

Helsinki Workshop on SB Assessment Methods and Tools

ISO/CEN work and Summary of methodology and rating tool discussions

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Terms and Definitions Reminder

ISO 21932. Building construction. Sustainability in building construction.
Terminology

- **Environmental aspect:** Aspect of buildings, part of buildings, processes or services related to their life cycle that can cause a change to the environment
- **Environmental impact:** any change that may be adverse or beneficial to the environment, wholly or partially resulting from **environmental aspects**
- **Indicator:** quantitative, qualitative or descriptive measure
- **Environmental indicator:** **indicator** related to an **environmental impact**

Terms and Definitions Reminder

ISO 21929. Building construction. Sustainability in building construction.
Sustainability indicators

- **Building performance:** ability of a building to fulfill required functions under intended use conditions or behavior when in use
- **Impact category:** class representing an economic, environmental or social issue(s) of concern (areas of protection) to which analysis (assessment) results may be assigned
- **Indicator:** quantitative, qualitative or descriptive measure representative of one or more impact categories

Resume of Methodologies for SB rating systems

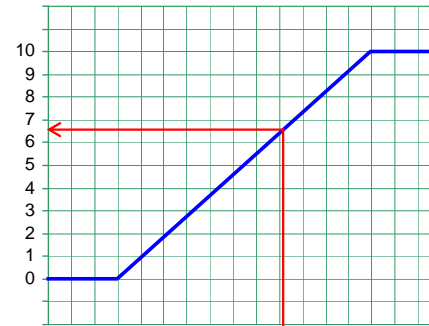
Building assessment methods

- **SBTool, VERDE Other Uses, ITACA, SBToolCz, SBToolPt, ...** SBMethod is a multi-criteria analysis method for assessing the sustainability of buildings. Starting from a set of assessment entries (called criteria). SBMethod provides a final concise score about a building's overall performance.
- **VERDE multi-Residential and Offices,.....** VERDE RO is based on calculation of the reduction of impacts in relation to those generated by a reference building over its life cycle
- **CASBE,....** Based on Eco-efficiency calculation $BEE = \text{High Quality of building (Q)} / \text{Environmental Loads (L)}$.
- **LEED, BREEAM, GREEN STAR,...** covers a number of **categories** that assess the environmental impact that is a direct consequence of a projects site selection, design, construction and maintenance, divided into **credits**, each of which addresses an initiative that improves or has the potential to improve environmental performance. Points are awarded in each credit for actions that demonstrate that the project has met the overall objectives

Sustainable Rating System Components (SRSC)

The main elements of the SB rating system can be summarized as follows:

1. a set of assessment entries, called criteria/credits;
2. a set of physical quantities, called indicators, which allow to quantify building performances with respect to each criterion/credit;
3. a normalization method;



4. a panel of experts, SB Standards or Sustainability Institute who establish and define number of criteria/credits and indicators;
5. a procedure for assigning weights to get a unique value for decision making

Sustainable Rating Tools(SRT)

Building assessment Tools

- The tools developed to address the methodology ranging from:
 - A simple "**check list**" represented by LEED, BREEAM,.....
 - A **spreadsheet to perform small calculations** represented by all SBTool based, CASBEE and others
 - Those based on calculating the impact reduction on reference and proposed building that **requires the use of databases and some calculations** for a final assessment such as VERDE RO and others.

Summary of the discussion for the assessment methods

- Assessment methodologies
 - LCA
 - Other
- Their scopes
 - Most focus on New Construction
 - Existing building, the future?
- Their Structures
 - From 5 to 8 categories
- Their content
 - From 40 to 120 criteria
- Their environmental relevance
 - high, low, medium
- Their weighting and aggregation
 - Based on damage, environmental goals, opinions of expert, others...

ISO/CEN Work

Product level

prEN15804 EPD-Core rules for the product category

Scope:

The core PCR:

defines the **parameters to be declared**,

describes which **stages** of a product's life cycle,

defines rules for the **development of scenarios**,

includes the **rules for calculating** the Life Cycle Inventory and the Life Cycle Impact Assessment,

includes **information that is not covered by LCA**,

defines the **conditions** under which construction **products can be compared**

ISO/CEN Work

Product level

- prEN15804 EPD-Core rules for the product category
- ISO 21930 Environmental Products Declaration(EPD)

EPD communicate verifiable, accurate, not misleading environmental information for the products.... scientifically based, fair choices and

The EPD information is expressed in information modules, throughout the life cycle of the product.

The EPD is expressed in a form that allows aggregation (summation) to provide complete information for buildings.

The standard deals with a limited number of predetermined parameters, quantifiablesufficient experience.... have been agreed on a European consensus.....

This European Standard developing a **Type III environmental declaration**

To what extent the current SB methodologies meet the requirements of ISO and CEN?

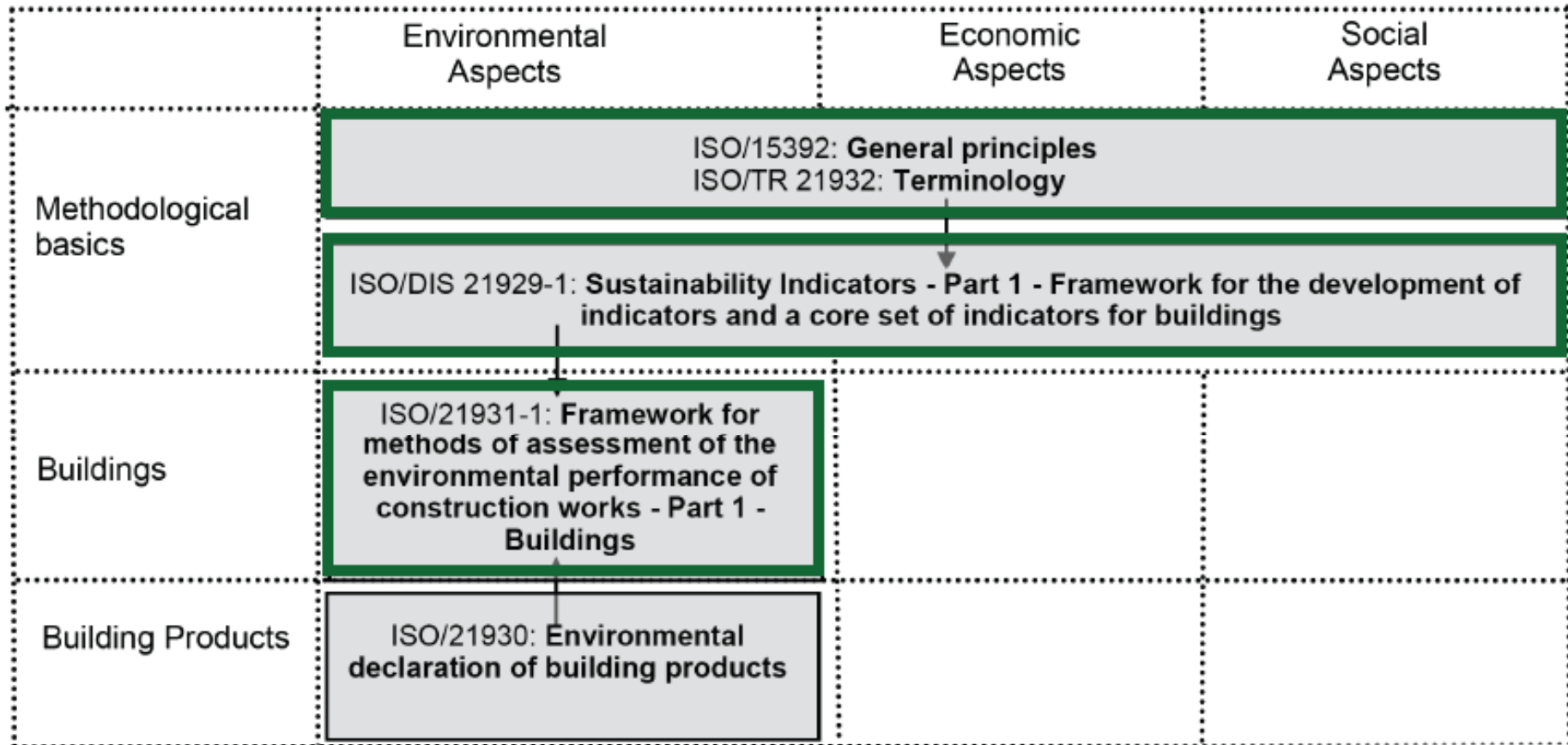
Product level

- ISO 21930 Environmental Products Declaration(EPD)
 - The following environmental information come from EPD.
 - climate change (greenhouse gases);
 - depletion of the stratospheric ozone layer;
 - acidification of land and water sources;
 - Eutrophication;
 - formation of tropospheric ozone (photochemical oxidants).
 - depletion of non-renewable energy resources;
 - depletion of non-renewable material resources;
 - use of renewable material resources
 - use of renewable primary energy;
 - consumption of freshwater.
- None of the most used tools incorporate the data from EPD.
- In Europe, the new Construction Products Regulations refers to EPDs (wherever available) as a preferred possibility to verify the compliance with its requirements

ISO/CEN Work

Building level

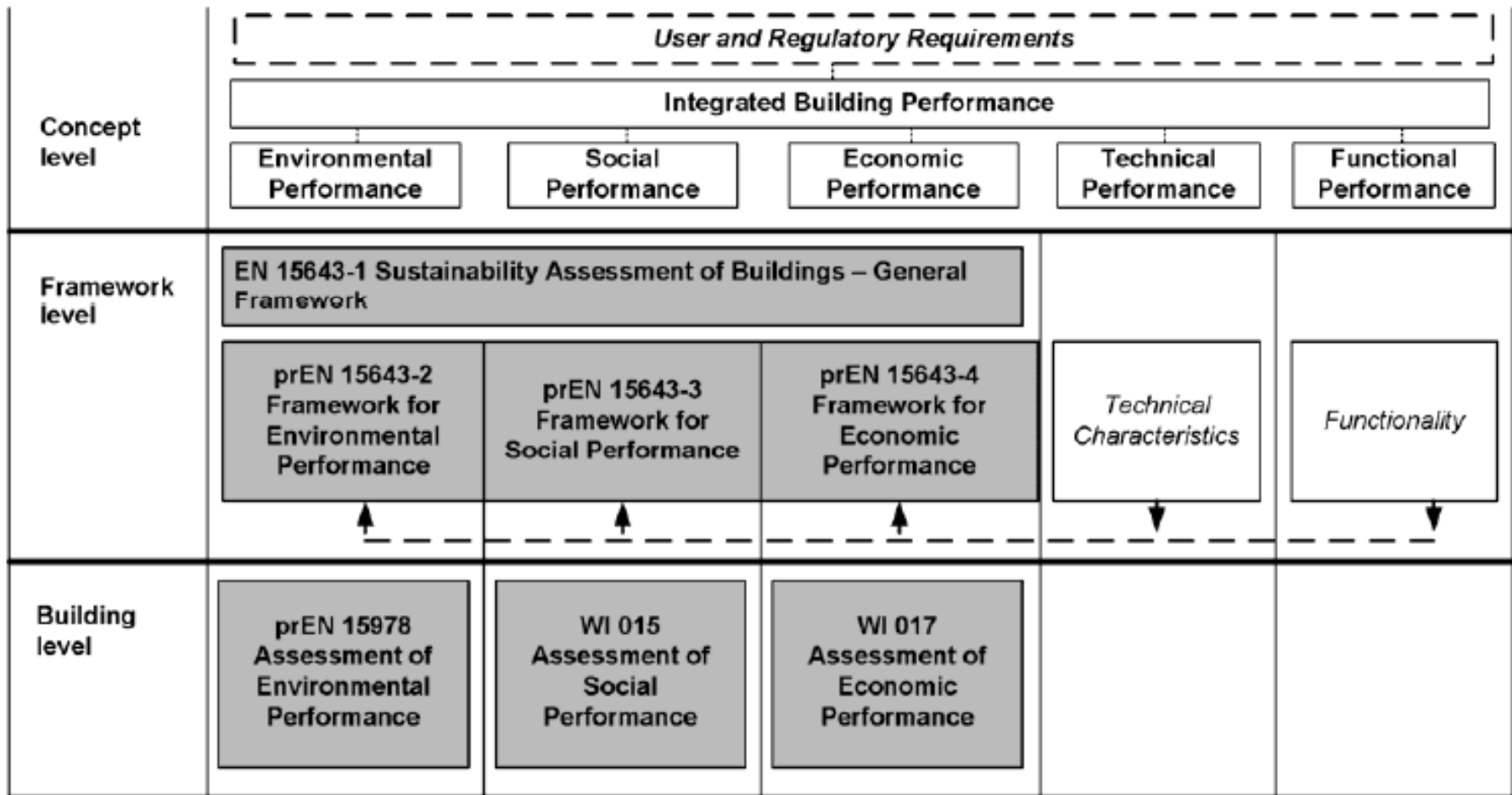
ISO



ISO/CEN Work

Building level

CEN



To what extent the current SB methodologies meet the requirements of ISO and CEN?

In relation to building methods of assessment of the environmental performance of buildings

- ISO 21931-1 Framework for methods of assessment of the environmental performance of construction works —Part 1: Buildings
 - establishing a list of A voluntary, M mandatory, MI mandatory, where information is available and V voluntary criteria to evaluate the different stages of life cycle
 - Defines a matrix of the relationships between environmental aspects and impacts
- ISO 21929 Building Construction – Sustainability in Building Construction – sustainability Indicators. Part 1 - Framework for the development of indicators for buildings and core indicators
 - establishing a list of core indicators

most used tools incorporate the mandatory criteria and core indicators.

To what extent the current SB methodologies meet the requirements of ISO and CEN?

In relation to building methods of assessment of the environmental performance of buildings

- prEN 15643-2 Sustainability of construction works - Assessment of buildings - Part 2: Framework for the assessment of **environmental** performance
 - establishing a list of indicators to be calculated
 - Six Indicators for environmental impacts (LCIA impact categories)
 - Five Indicators for resource use (environmental aspects)
 - Seven Indicators for additional environmental information (environmental aspects)

None of the most used tools incorporate the calculation of impacts and environmental aspects mentioned in the standard.

To what extent the current SB methodologies meet the requirements of ISO and CEN?

In relation to building methods of assessment of the environmental performance of buildings

- prEN 15643-3 Sustainability of construction works - Assessment of buildings - Part 2: Framework for the assessment of **social** performance
 - establishing a list of indicators to be calculated
 - Accessibility
 - Health and Comfort
 - Loadings on the neighborhood
 - Maintenance
 - Safety / Security
 - Sourcing of materials and services
 - Stakeholder involvement

most used tools incorporate the related social aspects.

To what extent the current SB methodologies meet the requirements of ISO and CEN?

In relation to building methods of assessment of the environmental performance of buildings

- prEN 15643-4 Sustainability of construction works - Assessment of buildings – Part 4: Framework for the economic of **social** performance
 - cost;
 - financial value

most used tools incorporate the related economic aspects.

To what extent the current SB methodologies meet the requirements of ISO and CEN?

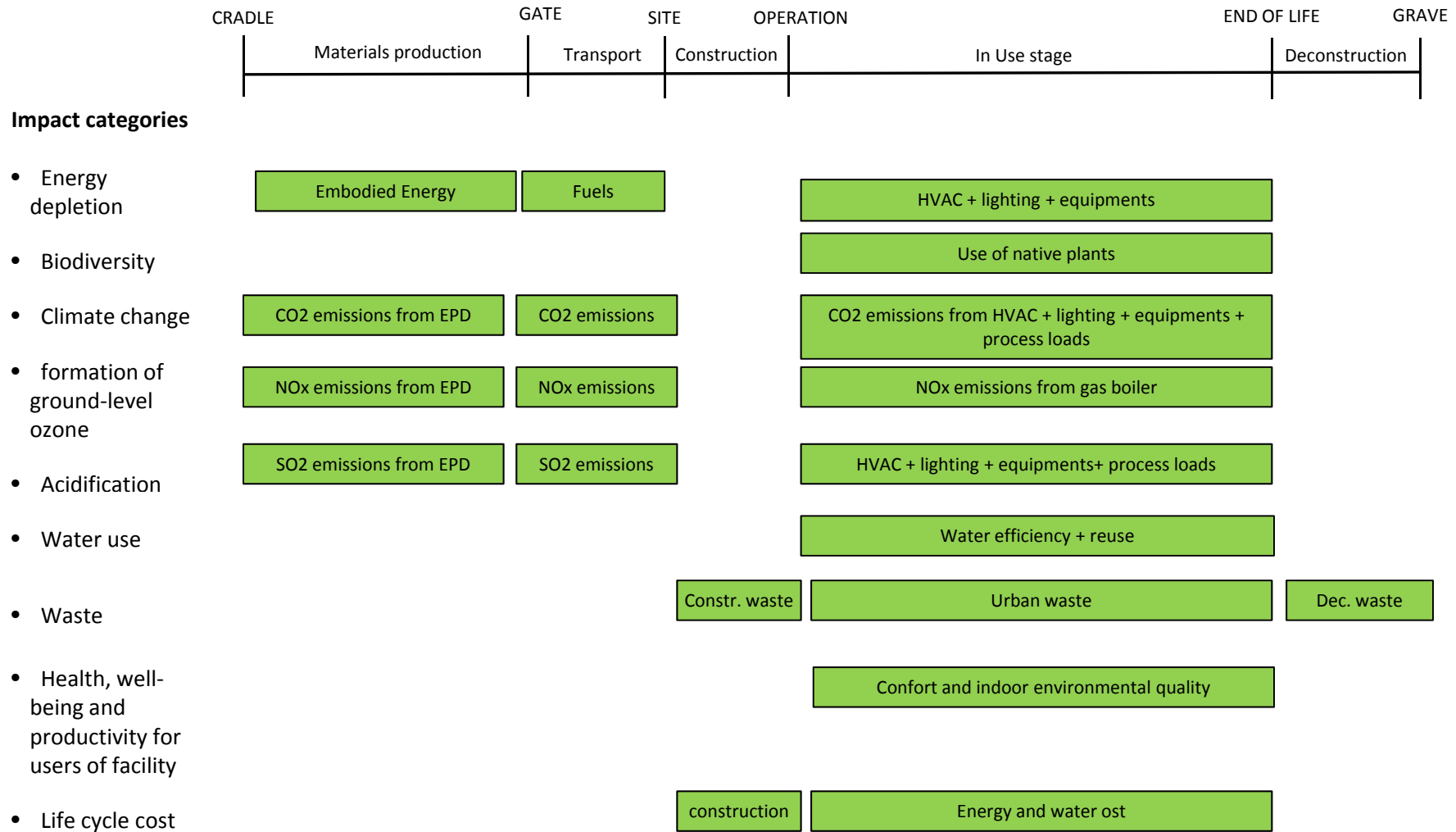
In relation to the calculation methods for environmental indicators

- EN 15978:2010 Sustainability of construction works — Assessment of environmental performance of buildings — **Calculation method**

Indicator	Unit
Global warming potential, GWP	kg CO ₂ equiv
Depletion potential of the stratospheric ozone layer, ODP;	kg CFC 11 equiv
Acidification potential of land and water; AP;	kg SO ²⁻ equiv
Eutrophication potential, EP;	kg (PO ₄) ³⁻ equiv
Formation potential of tropospheric ozone photochemical oxidants, POCP;	kg Ethene equiv
Abiotic Resource Depletion Potential for elements; ADP_elements	kg Sb equiv
Abiotic Resource Depletion Potential of fossil fuels ADP_fossil fuels	MJ
Use of renewable primary energy excluding energy resources used as raw material	MJ, net calorific value
Use of renewable primary energy resources used as raw material	MJ, net calorific value
Use of non-renewable primary energy excluding primary energy resources used as raw material	MJ, net calorific value
Use of non-renewable primary energy resources used as raw material	MJ, net calorific value
Use of secondary material	kg
Use of renewable secondary fuels	MJ
Use of non-renewable secondary fuels	MJ
Use of net fresh water	m ³

None of the most used tools incorporate the calculation methods mentioned in the standard. Most of the existing tools refers to CO₂ emissions, kg of materials use, etc

VERDE Spanish Tool



Summary from the methodology and rating tool discussions

1. Is important that tools follow ISO/CEN Guidelines?
2. Is it important that impact on environment, social conditions and local economy all are defined and included in a tool?
3. Construction Product Regulation (CPR) defines the requirements for building products to obtain the CE label. EPD must provide at least seven mandatory Impact evaluation. Is it important that tools support impact data from EPD?
4. Is it important to strive towards an international Environmental Assessment Tool Qualification method similar to BESTEST ?