



Development of European Ecolabel Criteria for Buildings

A focus on Energy

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Indicators of Energy Performance

Regarding energy issues European Ecolabel criteria should consider the EPBD Energy Efficiency Directive on Buildings and its relative **national applications**.

- European Ecolabel criteria will refer to the best energy performance levels identified by the national implementation.
- The **general objective** to define a set of indicators for energy performances of buildings which allow to evaluate
 - **Minimal requirement** for mandatory performances;
 - **Additional requirement** for a minimum score to award the European ECOLABEL.
- Application of the Ecolabel methodology also to **existing buildings**.
- A need to differentiate evaluation criteria but also indicators according to the use **destination**.



Indicators of Energy Performance

Concerning the Energy performances of buildings some of the following indicators could be used: some of them are referring to the **entire building** and others to specific and peculiar characteristics of some **building components** (such as U value – $\text{W/m}^2 \text{K}$, etc.).

Thermal uses

- ☐ Energy performance for **winter heating**
- ☐ Energy performance for **summer control**
- ☐ Energy performance for **hot water supply**

Electrical uses

- ☐ Energy performance for **lighting**
- ☐ Others



Energy performance for winter heating - 1

Total consumption of Primary Energy

This aspect is directly linked to the Energy consumption of the building, therefore to the related environmental impact for winter conditioning. Examples of mandatory and additional requirements for this aspect are:

- ☐ **Mandatory Requirement:** for new buildings limits reported to annex C dlgs 311/06, in function of the climatic zone and of Ratio S/V. For existing buildings an alternative criterion is needed (for instance requirements in the construction phase or corrective coefficient to apply to minimum limits required by the law 311). Unit measure is kWh/m^2 year or kWh/m^3 year.
- ☐ **Additional Requirement:** checking if the primary energy consumption of building is less than a value established using a score system based on the ratio between the real energy consumption and the minimum level.



Energy performance for winter heating - 2

Energy Performance of Building Envelope

The reference value is the average U of the walls, opaque and transparent, which define the envelope of the building. Example of mandatory and additional requirements are:

- **Mandatory Requirement:** for new buildings the limit value in terms of U value, as reported in annex C of dlgs 311/06, are increased of 30%, in relation to the climatic zone. For existing buildings instead an alternative criterion is needed. Unit measure is $W/m^2 K$.
- **Additional Requirement:** Average value of U of all elements which constitute the envelope loaded on the different surfaces. Calculation in order to assign to each surface the transmittance value reported in annex C of law 311/06 (always increased about 30%) and to obtain a new value of average transmittance. The ratio between the two average values of transmittance, the real one and the legal one, will be compared with a score system.



Energy performance for winter heating - 3

VMC – Controlled Mechanical Ventilation

The mechanical controlled ventilation is able to guarantee a correct change of air. In this case, at least for residential buildings, mandatory requirements are not foreseen as not required by law. An example of additional requirement could be the following

- **Mandatory Requirement:** only for non residential building, minimum requirements
- **Additional Requirement:** for residential buildings, where mechanical controlled ventilation systems exist, it is possible to assign points according to the quality of the system. It would be advisable to award additional points to those systems which are using energy coming from RES.



Energy performance for summer control - 1

Building energy consumption for summer control

This aspect is directly linked to the Energy consumption of the building, therefore to the related environmental impact for summer conditioning.

- **Mandatory Requirement:** Standards UNI-TS 11300 part I (italian transposition of CEN 13790) provide tools to evaluate the building energy consumption for summer conditioning considering as hypothesis a constant temperature of 26 °C. It would be necessary in this case to define minimum reference values which could be considered minimum requirement.
- **Additional Requirement:** Checking if the primary energy consumption of building is less than a value established using a score system based on the ratio between the real energy consumption and the minimum level.



Energy performance for summer control - 2

Solar radiation control

The solar radiation control through external or internal surfaces allows the reduction of thermal summer loads and therefore can be considered a quality element for the building.

- **Mandatory Requirement:** For new buildings is considered mandatory an internal or external protection system from solar radiation for expositions located within East, South-East, South, South-West and West.
- **Additional Requirement:** For shading system if located outside the building.



Energy performance for summer control - 3

Thermal inertia

To keep thermal comfort within internal spaces during the summer period avoiding air overheating.

- **Mandatory Requirement:** minimum required by law
- **Additional Requirement:** to be defined



Energy performance for summer control - 4

Air conditioning systems using RES (solar) and other (waste energy)
Award of conditioning systems using Renewable Energy Sources

- **Additional Requirement:** Conditioning systems using RES such as:
 - Refrigerators and PV system
 - Solar cooling
 - Energy from thermal process

The score is assigned according to the covering of the summer thermal load.



Energy performance for HW supply

Energy from RES (Solar)

After having defined the standard consumption, calculated on the basis of UNI-TS 11300 parte II, the primary energy quantity according to the type of system should be evaluated. Then according to this evaluation, it can be calculate the % of energy from RES.

- **Mandatory Requirement:** For new buildings shall be guaranteed a coverings of thermic load through using renewable energy sources with a contribution not lower than 50%. This requirement does not apply to existing buildings or if the building is linked to district heatings.
- **Additional Requirement:** If the % of RES vs total energy consumption is higher than 50%, better score can be achieved.



Energy performance for Electrical uses

- **Mandatory Requirement:** minimum required by law
- **Additional Requirement:**
 - Low consumption lighting systems
 - Devices for lighting controls
 - Energy covered by RES