



France | Environmental regulation for Buildings (RE2020)

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Background and objectives

The environmental regulations for new building construction (RE 2020) came into force on January 1, 2022, gradually replacing the 2012 thermal regulations (RT 2012) [1]. In response to the Grenelle de l'Environnement (2009), the RT 2012 aimed to make low-energy buildings the norm, with a requirement to control energy needs and consumption, and a performance target for summer comfort. RT 2012 also introduced a requirement for the use of renewable energies in detached and semi-detached houses. The new regulation, RE 2020, responds to the French Energy Transition for Green Growth Act (*“Loi pour la Transition Énergétique et la Croissance Verte”* (LTECV) 2015) and the French Housing, Planning and Digital Development Act (*Loi “Évolution du logement, de l'aménagement et du numérique”* (ELAN) 2018) by pursuing the objectives of improving the energy performance of new buildings, reducing their impact on the climate (taking into account greenhouse gas emissions over the entire life cycle of buildings) and adapting them to future climatic conditions (reinforcing summer comfort and mitigating overheating risks).

Key features

RE 2020 applies to the construction of buildings or parts of buildings for residential use, but also to buildings or parts of buildings for office use, or for primary or secondary education. It consists of a regulatory energy and environmental assessment of buildings.

The **energy assessment** considers the building's heating, cooling, domestic hot water, ventilation and lighting consumption (and their auxiliaries), as well as consumption linked to the internal mobility of occupants (use of elevators or escalators), including consumption linked to any parking lots (lighting and ventilation).

The **environmental assessment** takes into account the impact on climate change of the building and the development of the plot (external developments outside the building, networks, energy production systems and parking lots). In contrast, **regulatory requirements** focus on the impact of building components and energy consumption during operation.

The **conventional duration** of the building's operating phase taken into account in the calculation is 50 years.

The **energy performance calculation method** uses identical or similar calculation algorithms to those used in the previous regulations, with a few adaptations and additions, particularly with regard to summer comfort. RE 2020 introduces a new requirement for discomfort degree-hours (DH), with a new calculation method that takes into account the **effects of climate change** on buildings: future temperature trends, and heat waves that will become more frequent, more intense and longer [2]. For summer comfort calculations only, the updated meteorological scenarios include the **insertion of a heatwave sequence in the conventional weather files**.

The indicator used to assess discomfort is the **discomfort degree-hour (DH)**, expressed in °C.h and represents the level of discomfort caused by a heatwave. It represents the level of discomfort perceived by occupants. More



concretely, this indicator resembles a counter that accumulates, over the summer period, each uncomfortable degree for each hour of the day and night. Uncomfortable degrees are conventionally those that exceed a comfort indoor temperature, which generally varies between 26 and 28°C depending on outside temperatures

RE 2020 introduces **two discomfort thresholds**, based on the DH indicator in °C.h:

- a high threshold (DH_max, which depends on building's usage and external constraints), above which the building is not compliant with regulations (excessive discomfort),
- a low threshold (350 °C.h) below which the building is considered comfortable during heatwave periods.

Between these two thresholds, the building complies with the regulatory requirement, but to encourage the achievement of the low threshold with passive levers, a cooling lump sum is added to the energy consumption assessing the energy performance of the building.

RE 2020 defines also two thresholds that the building's indoor temperature must not exceed (when the building is occupied) to avoid discomfort:

- at night, a temperature threshold of 26°C;
- during the day, an adaptive temperature threshold between 26° and 28°C.

Beyond these thresholds, every degree in the building is considered uncomfortable for the occupant. During the day, this threshold is constant, but not necessarily identical to that of the previous day. It varies from one day to the next to take into account the human body's ability to adapt to high temperatures after a succession of hot days, up to a maximum of +2°C compared with the consensus threshold of 26°C.

Implementation

Applying the assessment method to a building project or an existing building requires the use of one or more assessment software programs. It is essential to start with carrying out an energy assessment. As a second step, and based on the data from the first assessment, an environmental assessment should be carried out.

Software approved for regulatory calculations using the Th-BCE 2020 method can be used to carry out the energy assessment and produce the outputs required to assess the environmental impact of energy consumption. It also creates a standardized thermal study summary file in an output format that must be compatible with the assessment of the building's environmental performance.

As for energy and summer comfort, the software used to carry out the environmental assessment required to calculate the "greenhouse gas emissions" indicators must be approved by the Ministry and enable the new calculation method based on life cycle analysis to be taken into account, in compliance with the RE 2020 decree. These software approved for regulatory calculations in accordance with the general rules for calculating energy and environmental performance, can be used to carry out the environmental assessment and to create a standardized energy and environmental study summary file.

Budget (or other cost data)

Not available

Results and impacts

The previous regulations had led to significant discrepancies, observed in the field, between compliance with energy performance standards and the summer comfort actually perceived by occupants. The new regulation is designed to reduce these discrepancies. However, it is too early to draw up an assessment of its implementation less than 3 years after it came into force.

Sources

[1] « [Textes réglementaires \[archive\]](#) », Ministère de la Transition écologique, sur RT-RE-bâtiment, seen on 2025 July, 15th

[2] Guide RE2020, Réglementation environnementale des bâtiments neufs, Ministère de la Transition Ecologique, CEREMA, janvier 2024