

Life Cycle Costing (LCC) – Methodological concept, applications and experiences in Europe



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LCC Workshop

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About Oeko-Institut

- also named *“Institute for Applied Ecology”* -

The Oeko-Institut is a leading European research and consultancy institution working for a sustainable future. It is a value driven non-profit-organisation and employs more than 140 staff at three locations: Freiburg, Darmstadt and Berlin.

The Oeko-Institut has five research Divisions:

- Energy & Climate Protection
- Infrastructure & Enterprises
- Nuclear Engineering & Facility Safety
- Sustainable Products & Material Flows
- Environmental Law & Governance



Definition LCC

- Assessment of all costs which are connected to the entire life cycle of a certain product.
- The costs are divided by one or more actors within this life cycle.
- By using this methodology, consumers are able to compare and evaluate alternative products and assess their economic viability.

Which costs?

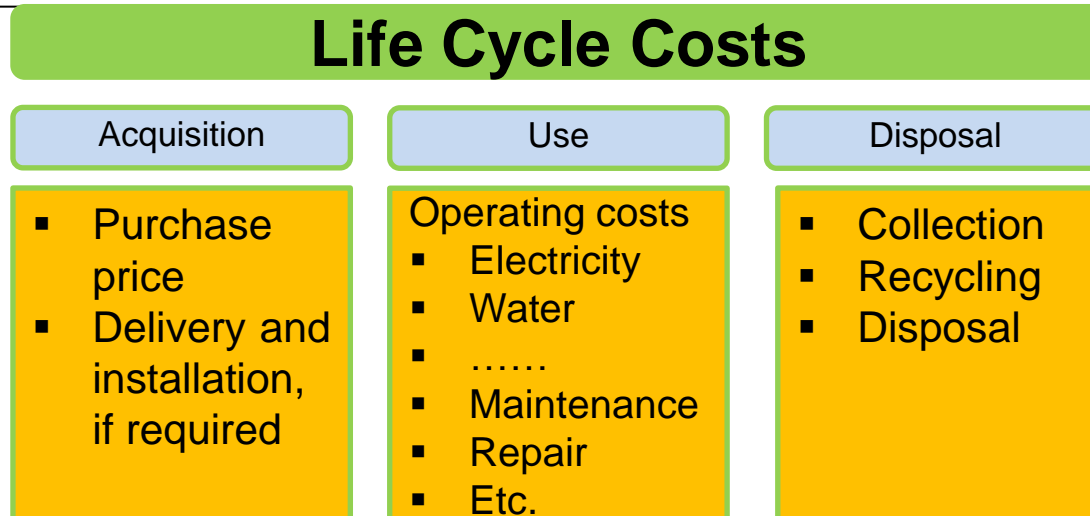
Which life cycle phase?

Which actor?



Source: [NAPA National Asphalt Pavement Association](#) 2012

LCC for public procurement departments



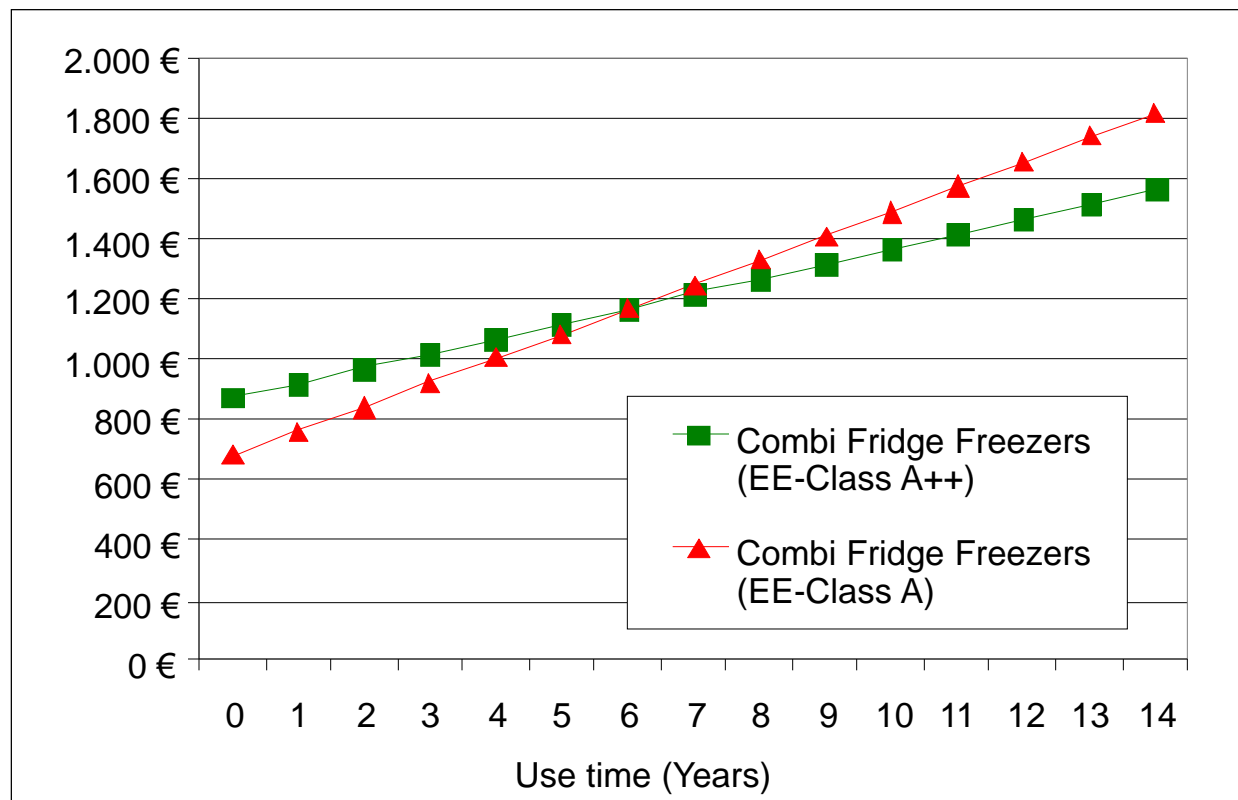
- Life cycle costs: Costs associated with a particular product over the entire life cycle of a product, borne by one stakeholder involved at a certain life cycle stage → **from the consumer's point of view**
- Operating costs: costs for electricity, water and, if necessary, other consumables which are necessary for the function of the product during the use phase and that are used up in the process → **from the consumer's point of view**

Background

- Highly efficient appliances are usually more expensive than similar conventional appliances.
- Operating costs, however, are comparable to or even lower than that of the conventional appliances.
- Operating costs, however, are generally not known to the consumer, and therefore are not considered when a purchase decision is taken → purchase price is the only cost argument in cost/benefit considerations
- Higher purchase prices with a simultaneous absence of transparency, and the lower willingness to pay more for environment-friendly products lead to relatively low market success of highly efficient appliances.

Energy Efficiency Gap

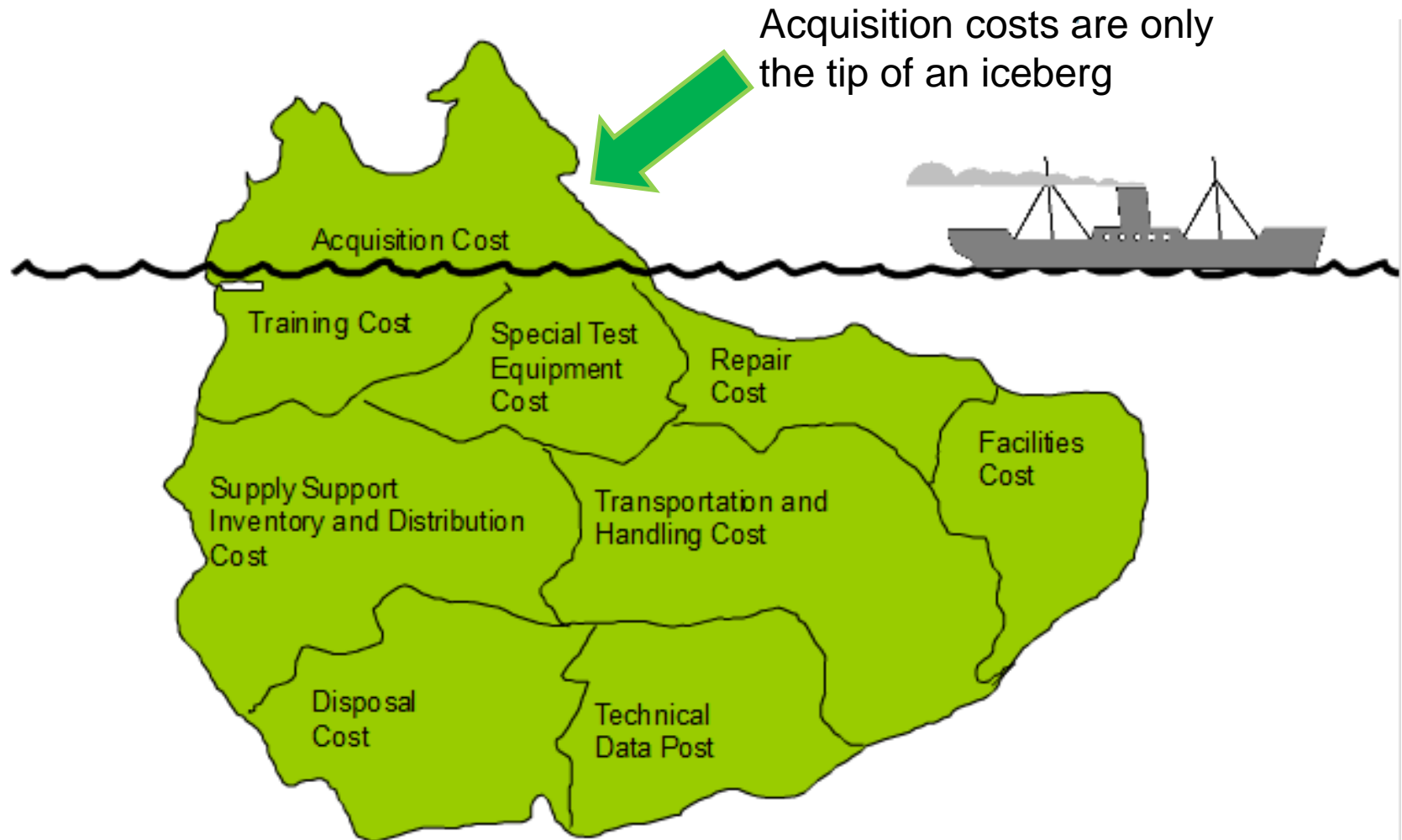
- Low market success of energy efficient appliances despite their economic benefits



Barriers for highly efficient products

- Future savings are perceived to be lower than current investment costs
- Environment is not the main criteria for purchase decisions
- Comfort factor (e.g. consumers are used to a certain brand)
- Negative image of eco-products
- High effort required to get information on benefits of environment-friendly products
- Externalities or societal costs are not reflected in the price
- Low willingness to pay a higher price for environment-friendly products
- Environment information is generally not available at the point-of-sale

General Perspective



Source: University of Nottingham

Example - Comparison of two product alternatives

Laserprinter



Canon i-SENSYS LBP
5360

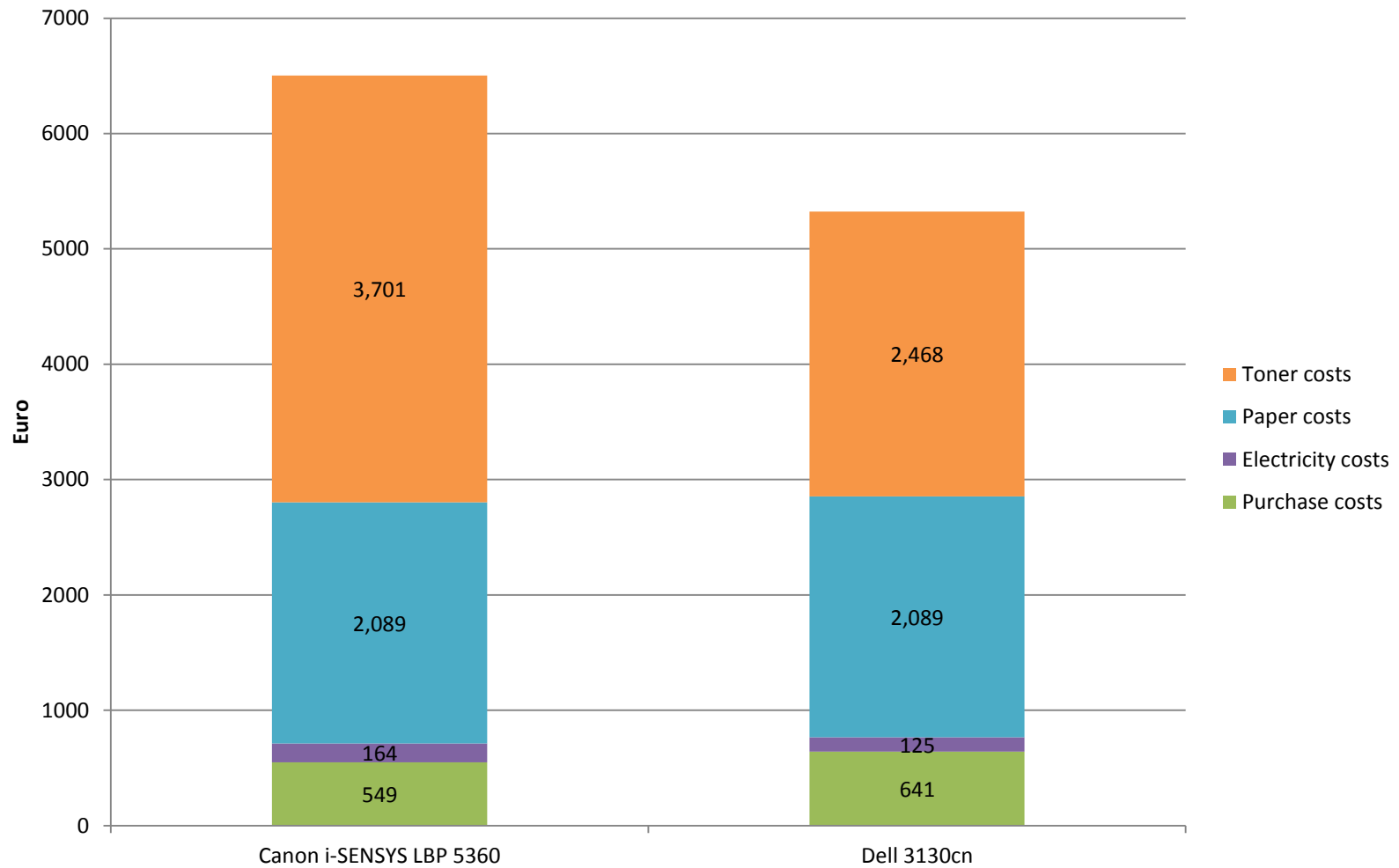


Dell 3130cn

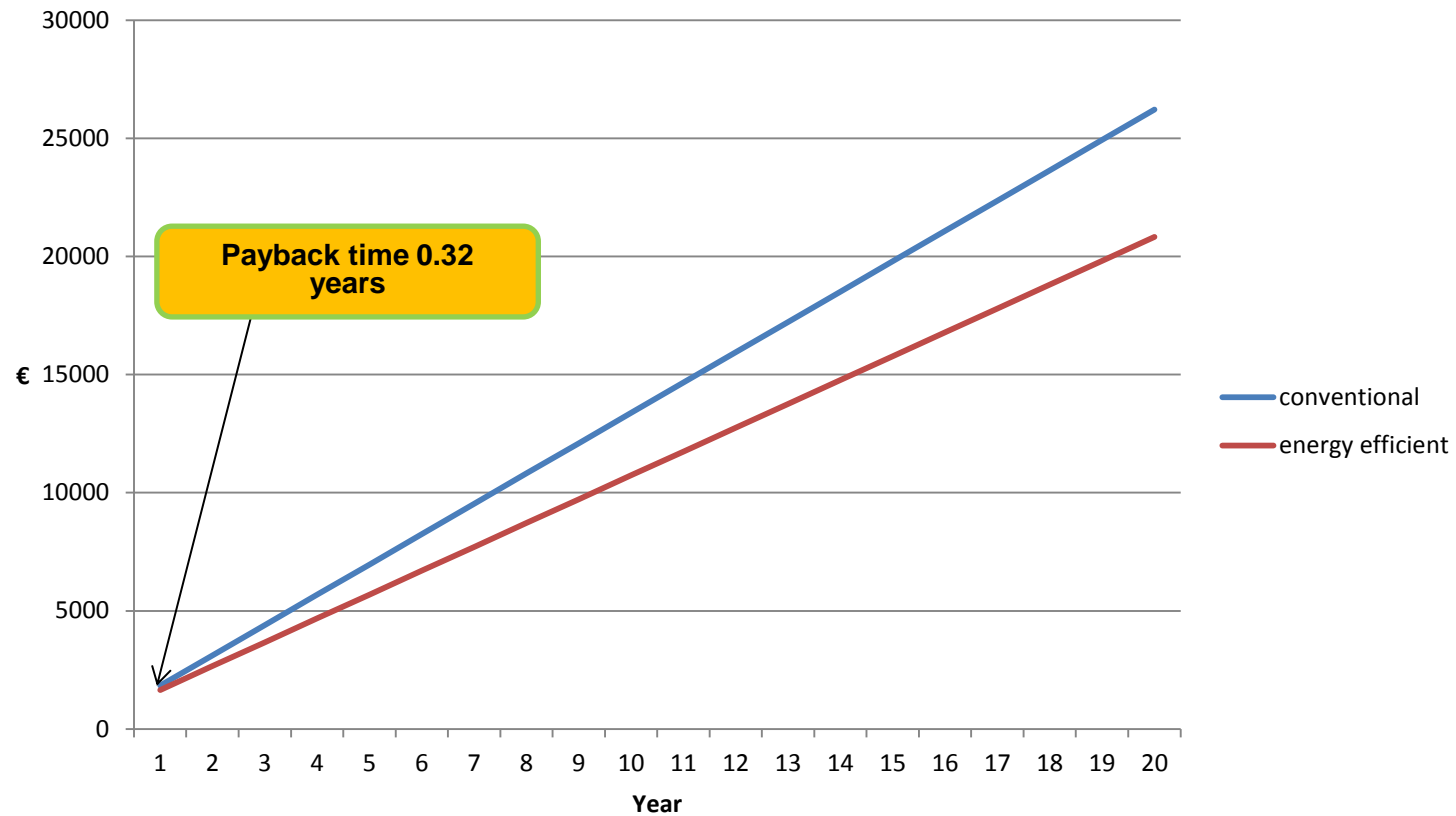
Example - Relevant (cost) data

	unit	Canon i-SENSYS LBP 5360	Dell 3130cn
Life time	years	5	5
Purchase			
Purchase costs	Euro	549	641

LCC Results – Laser printers



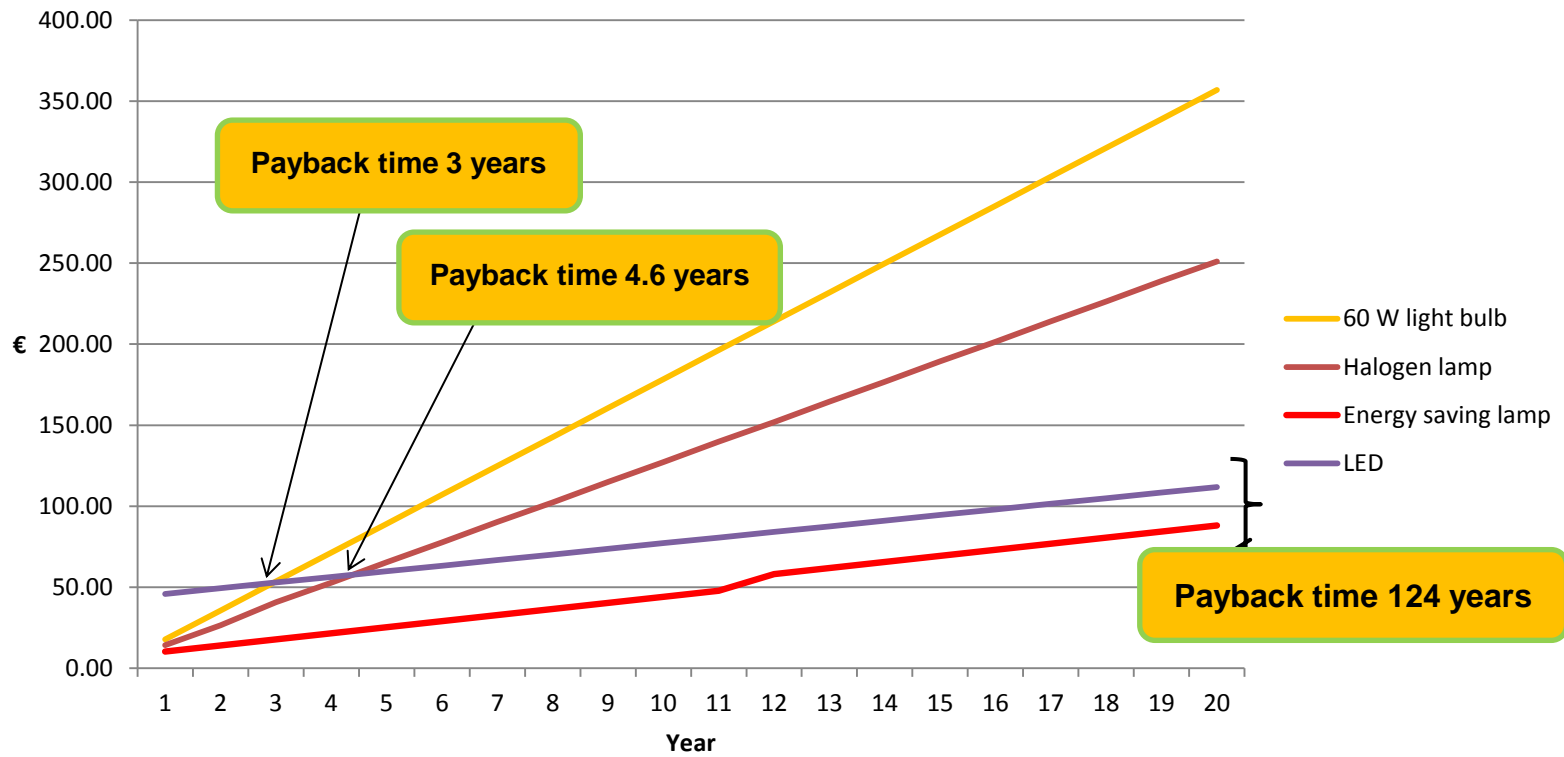
Calculation of Payback times – Laser Printer



Lighting

	Lumen	Watt	Price	Life time (hours)	Energy costs/ year
60 W light bulb	700	60	0,50 €	1.000	17,34 €
Halogen lamp	620	42	2,16 €	2.000	12,14 €
Energy saving lamp	760	13	6,50 €	11.000	3,76 €
LED	728	12	42,50 €	25.000	3,47 €

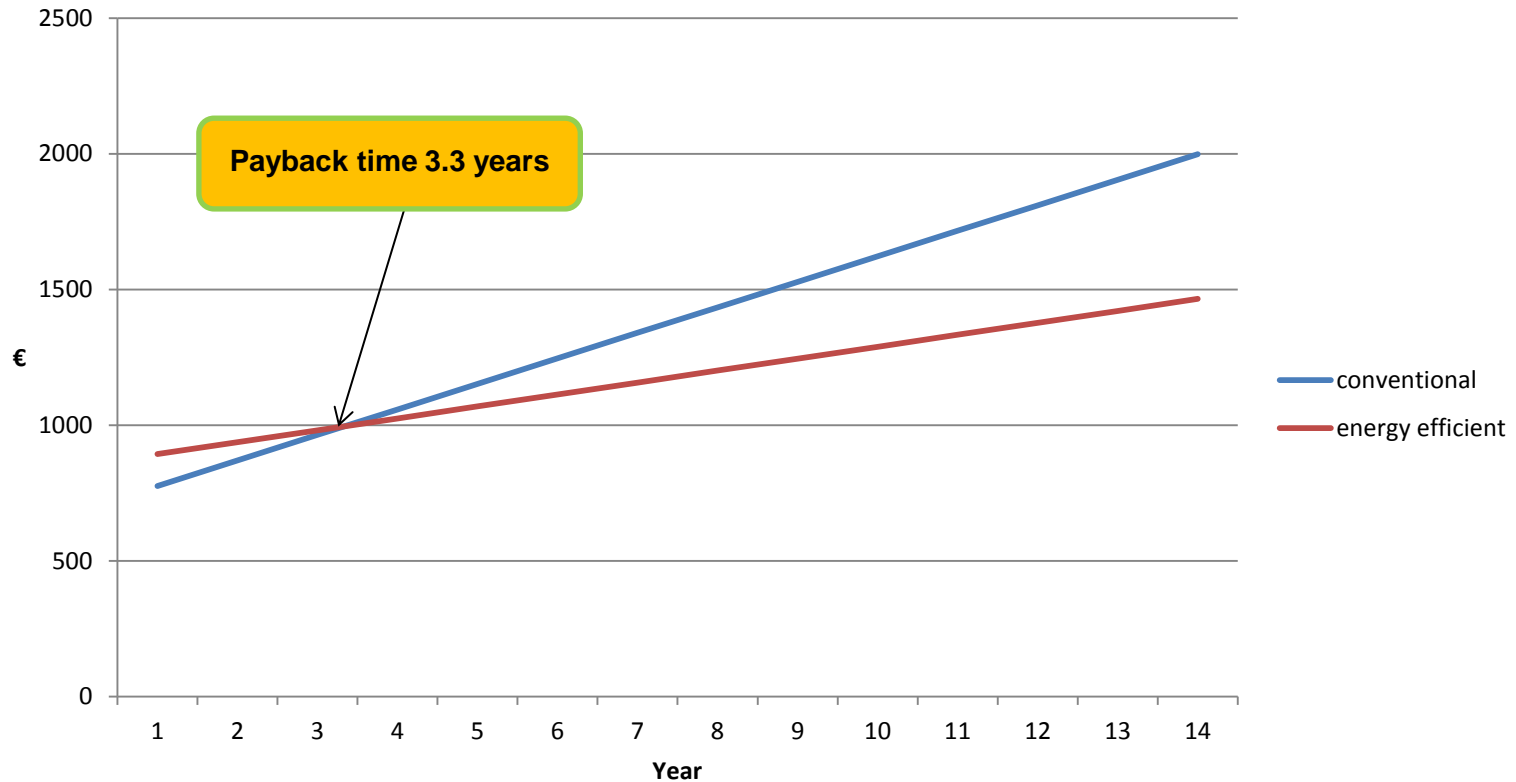
Calculation of Payback times – Lighting



Refrigerator

Product	Energy efficiency class	Capacity (fridge/freezer) l	Price	Life time (years)	Energy costs per year
Siemens KG39NVL20 (conventional)	A+	221/94	682 €	14	94 €
Bosch KGE36AW41 (energy efficient)	A+++	211/92	849 €	14	44 €

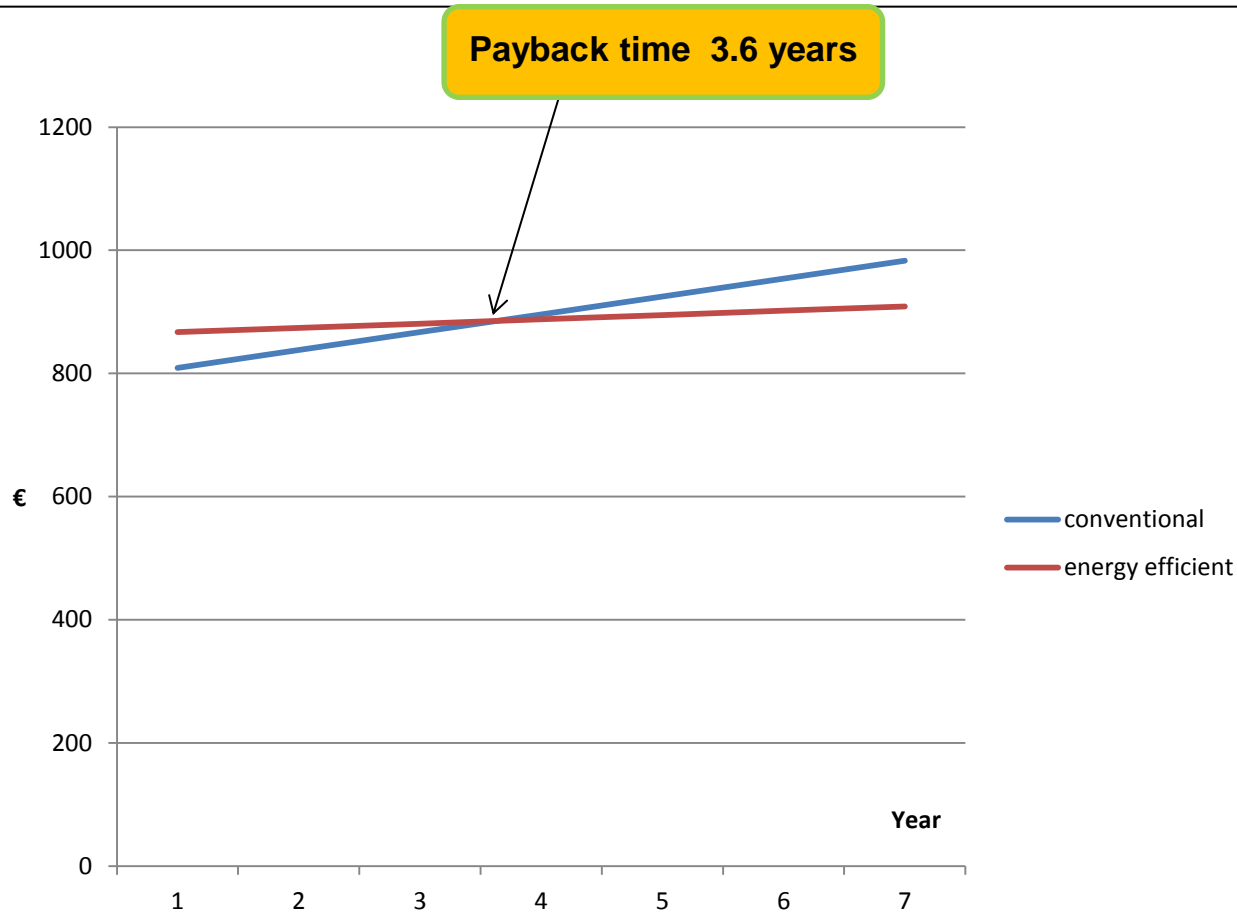
Calculation of Payback times – Refrigerator



Computer

Product	Price	Life time (years)	Energy costs per year	Maintenance costs
Average Desktop Computer	750 €	6,6	29 €	30 €
Energy efficient Desktop Computer	830 €	6,6	7 €	30 €

Calculation of Payback times – Computer



Please note: This Tool has been developed and tested with **Excel 2002 & 2003**. In order to use it with **Excel 2007**, macros have to be activated. Please, enable macros by going to Security Warning => Options => Enable this content.






LCC-CO₂ Tool

This calculation tool has been developed by Ecoinstitut Barcelona and Öko-Institut e.V. with support of ICLEI – Local Governments for Sustainability within the IEE funded project "SMART SPP - innovation through sustainable procurement". It allows you to calculate the **life cycle costs (LCC)** and **CO₂ emissions** of different products or services (from now on products) and to compare them. It particularly has been designed in order to support decision making when tendering sustainable and innovative products.


A user guide has been developed to help you use this tool. You can download it at www.smart-spp.eu.

General features of the tool

When filling in the tool with information from the different offers, remember the following rules:

-  White cells are those where you have to input data.
 -  Grey cells contain automatic calculations.
 -  Orange cells contain drop-down menus where you have to select an option.
 -  Light orange cells contain links to specific sheets where more detailed data can be provided.
 -  Green cells contain comments where further information is provided - move your mouse over the red box to see the comment.
- Error alerts are red text.

The tool often uses the option to show or hide additional rows and columns by clicking on an expansion button as shown here. This button is provided either:

-  - on top of the sheet (over the column headers A, B, C etc.) for expansion of columns or
- on the left side of the sheet (left of the row numbering) for expansion of rows.

By clicking these buttons you can e.g. show more columns for product options or more rows which provide additional input options or results.

Content of the tool

For a description of the different sheets in this tool please click on the expansion button on the left side.

LCC-CO₂ Tool

Disclaimer

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Legal Disclaimer: This tool has been drafted on the basis of research on carbon footprint and LCC calculation as well as on procurement legislation and practices across Europe. However, no legal guarantee can be given by the authors and it is therefore recommended that any public authority seek additional legal advice on a case-by-case basis.

Conclusions

- Energy efficient appliances are usually more expensive in comparison to equivalent conventional appliances
- But: their operating costs are often lower
- Operating costs are usually not known by consumers and they are not included in the purchase decision

Conclusions

- LCC can be used to put higher purchasing prices into a realistic perspective
- Energy efficient energy-using products often show monetary benefits
- (higher purchasing prices - lower operating costs)
- This could be used to convince consumers and to promote efficient appliances on the market
- LCC at consumer level could be helpful for achieving a faster market penetration for energy saving products

Thank you very much for your attention!

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