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EXPERIENCE

2,000+

Combined years of knowledge and expertise

2,500+

customers globally

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DOMAIN KNOWLEDGE

All Sustainability domains covered



Sustainable Businesses

Sustainable Products

Sustainable Supply Chains

Sustainable Cities



Material & Substance Compliance

INDUSTRY KNOWLEDGE

Market specialists in over 20 verticals

Global presence

Agenda

1. What is benchmarking?
2. Benchmarking with what?
3. Essentials for Benchmarking
4. Benchmarking with Indicators
5. Examples of Benchmarking

What is benchmarking?



benchmark

'ben(t)ʃmɑ:k/

Verb and Noun

gerund or present participle: **benchmarking**

- evaluate (something) by comparison with a standard.
- to measure the quality of something by comparing it with something else of an accepted standard.
- a level of quality that can be used as a standard when comparing other things.

Benchmarking with what?




What are you benchmarking sustainability performance against?

(check all that apply)



survey of 57 sustainability professionals conducted by ecoOS

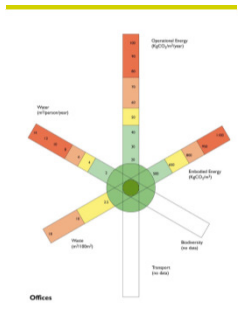
Benchmarking against the sector (KPIs)



Pros and Cons


Pros:
 Identify the key indicators
 Identify levels of performance
 Easy to measure and assess performance

Cons:
 Needs lots of data about the sector first
 May miss some hotspots
 Significant improvements may not change rating.



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Benchmarking with Ecolabels (Type I)



Pros and Cons

Pros:
 Based on Standards (ISO 14024)
 Uses LCA to address hotspots and multiple impacts
 Low Cost and quick to check compliance and collect evidence
 Clear

Cons:
 Proliferation of labels (type I and II)
 No comparability across product categories in same sector



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Benchmarking against the Average Product EPD

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Pros and Cons

Pros:

Shows where better and worse

Cons:

Needs Average Product EPD

Average product needs to be representative

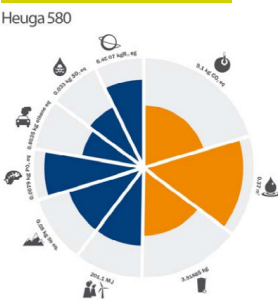
May have different functionality

Lots of information required

What is important?

How to communicate?

Heuga 580



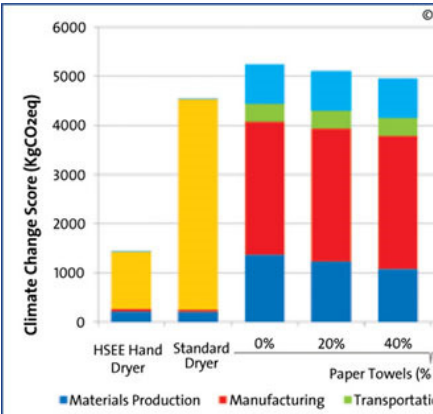
Interface pilot comparison with GuT average EPD for Grenelle, 2011

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Functional Unit issues

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Climate change score for paper towels of varying in comparison to the HSEE and conventional ha


Getting the facts on paper




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Construction Product Comparison: TC350




- Comparisons between construction products are carried out in the context of their application in the building;
- the same functional requirements as defined by legislation or in the client's brief are met,
- the environmental performance and technical performance of any assembled systems, components, or products excluded are the same,
- the amounts of any material excluded are the same,
- excluded processes or life cycle stages are the same,
- the influence of the product systems on the operational aspects and impacts of the building are taken into account.




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Essentials for Benchmarking in Construction




- Using a building context
- Considering required functionality
- Considering ancillary products
- Considering transport and location
- Considering the reference service life
- Considering maintenance and repair
- Considering the use stage
- Considering end of life
- Considering relevant indicators

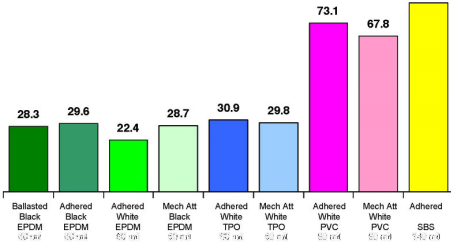


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Using Indicators to benchmark



- A single indicator might mask other impacts




| Roofing System | GWP |
|----------------------|------|
| Ballasted Black EPDM | 26.3 |
| Adhered Black EPDM | 29.6 |
| Adhered White EPDM | 22.4 |
| Mech Att Black EPDM | 26.7 |
| Adhered White TPO | 30.9 |
| Mech Att White TPO | 29.8 |
| Adhered White PVC | 73.1 |
| Mech Att White PVC | 67.8 |
| Adhered SBS | 81.8 |

Global Warming Potential (GWP) for Windy-Head Long-Shops Roofing Systems
by GWP Equivalent as Single-Indicated Comparison
Source: EPDM Roofing, International Roofing Association, American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE) (2009)

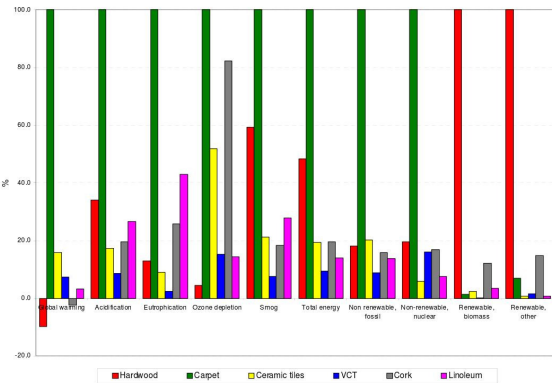
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Using Indicators to Benchmark



- Multiple indicators – often no clear “winner”



| Indicator | Hardwood | Carpet | Ceramic tiles | VCT | Cork | Linoleum |
|------------------------|----------|--------|---------------|------|------|----------|
| Total warming | -10.0 | 100.0 | 15.0 | 5.0 | 10.0 | 5.0 |
| Acidification | 35.0 | 100.0 | 15.0 | 10.0 | 15.0 | 25.0 |
| Eutrophication | 15.0 | 100.0 | 10.0 | 5.0 | 25.0 | 40.0 |
| Ozone depletion | 5.0 | 100.0 | 50.0 | 15.0 | 80.0 | 15.0 |
| Smog | 55.0 | 100.0 | 20.0 | 10.0 | 25.0 | 30.0 |
| Total energy | 45.0 | 100.0 | 20.0 | 15.0 | 20.0 | 15.0 |
| Non-renewable, fossil | 15.0 | 100.0 | 20.0 | 10.0 | 15.0 | 15.0 |
| Non-renewable, nuclear | 20.0 | 100.0 | 15.0 | 10.0 | 15.0 | 15.0 |
| Renewable, biomass | 100.0 | 10.0 | 5.0 | 5.0 | 10.0 | 5.0 |
| Renewable, other | 100.0 | 10.0 | 5.0 | 5.0 | 10.0 | 5.0 |

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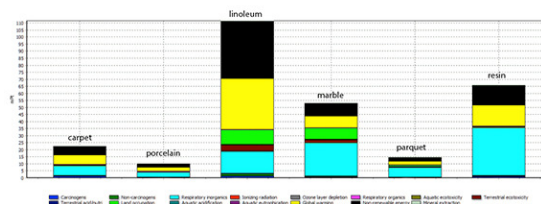
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Using Indicators to Benchmark



- Weighted indicators can make it easier to compare products

Figure 1 - Comparison between the impacts of flooring materials using IMPACT 2002+

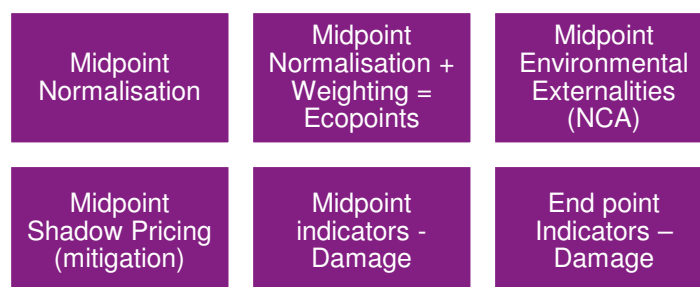


- But there are many ways to weight and all are subjective to some extent.

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Approaches to Weighted Indicators




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Examples of benchmarking

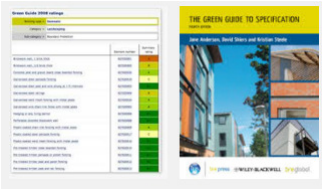


natureplus.org
natural, sustainable building



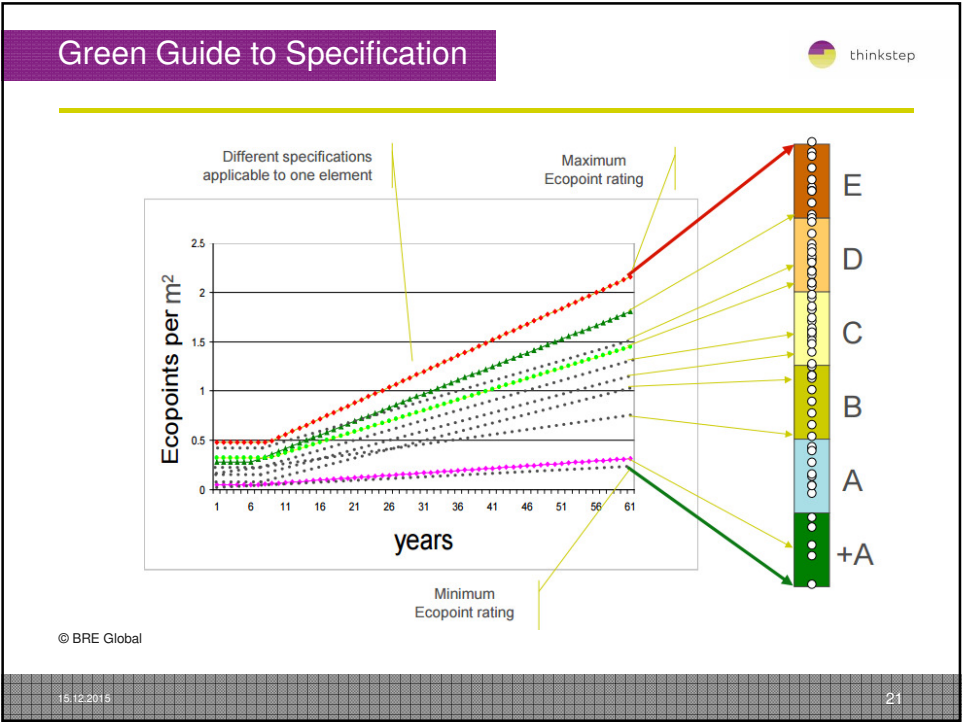
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 EU Product Environmental Footprint





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Green Guide to Specification





Pros

Easy to use
Compares by function not by product
Complies with EN 15804 comparison requirements
Reduces Multiple indicators to single Ecopoint
Based on LCA data from industry
Manufacturer Specific ratings available




Cons

No transparency of specification build ups or source of impacts
Ecopoints uses subjective weightings
Range of specifications influence ratings
Big improvements may not change ratings from A
No ability to improve an A+ rating
Requires an EPD to obtain rating for manufacturer
Requires BRE to provide bespoke rating for Architect

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Natureplus: Type 1 with LCIA criteria



LCA

Transparency about content and IAQ

Above average ecological performance

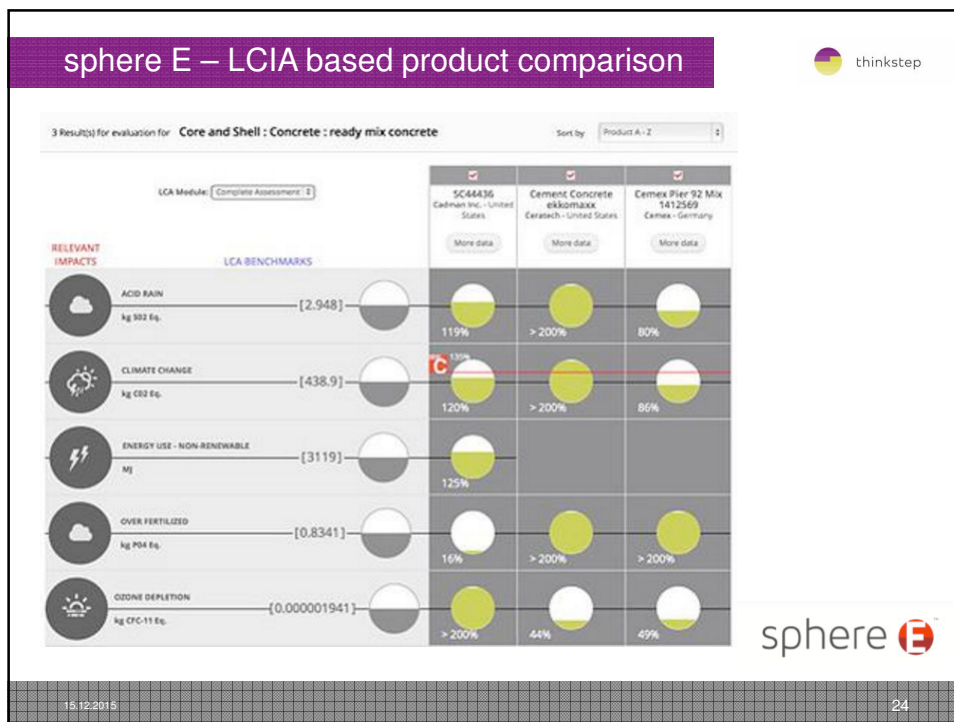


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Construction Products Europe. Workshop
EPD, the current debate and challenges.

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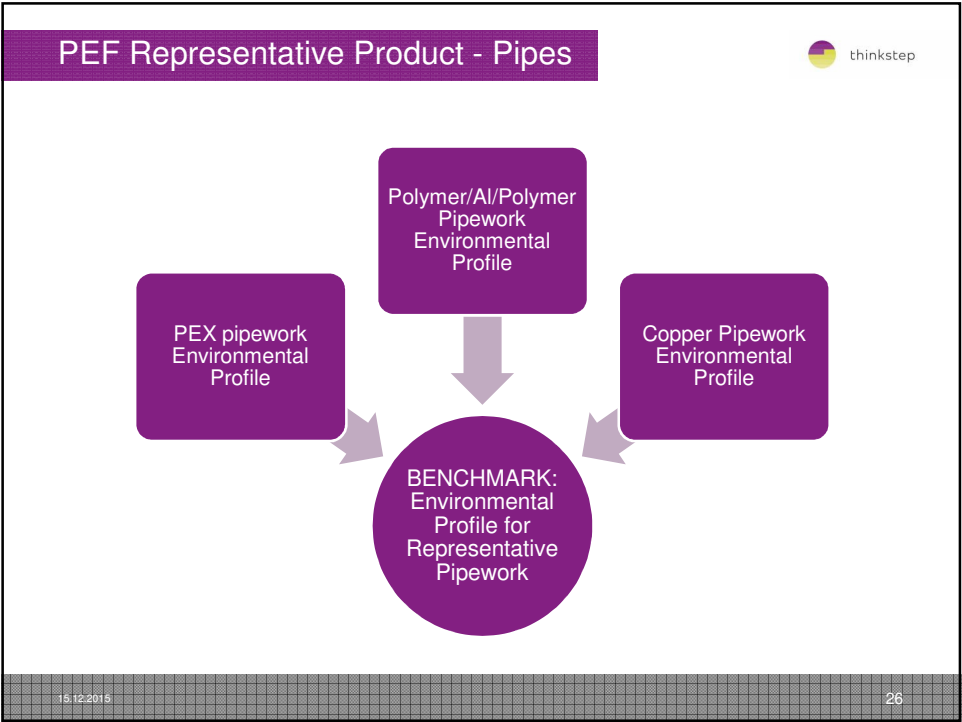


PEF – representative product



- The “representative product” may or may not be a real product that is sold on the market. Especially when the market is made up of different technologies, the “representative product” may be a virtual (non-existing) product with the average sales weighted characteristics of all technologies around. On the other hand, e.g. if the market and technical information is incomplete, the Technical Secretariat may decide to choose a real product that would represent ‘the representative’

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PEF Representative Product - Paints

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- The functional unit will be 1m² of substrate covered with a typical efficacy for the lifetime of the product, brought back to a year. Typical efficacy (differentiation based on paint quality) and repainting cycles to be defined
- Typical formulations estimation

| | Product 1 | Product 2 | Product 3 | Product 4 |
|-----------------------------|--|-----------------------|--|---|
| Product name | Interior white paint | Interior colour paint | exterior white masonry paint | exterior white trim (wood) paint |
| Estimated Bill of Materials | Binder – 9% Water – 33% Pigments and fillers (P&F) – 55% Additives – 3% | | Binder – 15% Water – 25% P&F – 54% Additives – 6% | Binder – 51% Solvent – 8% P&F – 37% Additives – 4% |

Table 1 – Estimated bill of materials for the representative products

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PEF Representative Product – Metal Sheet



4 representative (intermediate) products, 1 m² metal made of lead, copper, steel or aluminium produced under the specifications and conditions for use in building applications

Table 5-1: Data for calculation used in the screening exercise

| | Density (g/cm ³) | Typical thickness (mm) | Specific mass (kg/m ²) |
|-----------|------------------------------|------------------------|------------------------------------|
| Lead | 11,3 | 1,7 | 19,2 |
| Aluminium | 2,7 | 0,7/1* | 1,9/2,7* |
| Steel | 7,8 | 1 | 7,8 |
| Copper | 8,9 | 0,6 | 5,3 |

*For appliance application

This data considers the typical thicknesses, selected based on market data, the density and the calculated specific mass per m².

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PEF Representative Product – Insulation



Table 5 Characteristics of representative insulation product groups for pitched roof

| Pitched roof with massive timber rafters | Position of the insulation product | Lambda (W/m.K) | U _c value W/(m ² .K) | Density (kg/m ³) |
|--|------------------------------------|----------------|--|--------------------------------|
| Glass/stone wool product (metal frame) | Top | NO | - | |
| | Between | YES | 0.035 | Glass wool=19 Stone wool=40 |
| | Under | YES | 0.035 | Glass wool=19 Stone wool=45 |
| Cellulose product | Top | NO | | |
| | Between | YES | | |
| | Under | NO | | |
| Wood fibre product | Top | YES | | |
| | Between | YES | | |
| | Under | NO | | |

Table 6 Characteristics of representative insulation product groups for flat roof with concrete structure

| Flat roof | Density (kg/m ³) | Type of flat roof (conventional or inverted roof) | Lambda (W/m.K) | U _c value W/(m ² .K) |
|---------------------------|------------------------------|---|----------------|--|
| EPS products | 15 | Conventional roof | 0.031 | 0.14 |
| XPS products | 35 | Inverted | 0.031 | 0.14 |
| PUR/PIR (Boards) products | 32 | Conventional roof | 0.025 | 0.14 |
| Cellular Glass | 117 | Conventional roof | 0.041 | 0.14 |

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Thank you for your attention!

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