



The need for a **comprehensive and consistent approach** in sustainability assessment of buildings - **the EC Product Environmental Footprint**

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Who are we and what do we do?

The JRC is the European Commission's in-house science service. It provides the science for policy decisions, with a view to ensuring that the EU achieves its Europe 2020 goals for a productive economy as well as a safe, secure and sustainable future.

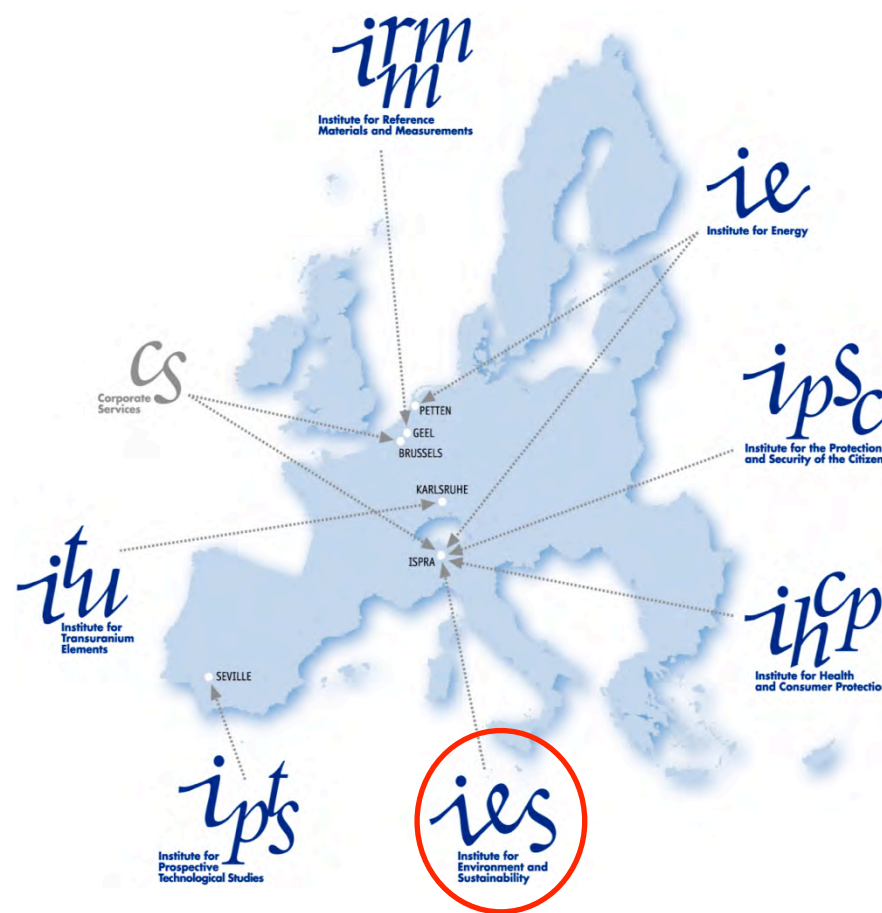
The JRC plays a key role in the European Research Area and reinforces its multidisciplinary by networking extensively with leading scientific organisations in the Member States, Associated Countries and worldwide.



The JRC inside the European Commission

European Commission,
Joint Research Centre (JRC),
Institute for Environment and
Sustainability (IES)

"The mission of the IES is to provide scientific-technical support to the European Union's policies for the protection and sustainable development of the European and global environment"





Proliferation of sustainability claims

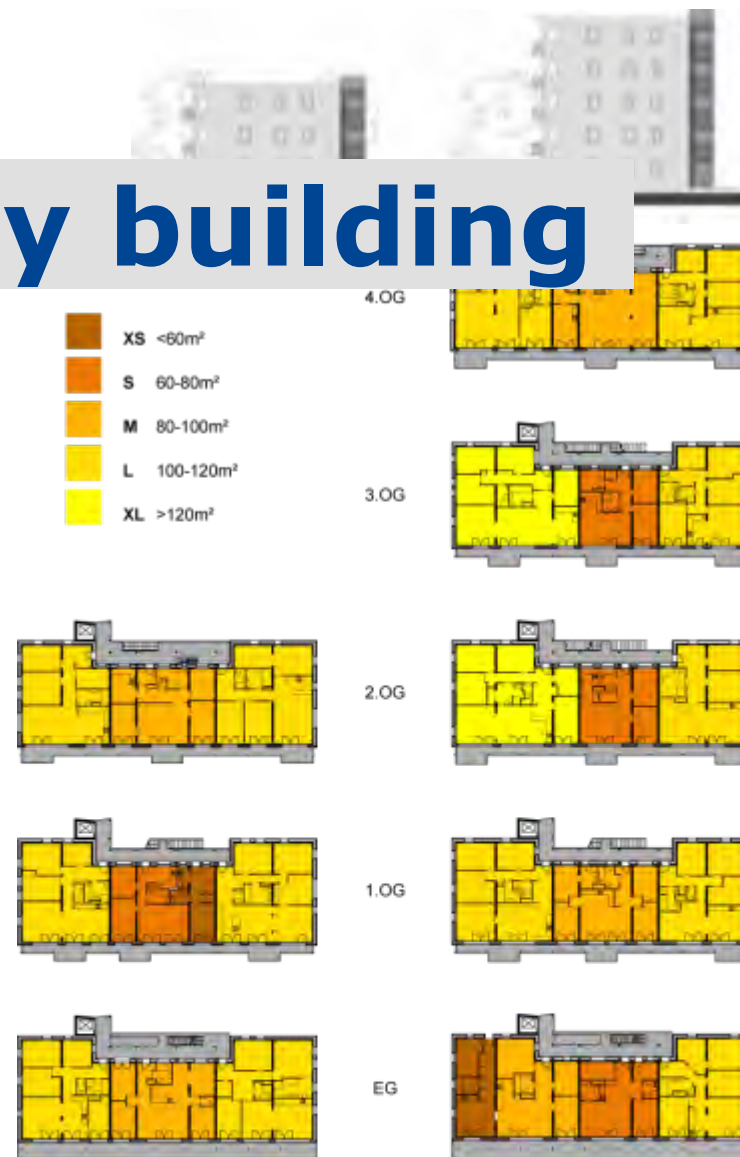


Passive House

Ecological passive house



Net zero energy building





CO₂ neutral building



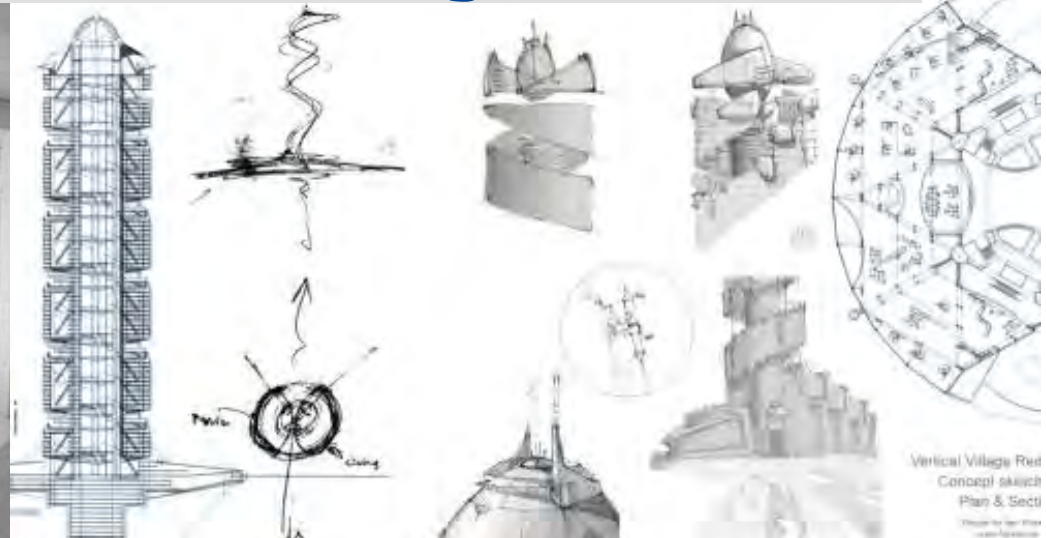


Solar self-sufficient





Autonomous object



Vertical Village Red
Concept sketch
Plan & Sect
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Energy autonomous city





Mixed use carbon-neutral development





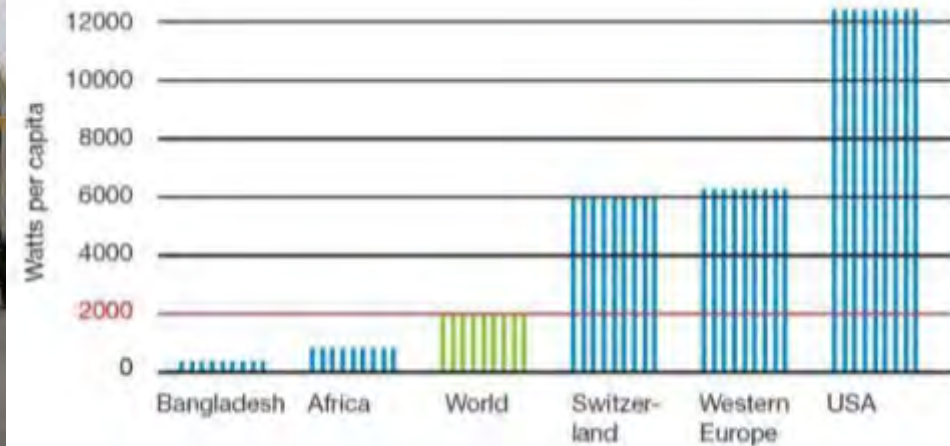
Eco village



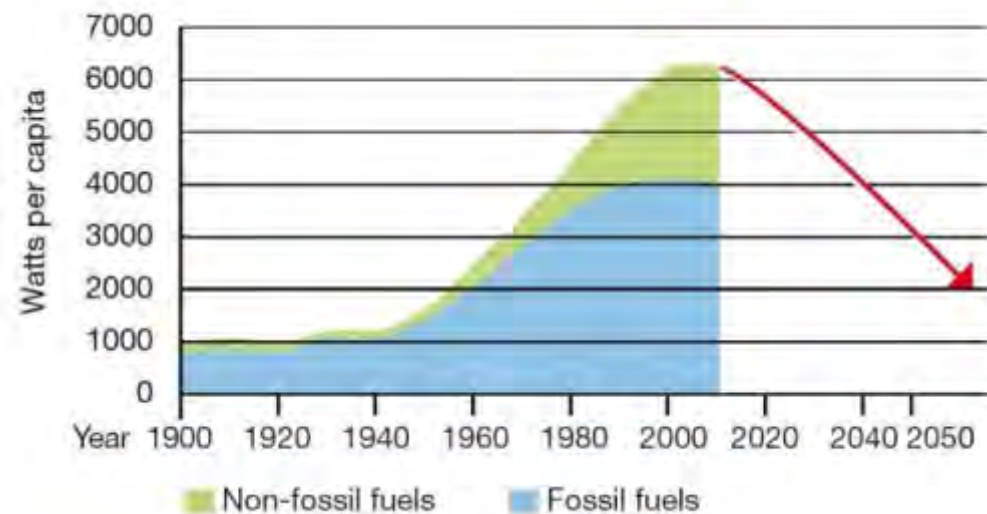
September 2013



Zürich



2000 Watt City



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➡ Main focus on **energy and CO₂** during the **use stage**

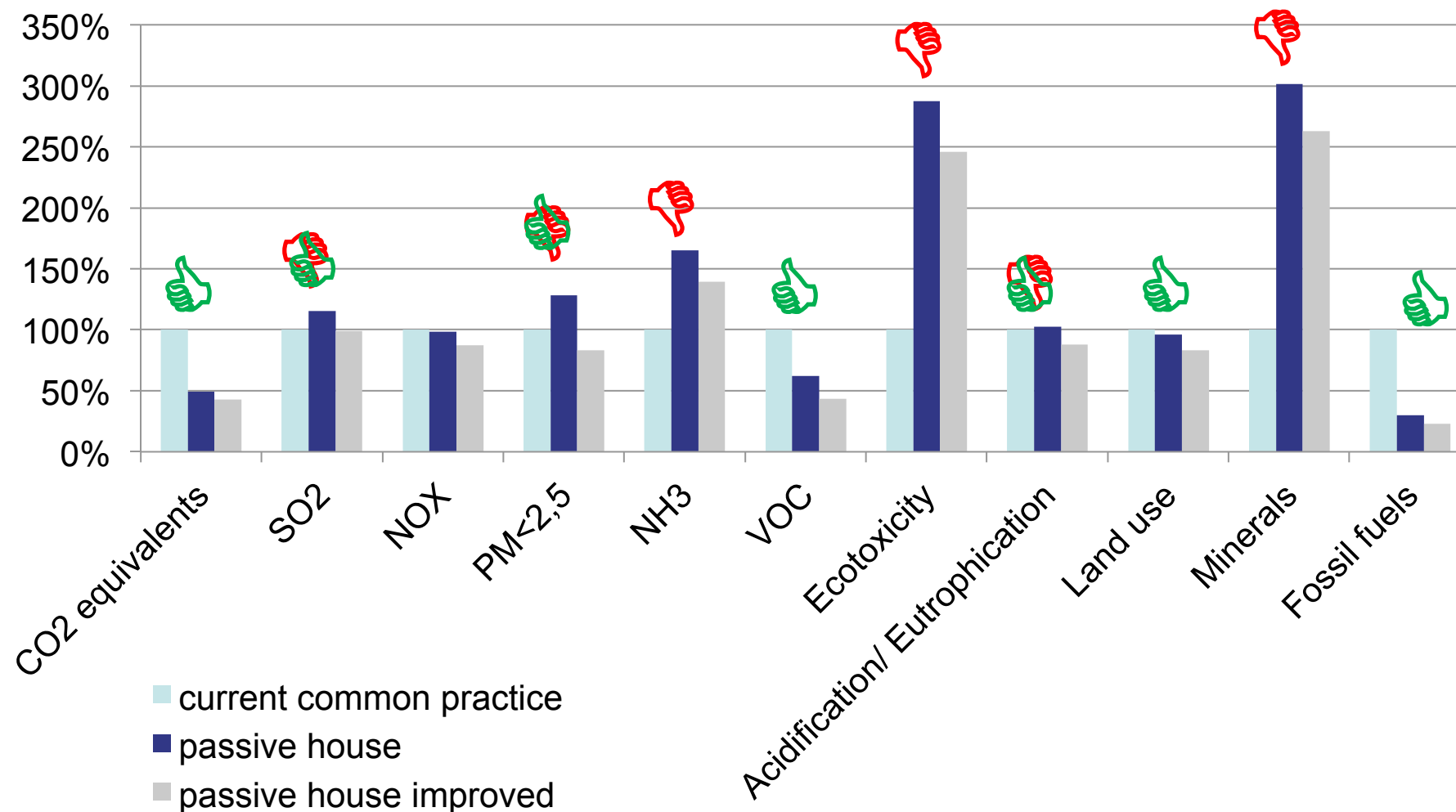
Important step forward as energy during use was highest priority

➡ Danger of “**burden shifting**”:

- Other impacts than global warming
- Other life cycle stages

➡ Need for a **more holistic perspective**

Holistic approach



More comprehensive sustainability labels for buildings



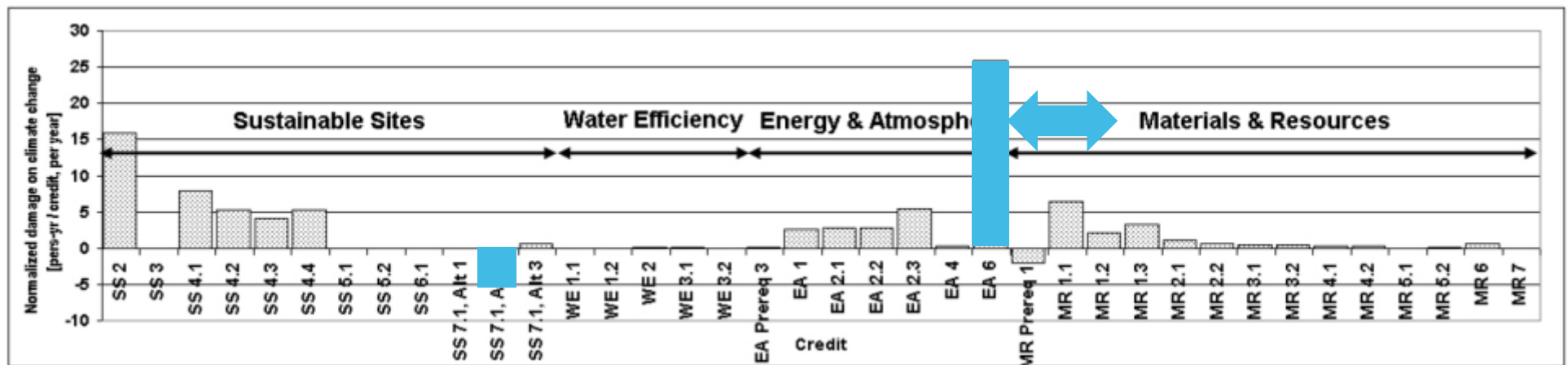
“scoring” systems

- Multi-criteria analysis **associating scores to a number of criteria** covering a wide range of sustainability issues such as energy, materials, water and comfort
- Rates are assigned to minimum scores
- Example of LEED



Linked? Double counting?

LEED: analysed based on LCA



Burden instead of benefit!

(Humbert et al. 2006)

Importance of 1 based on LEED has an importance of > 25 based on LCA



Current certification systems

- ➡ Important in terms of comprehensiveness and awareness raising
- ➡ Do not guarantee sustainable buildings
- ➡ Need for **more consistent and rigid LCA method** for the determination of the environmental benefits assigned to each building measure and the relative importance of each of the measures
- ➡ Consistency over the different building types, but also over the different EU Member States would be beneficial in terms of **transparency and comparability**



EC Environmental Footprint as a common method to calculate the life cycle environmental impact of products and organisations

- ✓ **Sustainable Consumption and Production Action Plan, 2008:**
"To implement this policy, consistent and reliable data and **methods are required to assess the overall environmental performance of products ...**" ;
- ✓ **The Resource Efficiency Roadmap, 2011:**
Establish a **common methodological approach** to enable Member States and the private sector to assess, display and benchmark the environmental performance of products, services and companies based on a comprehensive assessment of environmental impacts over the life-cycle ('environmental footprint')
- ✓ **Building the Single Market for Green Products, 2013:**
Commission Communication and Recommendation **related to** the Product Environmental Footprint and Organisation Environmental Footprint to "improve the availability of **clear, reliable and comparable** information on the **environmental performance of products and organisations** to all relevant stakeholders, including to players along the entire supply chain."



EC PEF method: LCA based method with

- **FULL SCOPE**

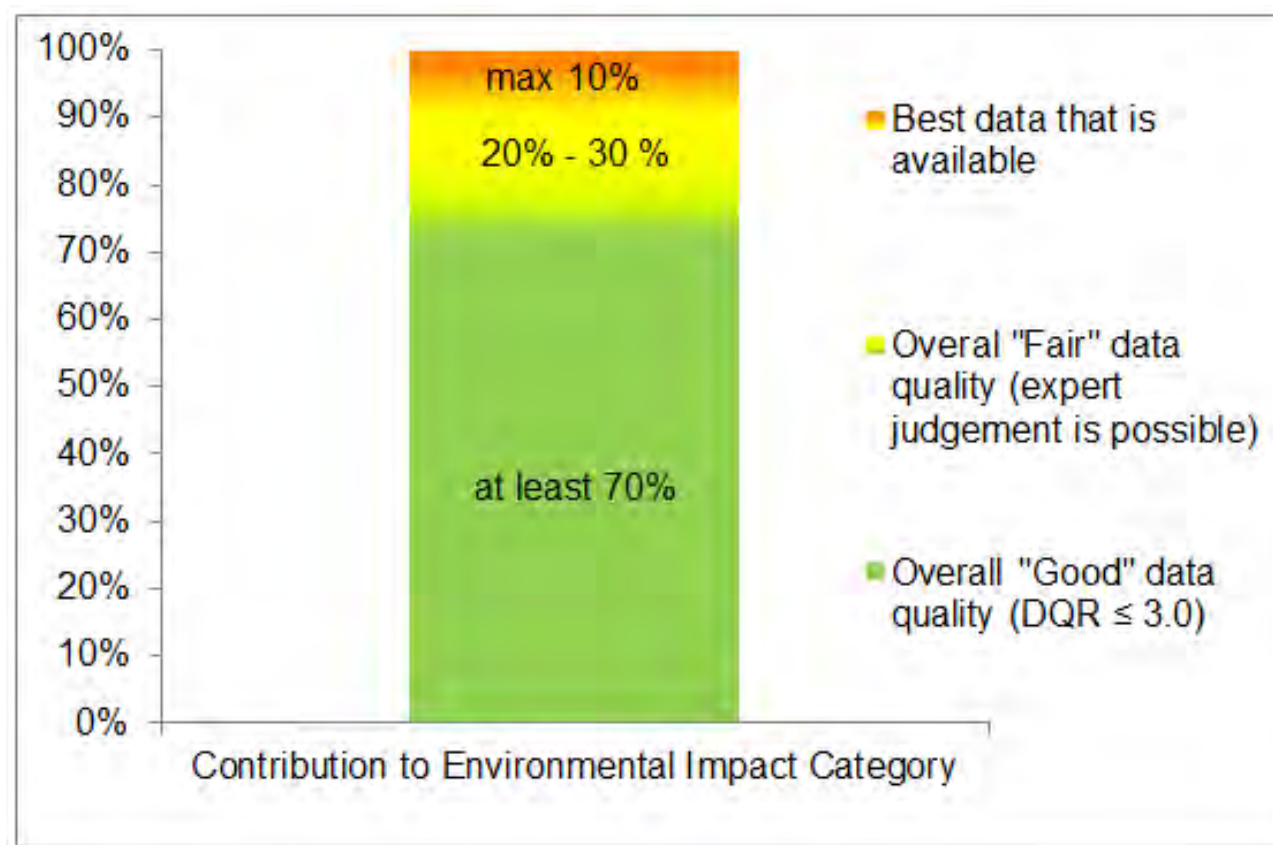
- all products including construction products
- all life cycle stages
- comprehensive list of environmental impact categories

- **HIGH LEVEL OF PRESCRIPTIVENESS**

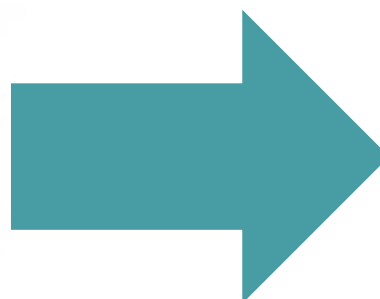
essential to obtain more consistent and comparable results

- nomenclature
- data quality
- allocation (co-products and EoL)
- cut-off
- impact assessment
- biogenic carbon removals and emissions
- temporary carbon storage

Strict data quality requirements



Impact assessment: multi-criteria

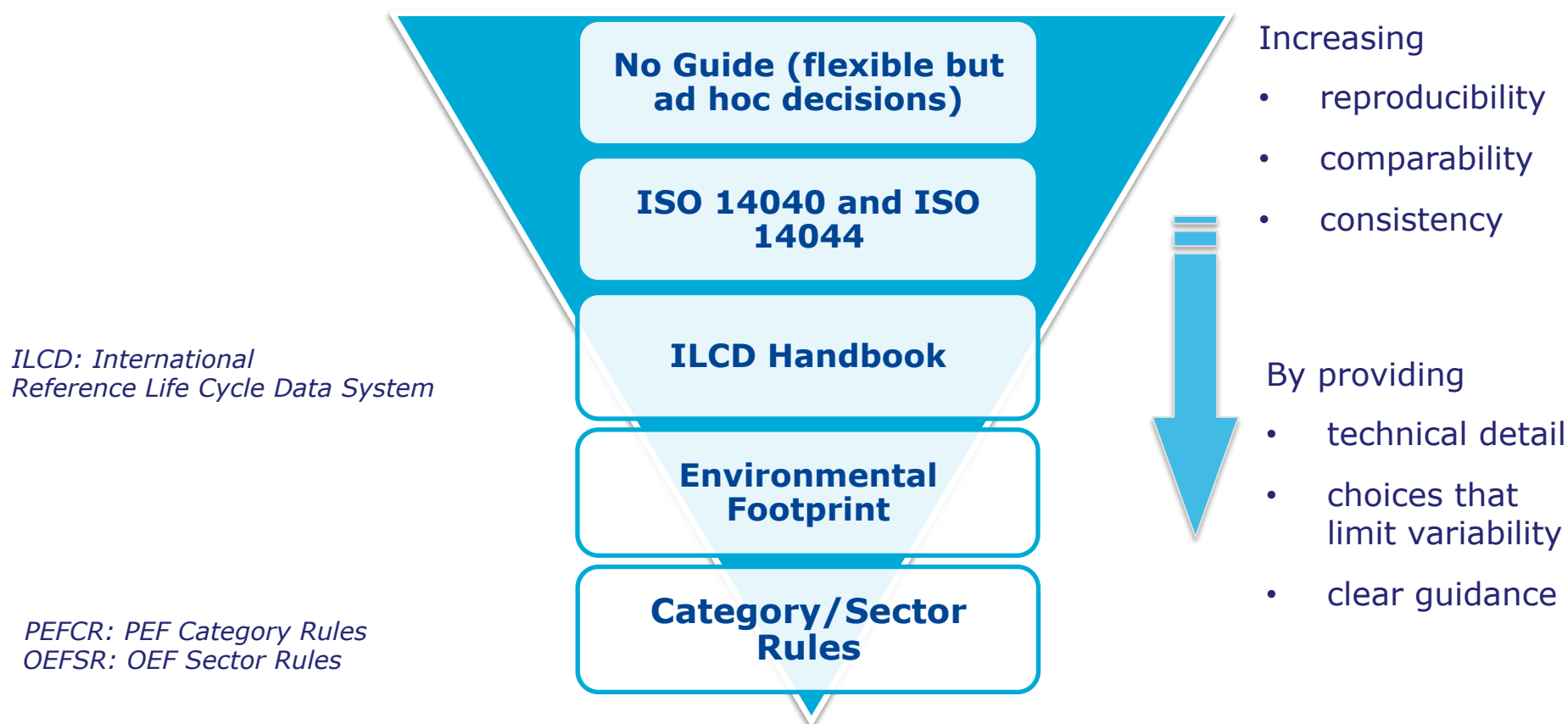


Environmental Footprint Impact Category
Climate Change
Ozone Depletion
Ecotoxicity – aquatic, freshwater
Human Toxicity – cancer effects
Human Toxicity – non-cancer effects
Particulate Matter
Ionising Radiation – human health
Photochemical Ozone Formation
Acidification
Eutrophication – terrestrial
Eutrophication – aquatic
Resource Depletion – water
Resource Depletion – mineral, fossil & renew.
Land Use



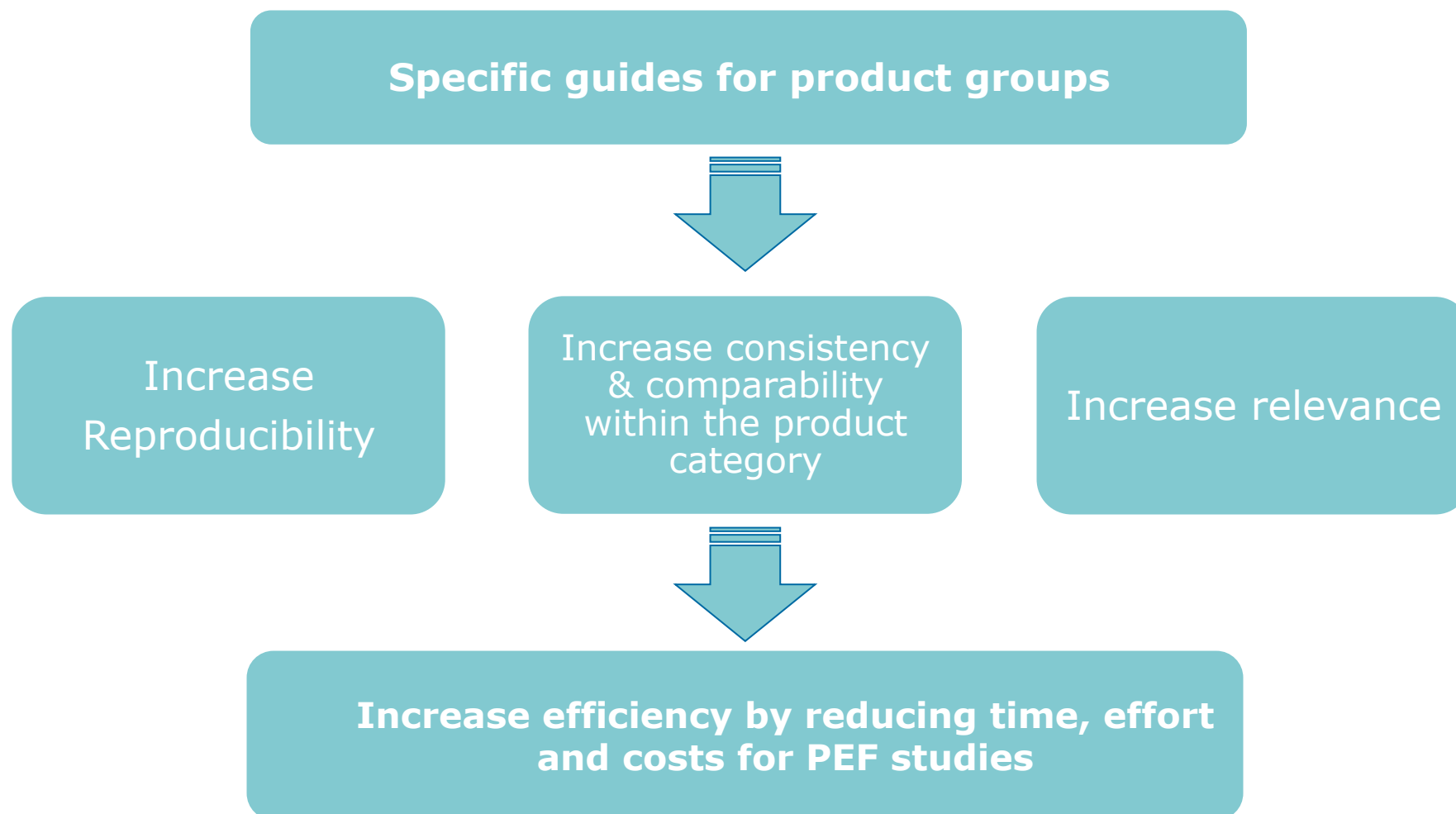
The EC PEF/OEF method and PEFCRs / OEFSRs

Hierarchy of methods





PEF Category Rules (PEFCRs)





Construction products: CEN standards

In 2004 the Standardisation Mandate M/350 was addressed to CEN for the development of horizontal standardised methods for the assessment of the integrated environmental performance of buildings. The work has been allocated to CEN/TC 350.

Several standards developed, amongst others:

- EN 15804 - Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products
- EN 15978 - Sustainability of construction works - Assessment of environmental performance of buildings - Calculation method



Different methods for different scopes

EN 15804:2012

- **core** Product Category Rules for all construction products and services.
- organised in **modules** covering different life cycle stages. The indicators declared in the individual information modules of a product life cycle **shall not be added up** into a total or sub-total of the life cycle stages.
- Declarations based on EN 15804 are **not comparative assertions**.

PEFCRs

- Provide specific rules to calculate the **PEF for a certain product group**, including benchmark and, if appropriate, performance grades.
- Each PEFCR **focuses on** the **most relevant life cycle stages, processes and impact categories** for the product group in scope.
- A declaration compliant with a PEFCR **can be used to make comparisons and comparative assertions**.



The way forward

- Based on preliminary analysis of some existing EPDs prepared in line with EN 15804, the work to be done to align the two methods would not be too difficult
- The European pilot phase would be an excellent chance to work collaboratively so that, at the end of it, the EN 15804 might be modified to align to PEF and PEF could be modified to take into account the lessons learned from the pilot phase
- Companies and trade associations active in the construction sector are invited to openly and “constructively” participate in the European pilot phase, possibly leading some pilots on construction products of higher relevance or maturity in terms of EPDs.

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Life Cycle Thinking and Assessment
European Commission >> JRC >> IES >> LCT

Welcome to Life Cycle website.

Thinking Assessment

Home LCT | Sectors | Approaches | Glossary | News archive | LCT forum | Terminology |

Our thinking - life cycle thinking



Life Cycle Thinking (LCT) seeks to identify possible improvements to goods and services in the form of lower environmental impacts and reduced use of resources across all life cycle stages. This begins with raw material extraction and conversion, then manufacture and distribution, through to use and/or consumption. It ends with re-use, recycling of materials, energy recovery and ultimate disposal.

The key aim of Life Cycle Thinking is to avoid burden shifting. This means minimising impacts at one stage of the life cycle, or in a geographic region, or in a particular impact category, while helping to avoid increases elsewhere. For example, saving energy during the use phase of a product, while not increasing the amount of material needed to provide it.

[Read more...](#)

Our common goal - sustainable consumption and production

The products we buy and use every day contribute to our comfort and well-being. However, awareness of the unsustainable levels of resource consumption and the significant impacts of these products on the environment is growing among consumers, policy makers and business.

Life Cycle Thinking seeks to identify possible improvements to goods and services in the form of lower environmental impacts and reduced use of the resources across all life cycle stages.

[Read more...](#)

Shortcuts

News

New ELCD Released
[20.02.2013]

Final Report EcoDesign Project
[19.12.2012]

EXPERT WORKSHOP: Security of Supply and Scarcity of Raw Materials
[13.11.2012]

Life cycle indicators framework and reports
[19.10.2012]

JRC Reference Report on ILCD Handbook online
[11.05.2012]

LCA Characterisation Factors
[01.03.2012]

ILCD recommended LCA methods - final version released in November 2011
[20.12.2011]

Thank you for your attention! Questions?

Further links and contact:

JRC website:

<http://ec.europa.eu/dgs/jrc/index.cfm>

IES website:

<http://ies.jrc.ec.europa.eu/>

Sustainability Unit (H08) website:

<http://ies.jrc.ec.europa.eu/the-institute/units/sustainability-assessment-unit.html>

LCA/LCT website:

<http://lct.jrc.ec.europa.eu/>

Environmental Footprint guides:

http://ec.europa.eu/environment/eusss/product_footprint.htm

Email: LCA@jrc.ec.europa.eu

Acknowledgments:

Part of the developments on the PEF have been financed by DG ENV by means of an Administrative Arrangement.