Italian policies concerning overheating

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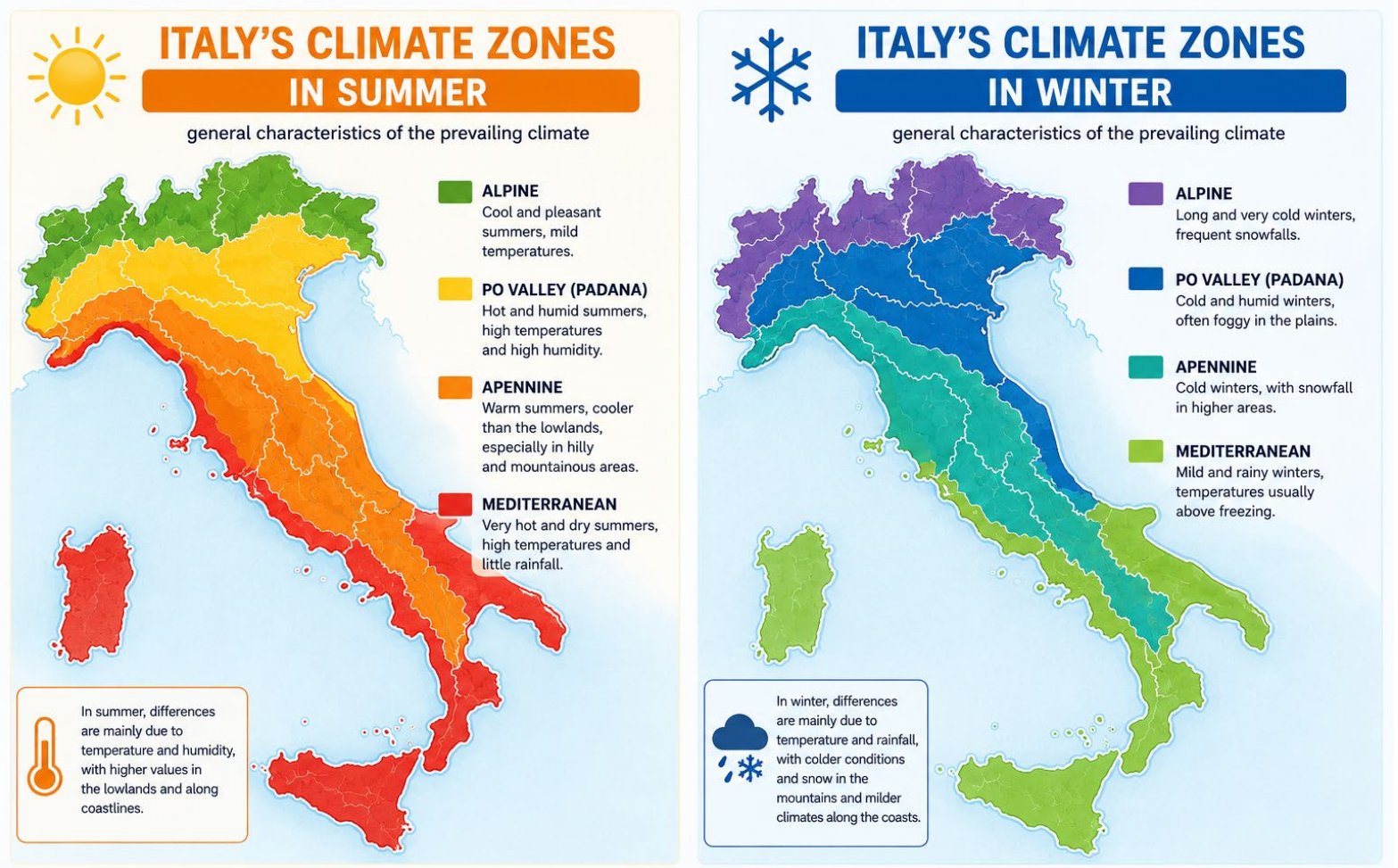
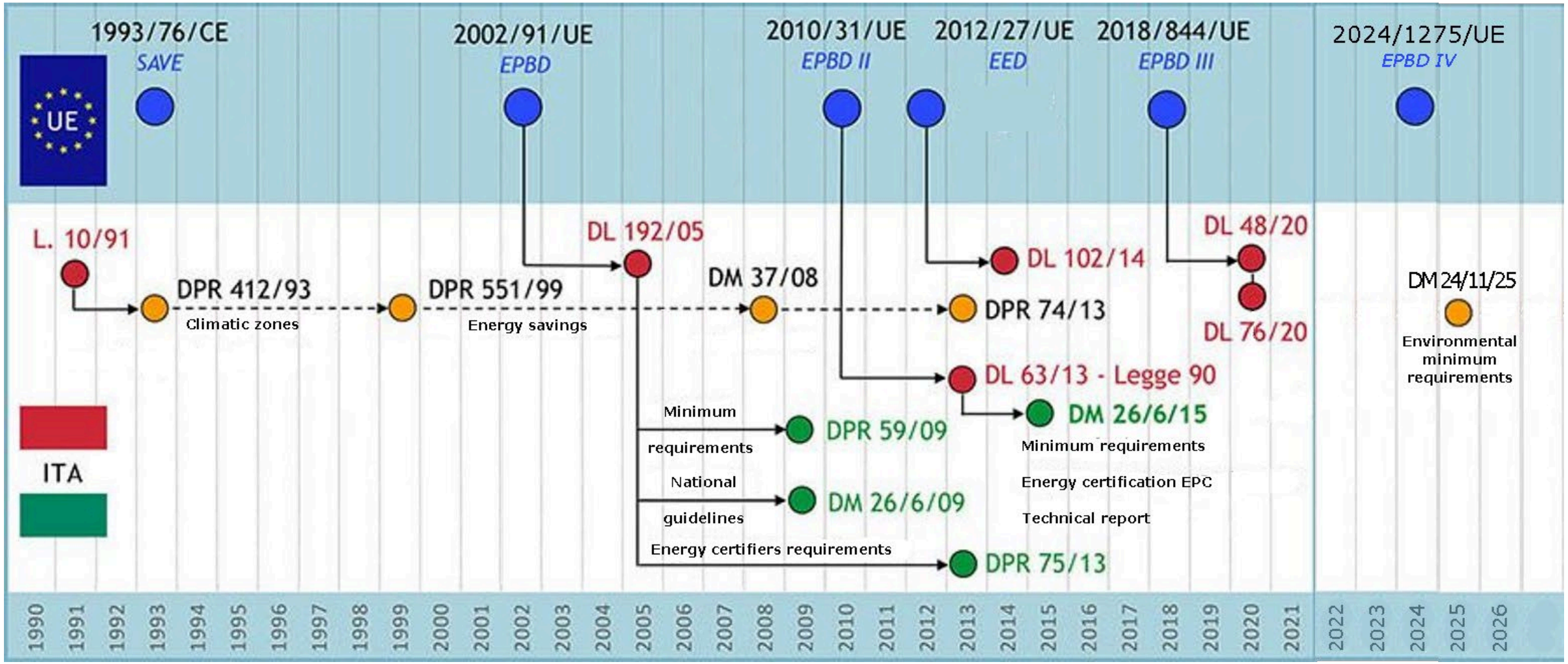
Italy's climate



Italian codes



Derived from https://www.infobuildenergia.it

Italian codes

- Ministerial Decree 26 June 2015 on "*Application of energy performance calculation methodologies and specification of prescriptions and minimum requirements*," updated by Ministerial Decree 28 October 2025.

- Ministerial Decree 24 November 2025 on "*Adoption of minimum environmental criteria for the awarding of design services and the awarding of works for building interventions*".

Minimum Requirements vs. Minimum Environmental Criteria

Minimum Requirements	Minimum Environmental Criteria
Applies to all buildings	Applies to public buildings
Indirect overheating control	Explicit overheating assessment
Envelope prescriptions	Thermal comfort verification
Cooling energy demand	Indoor operative temperature
Building scale	Building + urban scale

Ministerial decree – Minimum requirements

Main objective

The decree aims to improve efficiency, reduce energy consumption, and align national rules with European directives.

It defines the minimum energy performance requirements for buildings in Italy.

It applies to new and existing buildings.

Requirements depend on the type of intervention (e.g., new construction, major renovation, etc.) as well as on the climatic zone.

Ministerial decree – Minimum requirements

Overheating – Overview

- No specific overheating indicator is currently prescribed.
- Overheating is addressed indirectly, through prescriptions concerning building envelope properties and energy indicator requirements:
  - Control of solar gains (total solar energy transmittance of glazing + shading device)
  - Dynamic thermal properties of opaque elements (surface mass, time lag, decrement factor)
  - Cooling energy needs

Ministerial decree – Minimum requirements

Envelope requirements - Overheating

- Roof technologies

Two possible options are allowed:

- High solar reflectance materials
- Passive solutions (e.g., ventilated roofs or green roofs)

Ministerial decree – Minimum requirements

Envelope requirements - Overheating

- Windows solar properties

The effectiveness of internal and external shading devices shall be assessed.

For refurbishments, there are TSET limit values for windows with the highest solar influence (oriented to east, south, west)

Ministerial decree – Minimum requirements

Envelope requirements - Overheating

- Dynamic thermal properties of opaque elements

For vertical components with the strongest solar influence (i.e., oriented to east, south, west), at least one of two parameters should be verified:

- surface mass (>230 kg/m^2)
- periodic thermal transmittance (<0,10 W/m^{2}K)

For all horizontal and inclined components:

- periodic thermal transmittance (<0,18 W/m^{2}K)

Ministerial decree – Minimum requirements

Whole building requirements - Overheating

- $A_{sol,est}/A_{sup,utile}$

It is defined as the ratio between:

$A_{sol,est}$ [m²] is the summer equivalent solar area calculated as the sum of all the areas of the transparent surfaces of the envelope corrected by appropriate coefficients

$A_{sup,utile}$ [m²] is the net floor surface of the building

A threshold value is defined depending on the building intended use.

Ministerial decree – Minimum requirements

Whole building requirements - Overheating

$$A_{\mathrm{sol,est}} = \sum_k F_{\mathrm{sh,ob}} \cdot g_{\mathrm{gl+sh}} \cdot (1 - F_{\mathrm{F}}) \cdot A_{\mathrm{w,p}} \cdot F_{\mathrm{sol,est}} \ [\mathrm{m}^2]$$

Where:

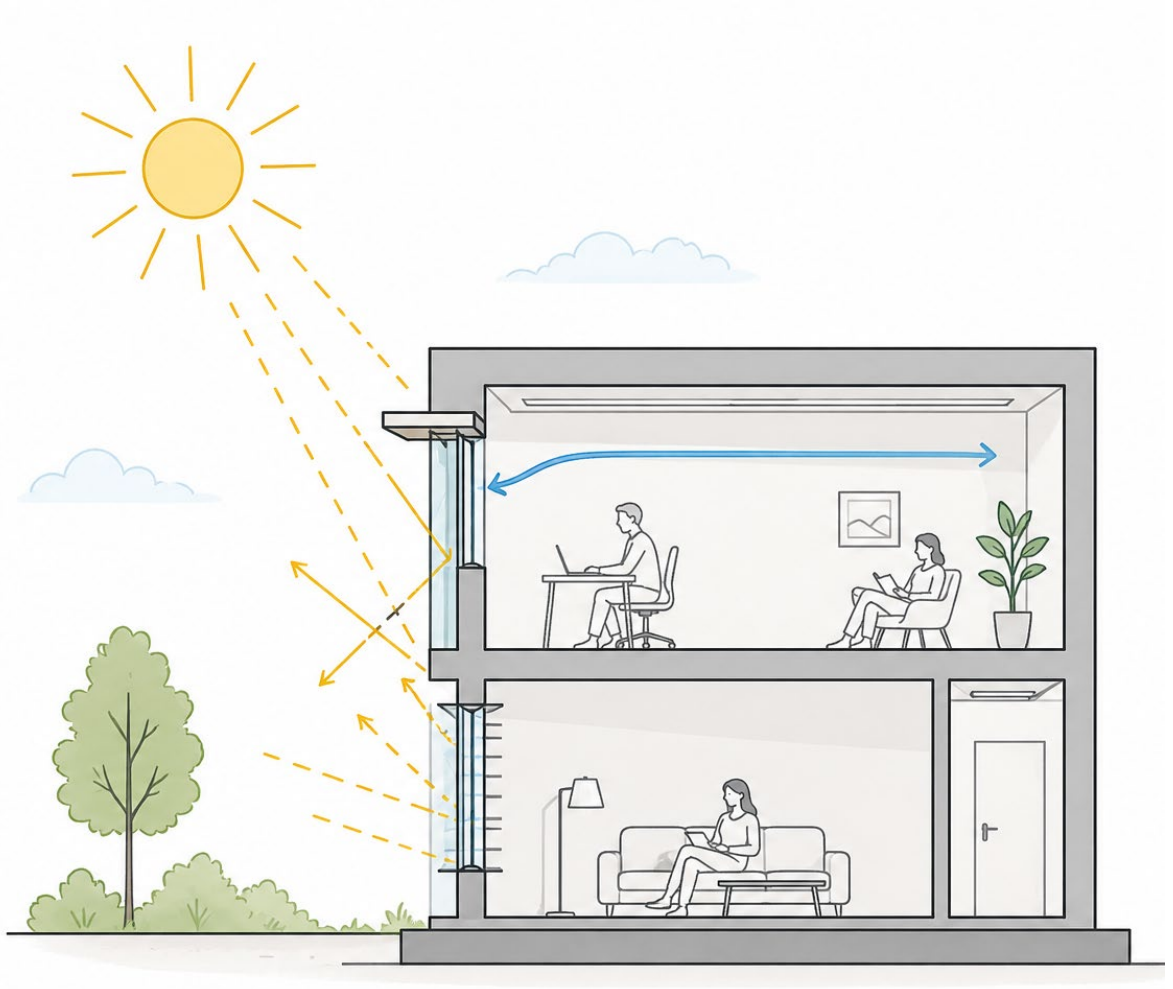
- $F_{sh,ob}$ is the shading reduction factor for external elements;
- g_{gl+sh} is the total solar energy transmittance of the window, when sun shading is in use;
- F_F is the frame area fraction;
- $A_{w,p}$ is window opening area;
- $F_{sol,est}$ is a correction factor for incident radiation.

Ministerial decree – Minimum requirements

Whole building requirements - Overheating

- $Q_{C,nd}$

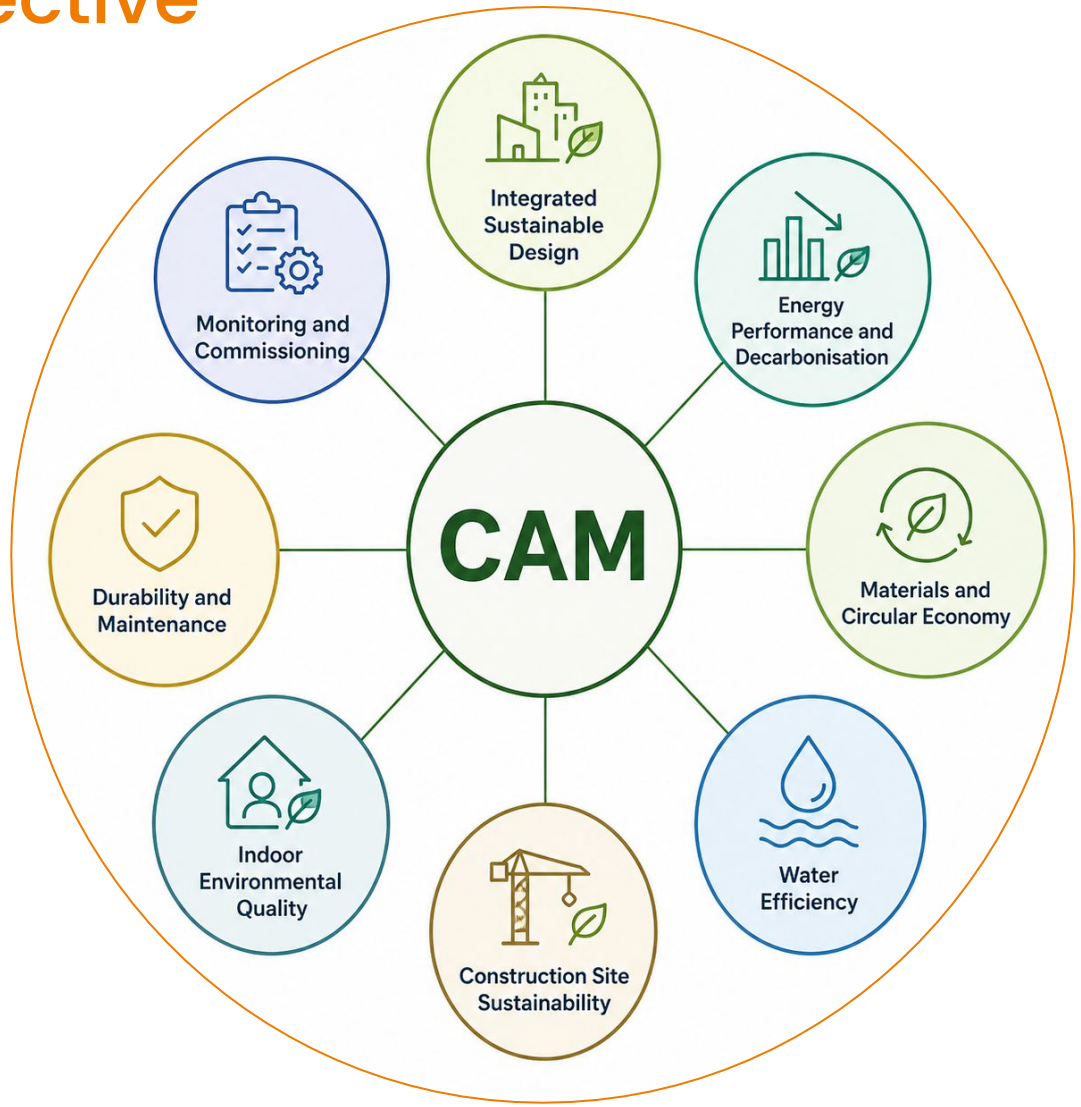
Minimum requirements are set out for the thermal energy need for cooling through the comparison with a reference building.



Ministerial decree – CAM

Main objective

The CAM (Minimum Environmental Criteria) apply to the design, construction, renovation, management, and maintenance of public buildings and are intended to reduce environmental impacts throughout the life cycle of buildings.



Ministerial decree – CAM

Main objective - Overheating

Overheating is addressed explicitly through design-oriented requirements:

- Limitation of solar gains
  - mandatory shading systems
- Passive strategies
  - natural ventilation
  - thermal mass
- Limitation of operative temperature in summer conditions
- Integration with climate adaptation
  - resilience to heat waves
  - design for future climate

Ministerial decree – CAM
Building level- Overheating

- Thermal comfort

In case of the presence of a cooling system, the following parameters have to be verified:

- class B for PMV and PPD (EN ISO 7730)

In case of the absence of a cooling system, it should be assessed:

- the thermal comfort class through the adaptive theory (EN 16798-1)

Ministerial decree – CAM
Building level- Overheating

- Summer energy performance (adaptive theory)

In summer, without the cooling system, the following requirement is to be verified for at least 85% of the occupied hours:

$$\left|\theta_{o,t} - \theta_{rif}\right| < 4°C$$

$$\theta_{rif} = (0{,}33 \cdot \theta_{rm}) + 18{,}8$$

where:

$\theta_{o,t}$ is the indoor operative temperature (EN ISO 52016-1)

θ_{rif} is the mean running outdoor temperature (EN 16798-1)

Ministerial decree – CAM
Building level- Overheating

- Summer ventilation control

In the cooling season and in the periods between cooling and heating, the heat recovery for the ventilation system shall be bypassed in the hours when the outside temperature is lower than the inside one.

Ministerial decree – CAM
Building level- Overheating

- Solar radiation

Minimum requirement in case of mobile solar shading systems:

- Class 3 TSET (EN 14501)

Minimum requirement in case of permanent solar shading systems:

- Windows shading factor <0,85 (UNI/TS 11300)

Ministerial decree – CAM
Territorial specifications - Overheating

- Mitigation of the urban heat island effect

All external areas -> Solar Reflectance Index (SRI) ≥ 29

Parking areas -> at least 10% of green surfaces,

-> the area should be surrounded by vegetation

Building roofs -> SRI ≥ 29 (for slope > 15%) or

-> SRI ≥ 76 (for slope ≤ 15%)

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