

Tool scope, structure and content



Tove Malmqvist

Researcher at Environmental Strategies Research – fms, KTH
(Royal Institute of Technology), Stockholm

tove.malmqvist@abe.kth.se

Use of building tools



- Marketing
- Internal learning
- Evaluation of environmental/sustainability targets
- Formulation of targets
- Design tool
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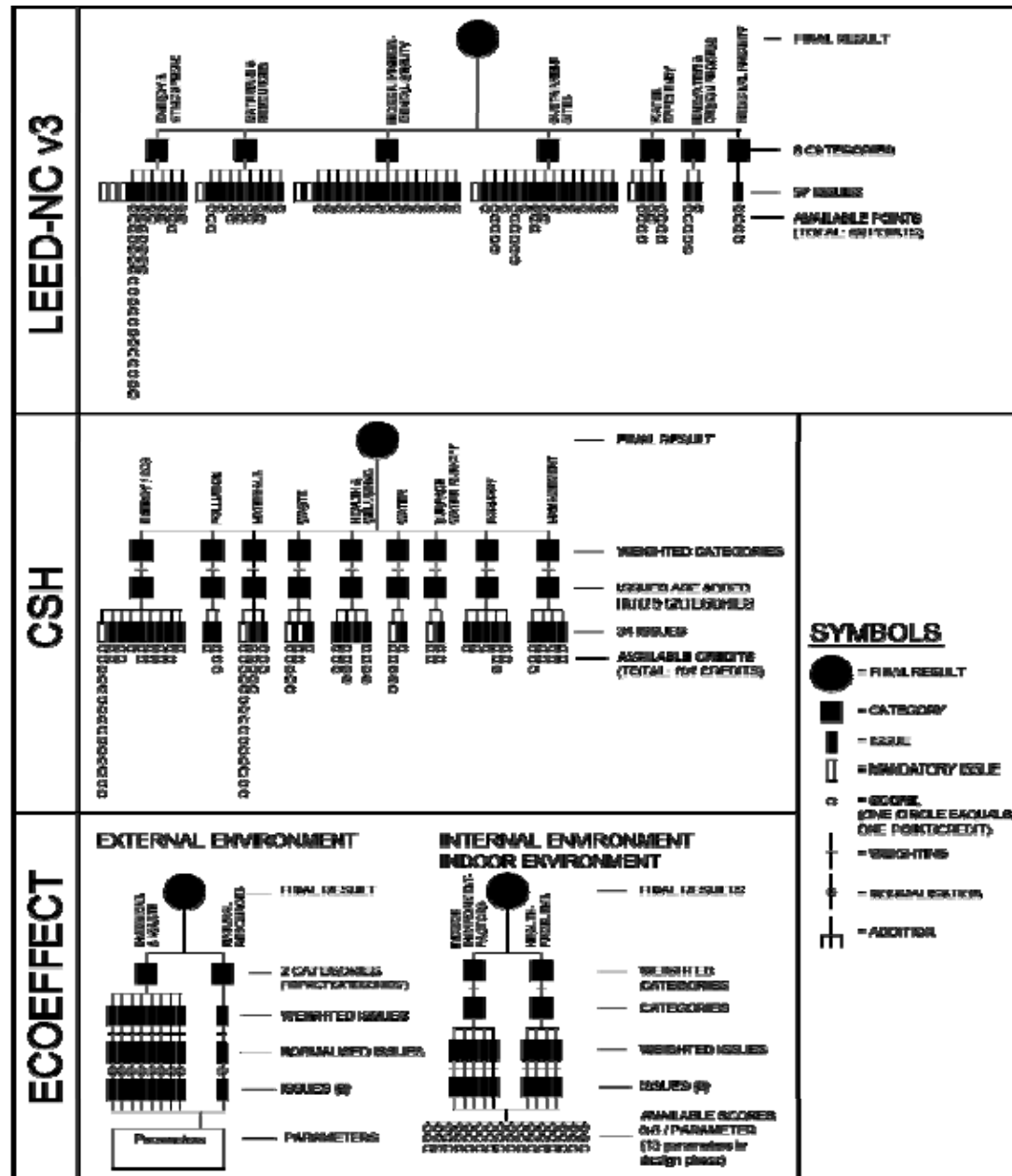
Scope or assessment boundaries



- Building stage
- Building type
- Scale (object of study)
- Coverage regarding issues/impacts that are assessed
- Coverage regarding for instance flows contributing to external impacts
- Assessment methodologies (e.g LCA or not)
- ...



Illustration of tool structure



Source: Wallhagen, M.
Licentiate thesis

Note: after this article was published LEED has included weighting of categories.

Tool structure and category focus

	LEED NC	BREEAM	CSH	Green star	Miljöbygg	EcoEffect
Energy	31%	23%	29%	20%	24%	
Material/Waste	12%	14%	30%	17%	12%	38%
Emissions/pollution		13%	4%	13%		
Indoor env./Helth	13%	14%	11%	19%	53%	42%
Site/Ecology	26%	11%	8%	6%		21%
Water	10%	6%	9%	8%	12%	
Management	8%	11%	8%	8%		
Transports		9%		8%		
Max points	110	105	107	148	-	-
Assessed issues (mandatory)	37 (8)	105(4)	34 (7)	62 (2)	17 (17)	24

% of possible credits in a category

LEED 2009 New Construction
 BREEAM New Construction 2011 – non domestic
 Code for Sustainable Homes 2009 ("version" of BREEAM)
 Green Star Office ver. 3
 Miljöbygg is the Swedish tool Miljöbyggnad
 EcoEffect, swedish life-cycle based tool

Selection of aspects for inclusion in a tool

ex. indoor environmental aspects

Most severe problems/aspects	Most extensive problems/aspects	Aspects in Swedish official objectives	Aspects in Swedish mandatory rules	Most common aspects in current practice
Indoor air quality – <i>radon</i>	Indoor air quality – <i>SBS related</i>	Indoor air quality – <i>ventilation</i>	Indoor air quality - <i>ventilation</i>	Indoor air quality
Indoor air quality – <i>legionella</i>	Noise & acoustics	Indoor air quality - <i>radon</i>	Indoor air quality - <i>formaldehyde in plywood, chipboard, etc.</i>	Noise & acoustics
Indoor air quality – <i>allergy related</i>	Thermal climate – <i>cold</i>	Noise & acoustics - <i>traffic noise</i>		Thermal climate
Noise & acoustics – <i>traffic noise</i>	Electromagnetic fields (EMF) – <i>EMF sensitivity</i>	Tap water quality		Daylight conditions
Magnetic fields – <i>childhood leukaemia</i>				Illumination
Tap water quality				

We ended in prioritising most severe aspects and aspects dealt with in official objectives

Differences in content focus

	LEED	BREEAM (CSH)	MILJÖBYGGNAD
ENERGY	Energy efficiency Renewable energy	Energy efficiency Reduced CO2 emissions	Low energy use Renewable energy
MATERIAL	Recycling of waste Reused material	Reduced CO2 emissions Recycling of waste	Embedded hazardous substances
INDOOR ENV.	Indoor air quality Thermal climate	Indoor air quality, thermal climate, lighting, (Daylight Noise), legionella	Noise, indoor air quality, thermal climate, daylight, legionella
SITE	Choice of site User transports	Ecology, biodiversity User transports	
WATER	Reduced water use	Reduced water use Flooding	Tap water quality Low emissions from individual sewage systems

Indicator types



- **Performance** - measurable properties kWh/m² etc,
- **Features** – used technology, properties, etc. for example solar panels, cycle storage...
- **Process** – organisation and routines, ex. environmental management routines, follow-up routines, competence

Some comments on indicator types

- Performance – *coverage of contributing flows can be more or less complete*
- Features, process – *can be more or less of potentials, ex. cycle storage and adjustable inner walls are more of potentials than solar panels*
- Innovations – *feature (or process) indicators measuring innovative creativity rather than environmental performance*

Indicator types

ex. assessment of health problems due to inferior indoor air quality

DIRECT PERFORMANCE

**INDIRECT PREVENTIVE
MEASURES/
PROCEDURES**



Occupant survey on health symptoms

Measurement of indoor contaminants

Measurement of ventilation qualities (air flow rates, etc.)

Position of air intakes

Individual controllability of ventilation

Routines for ventilation filter exchange

Selection of indicators

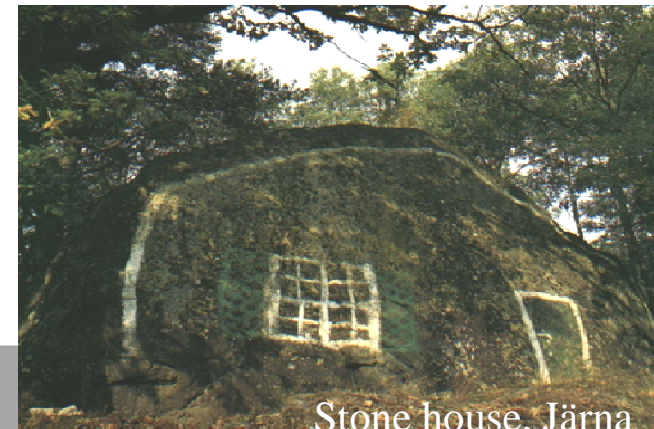
Possible indicators can be more or less appropriate for characterising an environmental problem with regard to:

Theoretical criteria

- Validity (to what extent is the addressed problem measured?)
- Accuracy (how accurately is the addressed problem measured?)
- Repeatability (do repeated measurements produce the same result?)

Practical criteria

- Influence (to what extent can the building owner influence the result?)
- Intelligibility (how easy is it to communicate the indicator?)
- Cost (how costly is it to collect data needed for calculations?)



Stone house, Järna

Analysis of indicator types



- Wallhagen, M, Glaumann, M, Westerberg, U. Understanding differences between the environmental assessment tools – LEED, Code for Sustainable Homes and EcoEffect. *Analysis of indicator types with regard to performance, process and features.*
- Malmqvist, T. (2008). Environmental rating methods: Selecting indoor environmental quality (IEQ) aspects and indicators. Building Research & Information 36 (5): 466-485. *Analysis of indoor environmental quality indicators in 16 tools with regard to theoretical and practical criteria*
- Malmqvist, T, Glaumann, M. (2006). Selecting problem-related environmental indicators for housing management. Building Research & Information 34 (4), 321-333. *Analysis of indicators with regard to theoretical and practical criteria.*

To discuss



1. Is it important that clients/users understand the differences in tool content?
2. On what basis should one decide on inclusion of an issue (aspect) in a tool? Rank the following... (Severity for people of a problem, extent of a problem, issues prioritised in agreed-on societal objectives, issues dealt with in current legislation, issues dealt with in other tools, issues prioritised by industry, other?)
3. Is it a problem that different tools put so different emphasis on different issues?
4. Is it a problem that tools claim to assess sustainability while covering very different issues?
5. Is it OK that highly rated buildings may have poor performance in some issues?
6. Is it important for the tool user that a tool has a simple structure?
7. On what basis should one select indicators? Rank the following....(validity, repeatability, accuracy, influence, intelligibility, cost, other?)