



# Common Metrics for Key Issues

**Bâtimat 2009**  
**SB Alliance Annual Conference**  
Thursday 05th November 2009

A proposal for  
The Sustainable Building  
Alliance  
Core set of indicators

# A core set of indicators, why?

- To enable the assessment of main environmental impacts
- To develop a common international vocabulary for building environmental assessment
- To facilitate communication between stakeholders
- To support the development of future assessment schemes
- To facilitate inter building and inter countries comparisons

# Key challenges to get the core set of indicators

1. Select first candidates among a large number of potential indicators
2. Define a methodology to assess them
3. Define a way to report on the indicators
4. Define subsidiarity between international and national approaches

# Where are we today

- A working group of SB Alliance has produced
  - A selection of 6 indicators
  - A methodology to assess them
  - A method to report on the indicators
  - A proposal for links between SBA indicators and assessment schemes
  - This will be presented today
- The next steps are
  - To discuss this proposal with all SB Alliance members
  - To make a decision
  - To implement these indicators in assessment schemes

# Key challenges to get the core set of indicators

1. Select first candidates among a large number of potential indicators
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# Select first candidates among a large number of potential indicators

- 1st step : bottom up approach
  - Analyse all potential indicators coming from
    - Existing approaches
    - Standards under development
  - Get a long list of potential indicators
- 2<sup>nd</sup> Step: Top down approach
  - A vote among sba members enabled to select first priority indicators

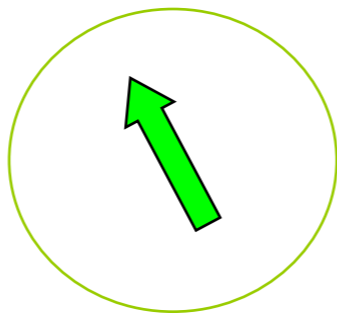
# The 6 indicators chosen for the first 2009 version

**Ressources  
depletion**

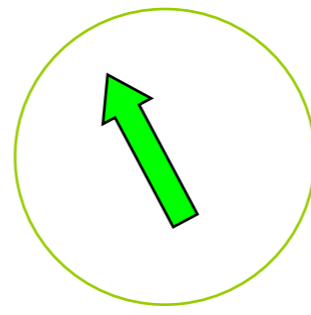
**Primary  
Energy**

**Wastes  
production**

**Indoor  
Environment  
quality**



**Thermal  
comfort**



**Indoor air  
quality**

**Building  
Emissions**

**Green house  
Gas emissions**

**Wastes  
production**

# Indicators under discussion

- Economic performance
- Visual Comfort
- Acoustic Comfort



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# A pragmatic life cycle approach

- The goal is to take into account the whole life cycle

before use stage	product stage
	construction stage
use stage	operation of building incorporated services
	operation of non building incorporated services
	maintenance repair and refurbishment
	transport
end of life stage	deconstruction
	disposal stage

# A pragmatic life cycle approach

- The goal is to take into account the whole life cycle
- But Assessment methods have different levels of maturity
  - Some elements can be assessed with well known methods
    - e.g. Methods used for Energy performance regulations
  - Some elements can be assessed with recently developed methods
    - e.g: Cradle to gate Environment Product Declarations
  - Some elements can be assessed with methods which are not available in all countries
    - e.g. Cradle to grave Environment Product Declarations

# Main sources of data

		CO2 eq	Energy	Water	Wastes
before use stage	product stage	Orange	Orange	Orange	Orange
	construction stage	Light Yellow	Light Yellow	Light Yellow	Light Yellow
use stage	operation of building incorporated services	Dark Green	Dark Green	Bright Green	Dark Green
	operation of non building incorporated services	Bright Green	Bright Green	Bright Green	Bright Green
	maintenance repair and refurbishment	Light Yellow	Light Yellow	Light Yellow	Light Yellow
	transport	Light Yellow	Light Yellow	Light Yellow	Light Yellow
end of life stage	deconstruction	Light Yellow	Light Yellow	Light Yellow	Light Yellow
	disposal stage	Light Yellow	Light Yellow	Light Yellow	Light Yellow

EPD/ LCA : cradle to gate	Orange
EPD/LCA : cradle to grave or or cradle to gate+ scenarios	Light Yellow
Standardised Energy calculation	Dark Green
Estimations based on scenarios	Bright Green
No common method	Light Yellow

# A pragmatic life cycle approach

- The goal is to take into account the whole life cycle
- But Assessment methods have different levels of maturity
- Our proposal is to set up the method step by step
  - The assessment of each stage could be

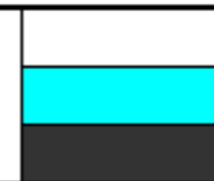
<b>Required in 2009 version</b>	
<b>Optional in 2009 version</b>	
<b>Not included in 2009 version</b>	

- The proposal is based on
  - Maturity of the assessment method
  - Importance of the Impacts

# Elements to consider in 2009 version

		CO2 eq	Energy	Water	Wastes
before use stage	product stage				
	construction stage				
use stage	operation of building incorporated services				
	operation of non building incorporated services				
	maintenance repair and refurbishment				
	transport				
end of life stage	deconstruction				
	disposal stage				

Required in 2009 version  
 Optional in 2009 version  
 Not included in 2009 version



# Apply a 20/80 rule

To enable a progressive development only some buildings components or services shall be assessed in 1st version

## Example for the product stage

- Requested

- Roof
- Load bearing structure
- Exterior and basement walls including windows
- Internal Walls
- Floor Slabs
- Foundation
- Floor Finishes/Coverings

- Optional

- decorative wall finishes/coatings
- Doors
- Heating/Cooling/lighting Equipment and any power generating equipment (e.g. wind turbines/PV/solar heating)
- Internal Transport (Elevators, Escalators )
- Water and Sewerage systems
- Electrical distribution systems

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# Units for reporting data

- Green house gas emission
  - CO2 eq (kg)
- Energy
  - Primary energy (kWh)
- Water
  - m<sup>3</sup>
- Wastes
  - 4 type of wastes differentiated
    - Hazardous (Tonnes)
    - Non Hazardous (Tonnes)
    - Inert (Tonnes)
    - Nuclear (kg)
- Data are reported for the different stages

# Indoor environment indicator

- Thermal comfort
  - % of occupied period where temperature exceeds a given value
    - Eg: 2% of time temperature above 26°C
- Indoor air quality
  - CO2 in ppm
  - Formaldehyde in  $\mu\text{g}/\text{m}^3$

The indicators could be assessed at two stages:

- before use
- in use

# Building characteristics

- Key parameters to enable comparison between buildings

<b>Type of Building</b>	<Office, house , school etc.>
<b>Occupancy (Pattern of Use)</b>	<number of occupants, hours of use>
<b>Required Service Life</b>	<for the building in years>
<b>Regulations and Standards</b>	<Country/Region for the building regulations or standards for the construction or use of the building>
<b>Climate Type</b>	<e.g. Mediterranean.>

# Results presentation

- We are now working on the layout

Functional Equivalent															
Type of Building		<Office, house, school etc.>													
Occupancy (Pattern of Use)		<number of occupants, hours of use>													
Required Service Life		<for the building in years>													
Regulations and Standards		<Country/Region for the building regulations or standards for the construction or use of the building>													
Climate Type		<e.g. Mediterranean.>													
Indicator	Annualised Unit	Before use stage			Use Stage					End of Life Stage					
		Product Stage		Construction Stage	Use Stage			Disposal Stage							
		Raw Material Process	Transport	Manufacturing	Transport	Construction Installation Process	Operation of building-incorporated services	Operation of non building-incorporated appliances	Maintenance, repair and refurbishment	Transport (of people)	Deconstruction	Transport	Recycling, reuse and energy recovery	Waste Disposal	
GWP	CO <sub>2</sub> eq														
Energy	kWh														
Water	m <sup>3</sup>														
Waste	Tonnes Hazardous														
	Tonnes Non-hazardous														
	Tonnes Inert														
	kg - Nuclear														
					Design	In-use									
IEQ	Thermal Comfort %TOR														
	Thermal Comfort Dev														
	IAQ [CO <sub>2</sub> ] ppm														
	IAQ [Formaldehyde] µg/m <sup>3</sup>														

Stages included for each indicator		Required in 2009 version		Optional in 2009 version
		Not included in 2009 version		Not relevant

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# Subsidiarity between SBA and national approaches

- **Assessment procedure**
  - Allow the use of national procedures and processes (e.g. energy calculation procedures etc.)
  - Provides default scenarios which can be use when no national data is available

# Presentation of results

- SBA international approach

- Define a common detailed reporting format

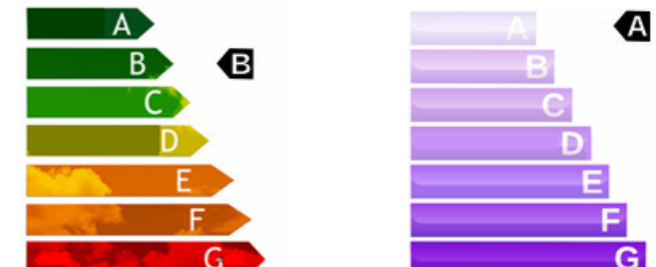
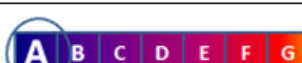



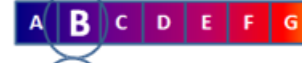

- National approaches

- Define benchmarks and layout for presentation

Functional Equivalent																	
Type of Building		<Office, house, school etc.>															
Occupancy (Pattern of Use)		<number of occupants, hours of use>															
Required Service Life		<for the building in years>															
Regulations and Standards		<Country/Region for the building regulations or standards for the construction or use of the building>															
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Performance énergétique et environnementale		
★★★★★		
Exploitation		
		
Préoccupations	valeur	Performance
Consommation d'eau	... l/m <sup>2</sup> .an	
Construction		
Consommation d'Énergie	... kW h/m <sup>2</sup> .an	
Emission de CO <sub>2</sub>		
...	-	
Qualité des ambiances		
Confort d'été		
Qualité air intérieur		
Confort acoustique		
Coordonnées du bâtiment		Certifié le par

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# Questions ?