Öko-Institut e.V.
Institut für angewandte Ökologie
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Life Cycle Assessment (LCA)

Basic principles, applications and implications for GPP/GGP

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Regional Capacity Building on the application of LCA and LCC in Public Procurement,
Advancing and Measuring Sustainable Consumption and Production (SCP) for a Low-Carbon Economy in Middle-Income and Newly Industrialized Countries (Advance SCP) in Southeast Asia

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Overview

1 About LCA

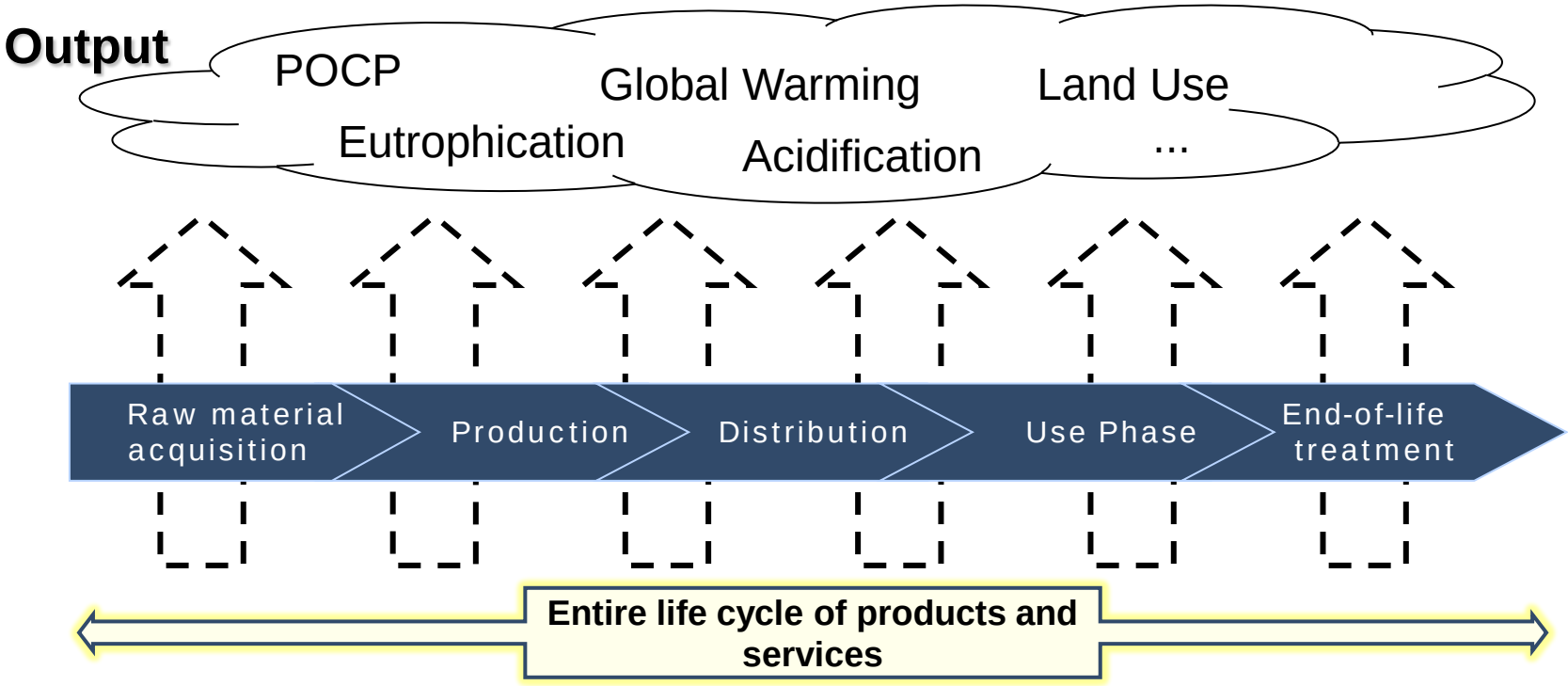
2 Methodological approach

3 Examples

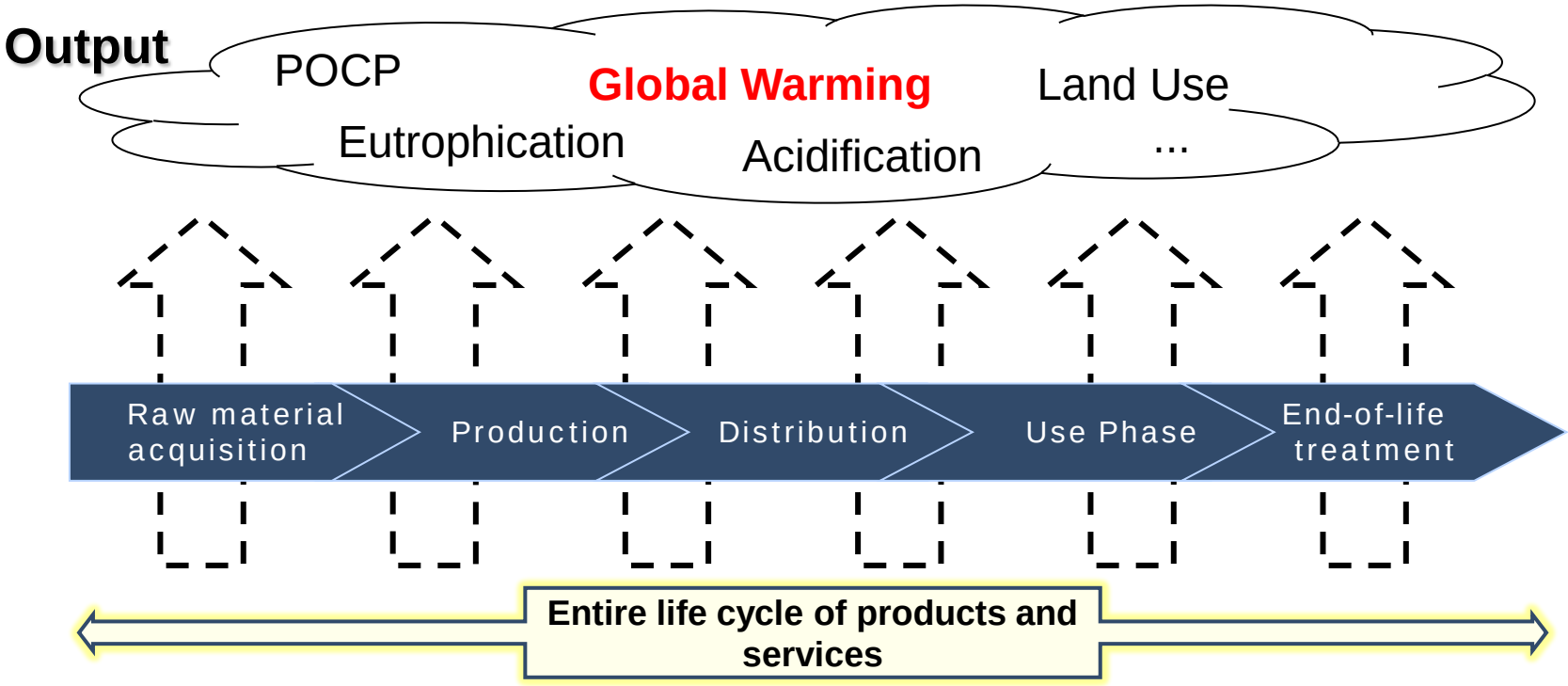
4 Recommendations and applications for GPP

5 Conclusions

Background of an LCA



Background of an LCA



Definition LCA

Which environmental burdens?

Which life cycle phase?

- Assessment of all environmental burdens which are connected to the entire life cycle of a certain product

Which actor?

- The environmental burdens are directly covered 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 ecological viability.

LCA can assist in…

- identifying opportunities to improve the environmental performance of products at various points in their life cycle,
- informing decision-makers in industry, government or non-government organizations (e.g. for the purpose of strategic planning, priority setting, product or process design or redesign),
- the selection of relevant indicators of environmental performance, including measurement techniques, and
- marketing (e.g. implementing an ecolabelling scheme, making an environmental claim, or producing an environmental product declaration).

Source: DIN EN 14040:2006: Environmental management – Life cycle assessment – Principles and framework, German and English version, October 2006

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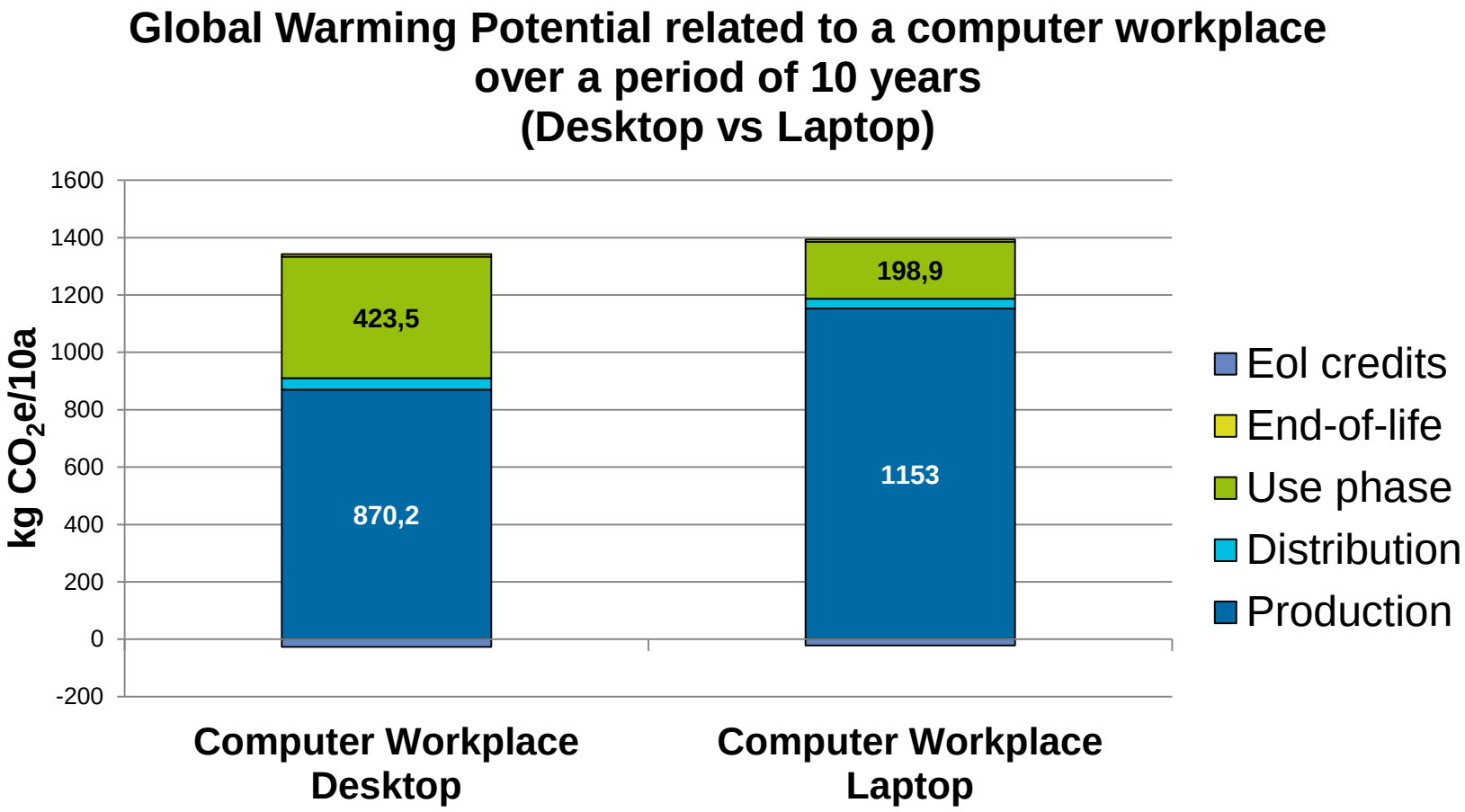
Example – Computer Workplace (Desktop vs Laptop)

	unit	Desktop	Laptop
Period under review	years	10	10
Product life time	years	5	3
Products per period under review	piece	2	3,33
Purchase			
Production (embedded emissions)	kg CO_2e/10 years	870,2	1.153
Distribution (embedded emissions)	kg CO_2e/10 years	39,4	33,7
Use phase			
Energy demand	kWh/10 years	636,8	298,9
Emission factor (electricity embedded emissions*)	kg CO_2e/kWh	0,665	0,665
Emissions in use phase	kg CO_2e/10 years	423,5	198,8
End of life			
End of life treatment	kg CO_2e/10 years	9,6	8,1
Recycling credits	kg CO_2e/10 years	-27,0	-22,0
Sum	kg CO_2e/10 years	**1316**	**1372**

*Emission factor for German ecletricity mix

Example – Desktop-PCs vs Notebooks

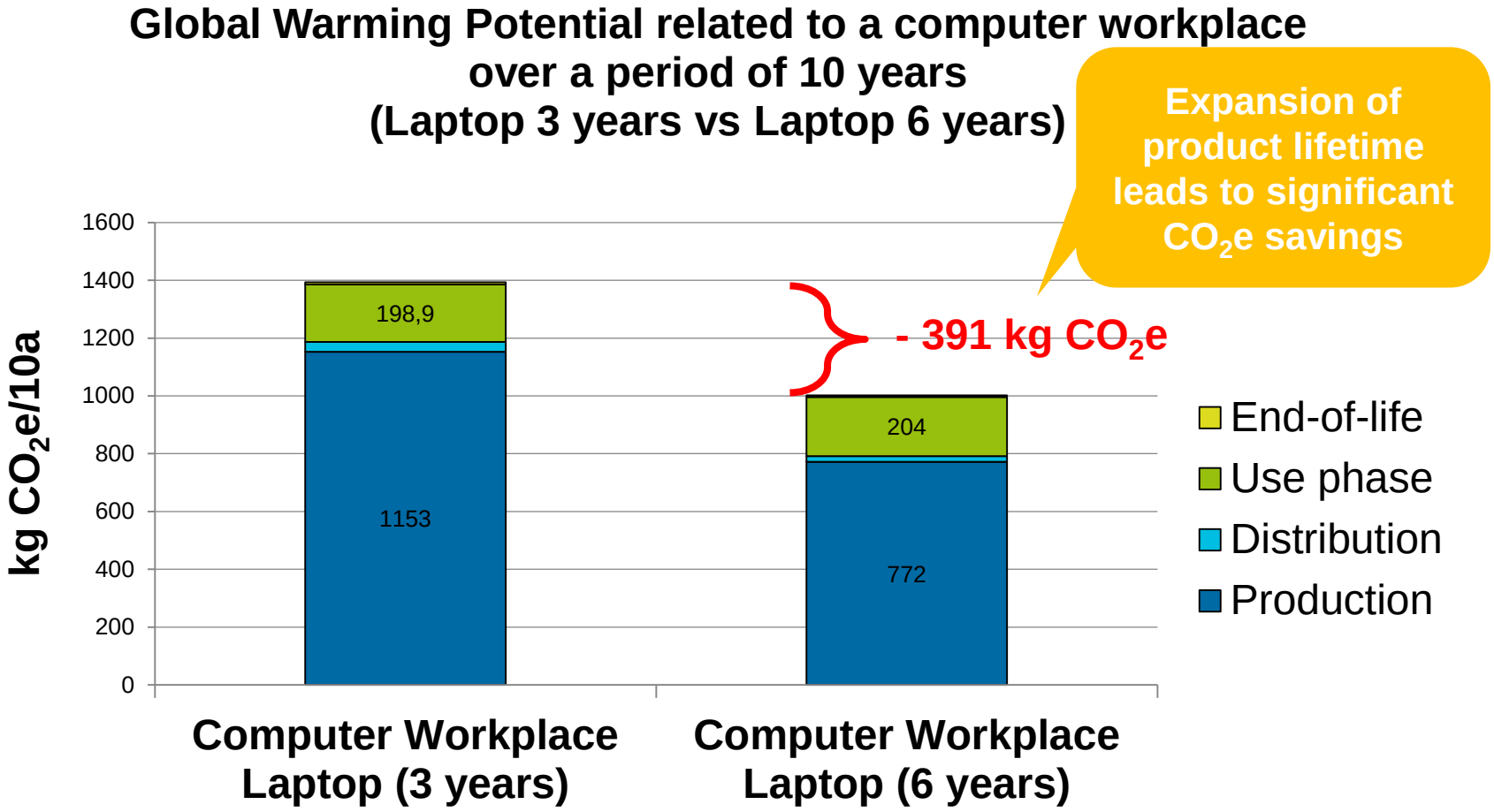


Example – Computer Workplace (Desktop vs Laptop)

	unit	Laptop	Laptop
Period under review	years	10	10
Product life time	years	3	**6**
Products per period under review	piece	3.33	**1,67**
Purchase			
Production (embedded emissions)	kg CO_2e/10 years	1,153	**772**
Distribution (embedded emissions)	kg CO_2e/10 years	33.7	**20.1**
Use phase			
Emissions in use phase	kg CO_2e/10 years	198.8	**204.0**
End of life			
End of life treatment	kg CO_2e/10 years	8.1	**6.3**
Sum	kg CO_2e/10 years	**1394**	**1003**

*Emission factor for German ecletricity mix

Example – Desktop-PCs vs Notebooks



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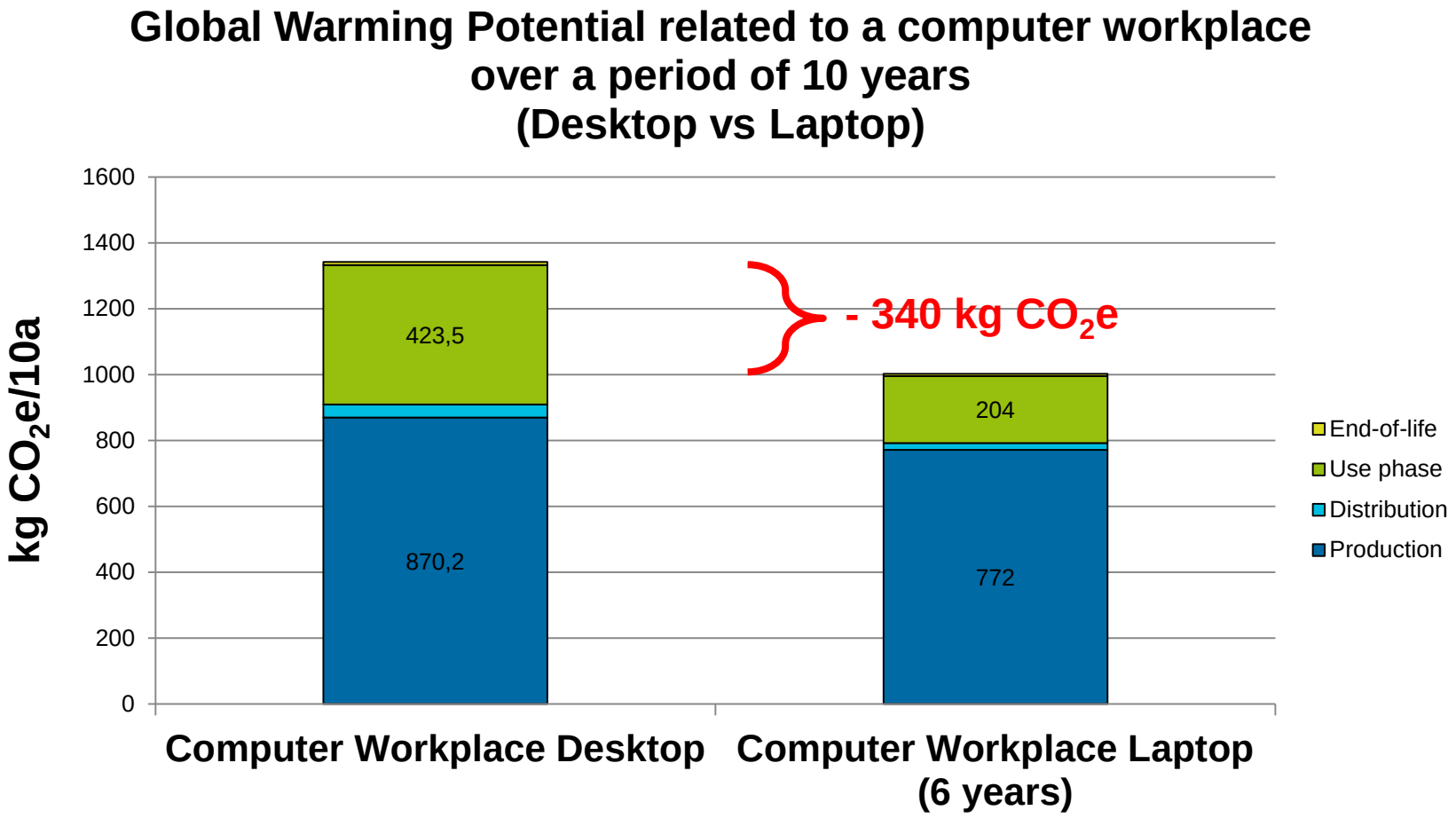


LCA for public procurement departments

Life Cycle Assessments

Acquisition

- Embedded environmental burdens through production
- Environmental burdens through delivery and installation, if required

Use

- Environmental burdens through operation:
  - Electricity
  - Water
  - ……
  - Maintenance
  - Repair
  - Etc.

Disposal

- Environmental burdens through EoL-Treatment:
  - Collection
  - Recycling
  - Disposal

Key challenges for application of LCA

- LCA must rely on sufficient data / data basis
  - data availability
  - data quality assurance
  - à Compilation of data is the most time-consuming part of a full scale LCA-project
- LCA needs experts (skills and maybe digital infrastructure)
  - Skilled staff / external consultants
  - Software tools / access to databases (some of which proprietary)
- LCA results need carefull interpretation

Limitations of LCA for use in procurement

- Too complex to be applicable on a daily basis
  - Enormous data requirements and uncertainties
  - Decisions based on single analyses can be challenged legally
- Evaluation/interpretation depend strongly upon value choices
  - e.g. estimation of relevant parameters (e.g. product life time, crediting for recycling)
- Applicable and well-proven LCA results do not exist for all products
- Environmental impacts are often uncertain.

Recommendations for action

- Search for LCA-studies on products you want to purchase; but always make sure that the studies' results are applicable in your special context.
- Ecolabel use findings from LCA studies to define product specific eco-performance criteria
- If you have any concerns on the applicability of LCA results you should use ecolabel certification criteria.

Ecolabels can help in GPP

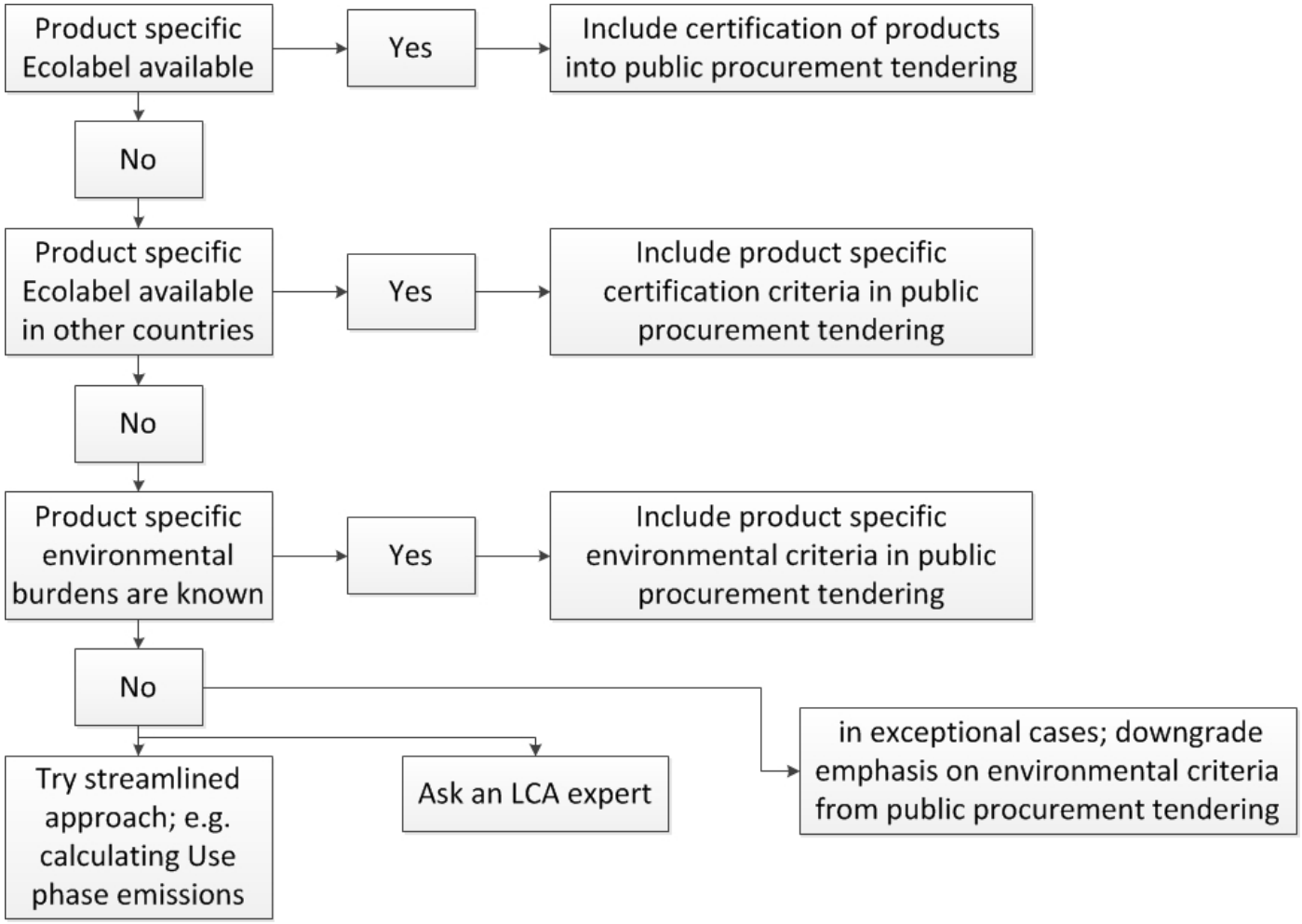
- Developing environmental criteria for tendering
  - Independent ecolabels provide excellent source for finding criteria
  - Environmental criteria underpinning independent ecolabels have been based on solid scientific evidence and in co-operation with relevant stakeholders.
- Verifying the environmental performance of products
  - As long as environmental criteria set in the tendering are the same (or less ambitious) than those defined in an ecolabel, and the product carries this ecolabel, this is a simple and reliable way for the procurer to check compliance.
  - If the products don't have an ecolabel, make sure that the tenderer provides reliable proof of compliance.

Recommendations for action

- There exists a toolkit for GPP priority product groups, including GPP criteria for:
  - Cleaning products and services
  - Construction
  - Copying and Graphic paper
  - Electricity
  - Food and Catering services
  - Furniture
  - Gardening products and services
  - Office IT equipment
  - Textiles
  - Transport

Available online via URL: http://ec.europa.eu/environment/gpp/toolkit_en.htm

Decision tree



Conclusions on the use of LCA in GPP

- LCA results maybe used for informing decision-makers in GPP
- Applicable and well-proven LCA results do not exist for all products relevant for procurement
- The (direct) costs of conducting product specific LCAs are rather high
- Independent ecolabels provide excellent source for developing environmental criteria for tendering.
- Also already existing toolkits for GPP maybe used as source for developing environmental criteria for tendering

Thank you for your attention!

Do you have any questions?

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