

STUDY FOR THE DEVELOPMENT OF EUROPEAN ECOLABEL
CRITERIA FOR BUILDINGS

Second background report

March 2009



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1. Foreword

The main purpose of this report is to provide background information in order to understand further steps in the criteria development process, in particular the identification of a possible range of criteria to be discussed in the third AHWG meeting and on which focusing attention for future work in terms of wording and thresholds development.

From the main results of the first background document presented and discussed during the second AHWG meeting held in Rome on the 28th October 2008, the further step has been to identify the most used environmental criteria in a range of selective existing initiatives, adding them environmental criteria that according to the work carried out are significant in terms of environmental efficiency as well as in terms of feasibility.

For the energy aspects a pragmatic approach has been considered referring to the Directive 2002/91/EC adopted by all the Member states.

The report is mainly focused on the methodology used for the identification of the possible range of criteria on which to work for future development but also provide a first proposal for the criteria structure according to the product group definition already discussed and approved.

Furthermore a proposal on two delicate aspects has been provided: the validity of criteria according to the different situations for new and existing buildings and the use of the logo.



2. Main results coming from the First background report

During the 2° AHWG, held in Rome (28-10-08), it was discussed the First background report. In Particular during the meeting the following issues have been discussed:

- ✓ main environmental aspects pointed out from the LCA methodology;
- ✓ the existing initiatives of environmental certifications for building present today;
- ✓ the building sustainable initiatives carried out at European level. Related both to the sustainable products used for building construction and to the building construction itself;
- ✓ the EU Eco-label characteristics

A list of issues have been presented and considered the most important ones for identifying specific EU Eco-label criteria.

A synthetic number of labels, environmental certifications, particularly related to residential buildings have been analysed and listed below:

- ✓ iiSBE International
- ✓ LEED rating system
- ✓ CASBEE - Japanese system
- ✓ The Code for Sustainable Homes - UK
- ✓ Swan-labelling of Small houses
- ✓ Haute Qualité Environnementale
- ✓ klima:aktiv
- ✓ ITACA protocol
- ✓ SB100 standard
- ✓ LEnSE project

Together with the above labels, the following existing initiatives related to sustainable buildings have been considered:

- ✓ The CEN350 Indicators
- ✓ The Construction Products Directive (CPD)
- ✓ The GPP - Green Public Procurement environmental criteria

Some of the existing certification schemes analysed consider economic (direct and indirect) and social aspects. Nevertheless during the Second AHWG meeting it has been decided to focus only on environmental aspects according to the European Ecolabel Regulation.

The table below is the result of a synthesis of the following elements:

- main environmental aspects pointed out from the LCA methodology;
- main issues used in different certification schemes examined;
- Indicators/focal points identified within the existing initiatives at European level (CEN/TC 350, CPR proposal, GPP criteria for construction).

The main issues to be considered are organised according to the life cycle phases of the building, as mainly approached by the certification schemes and other activities mentioned. In grey the issues not considered for the EU Ecolabel criteria development.



Table 2.1: Issues for the development of EU Ecolabel criteria for buildings

	Project	Construc.	Use and mainten.	Refurbish.	End of Life
Environmental issues					
Environmental loadings					
Emission in atmosphere		x	x	x	x
Emission to the soil		x	x	x	x
Emission to the water		x	x	x	x
Wastes		x	x	x	x
...					
Resource use					
Energy		x	x	x	x
Materials	x	x	x	x	x
Water	x	x	x	x	x
Land use	x	x		x	x
Site selection	x			x	x
...					
Health and safety					
Indoor quality			x	x	
Noise			x	x	
Comfort	x	x	x	x	
Daylighting and illumination	x	x	x	x	
....					
Social issues					
Relation with the territory					
Outdoor environmental quality					
Social and cultural value					
....					
Economic issues / Fitness for use					
Service quality					
Management	x		x		
Maintenance	x		x		
Performance			x		
Functionality	x		x		
....					
Services					
Transport			x		
Waste collection	x		x	x	
Common services (e.g. wash-machines..)	x		x	x	
Parking (auto, bike)	x		x	x	



ISPRA

Second Background report- March 2009

	Project	Construc.	Use and mainten.	Refurbish.	End of Life
.....					
Costs					
Management/Maintenance costs	?				
External costs					
....					



3. The energy issues in the use phase

The energy aspects, related to the use phase, will be referred to the criteria included in the Directive 2002/91/EC adopted by all the Member states. The Directive establishes that all new buildings and also the existing ones must have an energy efficiency certification based on dispositions and/or requirements laid at national and/or regional level.

For the buildings energy performance evaluation, in the use phase, it appears necessary the selection of the energy class that is used both at national and European level. This particular approach can be used within each Member State. Due to the above consideration it is important, for the EU Eco-label certification, to maintain the evaluation criteria (energy performance) as it is already established at national level for each Member State.

In fact, all the building projects that will be presented from the 1st January 2010 will have to comply with the minimal requirements included in column class C of the EU Directive.

It appears necessary, for new buildings, to be able to satisfy the EU Eco-label requirement to include an obligatory and more restrictive requirement compared to the EU Directive, since Eco-label is a tool for environmental high standards quality. Thus, it is suggested, for new buildings (or buildings that have to undertake major reconstruction works) that these buildings will have to be classified as energy efficiency class A (50% reduction of primary energy consumption) to satisfy the Eco-label criteria mandatory requirement.

Related to the possible optional criteria, instead, it could be established a criteria with a particular score, always related to the energy efficiency indicator, that aims to 75% reduction of primary energy consumption of the building classified as energy efficiency class A+.

The Eco-label certification will have to take into account, also, the existing buildings for which high environmental standards, example those indicated for new buildings, can not be required and will be impossible to satisfy. However, it is plausible to consider that a complex of existing buildings wish to obtain the Eco-label certification and it could be possible by complying with a minimal requirement, energy efficiency class C, as it is also considered within the EU Directive.

In this case, it is also possible, to establish optional criteria with different scores that are related to the energy efficiency of the exiting building that could reach also higher classes such as: class B, class A, class A+.

The following table shows briefly the criteria proposal related to the energy efficiency of buildings.

Table 3.2: Energy efficiency criteria

	Energy efficiency class	Mandatory	Assessment
New building	A	yes	Energy Efficiency Certificate
Existing building	C	yes	

Together with the obligatory criteria, described above, that could be consider as pre-requirements the other energy requirements will be included with different indicators, eventually as optional criteria. These indicators and/or requirements will be developed with the intent of emphasising the environmental performance adopted during the different phase of the life cycle of a building, particularly related to the construction phase and the use phase of a building.



4. Towards a first range of criteria

The aim of this chapter is to define a range of criteria in consistency with the issues identified so far, to be discussed during the third AHWG meeting .

During this phase, only the identification of possible criteria will be carried out with the aim of including them in the EU Eco-label buildings criteria development. The further step will be to identify specific indicators to measure them and to establish thresholds as well as means of verification and assessment .

These latter aspects, thresholds and verification methods, will be tackled as next step of the project.

The product group definition, is here reported with in order to illustrate the methodology used to identify a possible set of criteria:

Product group definition for “buildings” shall comprise: “buildings considered in their entirety, as well as small houses, new or existing, public or private, used for residential purpose and for use as offices”.

From the definition part of the building such as dwellings are excluded.

New buildings include also major refurbishments.

Existing buildings include also renovations.

Residential purpose is meant as for dwelling purpose.

Use as offices is meant to be the use of the building for administrative, bureaucratic and educational activities of a public or private nature.

4.1 METHODOLOGY

According to the Product group definition reported above the following aspects have been analysed and identified:

- ✓ criteria used by the most important Environmental Certification Scheme for buildings, at European and international level, related to the aspects identified in tab. 2.1;
- ✓ for each criterion the type of building for which the criterion is applicable has been defined. Example: if the criterion is applicable to new or existing buildings, to residential or office building etc.
- ✓ It has also been provided, for each criterion, the specification; if there is on/off criterion or if the criterion is related to a score system to be reached and/or not be reached.

As stated in the First Background Report, in order to define Ecolabel criteria with a common approach amongst European tools, environmental indicators defined by CEN/TC 350 have been taken into account (see figure below).



Figure 4.1: Proposal of the environmental indicators in CEN/TC 350



European Committee for Standardization
Comité Européen de Normalisation
Europäisches Komitee für Normung

Environmental indicators in CEN/TC350

- 1) LCIA emission indicators (output):
 - Climate change
 - Destruction of the stratospheric ozone layer
 - Acidification of land and water resources
 - Eutrophication
 - Formation of ground level ozone
- 2) Resource use indicators (input):
 - Use of non-renewable materials
 - Use of renewable materials
 - Use of secondary materials
 - Use of non-renewable primary energy
 - Use of renewable primary energy
 - Use of freshwater resources
- 3) Waste indicators
 - Construction and demolition waste to recycling
 - Construction and demolition waste to energy recovery
 - Non-hazardous waste to disposal
 - Hazardous waste to disposal
 - Radioactive waste to disposal

Source: Ari Ilomäki, chairman, CEN/TC 350

In the same way Construction Products Directive (CPD) aspects have been taken into account (see box below).

CPD – ANNEX 1

art. 3. HYGIENE, HEALTH AND THE ENVIRONMENT

The construction works must be designed and built in such a way that they will not be a threat neither to the hygiene nor health of the occupants and neighbours, nor exert a exceedingly high impact over their entire life cycle to the environmental quality nor to the climate, during their construction, use and demolition, in particular as a result of any of the following:

- (a) the giving-off of toxic gas;
- (b) the emissions of dangerous substances, volatile organic compounds (VOC), greenhouse gases or dangerous particles into indoor or out door air;
- (c) the emission of dangerous radiation;
- (d) the release of dangerous substances into drinking water, ground water, marine waters or soil;
- (e) faulty discharge of waste water, emission of flue gases or faulty disposal of solid or liquid wastes;
- (f) the presence of dampness in parts of the works or on surfaces within the works.

Art. 5. PROTECTION AGAINST NOISE



The construction works must be designed and built in such a way that noise perceived by the occupants or people nearby is kept down to a level that will not threaten their health and will allow them to sleep, rest and work in satisfactory conditions.

Art. 6. ENERGY ECONOMY AND HEAT RETENTION

The construction works and their heating, cooling and ventilation installations must be designed and built in such a way that the amount of energy required in use shall be low, when account is taken of the climatic conditions of the location and the occupants.

Art. 7. SUSTAINABLE USE OF NATURAL RESOURCES (new CPR element)

The construction works must be designed, built and demolished in such a way that the use of natural resources is sustainable and ensure the following:

- (a) recyclability of the construction works, their materials and parts after demolition;
- (b) durability of the construction works;
- (c) use of environmentally compatible raw and secondary materials in the construction works.

During the working group activities, some other aspects to be included among the list of criteria for the development of European Ecolabel for buildings have been underlined. This list of criteria is reported in Annex 1, Table 8.9.

4.2 FIRST CRITERIA PROPOSAL

In this phase the range of criteria proposed is related to each item previously identified in the First Background Report and selected on the basis of their frequency within existing initiatives in order to identify the most used criteria according to the following certification schemes analysed.

The following table shows the list of certification schemes or initiatives analysed and the related number of criteria considered in the analysis. More than 600 criteria have been examined.

Table 4.1: Schemes of EU initiatives taken into account in order to identify the first criteria proposal and criteria accounted for each scheme and in total

Scheme	Criteria (n.)
Breeam	101
Breeam Ecohomes 2006	25
Casbee for Home 2007	75
Casbee NC 2008	106
CEN/TC 350	14
CPD	17
GPP - EnvCrit	32
iiSBE - SBT	137
ISPRA	26
LEED for Homes 2008	43
Swan-labelling of Small houses	57
Total	633



In the following step the selected criteria will be investigated in order to identify specific indicators to measure them, the limits and eventually reference ranges as well as methods and test for the verification and assessment. In particular further researches will be needed in order to verify the applicability and feasibility of criteria proposed.

In order to select a possible range of criteria, beside the most used criteria of the existing initiatives examined other criteria have been added according to principles and recommendations emerged during the working group consultations such as:

- ✓ environmental effectiveness;
- ✓ ambitious level of criteria according to the market situation;
- ✓ simplicity in their application and assessment.

In this sense it is important to differentiate the ambitious level for criteria addressed to new building from the ambitious level for those criteria addressed to existing buildings. In particular for the existing buildings exist in Europe very different situations in which the environmental performance levels are quite far from buildings situated in North Europe compared to the ones of the Mediterranean area especially in terms of consumption for summer cooling and comfort, and in terms of heat islands caused by buildings (Santamouris, M., 2009).

It is important to recall again that the 99% of the building market is composed by existing buildings built for the majority after the Second World War (1946 - 1990) [see Preliminary Report, § 2]. It is therefore in this area where environmental performance improvement can be reached at the highest level within the European stock building.

The criteria have been selected and characterised pointing out the following information:

- ✓ Field of application
 - New buildings (residential, offices, schools);
 - Existing buildings (residential, offices, schools);
- ✓ Type of criterion
 - Mandatory;
 - Optional
- ✓ Kind of criterion
 - Threshold, on-off
 - Point score system.

The complete list of criteria examined is reported in Annex 1.

In order to count the frequency of criteria in the different initiatives they have been grouped in classes related to main aspects identified such as:

- ✓ Class A: general aspects related to planning, project, construction phase, economic aspects;
- ✓ Class B: environmental impacts;
- ✓ Class C: resource consumption;
- ✓ Class D: fitness for use, comfort and safety aspects.

Within these main classes specific sub-classes have been identified as well as the number of criteria belonging to these sub-classes (see Table 4.2).



As shown in table 4.2 the criteria belonging to Class D2 - Operation & Maintenance, B5 - Indoor pollution, C1 - Energy and C2 - Materials represent about 50% of all criteria examined.

Table 4.2: Main issues taken into account and related number of criteria

CODE-ISSUES	Criteria (n)
A1 - Planning - Project	51
A2 - Costs and Economics	5
B1 - Emission to atmosphere	29
B2 - Emission to water	12
B3 - Emission to soil	3
B4 - Waste production	5
B5 - Indoor pollution	69
B6 - Impacts on site	22
B7 - Ecology	16
C1 - Energy	86
C2 - Materials	102
C3 - Waste management	21
C4 - Water consumption and management	34
D1 - Health and well-being	46
D2 - Operation & Maintenance	57
D3 - Facilities provided	37
D4 - Fitness for use	22
D5 - Safety system	16
Tot	633

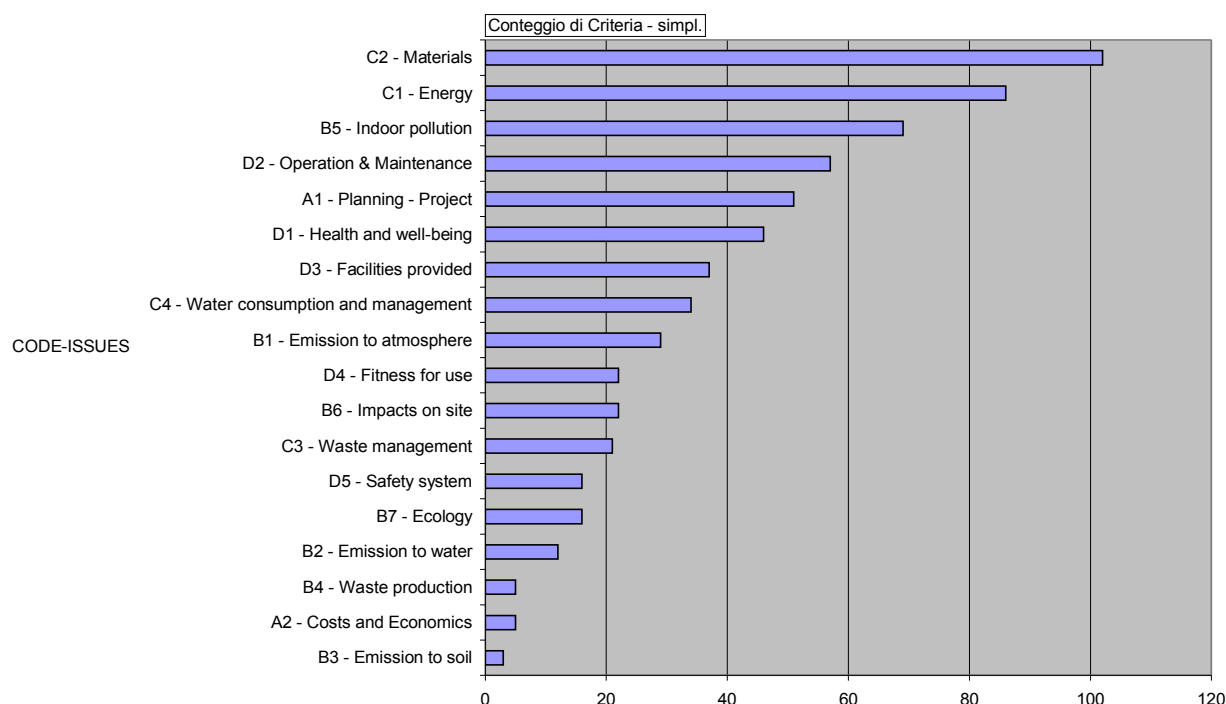
In order to let the different criteria be comparable amongst each other, they have been “translated” in a common language as reported in the table below, which shows how criteria belonging to different initiatives have been classified according to a simpler wording (Simplified Criteria).

**Table 4.3: Example of simplified criteria as a result of comparison between criteria from different schemes.**

Scheme	CODE-ISSUES	Simplified Criteria	CRITERIA
Casbee NC 2008	B5 - Indoor pollution	Noise reduction	Background noise level
Casbee NC 2008	B5 - Indoor pollution	Noise reduction	Sound insulation of openings
Casbee NC 2008	B5 - Indoor pollution	Noise reduction	Sound insulation of partition walls
Casbee NC 2008	B5 - Indoor pollution	Noise reduction	Sound insulation performance of floor slabs (light-weight impact source)
Casbee NC 2008	B5 - Indoor pollution	Noise reduction	Sound insulation performance of floor slabs (heavy-weight impact source)
Casbee NC 2008	B5 - Indoor pollution	Noise reduction	Sound absorption
Casbee NC 2008	B5 - Indoor pollution	Noise reduction	Noise
Casbee for Home 2007	B5 - Indoor pollution	Noise reduction	Reduction of noise, vibration, exhaust and exhaust heat
iiSBE - SBT	B5 - Indoor pollution	Noise reduction	Noise attenuation through the exterior envelope.
iiSBE - SBT	B5 - Indoor pollution	Noise reduction	Noise attenuation between primary occupancy areas.
iiSBE - SBT	B5 - Indoor pollution	Noise reduction	Acoustic performance within primary occupancy areas.
Breeam	B5 - Indoor pollution	Noise reduction	Sound Insulation
Breeam	B5 - Indoor pollution	Noise reduction	Noise Attenuation
Breeam Ecohomes 2006	B5 - Indoor pollution	Noise reduction	Sound insulation - noise
CPD	B5 - Indoor pollution	Noise reduction	Protection against noise
GPP - EnvCrit	B5 - Indoor pollution	Noise reduction	Internal noise reduction



Figure 4.2: Total number of simplified criteria per issues (n.)



The following table 4.4 shows for each aspect (class) the simplified criteria and their recurrence.

Table 4.4: List of the simplified criteria per issue and their recurrence

CODE-ISSUES	Simplified Criteria	Tot
A1 - Planning - Project	Constructor's requirements	7
	Design for disassembly, re-use or recycling.	2
	Innovative or regional design	4
	Integrated project planning	3
	Laws and regulations	1
	Local inter-actions	8
	Project's and Construction's QMS - Quality Management System	5
	Responsibility	2
	Risk assessment for the site	2
	Site pre-assessment	6
	Site selection	3
	Sustainable project	8
A1 - Planning - Project Tot		51
A2 - Costs and Economics	Affordability of residential rental or cost levels.	1
	Life Cycle Costing	4
A2 - Costs and Economics Tot		5



CODE-ISSUES	Simplified Criteria	Tot
B1 - Emission to atmosphere	Air pollution	1
	CO2 embodied in construction products	1
	CO2 emissions	9
	CO2 emissions insulants	1
	Emissions of dangerous radiation	1
	Emissions of dangerous substances	1
	Emissions of flue gases	1
	Emissions of toxic gas	1
	NOx / VOC emissions	5
	ODS (Ozone depleting substances)	6
	SO2 emissions	2
B1 - Emission to atmosphere Tot		29
B2 - Emission to water	Embodied waste water	1
	Faulty discharge of waste water	1
	PO4 emissions	1
	Rainwater loads	4
	Release of dangerous substances into drinking water	1
	Release of dangerous substances into water (watercourse, ground water, ..)	2
	Sewage load	1
	Watercourse pollution	1
B2 - Emission to water Total		12
B3 - Emission to soil	Faulty disposal of solid or liquid waste	1
	Hazardous waste on site	1
	Release of dangerous substances into soil	1
B3 - Emission to soil Tot		3
B4 - Waste production	Design for waste production reduction	3
	Solid waste from construction and demolition	1
	Solid waste from facility operations	1
B4 - Waste production Tot		5
B5 - Indoor pollution	Air filtering	1
	Chemicals	3
	CO2	2
	Combustion venting	1
	Contaminant control	2
	Control of smoking	1
	Cooling	2
	Electromagnetic pollution	1
	Exhaust gases	3
	Exhaust heat	1
	Heating	2
	Indoor air quality	2
	Information on the indoor climate	1



CODE-ISSUES	Simplified Criteria	Tot
	Microbes, mites, mold	3
	Moisture	1
	Noise control	2
	Noise reduction	16
	Nontoxic pest control	1
	Odour	1
	Outdoor air ventilation	1
	Pollutant migration between occupancies.	1
	Pollutants from products, facilities, operations	5
	Radon	2
	Ventilation - natural ventilation	10
	Vibrations	3
	VOC	1
B5 - Indoor pollution Tot		69
B6 - Impacts on site	Construction site noise reduction	1
	Contaminated land	1
	Day-lighting	1
	Heat island	6
	Impact of construction process on ecology	3
	Impacts on site	3
	Light pollution	2
	Re-use of land	1
	Site management	3
	Thermal changes on water (course, aquifers)	1
B6 - Impacts on site Tot		22
B7 - Ecology	Building footprint	1
	Protection of ecological features	13
	Use of trees, ...	2
B7 - Ecology Tot		16
C1 - Energy	BAT energy (LZC)	3
	Building thermal load	1
	Building's Insulation	4
	Construction and demolition waste to energy recovery	1
	Display panel	1
	Electrical peak demand	1
	Energy consumption/performance standards	1
	Energy efficiency certification	3
	Energy efficiency training	1
	Heat - Power Loss	4
	Heating and cooling systems	17
	Innovative energy efficient building services	1
	Insulation material's performance	1



CODE-ISSUES	Simplified Criteria	Tot
	Insulation of H&C distribution system	4
	Labelled domestic appliances (Energy - Eco)	6
	Labelled Lighting system (energy - eco)	7
	Lifts and elevators	3
	Monitoring & Control of energy consumption	7
	Renewable and low emission energy source	18
	Use of non renewable primary energy	1
	Use of renewable primary energy	1
C1 - Energy Tot		86
C2 - Materials	Adhesive (for indoor use)	1
	Avoidance of CFCs and Halons	3
	Chemical products (safety data, active substances)	3
	Chlorine-free coverings	1
	Energy embodied in materials	1
	Filler, floor screed/liquid filler, filler/sealant	1
	Indoor paint, varnish and floor oil	1
	Labelled construction products (Eco, Energy, responsible sources)	8
	Labelled materials (Energy - Eco)	5
	LCA comparison of construction materials	1
	List of products/materials	7
	Long life service materials	5
	Material-efficient framing	2
	Material's management	1
	Materials with low VOC content	1
	No materials with hazardous substances	1
	No materials with hydrofluorocarbons (HFCs).	1
	No materials with sulphurhexafluoride (SF).	1
	No use of silicon-blasting agents for steel's renovation	1
	Plastic's products - Halogen free/Additives	4
	Recyclability of the construction works, their materials and parts after demolition	1
	Reducing usage of materials	4
	Responsible Sourcing of Materials	4
	Re-use of materials or building's parts (in or off site)	5
	Short chain materials	1
	Thermal insulation materials	5
	Timber from sustainable forestry	9
	Transport and recycling of building materials	1
	Use of bio-based products obtained from sustainable sources.	1
	Use of blended or eco-cement	2
	Use of durable materials.	1
	Use of materials that are locally produced.	2
	Use of materials without lead or lead-compounds	1



CODE-ISSUES	Simplified Criteria	Tot
	Use of non-renewable materials	1
	Use of recycled aggregates	2
	Use of recycled materials	7
	Use of renewable materials	1
	Use of re-used materials	1
	Use of sealants without toxic chemicals	1
	Use of structural steel	2
	Water embodied in materials	1
C2 - Materials Tot		102
C3 - Waste management	Common waste storage systems	1
	Compactor / Baler	1
	Composting	2
	Construction and demolition waste to energy recovery	2
	Construction and demolition waste to recycling	2
	Construction and demolition waste to re-use	1
	Non-hazardous waste to disposal	1
	Radioactive waste to disposal	1
	Recycling facilities	4
	Sustainable Waste management	6
C3 - Waste management Tot		21
C4 - Water consumption and management	Availability of a split grey / potable water system.	3
	Grey-water reuse system	5
	Irrigation system	2
	Low-flush systems (toilets, showers, ..)	6
	Major leak detection	1
	Minimise water use	6
	Potable water treatment system	1
	Rainwater use	7
	Surface water management system	1
	Water Meter	2
C4 - Water consumption and management Tot		34
D1 - Health and well-being	Acoustic Performance	1
	Aesthetic concerns	4
	Air conditioning system	2
	Air supply planning	1
	Day-lighting	12
	Drinking Water	1
	Glare Control	4
	High frequency lighting	1
	Lighting system and control	6
	Outdoor air ventilation	1
	Outdoor lighting	1



CODE-ISSUES	Simplified Criteria	Tot
	Temperature and humidity control	10
	View Out	1
	Visual privacy	1
D1 - Health and well-being Tot		46
D2 - Operation & Maintenance	Building's information	3
	Capability for partial operation of facility technical systems.	1
	Commissioning of facility systems	1
	Design for maintenance	1
	Durability of the construction works	1
	Ease of building's maintenance (without plants)	1
	Ease of equipments and plants renewal	5
	Ease of Maintenance	1
	Flexibility and adaptability (space, plants)	6
	Frequency of refurbishment and renewal (plants, interior, exterior, services)	7
	Local control of lighting systems	1
	Maintenance system - plan	9
	Monitoring & Control of building's functions	1
	Performance incentives in leases or sales agreements.	1
	Personal control of lighting systems	1
	Reliability of equipments and plants	5
	Technical manuals (heating, cooling, ..)	1
	Training - knowledge of maintenance operating staff	2
	User's guide - operation and management system	9
D2 - Operation & Maintenance Tot		57
D3 - Facilities provided	Car facilities - regulations	5
	Common ITC services - home office	6
	Cycle Facilities	5
	Drying space	2
	Encouragement of walking	1
	Open spaces, green areas, common areas	8
	Proximity to commercial, cultural and recreation facilities	4
	Public transport	4
	Shared Facilities	2
D3 - Facilities provided Tot		37
D4 - Fitness for use	Adequacy of equipments	1
	Adequacy of spaces	1
	Adequacy of type of facilities provided for tenant or occupant needs.	1
	Barrier-free planning	3
	Building's air-tightness	4
	Customer information	2
	Functionality (layouts, space, allowance, adaptability)	7
	Quality control (construction phase)	3



CODE-ISSUES	Simplified Criteria	Tot
D4 - Fitness for use Tot		22
D5 - Safety system	Antropic risk (crime, chemicals, biologicals, explosive, ..)	4
	Natural risk (flood, earthquake, fire, wind, ...)	9
	Risk for users	2
	Risk in the construction phase	1
D5 - Safety system Tot		16
Tot		633

In table 4.5 are summarised the Classes related to the main issues to be considered in the European Ecolabel criteria. Economic aspects (A2 Class) and safety aspects (D5 Class) have been excluded as not directly related to environmental aspects.

According to this exclusion the criteria considered in the analysis have been 612, as reported in the table below.

Table 4.5: Main issues to be consider for the EU Ecolabel Criteria development and related number of criteria

CODE-ISSUES	(n)
A1 - Planning - Project	51
B1 - Emission to atmosphere	29
B2 - Emission to water	12
B3 - Emission to soil	3
B4 - Waste production	5
B5 - Indoor pollution	69
B6 - Impacts on site	22
B7 - Ecology	16
C1 - Energy	86
C2 - Materials	102
C3 - Waste management	21
C4 - Water consumption and management	34
D1 - Health and well-being	46
D2 - Operation & Maintenance	57
D3 - Facilities provided	37
D4 - Fitness for use	22
Tot	612

Through the translation of the Criteria into Simplified Criteria, their total number has decrease at 208, as shown by table 4.6.

**Table 4.6: Total number of Simplified criteria**

CODE-ISSUES	(n)
A1 - Planning - Project	12
B1 - Emission to atmosphere	11
B2 - Emission to water	8
B3 - Emission to soil	3
B4 - Waste production	3
B5 - Indoor pollution	26
B6 - Impacts on site	10
B7 - Ecology	3
C1 - Energy	21
C2 - Materials	41
C3 - Waste management	10
C4 - Water consumption and management	10
D1 - Health and well-being	14
D2 - Operation & Maintenance	19
D3 - Facilities provided	9
D4 - Fitness for use	8
Simplified criteria tot.	208

In order to identify the most used criteria the recurrence for each criterion has been calculated as percentage compared to the total amount of criteria.

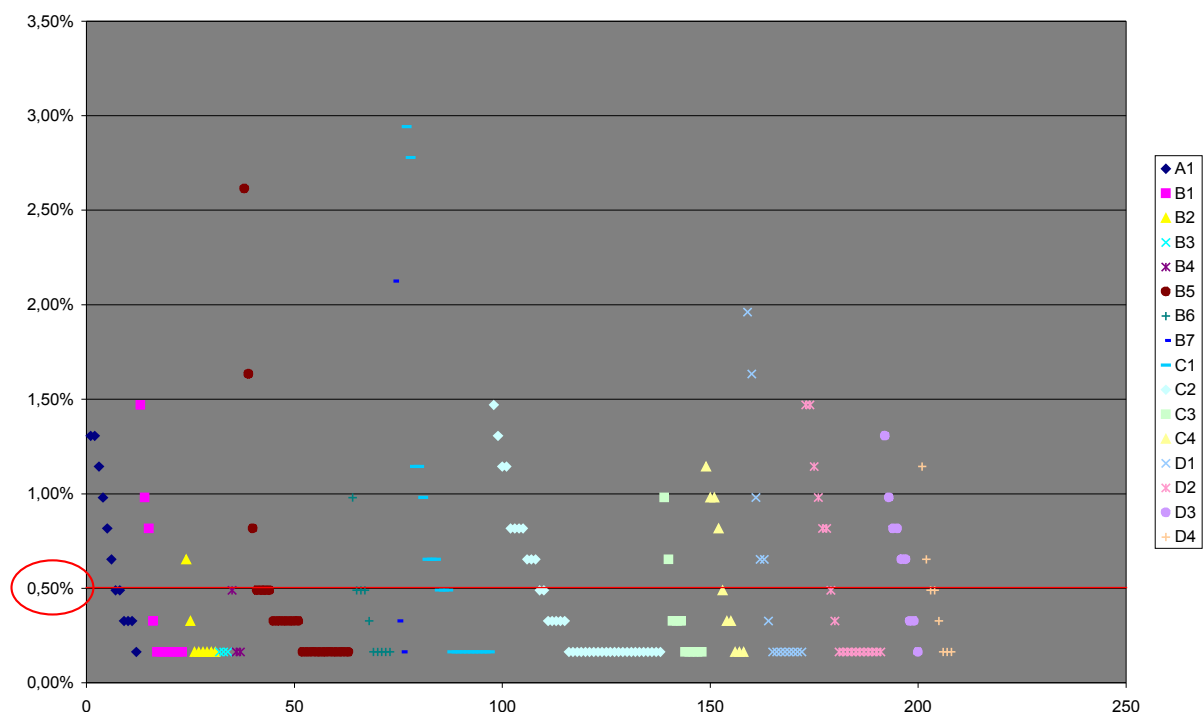
Table 9.1 reported in Annex 2 shows the list of simplified criteria, their codes, the recurrence expressed both in absolute number and in percentage of the total amount of criteria. The last column shows the selected simplified criteria according to a threshold value of ≥ 0.5 .

The recurrence distribution of simplified criteria is shown in figure 4.3.

The hurdle of 0.5% has been chosen by cutting the distance between the extreme of the percentage values (which vary from 0.16% to 2.94%) at a value higher of $\frac{3}{4}$, in precautionary way. In such way we catch more than 60% of the whole criteria presented (396/633).



Figure 4.3: Recurrence distribution of Simplified Criteria (%)



According to the methodology applied, 59 criteria have been selected as the most used in the initiatives considered (points above the read line in the previous figure), distributed amongst the different issues (see tables 4.7. and 4.8).

Table 4.7: Number of selected simplified criteria according to the $\% \geq 0,5$ methodology.

CODE-ISSUES	Selected Simplified Criteria
	(n)
A1 - Planning - Project	6
B1 - Emission to atmosphere	3
B2 - Emission to water	1
B5 - Indoor pollution	3
B6 - Impacts on site	1
B7 - Ecology	1
C1 - Energy	8
C2 - Materials	11
C3 - Waste management	2
C4 - Water consumption and management	4
D1 - Health and well-being	5
D2 - Operation & Maintenance	6
D3 - Facilities provided	6
D4 - Fitness for use	2
Tot	59



Table 4.8: Selected Simplified Criteria according to the % $\geq 0,5$ methodology.

CODE-ISSUES	Selected Simplified Criteria	%
A1 - Planning - Project	Constructor's requirements	1,14%
	Innovative or regional design	0,65%
	Local inter-actions	1,31%
	Project's and Construction's QMS - Quality Management System	0,82%
	Site pre-assessment	0,98%
	Sustainable project	1,31%
B1 - Emission to atmosphere	CO2 emissions	1,47%
	NOx / VOC emissions	0,82%
	ODS (Ozone depleting substances)	0,98%
B2 - Emission to water	Rainwater loads	0,65%
B5 - Indoor pollution	Noise reduction	2,61%
	Pollutants from products, facilities, operations	0,82%
	Ventilation - natural ventilation	1,63%
B6 - Impacts on site	Heat island	0,98%
B7 - Ecology	Protection of ecological features	2,12%
C1 - Energy	Building's Insulation	0,65%
	Heat - Power Loss	0,65%
	Heating and cooling systems	2,78%
	Insulation of H&C distribution system	0,65%
	Labelled domestic appliances (Energy - Eco)	0,98%
	Labelled Lighting system (energy - eco)	1,14%
	Monitoring & Control of energy consumption	1,14%
	Renewable and low emission energy source	2,94%
C2 - Materials	Labelled construction products (Eco, Energy, responsible sources)	1,31%
	Labelled materials (Energy - Eco)	0,82%
	List of products/materials	1,14%
	Long life service materials	0,82%
	Plastic's products - Halogen free/Additives	0,65%
	Reducing usage of materials	0,65%
	Responsible Sourcing of Materials	0,65%
	Re-use of materials or building's parts (in or off site)	0,82%
	Thermal insulation materials	0,82%
	Timber from sustainable forestry	1,47%
	Use of recycled materials	1,14%
C3 - Waste management	Recycling facilities	0,65%
	Sustainable Waste management	0,98%
C4 - Water consumption and management	Gray-water reuse system	0,82%
	Low-flush systems (toilets, showers, ..)	0,98%
	Minimise water use	0,98%



CODE-ISSUES	Selected Simplified Criteria	%
	Rainwater use	1,14%
D1 - Health and well-being	Aesthetic concerns	0,65%
	Day-lighting	1,96%
	Glare Control	0,65%
	Lighting system and control	0,98%
	Temperature and humidity control	1,63%
D2 - Operation & Maintenance	Ease of equipments and plants renewal	0,82%
	Flexibility and adaptability (space, plants)	0,98%
	Frequency of refurbishment and renewal (plants, interior, exterior, services)	1,14%
	Maintenance system - plan	1,47%
	Reliability of equipments and plants	0,82%
	User's guide - operation and management system	1,47%
D3 - Facilities provided	Car facilities - regulations	0,82%
	Common ITC services - home office	0,98%
	Cycle Facilities	0,82%
	Open spaces, green areas, common areas	1,31%
	Proximity to commercial, cultural and recreation facilities	0,65%
	Public transport	0,65%
D4 - Fitness for use	Building's air-tightness	0,65%
	Functionality (layouts, space, allowance, adaptability)	1,14%

In addition to the most used criteria selected with the above mentioned methodology a number of suggested criteria (listed in table 4.9) have been also added in the proposal from the working group as considered significant criteria from an environmental point of view and even if their recurrence is below to 0.5%.

Table 4.9: Suggested Criteria

CODE-ISSUES	sub-code	Suggested Criteria
A1 - Planning - Project	A1.7	Integrated project planning
A1 - Planning - Project	A1.8	Site selection
A1 - Planning - Project	A1.9	Design for disassembly, re-use or recycling.
B1 - Emission to atmosphere	B1.4	SO2 emissions
B1 - Emission to atmosphere	B1.6	CO2 embodied in construction products
B3 - Emission to soil	B3.3	Release of dangerous/toxic substances into soil
B4 - Waste production	B4.1	Design for waste production reduction
B5 - Indoor pollution	B5.4	Chemicals
B5 - Indoor pollution	B5.5	Exhaust gases
B5 - Indoor pollution	B5.6	Microbes, mites, mold
B5 - Indoor pollution	B5.7	Vibrations
B5 - Indoor pollution	B5.10	Cooling
B5 - Indoor pollution	B5.11	Heating
B5 - Indoor pollution	B5.14	Radon



B6 - Impacts on site	B6.2	Impact of construction process on ecology
B6 - Impacts on site	B6.3	Impacts on site
B6 - Impacts on site	B6.4	Site management
B6 - Impacts on site	B6.5	Light pollution
B7 - Ecology	B7.2	Use of trees, ...
C1 - Energy	C1.9	BAT energy (LZC)
C1 - Energy	C1.10	Energy efficiency certification
C2 - Materials	C2.12	Avoidance of CFCs and Halons
C2 - Materials	C2.13	Chemical products (safety data, active substances)
C2 - Materials	C2.16	Use of materials that are locally produced.
C2 - Materials	C2.21	Energy embodied in materials
C3 - Waste management	C3.4	Sustainable management of Construction and demolition waste
C4 - Water consumption and management	C4.5	Availability of a split grey / potable water system.
D1 - Health and well-being	D1.6	Air conditioning system
D2 - Operation & Maintenance	D2.7	Building's information
D2 - Operation & Maintenance	D2.8	Training - knowledge of maintenance operating staff
D2 - Operation & Maintenance	D2.14	Ease of Maintenance
D3 - Facilities provided	D3.8	Shared Facilities
D4 - Fitness for use	D4.4	Quality control (construction phase)

From the selected criteria we suggest to exclude those criteria concerning site specific aspects such as:

- ✓ Proximity to commercial, cultural and recreation facilities
- ✓ Public transport

As total, considering the selected, the suggested and the excluded criteria, in table 4.10 a possible range of criteria is proposed already considering the specific field of application:

- ✓ N: New buildings;
- ✓ E+N: New and Existing buildings

and the related Life Cycle Phase of application of the criterion (table 4.11):

- ✓ A: Planning, Project, Construction phase;
- ✓ B: Use/Operating phase;
- ✓ C: End of Life phase.

The proposed number of criteria is 90, of which 17 are specifically addressed to New buildings (or buildings with major renovations) while all the others are addressed to both New and Existing buildings.

Table 4.10 shows the number of Proposed criteria, grouped for New and New+Existing Buildings together with the issues covered by those criteria.

Table 4.11 shows the same Proposed criteria but underling the specific related Life Cycle phase.

Finally, the last Table 4.12 shows the complete list of proposed criteria for the EU Ecolabel for buildings.

We would like to underline that all other required information for each criterion (such as indicator, hurdles, assessment method) will be defined in the next phase of the project activity.

**Table 4.10: Number of Proposed Ecolabel Criteria for New and New+Existing Buildings**

Applicability	CODE-ISSUES	(n)
N	A1 - Planning - Project	9
	B1 - Emission to atmosphere	1
	B6 - Impacts on site	3
	B7 - Ecology	1
	C2 - Materials	1
	C3 - Waste management	1
	D4 - Fitness for use	1
N. of criteria for new buildings		17
E+N	B1 - Emission to atmosphere	4
	B2 - Emission to water	1
	B3 - Emission to soil	1
	B4 - Waste production	1
	B5 - Indoor pollution	10
	B6 - Impacts on site	2
	B7 - Ecology	1
	C1 - Energy	10
	C2 - Materials	13
	C3 - Waste management	2
	C4 - Water consumption and management	5
	D1 - Health and well-being	6
	D2 - Operation & Maintenance	9
	D3 - Facilities provided	5
	D4 - Fitness for use	3
N. of criteria for New+Existing buildings		73
Total proposed criteria		90



Table 4.11: Number of Proposed Ecolabel Criteria for Life Cycle Phase

Life Cycle phase	CODE-ISSUES	(n)
A - Planning, Project, Construction	A1 - Planning - Project	8
	B1 - Emission to atmosphere	1
	B6 - Impacts on site	2
	B7 - Ecology	1
Total A		12
A, B, C	B3 - Emission to soil	1
	B4 - Waste production	1
Total A, B, C		2
A, C	C2 - Materials	1
	C3 - Waste management	1
Total A, C		2
B - Use / Operating	B1 - Emission to atmosphere	4
	B2 - Emission to water	1
	B5 - Indoor pollution	10
	B6 - Impacts on site	3
	B7 - Ecology	1
	C1 - Energy	10
	C2 - Materials	13
	C3 - Waste management	2
	C4 - Water consumption and management	5
	D1 - Health and well-being	6
	D2 - Operation & Maintenance	9
	D3 - Facilities provided	5
	D4 - Fitness for use	4
Total B		73
C - End of Life	A1 - Planning - Project	1
Total C		1
Total		90



Table 4.12: Proposed criteria for EU Ecolabel for buildings

CODE-ISSUES	sub-code	Proposed Criteria	Life Cycle phase	Applicability
A1 - Planning - Project	A1.1	Local inter-actions	A	N
A1 - Planning - Project	A1.2	Sustainable project	A	N
A1 - Planning - Project	A1.3	Constructor's requirements	A	N
A1 - Planning - Project	A1.4	Site pre-assessment	A	N
A1 - Planning - Project	A1.5	Project's and Construction's QMS - Quality Management System	A	N
A1 - Planning - Project	A1.6	Innovative or regional design	A	N
A1 - Planning - Project	A1.7	Integrated project planning	A	N
A1 - Planning - Project	A1.8	Site selection	A	N
A1 - Planning - Project	A1.9	Design for disassembly, re-use or recycling.	C	N
B1 - Emission to atmosphere	B1.1	CO2 emissions	B	E+N
B1 - Emission to atmosphere	B1.2	ODS (Ozone depleting substances)	B	E+N
B1 - Emission to atmosphere	B1.3	NOx / VOC emissions	B	E+N
B1 - Emission to atmosphere	B1.4	SO2 emissions	B	E+N
B1 - Emission to atmosphere	B1.6	CO2 embodied in construction products	A	N
B2 - Emission to water	B2.1	Rainwater loads	B	E+N
B3 - Emission to soil	B3.3	Release of dangerous/toxic substances into soil	A, B, C	E+N
B4 - Waste production	B4.1	Design for waste production reduction	A, B, C	E+N
B5 - Indoor pollution	B5.1	Noise reduction	B	E+N
B5 - Indoor pollution	B5.2	Ventilation - natural ventilation	B	E+N
B5 - Indoor pollution	B5.3	Pollutants from products, facilities, operations	B	E+N
B5 - Indoor pollution	B5.4	Chemicals	B	E+N
B5 - Indoor pollution	B5.5	Exhaust gases	B	E+N
B5 - Indoor pollution	B5.6	Microbes, mites, mold	B	E+N
B5 - Indoor pollution	B5.7	Vibrations	B	E+N
B5 - Indoor pollution	B5.10	Cooling	B	E+N
B5 - Indoor pollution	B5.11	Heating	B	E+N
B5 - Indoor pollution	B5.14	Radon	B	E+N
B6 - Impacts on site	B6.1	Heat island	B	E+N
B6 - Impacts on site	B6.2	Impact of construction process on ecology	A	N
B6 - Impacts on site	B6.3	Impacts on site	B	N
B6 - Impacts on site	B6.4	Site management	A	N



CODE-ISSUES	sub-code	Proposed Criteria	Life Cycle phase	Applicability
B6 - Impacts on site	B6.5	Light pollution	B	E+N
B7 - Ecology	B7.1	Protection of ecological features	A	N
B7 - Ecology	B7.2	Use of trees, ...	B	E+N
C1 - Energy	C1.1	Renewable and low emission energy source	B	E+N
C1 - Energy	C1.2	Heating and cooling systems	B	E+N
C1 - Energy	C1.3	Labelled Lighting system (energy - eco)	B	E+N
C1 - Energy	C1.4	Monitoring & Control of energy consumption	B	E+N
C1 - Energy	C1.5	Labelled domestic appliances (Energy - Eco)	B	E+N
C1 - Energy	C1.6	Building's Insulation	B	E+N
C1 - Energy	C1.7	Heat - Power Loss	B	E+N
C1 - Energy	C1.8	Insulation of H&C distribution system	B	E+N
C1 - Energy	C1.9	BAT energy (LZC)	B	E+N
C1 - Energy	C1.10	Energy efficiency certification	B	E+N
C2 - Materials	C2.1	Timber from sustainable forestry	B	E+N
C2 - Materials	C2.2	Labelled construction products (Eco, Energy, responsible sources)	B	E+N
C2 - Materials	C2.3	List of products/materials	B	N
C2 - Materials	C2.4	Use of recycled materials	B	E+N
C2 - Materials	C2.5	Labelled materials (Energy - Eco)	B	E+N
C2 - Materials	C2.6	Long life service materials	B	E+N
C2 - Materials	C2.7	Re-use of materials or building's parts (in or off site)	A, C	E+N
C2 - Materials	C2.8	Thermal insulation materials	B	E+N
C2 - Materials	C2.9	Plastic's products - Halogen free/Additives	B	E+N
C2 - Materials	C2.10	Reducing usage of materials	B	E+N
C2 - Materials	C2.11	Responsible Sourcing of Materials	B	E+N
C2 - Materials	C2.12	Avoidance of CFCs and Halons	B	E+N
C2 - Materials	C2.13	Chemical products (safety data, active substances)	B	E+N
C2 - Materials	C2.16	Use of materials that are locally produced.	B	E+N
C2 - Materials	C2.21	Energy embodied in materials	B	E+N
C3 - Waste management	C3.1	Sustainable Waste management	B	E+N
C3 - Waste management	C3.2	Recycling facilities	B	E+N
C3 - Waste management	C3.4	Sustainable management of Construction and demolition waste	A, C	N
C4 - Water consumption and management	C4.1	Rainwater use	B	E+N
C4 - Water consumption and management	C4.2	Low-flush systems (toilets, showers, ..)	B	E+N



CODE-ISSUES	sub-code	Proposed Criteria	Life Cycle phase	Applicability
C4 - Water consumption and management	C4.3	Minimise water use	B	E+N
C4 - Water consumption and management	C4.4	Grey-water reuse system	B	E+N
C4 - Water consumption and management	C4.5	Availability of a split grey / potable water system.	B	E+N
D1 - Health and well-being	D1.1	Daylighting	B	E+N
D1 - Health and well-being	D1.2	Temperature and humidity control	B	E+N
D1 - Health and well-being	D1.3	Lighting system and control	B	E+N
D1 - Health and well-being	D1.4	Aesthetic concerns	B	E+N
D1 - Health and well-being	D1.5	Glare Control	B	E+N
D1 - Health and well-being	D1.6	Air conditioning system	B	E+N
D2 - Operation & Maintenance	D2.1	Maintenance system - plan	B	E+N
D2 - Operation & Maintenance	D2.2	User's guide - operation and management system	B	E+N
D2 - Operation & Maintenance	D2.3	Frequency of refurbishment and renewal (plants, interior, exterior, services)	B	E+N
D2 - Operation & Maintenance	D2.4	Flexibility and adaptability (space, plants)	B	E+N
D2 - Operation & Maintenance	D2.5	Ease of equipments and plants renewal	B	E+N
D2 - Operation & Maintenance	D2.6	Reliability of equipments and plants	B	E+N
D2 - Operation & Maintenance	D2.7	Building's information	B	E+N
D2 - Operation & Maintenance	D2.8	Training - knowledge of maintenance operating staff	B	E+N
D2 - Operation & Maintenance	D2.14	Ease of Maintenance	B	E+N
D3 - Facilities provided	D3.1	Open spaces, green areas, common areas	B	E+N
D3 - Facilities provided	D3.2	Common ITC services - home office	B	E+N
D3 - Facilities provided	D3.3	Car facilities - regulations	B	E+N
D3 - Facilities provided	D3.4	Cycle Facilities	B	E+N
D3 - Facilities provided	D3.8	Shared Facilities	B	E+N
D4 - Fitness for use	D4.1	Functionality (layouts, space, allowance, adaptability)	B	E+N
D4 - Fitness for use	D4.2	Building's airtightness	B	E+N
D4 - Fitness for use	D4.4	Quality control (construction phase)	A	N



5. The criteria structure

According to the product definition the product group “Buildings” refers to “Buildings considered in their entirety, as well as small houses, new or existing, public or private, used for residential purpose and for use as offices”.

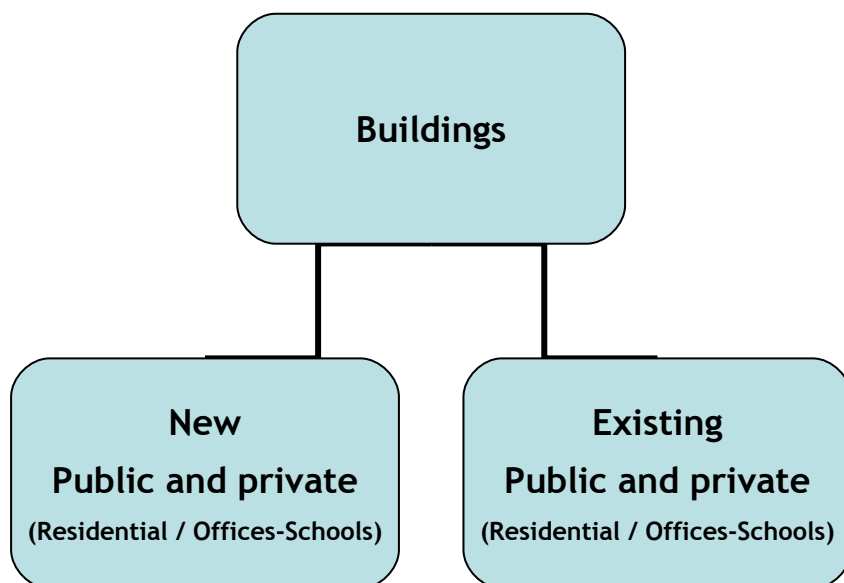
The following considerations are also part of the product group definition:

- From the definition part of the building such as dwellings are excluded;
- New buildings include also major refurbishments.
- Existing buildings include also renovations.
- Residential purpose is meant as for dwelling purpose.
- Use as offices is meant to be the use of the building for administrative, bureaucratic and educational activities of a public or private nature.

According to the product group definition above, we are facing criteria development for the following categories of buildings:

- New buildings for residential purpose (public or private)
- New buildings for office purposes (public or private)
- Existing buildings for residential purpose (public or private)
- Existing buildings for office purposes (public or private)

The criteria structure of the product group “Buildings” could therefore foresees two main sub-product groups such as New buildings and Existing buildings in which criteria could refer to both residential or office purposes (public or private):



The structure of criteria would include two sections: mandatory and optional criteria with a minimum score requested according to different situations in order to foresee a certain degree of flexibility especially for existing buildings.



The criteria for new buildings shall concern the planning and construction phases as well as the use phase of the life cycle of the building. End of life considerations shall be included in the planning and construction phase.

Criteria for existing buildings shall concern only the use phase.



6. Validity of criteria and use of the logo

According to the European Ecolabel Scheme the validity of criteria is commonly established between 3-5 years and afterwards the criteria are revised.

The validity of criteria is indicated in each criteria Decision for each product group.

After criteria revision, all the products/services awarded with EU Ecolabel have to comply with the new criteria for each product group, requiring, in this way, a new EU Ecolabel licence since the old criteria are not valid any more.

However, it should be considered that the product group Building is very different from the other EU Ecolabel product groups since the life cycle of a building is definitely much longer than the medium period established for the validity of criteria. Furthermore the use of the logo which is normally related to the validity of criteria should be guarantee for a period consistent with the life time of a building.

The working group, with the support of the European Commission, has discussed these particular aspects in order to identify possible solutions.

Taking into account the product group definition which includes new and existing buildings, validity of criteria and the use of the logo have been proposed considering the different characteristics related to the two types of products:

- New buildings
- Existing buildings.

The new buildings criteria, according to the life cycle are related to the planning phase, construction and use phase, while the existing buildings criteria can only be related to the use phase of the building.

Taking into account the above considerations, in the table below is illustrated a proposal for the validity of criteria and the use of the logo within years time.

Table 6.1: Validity of criteria and use of the logo

Building type	Criteria validity	Transitional period	Renewal
New Building	5 years	2 years	Mandatory according to the Use phase of new criteria for New building (no more than 2 times) - After 2 times, the applicant must complain with new criteria for New building (Project-construction and use phases)
Existing Building	5 years	2 years	Mandatory according new criteria for Existing buildings



7. References

ISPRA (ex APAT), Study for the development of European Ecolabel criteria for buildings - Preliminary Report, Roma, October 2008;

ISPRA (ex APAT), Study for the development of European Ecolabel criteria for buildings - Product group definition, Roma, August 2008;

ISPRA (ex APAT), Study for the development of European Ecolabel criteria for buildings - First background Report, Roma, October 2008;

Santamouris, M., SHE Project - Sustainable Housing in Europe, Roma 12 February 2009 [Series Editor: 'Solar Energy and Energy Conservation in Buildings', James and James Science Publishers, London, UK.];



8. Annex 1 - List of criteria

Table 8.1: Breeam's list of criteria

Scheme	CRITERIA
Breeam	Commissioning
Breeam	Considerate Constructors
Breeam	Site Investigation
Breeam	Consultation
Breeam	Development as a learning resource
Breeam	Good Corporate Citizen
Breeam	Designing For Robustness
Breeam	Consultation with students and staff
Breeam	Flood risk
Breeam	Considerate Constructors
Breeam	Life Cycle Costing
Breeam	Reduction of CO2 Emissions
Breeam	Refrigerant GWP - Building services
Breeam	Preventing refrigerant leaks
Breeam	Refrigerant GWP - Cold storage
Breeam	NOx emissions from heating source
Breeam	Reduction of CO2 emissions
Breeam	Minimising watercourse pollution
Breeam	Indoor air quality
Breeam	Volatile Organic Compounds
Breeam	Microbial contamination
Breeam	Sound Insulation
Breeam	Noise Attenuation
Breeam	Construction Site Impacts
Breeam	Construction Site Impacts - Fit Out only
Breeam	Contaminated land
Breeam	Reduction of Night Time Light Pollution
Breeam	Re-use of land
Breeam	Ecological value of site AND Protection of ecological features
Breeam	Mitigating Ecological impact
Breeam	Enhancing Site Ecology
Breeam	Long term impact on biodiversity
Breeam	Local Wildlife Partnership
Breeam	Sub-metering of Substantial Energy Uses
Breeam	Sub-metering of high energy load Areas and Tenancy
Breeam	External Lighting
Breeam	Low zero carbon technologies



Scheme	CRITERIA
Breeam	Building fabric performance & avoidance of air infiltration
Breeam	Cold storage equipment
Breeam	Lifts
Breeam	Escalators & travelling walkways
Breeam	Free Cooling
Breeam	Labelled lighting controls
Breeam	BMS - Building Management Control System (BMS)
Breeam	Provision of Energy Efficient Equipment
Breeam	Low or Zero Carbon Technologies
Breeam	Materials Specification (major building elements)
Breeam	Materials Specification - Fit Out elements
Breeam	Hard landscaping and boundary protection
Breeam	Re-use of building façade
Breeam	Re-use of building structure
Breeam	Responsible sourcing of materials
Breeam	Responsible sourcing of materials - Fit Out only
Breeam	Insulation
Breeam	Responsible sourcing of materials - finishing elements
Breeam	Recycled aggregates
Breeam	Floor Finishes (used in a limited portion of the floor area)
Breeam	Materials Specification
Breeam	Responsible Sourcing of Materials
Breeam	Construction Site Waste Management
Breeam	Recyclable waste storage
Breeam	Compactor / Baler
Breeam	Composting
Breeam	Water Consumption
Breeam	Water meter
Breeam	Major leak detection
Breeam	Sanitary supply shut off
Breeam	Water recycling
Breeam	Irrigation systems
Breeam	Vehicle Wash
Breeam	Water Meter
Breeam	Daylighting
Breeam	View Out
Breeam	Glare Control
Breeam	High frequency lighting
Breeam	Internal and external lighting levels
Breeam	Lighting zones & controls
Breeam	Potential for natural ventilation
Breeam	Thermal comfort



Scheme	CRITERIA
Breeam	Thermal zoning
Breeam	Acoustic Performance
Breeam	Office Space
Breeam	Outdoor Space
Breeam	Drinking Water
Breeam	Home Office
Breeam	Daylighting
Breeam	Office Space (BREEAM Retail & Industrial Schemes only)
Breeam	Building user guide
Breeam	Publication of building information
Breeam	Ease of Maintenance
Breeam	Shared Facilities
Breeam	Drying space
Breeam	Provision of public transport
Breeam	Proximity to amenities
Breeam	Cyclist Facilities
Breeam	Pedestrian and cycle safety
Breeam	Travel plan
Breeam	Maximum car parking capacity
Breeam	Travel information point
Breeam	Deliveries & manoeuvring
Breeam	Security (against crime)

**Table 8.2: Breeam Ecohomes 2006 list of Criteria (Building type, Residential; Applicability, New build and major refurbishment)**

Scheme	CRITERIA	Mandatory	Type of criteria
Breeam Ecohomes 2006	Considerate constructors	yes	point score
Breeam Ecohomes 2006	Dwelling emission rate	yes	point score
Breeam Ecohomes 2006	Insulant GWP	yes	on-off
Breeam Ecohomes 2006	NOx emissions	yes	point score
Breeam Ecohomes 2006	Reduction of surface runoff	yes	on-off
Breeam Ecohomes 2006	Construction site impacts	yes	point score
Breeam Ecohomes 2006	Protection of ecological features	yes	on-off
Breeam Ecohomes 2006	Building footprint	yes	point score
Breeam Ecohomes 2006	Building fabric (Average Heat Loss Parameter)	no	point score
Breeam Ecohomes 2006	Ecolabelled goods	yes	point score
Breeam Ecohomes 2006	Internal lighting	yes	point score
Breeam Ecohomes 2006	External lighting	yes	point score
Breeam Ecohomes 2006	Renewable and low emission energy source	yes	point score
Breeam Ecohomes 2006	Environmental impacts of materials	yes	point score
Breeam Ecohomes 2006	Responsible sourcing of materials: basic building elements	yes	point score
Breeam Ecohomes 2006	Responsible sourcing of materials: finishing elements	yes	point score
Breeam Ecohomes 2006	Recycling facilities	yes	point score
Breeam Ecohomes 2006	Internal potable water use	no	point score
Breeam Ecohomes 2006	External potable water use	yes	on-off
Breeam Ecohomes 2006	Daylighting	yes	point score
Breeam Ecohomes 2006	Sound insulation - noise	yes	point score
Breeam Ecohomes 2006	Home user guide	yes	point score
Breeam Ecohomes 2006	Drying space	yes	on-off
Breeam Ecohomes 2006	Cycle storage	yes	point score
Breeam Ecohomes 2006	Home office	yes	on-off



Table 8.3: Casbee for Home 2007 list of Criteria (Building type, Detached house; Applicability, New build and major refurbishment and existing buildings)

Scheme	CRITERIA
Casbee for Home 2007	Utilizing Regional Resources and Inheriting the Regional Housing Culture
Casbee for Home 2007	Control of the burden on the local infrastructure
Casbee for Home 2007	Consideration of Global Warming
Casbee for Home 2007	Ensuring thermal insulation and airtightness performance
Casbee for Home 2007	Sunlight adjustment capability
Casbee for Home 2007	Allowing breezes in and heat out
Casbee for Home 2007	Proper planning for cooling
Casbee for Home 2007	Proper planning for heating
Casbee for Home 2007	Countermeasures against chemical contaminants
Casbee for Home 2007	Proper planning for ventilation
Casbee for Home 2007	Reduction of noise, vibration, exhaust and exhaust heat
Casbee for Home 2007	Reduction of noise, vibration, exhaust and exhaust heat
Casbee for Home 2007	Reduction of noise, vibration, exhaust and exhaust heat
Casbee for Home 2007	Reduction of noise, vibration, exhaust and exhaust heat
Casbee for Home 2007	Creating a Richer Townscape and Ecosystem
Casbee for Home 2007	Consideration of the Townscape and Landscape
Casbee for Home 2007	Greening of the premises
Casbee for Home 2007	Ensuring the biological habitat
Casbee for Home 2007	Preservation of the existing natural environment
Casbee for Home 2007	Control of thermal load of building
Casbee for Home 2007	Natural energy use
Casbee for Home 2007	Heating system
Casbee for Home 2007	Cooling system
Casbee for Home 2007	Hot-water supply equipment
Casbee for Home 2007	Heat insulation of bathtub
Casbee for Home 2007	Hot-water plumbing
Casbee for Home 2007	Lighting fixtures
Casbee for Home 2007	Home electric appliances and kitchen equipment
Casbee for Home 2007	Ventilation system
Casbee for Home 2007	Home cogeneration system
Casbee for Home 2007	Solar power generation system
Casbee for Home 2007	Management and control of energy
Casbee for Home 2007	Heating system
Casbee for Home 2007	Cooling system
Casbee for Home 2007	Hot-water supply equipment
Casbee for Home 2007	Heat insulation of bathtub
Casbee for Home 2007	Lighting fixtures, home electric appliances and kitchen equipment
Casbee for Home 2007	Ventilation system
Casbee for Home 2007	Home cogeneration system
Casbee for Home 2007	Solar power generation system



Scheme	CRITERIA
Casbee for Home 2007	Building frames
Casbee for Home 2007	Exterior wall materials
Casbee for Home 2007	Roof materials/flat roof
Casbee for Home 2007	Wooden house
Casbee for Home 2007	Steel-frame house
Casbee for Home 2007	Concrete house
Casbee for Home 2007	Concrete house
Casbee for Home 2007	Ground-reinforcing materials, foundation work and foundations
Casbee for Home 2007	Ground-reinforcing materials, foundation work and foundations
Casbee for Home 2007	Ground-reinforcing materials, foundation work and foundations
Casbee for Home 2007	Exterior materials
Casbee for Home 2007	Interior materials
Casbee for Home 2007	Materials for the external area
Casbee for Home 2007	Materials for the external area
Casbee for Home 2007	Materials for the external area
Casbee for Home 2007	Materials for the external area
Casbee for Home 2007	Production stage (members for building frames)
Casbee for Home 2007	Production stage (members other than those for building frames)
Casbee for Home 2007	Construction stage
Casbee for Home 2007	Provision of information on materials used
Casbee for Home 2007	Water-saving systems
Casbee for Home 2007	Rainwater use
Casbee for Home 2007	Use of daylight
Casbee for Home 2007	Size and layout of rooms
Casbee for Home 2007	Improvement of the thermal environment of the surrounding area
Casbee for Home 2007	Hot-water plumbing
Casbee for Home 2007	Ease of maintenance
Casbee for Home 2007	Maintenance system
Casbee for Home 2007	Resistance against natural disasters
Casbee for Home 2007	Fire-resistant structure (excluding openings)
Casbee for Home 2007	Barrier-free design
Casbee for Home 2007	Presentation of lifestyle advice
Casbee for Home 2007	Precautions against crime
Casbee for Home 2007	Early detection of fire
Casbee for Home 2007	Safety and Security of the Region

Table 8.4: Casbee NC 2008 list of Criteria (Building type, Apartments, Offices, Schools; Applicability, New build and major refurbishment)

Scheme	CRITERIA	Mandatory	Type of criteria
Casbee NC 2008	Attention to local character and improvement of comfort	yes	point score
Casbee NC 2008	Consideration of global warming	yes	point score



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Scheme	CRITERIA	Mandatory	Type of criteria
Casbee NC 2008	Air pollution	yes	point score
Casbee NC 2008	Reduction of rainwater discharge loads	yes	point score
Casbee NC 2008	Sewage load suppression	yes	point score
Casbee NC 2008	Background noise level	yes	point score
Casbee NC 2008	Equipment noise	yes	point score
Casbee NC 2008	Sound insulation of openings	yes	point score
Casbee NC 2008	Sound insulation of partition walls	yes	point score
Casbee NC 2008	Sound insulation performance of floor slabs (light-weight impact source)	yes	point score
Casbee NC 2008	Sound insulation performance of floor slabs (heavy-weight impact source)	yes	point score
Casbee NC 2008	Sound absorption	yes	point score
Casbee NC 2008	Chemical pollutants	yes	point score
Casbee NC 2008	Mites and mold	yes	point score
Casbee NC 2008	Legionella	yes	point score
Casbee NC 2008	CO ₂ monitoring	yes	point score
Casbee NC 2008	Control of smoking	yes	point score
Casbee NC 2008	Seismic isolation & vibration damping systems	yes	point score
Casbee NC 2008	Noise	yes	point score
Casbee NC 2008	Vibration	yes	point score
Casbee NC 2008	Odor	yes	point score
Casbee NC 2008	Townscape and landscape	yes	point score
Casbee NC 2008	Improvement of the thermal environment on site	yes	point score
Casbee NC 2008	Heat island effect	yes	point score
Casbee NC 2008	Preservation and creation of biotope	yes	point score
Casbee NC 2008	Building thermal load	yes	point score
Casbee NC 2008	Natural energy utilization	yes	point score
Casbee NC 2008	Direct use of natural energy	yes	point score
Casbee NC 2008	Coverted use of renewable energy	yes	point score
Casbee NC 2008	HVAC system	yes	point score
Casbee NC 2008	Ventilation system	yes	point score
Casbee NC 2008	Lighting system	yes	point score
Casbee NC 2008	Hot water supply system	yes	point score
Casbee NC 2008	Elevators	yes	point score
Casbee NC 2008	Equipment for improving energy efficiency	yes	point score
Casbee NC 2008	Monitoring	yes	point score
Casbee NC 2008	Reducing usage of materials	yes	point score
Casbee NC 2008	Continuing use of existing structural skeleton	yes	point score
Casbee NC 2008	Use of recycled materials as structural frame materials	yes	point score
Casbee NC 2008	Use of recycled materials as non structural materials	yes	point score
Casbee NC 2008	Timber from sustainable forestry	yes	point score
Casbee NC 2008	Efforts to enhance the reusability of components and materials	yes	point score
Casbee NC 2008	Use of materials without harmful substances	yes	point score
Casbee NC 2008	Avoidance of CFCs and Halons - Fire retardant	yes	point score



Scheme	CRITERIA	Mandatory	Type of criteria
Casbee NC 2008	Avoidance of CFCs and Halons - Insulation materials	yes	point score
Casbee NC 2008	Avoidance of CFCs and Halons - Refrigerants	yes	point score
Casbee NC 2008	Waste treatment loads	yes	point score
Casbee NC 2008	Water saving	yes	point score
Casbee NC 2008	Rain-water use system	yes	point score
Casbee NC 2008	Gray-water reuse system	yes	point score
Casbee NC 2008	Room temperature setting	yes	point score
Casbee NC 2008	Variable loads and following-up control	yes	point score
Casbee NC 2008	Perimeter performance	yes	point score
Casbee NC 2008	Zoned control	yes	point score
Casbee NC 2008	Temperature and humidity control	yes	point score
Casbee NC 2008	Individual control - Temperature	yes	point score
Casbee NC 2008	Allowance for after-hours air-conditioning	yes	point score
Casbee NC 2008	Humidity control	yes	point score
Casbee NC 2008	Type of air conditioning system	yes	point score
Casbee NC 2008	Daylight factor	yes	point score
Casbee NC 2008	Openings by orientation	yes	point score
Casbee NC 2008	Daylight devices	yes	point score
Casbee NC 2008	Glare from light fixtures	yes	point score
Casbee NC 2008	Daylight control	yes	point score
Casbee NC 2008	Illuminance	yes	point score
Casbee NC 2008	Uniformity of illuminance	yes	point score
Casbee NC 2008	Lighting controllability	yes	point score
Casbee NC 2008	Ventilation rate	yes	point score
Casbee NC 2008	Natural ventilation performance	yes	point score
Casbee NC 2008	Consideration for outside air intake	yes	point score
Casbee NC 2008	Air supply planning	yes	point score
Casbee NC 2008	Perceived spaciousness & access to view	yes	point score
Casbee NC 2008	Decor planning	yes	point score
Casbee NC 2008	Restriction of sunlight obstruction	yes	point score
Casbee NC 2008	Outdoor illumination and light that spills from interiors	yes	point score
Casbee NC 2008	Measures for reflected solar glare from building walls	yes	point score
Casbee NC 2008	Design wich considers maintenance management	yes	point score
Casbee NC 2008	Securing maintenance management functions	yes	point score
Casbee NC 2008	Service life of structural frame materials	yes	point score
Casbee NC 2008	Necessary refurbishment interval for exterior finishes	yes	point score
Casbee NC 2008	Necessary renewal interval for main interior finishes	yes	point score
Casbee NC 2008	Necessary replacement interval for air conditioning and ventilation ducts	yes	point score
Casbee NC 2008	Necessary renewal interval for HVAC and water supply and drainage pipes	yes	point score
Casbee NC 2008	Necessary renewal interval for major equipment and services	yes	point score
Casbee NC 2008	Reliability - HVAC system	yes	point score
Casbee NC 2008	Reliability - Water supply & drainage	yes	point score



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Scheme	CRITERIA	Mandatory	Type of criteria
Casbee NC 2008	Reliability - Electrical equipment	yes	point score
Casbee NC 2008	Reliability - Support method of machine ducts	yes	point score
Casbee NC 2008	Reliability - Communications & IT equipment	yes	point score
Casbee NC 2008	Ease of air conditioning duct renewal	yes	point score
Casbee NC 2008	Ease of water supply and drain pipe renewal	yes	point score
Casbee NC 2008	Ease of electrical wiring renewal	yes	point score
Casbee NC 2008	Ease of communications cable renewal	yes	point score
Casbee NC 2008	Ease of equipment renewal	yes	point score
Casbee NC 2008	Operation and management system	yes	point score
Casbee NC 2008	Provision of space & storage	yes	point score
Casbee NC 2008	Use of advanced information system	yes	point score
Casbee NC 2008	Space for refreshment	yes	point score
Casbee NC 2008	Provision of backup space	yes	point score
Casbee NC 2008	Traffic load control	yes	point score
Casbee NC 2008	Barrier-free planning	yes	point score
Casbee NC 2008	Allowance for floor-to-floor height	yes	point score
Casbee NC 2008	Adaptability of floor layout	yes	point score
Casbee NC 2008	Floor load margin	yes	point score
Casbee NC 2008	Earthquake-resistance	yes	point score
Casbee NC 2008	Restriction of wind damage	yes	point score



Table 8.5: CEN/TC350 list of environmental indicators

Scheme	CRITERIA
CEN/TC 350	Climate change
CEN/TC 350	Destruction of the stratospheric ozone layer
CEN/TC 350	Acidification of land and water resources
CEN/TC 350	Eutrophication
CEN/TC 350	Formation of ground level ozone
CEN/TC 350	Use of non-renewable materials
CEN/TC 350	Use of renewable materials
CEN/TC 350	Use of non renewable primary energy
CEN/TC 350	Use of renewable primary energy
CEN/TC 350	Use of freshwater resources
CEN/TC 350	Construction and demolition waste to recycling
CEN/TC 350	Construction and demolition waste to energy recovery
CEN/TC 350	Non-hazardous waste to disposal
CEN/TC 350	Radioactive waste to disposal

Table 8.6: CPD's list of environmental indicators/criteria

Scheme	CRITERIA
CPD	Emissions of toxic gas
CPD	Emissions of dangerous substances
CPD	Emissions of VOCs
CPD	Emissions of greenhouse gases
CPD	Emissions of dangerous radiation
CPD	Release of dangerous substances into drinking water
CPD	Release of dangerous substances into ground water
CPD	Release of dangerous substances into marine water
CPD	Release of dangerous substances into soil
CPD	Faulty discharge of waste water
CPD	Emissions of flue gases
CPD	Faulty disposal of solid or liquid waste
CPD	Protection against noise
CPD	Recyclability of the construction works, their materials and parts after demolition
CPD	Durability of the construction works
CPD	Use of environmentally compatible raw and secondary materials in the construction works
CPD	Low energy use for heating, cooling and ventilation systems



Table 8.7: GPP's environmental criteria

Scheme	CRITERIA	Mandatory
GPP - EnvCrit	Exclusion of certain contractors	yes
GPP - EnvCrit	Experience of the architect in environmental construction	yes
GPP - EnvCrit	Technical capacity to take the necessary environmental management measures in order to ensure that the construction works are executed in an environmental friendly way.	yes
GPP - EnvCrit	Energy consumption standards	yes
GPP - EnvCrit	Display panel	yes
GPP - EnvCrit	Energy efficiency training	yes
GPP - EnvCrit	Materials not permitted - Recycled wood-based products (e.g. timber), plastics, steel or other materials not accompanied by test documents indicating that they contain no hazardous substances (as defined by national regulations).	yes
GPP - EnvCrit	Materials not permitted - Products which contain hydrofluorocarbons (HFCs).	yes
GPP - EnvCrit	Materials not permitted - Products which contain sulphurhexafluoride (SF ₆).	yes
GPP - EnvCrit	Materials not permitted - Indoor paints and varnishes with a content of solvents (volatile organic compounds (VOCs) with a boiling point of 50°C maximum) higher than: - for wall paints (according to EN 13300): 30 g/l (minus water). - for other paints with a spreading rate of at least 15 m ² /l at a hiding power of 98% opacity: 50 g/l (minus water).- for all other products (including paints that are not wall paints and that have a spreading rate of less than 15m ² /l, varnishes, wood stains, floor coatings and floor, paints, and related products): 180g/l (minus water).	yes
GPP - EnvCrit	Timber used in the building shall come from legal sources.	yes
GPP - EnvCrit	Use of environmental construction materials and products	no
GPP - EnvCrit	Sustainable forestry sources	no
GPP - EnvCrit	Water saving installations	yes
GPP - EnvCrit	Compulsory blower door test	yes
GPP - EnvCrit	Book-keeping	yes
GPP - EnvCrit	Transport and recycling of building materials	yes
GPP - EnvCrit	Waste reduction and management	yes
GPP - EnvCrit	Energy performance standard	yes
GPP - EnvCrit	Localised RES (I-RES)	yes
GPP - EnvCrit	Innovative energy efficient building services	no
GPP - EnvCrit	Lower energy consumption	no
GPP - EnvCrit	Recycled/re-used content	yes
GPP - EnvCrit	Steel	yes
GPP - EnvCrit	LCA comparison of construction materials [For countries where sufficient LCA data for building materials exists]	no
GPP - EnvCrit	Competition around R-values (combination of lambda and the thickness of insulation products) of the proposed insulation	no
GPP - EnvCrit	Construction site noise reduction	no
GPP - EnvCrit	Internal noise reduction	no
GPP -	Rainwater and grey-water use	no



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Scheme	CRITERIA	M and ator y
EnvCrit		
GPP - EnvCrit	Rainwater and grey-water use	no
GPP - EnvCrit	Waste reduction and management	yes
GPP - EnvCrit	Waste reduction and management	yes



Table 8.8: iiSBE - SBTool's criteria

Scheme	CRITERIA	Mandatory	Type of criteria
iiSBE - SBT	Pre-development ecological value or sensitivity of land.	yes	point score
iiSBE - SBT	Pre-development agricultural value of land.	yes	point score
iiSBE - SBT	Potential for development to contaminate nearby bodies of water.	yes	point score
iiSBE - SBT	Pre-development contamination status of land.	yes	point score
iiSBE - SBT	Use of Integrated Design Process.	yes	point score
iiSBE - SBT	Potential environmental impact of development or re-development.	yes	point score
iiSBE - SBT	Site orientation to maximize passive solar potential.	yes	point score
iiSBE - SBT	Development density.	yes	point score
iiSBE - SBT	Provision of mixed uses within the project.	yes	point score
iiSBE - SBT	Design for disassembly, re-use or recycling.	yes	point score
iiSBE - SBT	Access to views from work areas.	yes	point score
iiSBE - SBT	Social utility of primary building function	yes	point score
iiSBE - SBT	Support of Local Economy.	yes	point score
iiSBE - SBT	Commercial viability	yes	point score
iiSBE - SBT	Relationship of design with existing streetscapes.	yes	point score
iiSBE - SBT	Compatibility of urban design with local cultural values.	yes	point score
iiSBE - SBT	Maintenance of heritage value of existing facility.	yes	point score
iiSBE - SBT	Minimization of life-cycle cost.	yes	point score
iiSBE - SBT	Minimization of construction cost.	yes	point score
iiSBE - SBT	Minimization of operating and maintenance cost.	yes	point score
iiSBE - SBT	Affordability of residential rental or cost levels.	yes	point score
iiSBE - SBT	Annualized GHG emissions embodied in construction materials.	yes	point score
iiSBE - SBT	Annual GHG emissions from all energy used for facility operations.	yes	point score
iiSBE - SBT	Annual GHG emissions from commuting transport	yes	point score
iiSBE - SBT	Emissions of ozone-depleting substances during facility operations.	yes	point score
iiSBE - SBT	Emissions of acidifying emissions during facility operations.	yes	point score
iiSBE - SBT	Emissions leading to photo-oxidants during facility operations.	yes	point score
iiSBE - SBT	Liquid effluents from facility operations sent off the site.	yes	point score
iiSBE - SBT	Untreated stormwater retained on the site.	yes	point score
iiSBE - SBT	Embodied waste water	yes	point score
iiSBE - SBT	Minimizing danger of hazardous waste on site.	yes	point score
iiSBE - SBT	Solid waste resulting from the construction and demolition process.	yes	point score



Scheme	CRITERIA	Mandatory	Type of criteria
iiSBE - SBT	Solid waste resulting from facility operations.	yes	point score
iiSBE - SBT	Protection of materials during construction phase.	yes	point score
iiSBE - SBT	Removal, before occupancy, of pollutants emitted by new interior finish materials.	yes	point score
iiSBE - SBT	Off-gassing of pollutants from interior finish materials.	yes	point score
iiSBE - SBT	Pollutant migration between occupancies.	yes	point score
iiSBE - SBT	Pollutants generated by facility maintenance.	yes	point score
iiSBE - SBT	Pollutants generated by occupant activities	yes	point score
iiSBE - SBT	CO2 concentrations in indoor air.	yes	point score
iiSBE - SBT	IAQ monitoring during project operations.	yes	point score
iiSBE - SBT	Effectiveness of ventilation in naturally ventilated occupancies.	yes	point score
iiSBE - SBT	Air quality and ventilation in mechanically ventilated occupancies.	yes	point score
iiSBE - SBT	Air movement in mechanically ventilated occupancies.	yes	point score
iiSBE - SBT	Effectiveness of ventilation in mechanically ventilated occupancies.	yes	point score
iiSBE - SBT	Air temperature and relative humidity in mechanically cooled occupancies.	yes	point score
iiSBE - SBT	Air temperature in naturally ventilated occupancies.	yes	point score
iiSBE - SBT	Glare in non-residential occupancies.	yes	point score
iiSBE - SBT	Illumination levels and quality of lighting.	yes	point score
iiSBE - SBT	Noise attenuation through the exterior envelope.	yes	point score
iiSBE - SBT	Transmission of facility equipment noise to primary occupancies.	yes	point score
iiSBE - SBT	Noise attenuation between primary occupancy areas.	yes	point score
iiSBE - SBT	Acoustic performance within primary occupancy areas.	yes	point score
iiSBE - SBT	Control of electromagnetic emissions	yes	point score
iiSBE - SBT	Impact on access to daylight or solar energy potential of adjacent property	yes	point score
iiSBE - SBT	Cumulative thermal changes to lake water or sub-surface aquifers.	yes	point score
iiSBE - SBT	Heat Island Effect - landscaping and paved areas.	yes	point score
iiSBE - SBT	Heat Island Effect - roofing.	yes	point score
iiSBE - SBT	Atmospheric light pollution.	yes	point score
iiSBE - SBT	Use of native plantings.	yes	point score
iiSBE - SBT	Provision of trees with shading potential.	yes	point score
iiSBE - SBT	Development or maintenance of wildlife corridors.	yes	point score
iiSBE - SBT	Impact of construction process on natural features of the site.	yes	point score
iiSBE - SBT	Impact of construction process or landscaping on soil erosion.	yes	point score
iiSBE - SBT	Changes in biodiversity on the site.	yes	point score



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Scheme	CRITERIA	Mandatory	Type of criteria
iiSBE - SBT	Feasibility of use of renewables.	yes	point score
iiSBE - SBT	Annualized non-renewable primary energy embodied in construction materials.	yes	point score
iiSBE - SBT	Annual non-renewable primary energy used for facility operations	yes	point score
iiSBE - SBT	Electrical peak demand for facility operations	yes	point score
iiSBE - SBT	Use of off-site energy that is generated from renewable sources.	yes	point score
iiSBE - SBT	Provision of on-site renewable energy systems.	yes	point score
iiSBE - SBT	Re-use of suitable existing structure(s).	yes	point score
iiSBE - SBT	Minimal use of finishing materials.	yes	point score
iiSBE - SBT	Minimal use of virgin materials.	yes	point score
iiSBE - SBT	Use of durable materials.	yes	point score
iiSBE - SBT	Re-use of salvaged materials.	yes	point score
iiSBE - SBT	Use of recycled materials from off-site sources.	yes	point score
iiSBE - SBT	Use of bio-based products obtained from sustainable sources.	yes	point score
iiSBE - SBT	Use of materials that are locally produced.	yes	point score
iiSBE - SBT	Water embodied in materials	yes	point score
iiSBE - SBT	Collection and recycling of solid wastes in the community or project.	yes	point score
iiSBE - SBT	Composting and re-use of sludge in the community or project.	yes	point score
iiSBE - SBT	Provision of surface water management system.	yes	point score
iiSBE - SBT	Availability of potable water treatment system.	yes	point score
iiSBE - SBT	Availability of a split grey / potable water system.	yes	point score
iiSBE - SBT	Use of potable water for site irrigation.	yes	point score
iiSBE - SBT	Use of potable water for occupancy needs.	yes	point score
iiSBE - SBT	Retention of rainwater for later re-use.	yes	point score
iiSBE - SBT	Daylighting in primary occupancy areas	yes	point score
iiSBE - SBT	Spatial efficiency.	yes	point score
iiSBE - SBT	Volumetric efficiency.	yes	point score
iiSBE - SBT	Access to direct sunlight from living areas of dwelling units.	yes	point score
iiSBE - SBT	Access to private open space from dwelling units.	yes	point score
iiSBE - SBT	Visual privacy from the exterior in principal areas of dwelling units.	yes	point score
iiSBE - SBT	Aesthetic quality of site development.	yes	point score
iiSBE - SBT	Aesthetic quality of facility exterior.	yes	point score
iiSBE - SBT	Aesthetic quality of facility interior.	yes	point score
iiSBE - SBT	Provision and operation of an effective facility management control system.	yes	point score



Scheme	CRITERIA	Mandatory	Type of criteria
iiSBE - SBT	Capability for partial operation of facility technical systems.	yes	point score
iiSBE - SBT	Degree of local control of lighting systems in non-residential occupancies.	yes	point score
iiSBE - SBT	Degree of personal control of technical systems by occupants.	yes	point score
iiSBE - SBT	Ability to modify facility technical systems.	yes	point score
iiSBE - SBT	Adaptability constraints imposed by structure.	yes	point score
iiSBE - SBT	Adaptability constraints imposed by floor-to-floor heights.	yes	point score
iiSBE - SBT	Adaptability constraints imposed by building envelope and technical systems.	yes	point score
iiSBE - SBT	Adaptability to future changes in type of energy supply.	yes	point score
iiSBE - SBT	Commissioning of facility systems	yes	point score
iiSBE - SBT	Maintenance of building envelope performance.	yes	point score
iiSBE - SBT	Use of durable materials	yes	point score
iiSBE - SBT	Development and implementation of a maintenance management plan.	yes	point score
iiSBE - SBT	On-going monitoring and verification of performance.	yes	point score
iiSBE - SBT	Retention of as-built drawings and documentation.	yes	point score
iiSBE - SBT	Provision and maintenance of a building log.	yes	point score
iiSBE - SBT	Performance incentives in leases or sales agreements.	yes	point score
iiSBE - SBT	Skills and knowledge of operating staff.	yes	point score
iiSBE - SBT	Proximity of site to public transportation.	yes	point score
iiSBE - SBT	Distance between site and centres of employment or residential occupancies.	yes	point score
iiSBE - SBT	Proximity to commercial and cultural facilities.	yes	point score
iiSBE - SBT	Proximity to public recreation areas and facilities.	yes	point score
iiSBE - SBT	Encouragement of walking.	yes	point score
iiSBE - SBT	Support for bicycle use.	yes	point score
iiSBE - SBT	Policies governing use of private vehicles	yes	point score
iiSBE - SBT	Provision of project green space.	yes	point score
iiSBE - SBT	Adequacy of type of facilities provided for tenant or occupant needs.	yes	point score
iiSBE - SBT	Functionality of layout(s).	yes	point score
iiSBE - SBT	Adequacy of space provided for required functions.	yes	point score
iiSBE - SBT	Adequacy of equipment for required functions.	yes	point score
iiSBE - SBT	Access for physically handicapped persons.	yes	point score
iiSBE - SBT	Vulnerability of land to flooding.	yes	point score
iiSBE - SBT	Minimization of risk to occupants and facilities from fire.	yes	point score
iiSBE - SBT	Minimization of risk to occupants and facilities from flooding.	yes	point score



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Scheme	CRITERIA	Mandatory	Type of criteria
iiSBE - SBT	Minimization of risk to occupants and facilities from earthquake.	yes	point score
iiSBE - SBT	Minimization of risk to occupants and facilities from use of explosive devices.	yes	point score
iiSBE - SBT	Minimization of risk to occupants from biological or chemical substances.	yes	point score
iiSBE - SBT	Personal security for building users during normal operations.	yes	point score
iiSBE - SBT	Security from theft for building tenancies and occupants during normal operations.	yes	point score
iiSBE - SBT	Minimization of construction accidents.	yes	point score

**Table 8.9: Some criteria proposed by the ISPRA working group**

Scheme	CRITERIA
ISPRA	Sustainable use of energy
ISPRA	EPBD Directive - 2002/91/CE
ISPRA	Energy labelled white goods
ISPRA	Low or Zero Carbon (LZC) technologies
ISPRA	Design for disassembly, re-use or recycling.
ISPRA	Energy embodied in materials
ISPRA	Use of certified wood
ISPRA	Use of secondary materials
ISPRA	Use of eco-labelled materials
ISPRA	Use of EPD materials
ISPRA	Provenience of materials (km)
ISPRA	Insulant materials
ISPRA	Sustainable management of construction site wastes
ISPRA	Common waste storage systems
ISPRA	Sustainable use of water
ISPRA	Water use for equivalent inhabitant (m ³ /inhab)
ISPRA	Separate plants for white and grey waters
ISPRA	Recovery of rainwater for use as grey waters
ISPRA	Users manual
ISPRA	Technological plants - ease maintenance/adaptability
ISPRA	External walls maintenance term
ISPRA	Internal walls maintenance term
ISPRA	Cycle storage
ISPRA	Auto garage
ISPRA	Common ITC services
ISPRA	Common home-appliance services



Table 8.10: LEED for Homes 2008 list of criteria (Building type, Residential; Applicability, New build and major refurbishment)

Scheme	CRITERIA	Mandatory	Type of criteria
LEED for Homes 2008	Integrated project planning	yes	point score
LEED for Homes 2008	Innovative or regional design	yes	point score
LEED for Homes 2008	Site selection	yes	point score
LEED for Homes 2008	Preferred locations	yes	point score
LEED for Homes 2008	Infrastructure	yes	point score
LEED for Homes 2008	Community resources - Transit	yes	point score
LEED for Homes 2008	Compact development	yes	point score
LEED for Homes 2008	Residential refrigerant management	yes	point score
LEED for Homes 2008	Nontoxic pest control	yes	point score
LEED for Homes 2008	Combustion venting	yes	point score
LEED for Homes 2008	Moisture control	no	on-off
LEED for Homes 2008	Outdoor air ventilation	yes	point score
LEED for Homes 2008	Local exhaust	yes	point score
LEED for Homes 2008	Distribution of space heating and cooling	yes	point score
LEED for Homes 2008	Distribution of space heating and cooling	yes	point score
LEED for Homes 2008	Air filtering	yes	point score
LEED for Homes 2008	Contaminant control	yes	point score
LEED for Homes 2008	Contaminant control	yes	point score
LEED for Homes 2008	Radon protection	yes	on-off
LEED for Homes 2008	Garage pollutant protection	yes	point score
LEED for Homes 2008	Site stewardship	yes	point score
LEED for Homes 2008	Landscaping	yes	point score
LEED for Homes 2008	Optimize energy performance	yes	point score
LEED for Homes 2008	Insulation	yes	point score
LEED for Homes 2008	Air infiltration	yes	point score
LEED for Homes 2008	Windows	yes	point score
LEED for Homes 2008	Heating and cooling distribution system	yes	point score
LEED for Homes 2008	Space heating and cooling equipment	yes	point score
LEED for Homes 2008	Water heating	yes	point score
LEED for Homes 2008	Lighting	yes	point score
LEED for Homes 2008	Appliances	yes	point score
LEED for Homes 2008	Renewable energy	yes	point score
LEED for Homes 2008	Material-efficient framing	yes	point score
LEED for Homes 2008	Environmentally preferable products	yes	point score
LEED for Homes 2008	Waste management	yes	point score
LEED for Homes 2008	Water reuse	yes	point score
LEED for Homes 2008	Irrigation system	yes	point score
LEED for Homes 2008	Indoor water use	yes	point score
LEED for Homes 2008	Local heat island effects	yes	point score
LEED for Homes 2008	Durability management process	yes	point score



Scheme	CRITERIA	Mandatory	Type of criteria
LEED for Homes 2008	Education of the homeowner or tenant	yes	point score
LEED for Homes 2008	Education of building manager	yes	on-off
LEED for Homes 2008	Access to open space	yes	point score

Table 8.11: Swan-labelling of Small houses list of criteria (Building type, Residential - small houses; Applicability, New build and major refurbishment)

Scheme	CRITERIA	Mandatory	Type of criteria
Swan-labelling of Small houses	Responsibility for the building process	yes	on-off
Swan-labelling of Small houses	Laws and regulations	yes	on-off
Swan-labelling of Small houses	Organisation and responsibility	yes	on-off
Swan-labelling of Small houses	Changes and nonconformities	yes	on-off
Swan-labelling of Small houses	Complaints	yes	on-off
Swan-labelling of Small houses	Traceability	yes	on-off
Swan-labelling of Small houses	Documentation of the application	yes	on-off
Swan-labelling of Small houses	Marketing	yes	on-off
Swan-labelling of Small houses	Radon	yes	on-off
Swan-labelling of Small houses	Information on the indoor climate	yes	on-off
Swan-labelling of Small houses	Surface heat loss coefficient	yes	on-off
Swan-labelling of Small houses	Relative power loss factor	yes	on-off
Swan-labelling of Small houses	Energy labelled	yes	on-off
Swan-labelling of Small houses	Reduced relative power loss factor	no	point score
Swan-labelling of Small houses	List of products/materials	yes	on-off
Swan-labelling of Small houses	Chemical products, safety data sheets	yes	on-off
Swan-labelling of Small houses	Indoor paint, varnish and floor oil	yes	on-off
Swan-labelling of Small houses	Adhesive (for indoor use)	yes	on-off
Swan-labelling of Small houses	Filler, floor screed/liquid filler, filler/sealant	yes	on-off
Swan-labelling of Small houses	Sustainable forestry	yes	on-off
Swan-labelling of Small houses	Timber from certified forest, conditional agreement	yes	on-off
Swan-labelling of Small houses	Use of more than 30% timber from certified forestry	no	point score
Swan-labelling of Small houses	Classification of chemical products, wood preserving (impregnation)	yes	on-off
Swan-labelling of Small houses	Active substances in impregnated wood	yes	on-off
Swan-labelling of Small houses	Formaldehyde emissions	yes	on-off
Swan-labelling of Small houses	Permanent sealants	yes	on-off
Swan-labelling of Small houses	Use of ecolabelled products	no	point score
Swan-labelling of Small houses	Thermal insulation material, flame retardant	yes	on-off
Swan-labelling of Small houses	Thermal insulation material, propellants	yes	on-off
Swan-labelling of Small houses	Thermal insulation material, cancer classification	yes	on-off
Swan-labelling of Small houses	Lead	yes	on-off



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Swan-labelling of Small houses	Plastic for interior flooring, wall coverings and ceilings	yes	on-off
Swan-labelling of Small houses	Plastic in windows	yes	on-off
Swan-labelling of Small houses	Additives in plastic products	yes	on-off
Swan-labelling of Small houses	Halogen-free plastic products (free from chlorine and bromine)	no	point score
Swan-labelling of Small houses	Chlorine-free coverings in wet rooms	no	point score
Swan-labelling of Small houses	Handling and storage of materials on the building site	yes	on-off
Swan-labelling of Small houses	Information on materials	yes	on-off
Swan-labelling of Small houses	Information on materials	yes	on-off
Swan-labelling of Small houses	Waste sorting container for household waste	no	point score
Swan-labelling of Small houses	Waste management on the building site	yes	on-off
Swan-labelling of Small houses	Waste sorting	no	point score
Swan-labelling of Small houses	Low-flow showers and basin mixer taps	no	point score
Swan-labelling of Small houses	Low-flush toilets	yes	on-off
Swan-labelling of Small houses	Ventilation	yes	on-off
Swan-labelling of Small houses	General description of the house	yes	on-off
Swan-labelling of Small houses	Moisture in wooden structures	yes	on-off
Swan-labelling of Small houses	Inspection of technical installations	yes	on-off
Swan-labelling of Small houses	Training	yes	on-off
Swan-labelling of Small houses	Maintenance plan	yes	on-off
Swan-labelling of Small houses	Manual for heating and ventilation systems	yes	on-off
Swan-labelling of Small houses	Ventilation ducts	yes	on-off
Swan-labelling of Small houses	Pre-inspection and final inspection	yes	on-off
Swan-labelling of Small houses	Quality control	yes	on-off
Swan-labelling of Small houses	Moisture control in concrete slabs	yes	on-off
Swan-labelling of Small houses	Building's airtightness (at 50 Pa pressure difference)	yes	on-off
Swan-labelling of Small houses	Customer information	yes	on-off



9. Annex 2 - List of Simplified Criteria

Table 9.1: List of Simplified Criteria, Sub-code, n. and % of recurrence and Selected Simplified Criteria (with % > 0,5%).

CODE-ISSUES		Criteria - simpl.	n	%	Selected criteria
A1 - Planning - Project	A1.1	Local inter-actions	8	1,31%	Local inter-actions
A1 - Planning - Project	A1.2	Sustainable project	8	1,31%	Sustainable project
A1 - Planning - Project	A1.3	Constructor's requirements	7	1,14%	Constructor's requirements
A1 - Planning - Project	A1.4	Site pre-assessment	6	0,98%	Site pre-assessment
A1 - Planning - Project	A1.5	Project's and Construction's QMS - Quality Management System	5	0,82%	Project's and Construction's QMS - Quality Management System
A1 - Planning - Project	A1.6	Innovative or regional design	4	0,65%	Innovative or regional design
A1 - Planning - Project	A1.7	Integrated project planning	3	0,49%	
A1 - Planning - Project	A1.8	Site selection	3	0,49%	
A1 - Planning - Project	A1.9	Design for disassembly, re-use or recycling.	2	0,33%	
A1 - Planning - Project	A1.10	Responsibility	2	0,33%	
A1 - Planning - Project	A1.11	Risk assessment for the site	2	0,33%	
A1 - Planning - Project	A1.12	Laws and regulations	1	0,16%	
A1 - Planning - Project Totale			51	8,33%	0
B1 - Emission to atmosphere	B1.1	CO2 emissions	9	1,47%	CO2 emissions
B1 - Emission to atmosphere	B1.2	ODS (Ozone depleting substances)	6	0,98%	ODS (Ozone depleting substances)
B1 - Emission to atmosphere	B1.3	NOx / VOC emissions	5	0,82%	NOx / VOC emissions
B1 - Emission to atmosphere	B1.4	SO2 emissions	2	0,33%	
B1 - Emission to atmosphere	B1.5	Air pollution	1	0,16%	
B1 - Emission to atmosphere	B1.6	CO2 embodied in construction products	1	0,16%	
B1 - Emission to atmosphere	B1.7	CO2 emissions insulants	1	0,16%	
B1 - Emission to atmosphere	B1.8	Emissions of dangerous radiation	1	0,16%	
B1 - Emission to atmosphere	B1.9	Emissions of dangerous substances	1	0,16%	
B1 - Emission to atmosphere	B1.10	Emissions of flue gases	1	0,16%	
B1 - Emission to atmosphere	B1.11	Emissions of toxic gas	1	0,16%	
B1 - Emission to atmosphere Totale			29	4,74%	0
B2 - Emission to water	B2.1	Rainwater loads	4	0,65%	Rainwater loads
B2 - Emission to water	B2.2	Release of dangerous substances into water (watercourse, ground water, ..)	2	0,33%	
B2 - Emission to water	B2.3	Embodied waste water	1	0,16%	
B2 - Emission to water	B2.4	Faulty discharge of waste water	1	0,16%	
B2 - Emission to water	B2.5	PO4 emissions	1	0,16%	
B2 - Emission to water	B2.6	Release of dangerous substances into drinking water	1	0,16%	
B2 - Emission to water	B2.7	Sewage load	1	0,16%	
B2 - Emission to water	B2.8	Watercourse pollution	1	0,16%	
B2 - Emission to water Totale			12	1,96%	0
B3 - Emission to soil	B3.1	Faulty disposal of solid or liquid waste	1	0,16%	
B3 - Emission to soil	B3.2	Hazardous waste on site	1	0,16%	
B3 - Emission to soil	B3.3	Release of dangerous substances into soil	1	0,16%	
B3 - Emission to soil Totale			3	0,49%	
B4 - Waste production	B4.1	Design for waste production reduction	3	0,49%	
B4 - Waste production	B4.2	Solid waste from construction and demolition	1	0,16%	
B4 - Waste production	B4.3	Solid waste from facility operations	1	0,16%	
B4 - Waste production Totale			5	0,82%	0



CODE-ISSUES		Criteria - simpl.	n	%	Selected criteria
B5 - Indoor pollution	B5.1	Noise reduction	16	2,61%	Noise reduction
B5 - Indoor pollution	B5.2	Ventilation - natural ventilation	10	1,63%	Ventilation - natural ventilation
B5 - Indoor pollution	B5.3	Pollutants from products, facilities, operations	5	0,82%	Pollutants from products, facilities, operations
B5 - Indoor pollution	B5.4	Chemicals	3	0,49%	
B5 - Indoor pollution	B5.5	Exhaust gases	3	0,49%	
B5 - Indoor pollution	B5.6	Microbes, mites, mold	3	0,49%	
B5 - Indoor pollution	B5.7	Vibrations	3	0,49%	
B5 - Indoor pollution	B5.8	CO2	2	0,33%	
B5 - Indoor pollution	B5.9	Contaminant control	2	0,33%	
B5 - Indoor pollution	B5.10	Cooling	2	0,33%	
B5 - Indoor pollution	B5.11	Heating	2	0,33%	
B5 - Indoor pollution	B5.12	Indoor air quality	2	0,33%	
B5 - Indoor pollution	B5.13	Noise control	2	0,33%	
B5 - Indoor pollution	B5.14	Radon	2	0,33%	
B5 - Indoor pollution	B5.15	Air filtering	1	0,16%	
B5 - Indoor pollution	B5.16	Combustion venting	1	0,16%	
B5 - Indoor pollution	B5.17	Control of smoking	1	0,16%	
B5 - Indoor pollution	B5.18	Electromagnetic pollution	1	0,16%	
B5 - Indoor pollution	B5.19	Exhaust heat	1	0,16%	
B5 - Indoor pollution	B5.20	Information on the indoor climate	1	0,16%	
B5 - Indoor pollution	B5.21	Moisture	1	0,16%	
B5 - Indoor pollution	B5.22	Nontoxic pest control	1	0,16%	
B5 - Indoor pollution	B5.23	Odor	1	0,16%	
B5 - Indoor pollution	B5.24	Outdoor air ventilation	1	0,16%	
B5 - Indoor pollution	B5.25	Pollutant migration between occupancies.	1	0,16%	
B5 - Indoor pollution	B5.26	VOC	1	0,16%	
B5 - Indoor pollution Totale			69	11,27%	0
B6 - Impacts on site	B6.1	Heat island	6	0,98%	Heat island
B6 - Impacts on site	B6.2	Impact of construction process on ecology	3	0,49%	
B6 - Impacts on site	B6.3	Impacts on site	3	0,49%	
B6 - Impacts on site	B6.4	Site management	3	0,49%	
B6 - Impacts on site	B6.5	Light pollution	2	0,33%	
B6 - Impacts on site	B6.6	Construction site noise reduction	1	0,16%	
B6 - Impacts on site	B6.7	Contaminated land	1	0,16%	
B6 - Impacts on site	B6.8	Daylighting	1	0,16%	
B6 - Impacts on site	B6.9	Re-use of land	1	0,16%	
B6 - Impacts on site	B6.10	Thermal changes on water (course, aquifers)	1	0,16%	
B6 - Impacts on site Totale			22	3,59%	0
B7 - Ecology	B7.1	Protection of ecological features	13	2,12%	Protection of ecological features
B7 - Ecology	B7.2	Use of trees, ...	2	0,33%	
B7 - Ecology	B7.3	Building footprint	1	0,16%	
B7 - Ecology Totale			16	2,61%	0
C1 - Energy	C1.1	Renewable and low emission energy source	18	2,94%	Renewable and low emission energy source
C1 - Energy	C1.2	Heating and cooling systems	17	2,78%	Heating and cooling systems
C1 - Energy	C1.3	Labelled Lighting system (energy - eco)	7	1,14%	Labelled Lighting system (energy - eco)
C1 - Energy	C1.4	Monitoring & Control of energy consumption	7	1,14%	Monitoring & Control of energy consumption
C1 - Energy	C1.5	Labelled domestic appliances (Energy - Eco)	6	0,98%	Labelled domestic appliances (Energy - Eco)
C1 - Energy	C1.6	Building's Insulation	4	0,65%	Building's Insulation
C1 - Energy	C1.7	Heat - Power Loss	4	0,65%	Heat - Power Loss
C1 - Energy	C1.8	Insulation of H&C distribution system	4	0,65%	Insulation of H&C distribution system
C1 - Energy	C1.9	BAT energy (LZC)	3	0,49%	
C1 - Energy	C1.10	Energy efficiency certification	3	0,49%	
C1 - Energy	C1.11	Lifts and elevators	3	0,49%	
C1 - Energy	C1.12	Building thermal load	1	0,16%	
C1 - Energy	C1.13	Construction and demolition waste to energy recovery	1	0,16%	
C1 - Energy	C1.14	Display panel	1	0,16%	
C1 - Energy	C1.15	Electrical peak demand	1	0,16%	



CODE-ISSUES		Criteria - simpl.	n	%	Selected criteria
C1 - Energy	C1.16	Energy consumption/performance standards	1	0,16%	
C1 - Energy	C1.17	Energy efficiency training	1	0,16%	
C1 - Energy	C1.18	Innovative energy efficient building services	1	0,16%	
C1 - Energy	C1.19	Insulation material's performance	1	0,16%	
C1 - Energy	C1.20	Use of non renewable primary energy	1	0,16%	
C1 - Energy	C1.21	Use of renewable primary energy	1	0,16%	
C1 - Energy Totale			86	14,05%	0
C2 - Materials	C2.1	Timber from sustainable forestry	9	1,47%	Timber from sustainable forestry
C2 - Materials	C2.2	Labelled construction products (Eco, Energy, responsible sources)	8	1,31%	Labelled construction products (Eco, Energy, responsible sources)
C2 - Materials	C2.3	List of products/materials	7	1,14%	List of products/materials
C2 - Materials	C2.4	Use of recycled materials	7	1,14%	Use of recycled materials
C2 - Materials	C2.5	Labelled materials (Energy - Eco)	5	0,82%	Labelled materials (Energy - Eco)
C2 - Materials	C2.6	Long life service materials	5	0,82%	Long life service materials
C2 - Materials	C2.7	Re-use of materials or building's parts (in or off site)	5	0,82%	Re-use of materials or building's parts (in or off site)
C2 - Materials	C2.8	Thermal insulation materials	5	0,82%	Thermal insulation materials
C2 - Materials	C2.9	Plastic's products - Halogen free/Additives	4	0,65%	Plastic's products - Halogen free/Additives
C2 - Materials	C2.10	Reducing usage of materials	4	0,65%	Reducing usage of materials
C2 - Materials	C2.11	Responsible Sourcing of Materials	4	0,65%	Responsible Sourcing of Materials
C2 - Materials	C2.12	Avoidance of CFCs and Halons	3	0,49%	
C2 - Materials	C2.13	Chemical products (safety data, active substances)	3	0,49%	
C2 - Materials	C2.14	Material-efficient framing	2	0,33%	
C2 - Materials	C2.15	Use of blended or eco-cement	2	0,33%	
C2 - Materials	C2.16	Use of materials that are locally produced.	2	0,33%	
C2 - Materials	C2.17	Use of recycled aggregates	2	0,33%	
C2 - Materials	C2.18	Use of structural steel	2	0,33%	
C2 - Materials	C2.19	Adhesive (for indoor use)	1	0,16%	
C2 - Materials	C2.20	Chlorine-free coverings	1	0,16%	
C2 - Materials	C2.21	Energy embodied in materials	1	0,16%	
C2 - Materials	C2.22	Filler, floor screed/liquid filler, filler/sealant	1	0,16%	
C2 - Materials	C2.23	Indoor paint, varnish and floor oil	1	0,16%	
C2 - Materials	C2.24	LCA comparison of construction materials	1	0,16%	
C2 - Materials	C2.25	Material's management	1	0,16%	
C2 - Materials	C2.26	Materials with low VOC content	1	0,16%	
C2 - Materials	C2.27	No materials with hazardous substances	1	0,16%	
C2 - Materials	C2.28	No materials with hydrofluorocarbons (HFCs).	1	0,16%	
C2 - Materials	C2.29	No materials with sulphurhexafluoride (SF ₆).	1	0,16%	
C2 - Materials	C2.30	No use of silicon-blasting agents for steel's renovation	1	0,16%	
C2 - Materials	C2.31	Recyclability of the construction works, their materials and parts after demolition	1	0,16%	
C2 - Materials	C2.32	Short chain materials	1	0,16%	
C2 - Materials	C2.33	Transport and recycling of building materials	1	0,16%	
C2 - Materials	C2.34	Use of bio-based products obtained from sustainable sources.	1	0,16%	



CODE-ISSUES		Criteria - simpl.	n	%	Selected criteria
C2 - Materials	C2.35	Use of durable materials.	1	0,16%	
C2 - Materials	C2.36	Use of materials without lead or lead-compounds	1	0,16%	
C2 - Materials	C2.37	Use of non-renewable materials	1	0,16%	
C2 - Materials	C2.38	Use of renewable materials	1	0,16%	
C2 - Materials	C2.39	Use of re-used materials	1	0,16%	
C2 - Materials	C2.40	Use of sealants without toxic chemicals	1	0,16%	
C2 - Materials	C2.41	Water embodied in materials	1	0,16%	
C2 - Materials Totale			102	16,67%	0
C3 - Waste management	C3.1	Sustainable Waste management	6	0,98%	Sustainable Waste management
C3 - Waste management	C3.2	Recycling facilities	4	0,65%	Recycling facilities
C3 - Waste management	C3.3	Composting	2	0,33%	
C3 - Waste management	C3.4	Construction and demolition waste to energy recovery	2	0,33%	
C3 - Waste management	C3.5	Construction and demolition waste to recycling	2	0,33%	
C3 - Waste management	C3.6	Common waste storage systems	1	0,16%	
C3 - Waste management	C3.7	Compactor / Baler	1	0,16%	
C3 - Waste management	C3.8	Construction and demolition waste to re-use	1	0,16%	
C3 - Waste management	C3.9	Non-hazardous waste to disposal	1	0,16%	
C3 - Waste management	C3.10	Radioactive waste to disposal	1	0,16%	
C3 - Waste management Totale			21	3,43%	0
C4 - Water consumption and management	C4.1	Rainwater use	7	1,14%	Rainwater use
C4 - Water consumption and management	C4.2	Low-flush systems (toilets, showers, ..)	6	0,98%	Low-flush systems (toilets, showers, ..)
C4 - Water consumption and management	C4.3	Minimise water use	6	0,98%	Minimise water use
C4 - Water consumption and management	C4.4	Gray-water reuse system	5	0,82%	Gray-water reuse system
C4 - Water consumption and management	C4.5	Availability of a split grey / potable water system.	3	0,49%	
C4 - Water consumption and management	C4.6	Irrigation system	2	0,33%	
C4 - Water consumption and management	C4.7	Water Meter	2	0,33%	
C4 - Water consumption and management	C4.8	Major leak detection	1	0,16%	
C4 - Water consumption and management	C4.9	Potable water treatment system	1	0,16%	
C4 - Water consumption and management	C4.10	Surface water management system	1	0,16%	
C4 - Water consumption and management Totale			34	5,56%	0
D1 - Health and well-being	D1.1	Daylighting	12	1,96%	Daylighting
D1 - Health and well-being	D1.2	Temperature and humidity control	10	1,63%	Temperature and humidity control
D1 - Health and well-being	D1.3	Lighting system and control	6	0,98%	Lighting system and control
D1 - Health and well-being	D1.4	Aesthetic concerns	4	0,65%	Aesthetic concerns
D1 - Health and well-being	D1.5	Glare Control	4	0,65%	Glare Control
D1 - Health and well-being	D1.6	Air conditioning system	2	0,33%	
D1 - Health and well-being	D1.7	Acoustic Performance	1	0,16%	
D1 - Health and well-being	D1.8	Air supply planning	1	0,16%	
D1 - Health and well-being	D1.9	Drinking Water	1	0,16%	
D1 - Health and well-being	D1.10	High frequency lighting	1	0,16%	
D1 - Health and well-being	D1.11	Outdoor air ventilation	1	0,16%	
D1 - Health and well-being	D1.12	Outdoor lighting	1	0,16%	
D1 - Health and well-being	D1.13	View Out	1	0,16%	
D1 - Health and well-being	D1.14	Visual privacy	1	0,16%	
D1 - Health and well-being Totale			46	7,52%	0
D2 - Operation & Maintenance	D2.1	Maintenance system - plan	9	1,47%	Maintenance system - plan
D2 - Operation & Maintenance	D2.2	User's guide - operation and management system	9	1,47%	User's guide - operation and management system
D2 - Operation & Maintenance	D2.3	Frequency of refurbishment and renewal (plants, interior, exterior, services)	7	1,14%	Frequency of refurbishment and renewal (plants, interior, exterior, services)



CODE-ISSUES		Criteria - simpl.	n	%	Selected criteria
					services)
D2 - Operation & Maintenance	D2.4	Flexibility and adaptability (space, plants)	6	0,98%	Flexibility and adaptability (space, plants)
D2 - Operation & Maintenance	D2.5	Ease of equipments and plants renewal	5	0,82%	Ease of equipments and plants renewal
D2 - Operation & Maintenance	D2.6	Reliability of equipments and plants	5	0,82%	Reliability of equipments and plants
D2 - Operation & Maintenance	D2.7	Building's information	3	0,49%	
D2 - Operation & Maintenance	D2.8	Training - knowledge of maintenance operating staff	2	0,33%	
D2 - Operation & Maintenance	D2.9	Capability for partial operation of facility technical systems.	1	0,16%	
D2 - Operation & Maintenance	D2.10	Commissioning of facility systems	1	0,16%	
D2 - Operation & Maintenance	D2.11	Design for maintenance	1	0,16%	
D2 - Operation & Maintenance	D2.12	Durability of the construction works	1	0,16%	
D2 - Operation & Maintenance	D2.13	Ease of building's maintenance (without plants)	1	0,16%	
D2 - Operation & Maintenance	D2.14	Ease of Maintenance	1	0,16%	
D2 - Operation & Maintenance	D2.15	Local control of lighting systems	1	0,16%	
D2 - Operation & Maintenance	D2.16	Monitoring & Control of building's functions	1	0,16%	
D2 - Operation & Maintenance	D2.17	Performance incentives in leases or sales agreements.	1	0,16%	
D2 - Operation & Maintenance	D2.18	Personal control of lighting systems	1	0,16%	
D2 - Operation & Maintenance	D2.19	Technical manuals (heating, cooling, ...)	1	0,16%	
D2 - Operation & Maintenance Totale			57	9,31%	0
D3 - Facilities provided	D3.1	Open spaces, green areas, common areas	8	1,31%	Open spaces, green areas, common areas
D3 - Facilities provided	D3.2	Common ITC services - home office	6	0,98%	Common ITC services - home office
D3 - Facilities provided	D3.3	Car facilities - regulations	5	0,82%	Car facilities - regulations
D3 - Facilities provided	D3.4	Cycle Facilities	5	0,82%	Cycle Facilities
D3 - Facilities provided	D3.5	Proximity to commercial, cultural and recreation facilities	4	0,65%	Proximity to commercial, cultural and recreation facilities
D3 - Facilities provided	D3.6	Public transport	4	0,65%	Public transport
D3 - Facilities provided	D3.7	Drying space	2	0,33%	
D3 - Facilities provided	D3.8	Shared Facilities	2	0,33%	
D3 - Facilities provided	D3.9	Encouragement of walking	1	0,16%	
D3 - Facilities provided Totale			37	6,05%	0
D4 - Fitness for use	D4.1	Functionality (layouts, space, allowance, adaptability)	7	1,14%	Functionality (layouts, space, allowance, adaptability)
D4 - Fitness for use	D4.2	Building's airtightness	4	0,65%	Building's airtightness
D4 - Fitness for use	D4.3	Barrier-free planning	3	0,49%	
D4 - Fitness for use	D4.4	Quality control (construction phase)	3	0,49%	
D4 - Fitness for use	D4.5	Customer information	2	0,33%	
D4 - Fitness for use	D4.6	Adequacy of equipments	1	0,16%	
D4 - Fitness for use	D4.7	Adequacy of spaces	1	0,16%	
D4 - Fitness for use	D4.8	Adequacy of type of facilities provided for tenant or occupant needs.	1	0,16%	
D4 - Fitness for use Totale			22	3,59%	0
Totale complessivo			612	100%	