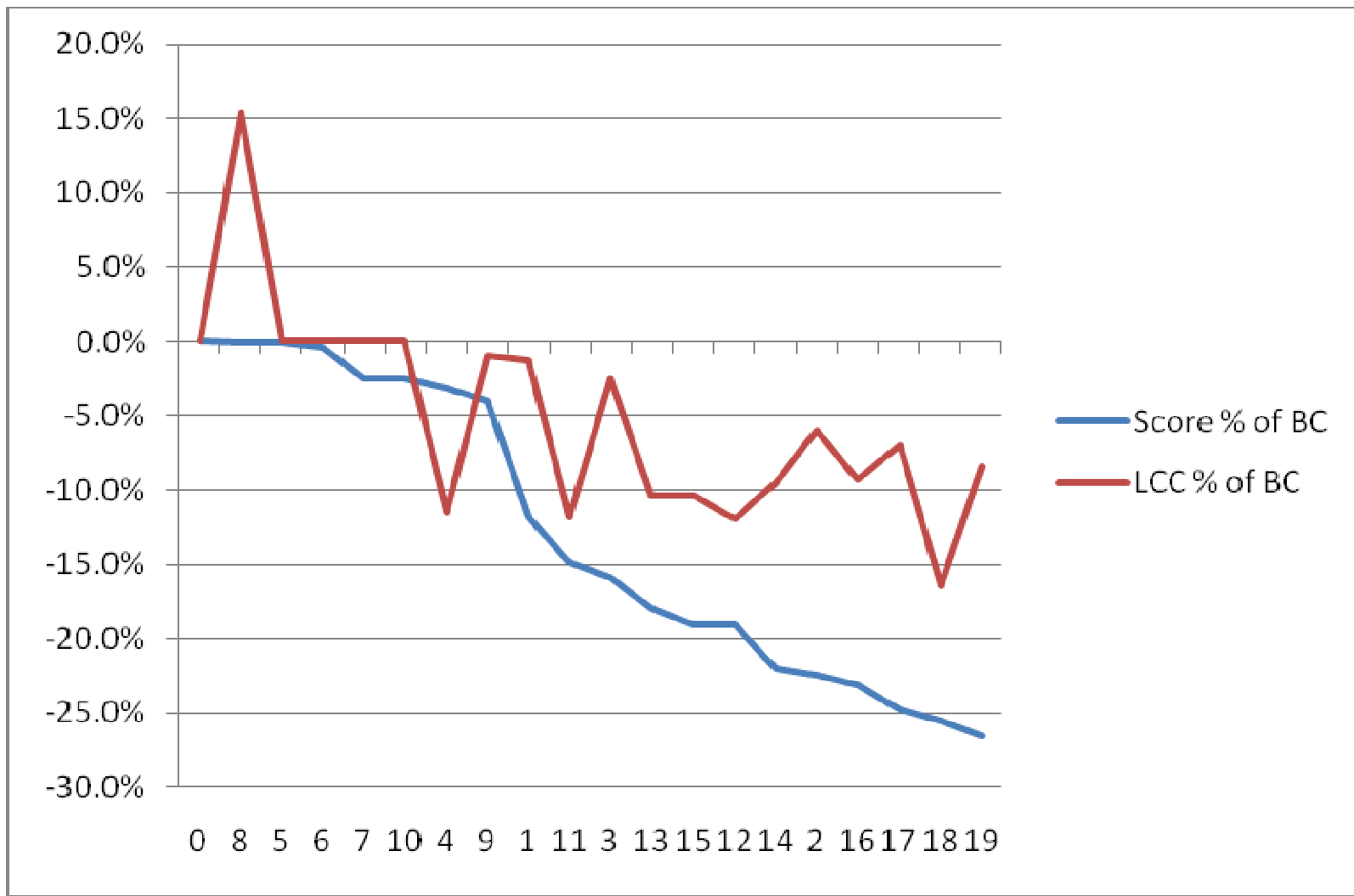
10 (minimum recycled content for plastics)

For all product types.

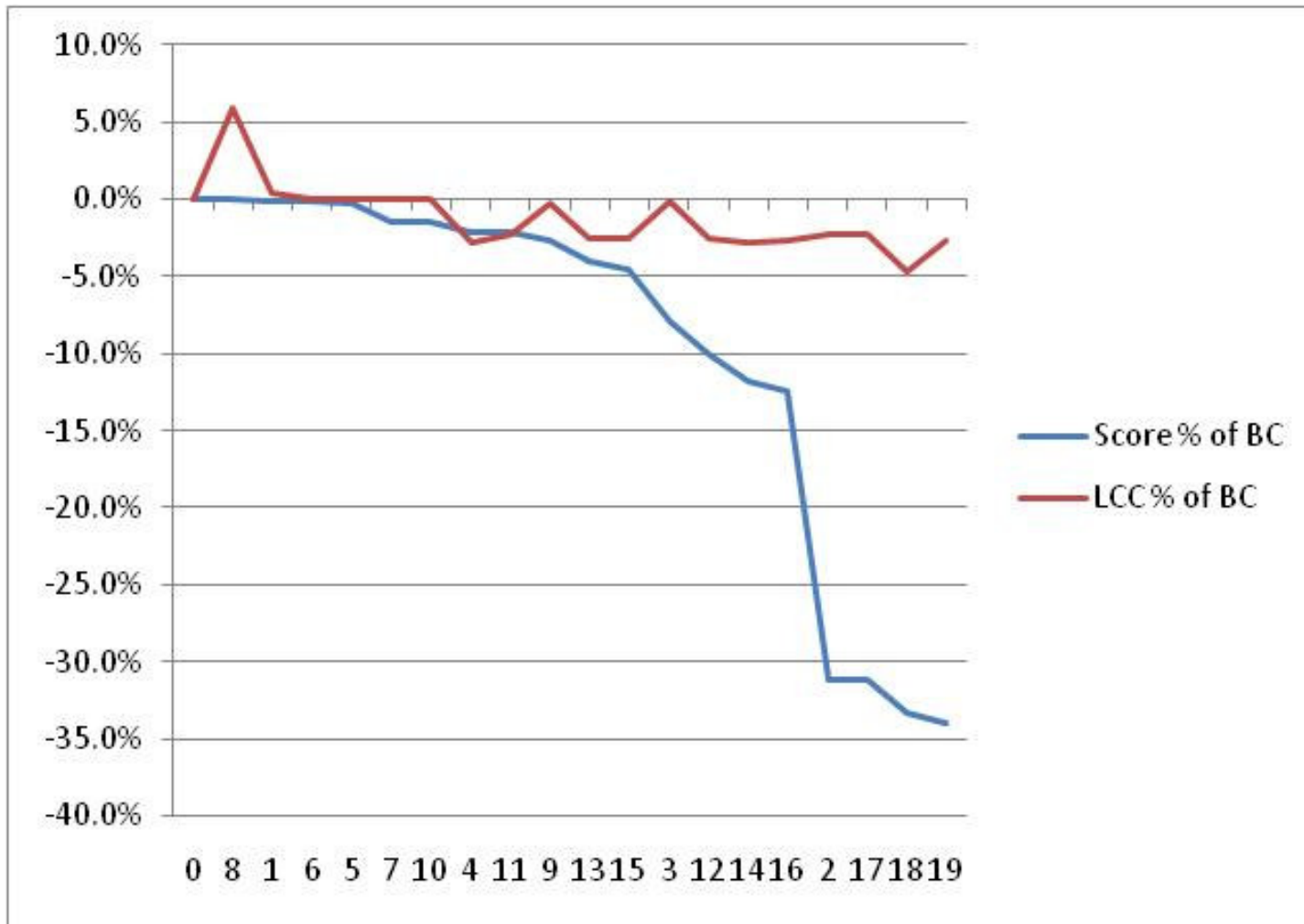
Combination of options

Option No.	Combinations	Description
11	1+4	APD feature and product lightweighting
12	3+4	Hard off-switch and product lightweighting
13	1+4+9	APD feature, product lightweighting and reusable components
14	3+4+9	Hard off-switch, product lightweighting and reusable components
15	1+4+9+(7 or 10)	APD feature, product lightweighting, reusable components and improved recycling
16	3+4+9+(7 or 10)	Hard off-switch, product lightweighting, reusable components and improved recycling
17	1+2	APD feature and operational mode requirements
18	2+4	Operational mode requirements and product lightweighting
19	2+4+9	Operational mode requirements, product lightweighting and reusable components

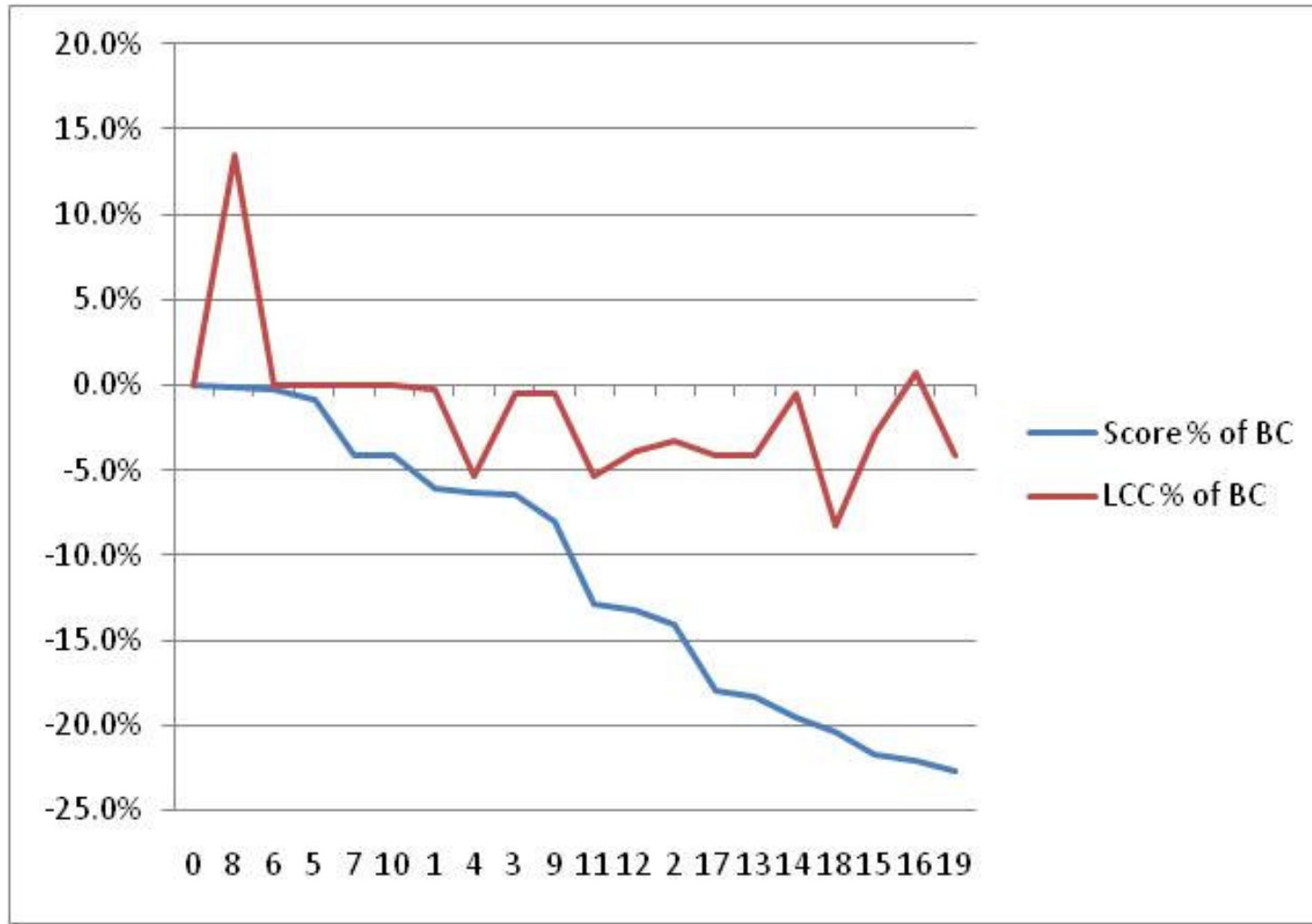
LLCC Curve – Video Recorders



LLCC for Projectors



LLCC for Games Consoles



Sensitivity analysis

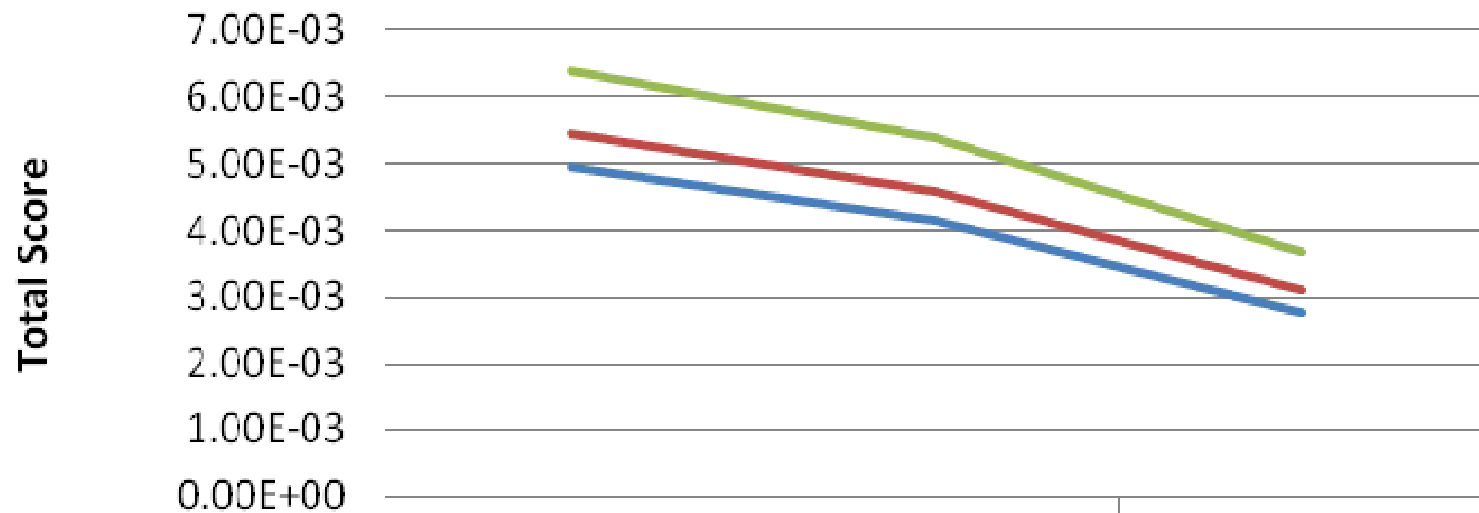
Covered:

1. Price sensitivity
2. Sensitivity to energy costs and discount factors
3. Use pattern sensitivity

Note: Changing technologies is a bigger uncertainty than our estimates for price, energy cost and use pattern uncertainties

Use Pattern Sensitivity – Video players

Video players - usage sensitivity



	2008	2014	2020
— Base case	4.96E-03	4.13E-03	2.79E-03
— 2 x on-mode	5.47E-03	4.58E-03	3.11E-03
— 2 x idle-mode	6.38E-03	5.38E-03	3.69E-03

Conclusions

A common theme exists of improvement suggestions that appear to offer the LLC point. These are:

- **Operational mode requirements**
- **Product lightweighting**
- **APD feature**
- **Reusable components**

Combination of two or more leads to the LLC point. This provides the basis upon which recommendations for policy actions have been made in Task 7