



# HQE™ SCHEME ENVIRONMENTAL PERFORMANCE RESIDENTIAL BUILDING

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Assessment scheme for the environmental performance  
of residential buildings under construction –  
HQE™ certified by Cerway

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## WARNING

This document forms part of the Certification Scheme for non-residential building construction projects applicable internationally outside of France, where a specific procedure is in place.

This Project's Environmental Management Requirements Scheme was approved by the President of Cerway on October 23rd, 2014 after collecting opinions from interested parties.

Earlier versions of this document is replaced by the current version (cf. to the section "History of modifications").

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## 0. History of modifications

Earlier versions of this document are replaced with the current version.

N° and date of version	Date of issue	Main modifications
00 / 13/09/2013	13/09/2013	First implementation
01 / 12/04/2014	12/04/2014	Assessment of the overall level
02 / 15/10/2014	23/10/2014	Evolutions of target names Evolution of the assessment method of a target (transition towards point system) Evolution of the assessment method of a theme

## 1. Introduction

This document specifies the requirements for the Environmental Performance of Residential Buildings under construction.

Requirements are divided into the 14 targets of the HQE approach, each of which covers 4 topics.

Environment	Energy and Savings	Comfort	Health and Safety
Target 1 Site	Target 4 Energy	Target 8 Hygrothermal comfort	Target 12 Spaces quality
Target 2 Components	Target 5 Water	Target 9 Acoustic comfort	Target 13 Air quality
Target 3 Worksite	Target 7 Maintenance	Target 10 Visual comfort	Target 14 Water quality
Target 6 Waste		Target 11 Olfactory comfort	

The certificate issued for the operation covers the entirety of the assessment information, along with the topics covered. (See section 3)

Each target contains an "additional information" section, which provides technical specifications, when indicated by the requirements.

## 2. Target assessment

The Applicant is required to assess or get an assessment for each of the technical criteria specified in the 14 HQE targets in order to control the environmental profile of the building as early as possible in the process.

The same general assessment method is implemented for each target:

- PREREQUISITE level:

To achieve the PREREQUISITE (PR) level on a specific target, the project must meet all the target's PREREQUISITE requirements.

To be certified, a project must achieve at least all PREREQUISITES on each target.

- PERFORMING and HIGH PERFORMING levels:

To achieve respectively the PERFORMING and HIGH PERFORMING levels, it is necessary to reach a total of points corresponding to the targeted level.

Among the points available for a target, it is sometimes indicated that the points for a specific requirement can not be combined with the points for another requirement. This information is marked by the abbreviation "NCP" in the column dedicated for points (**NCP = Non-Cumulative Points with previous requirement**).

To indicate the assessment methods for each requirement, and by audit type, the symbol  indicates the methods of substantiation that can be provided by the Applicant during the various audits.

The methods of substantiation may be, for example:

- drawings;
- supporting documentation;
- descriptive documentation;
- written undertakings;
- calculations notes;
- Excel calculation files;
- construction specifications extracts;
- works contracts;
- organizational documents of the building-site;
- etc.

Verification of a requirement may be made using one or several methods of substantiation. For example, when a drawing contains clear captions, an accompanying note is not necessarily needed. However, in some cases, written proof is required to meet the requirement.

To demonstrate compliance with a requirement, the reference framework may indicate several methods of substantiation, separated by:

- the symbol "," meaning that the methods of substantiation listed are non-exhaustive examples,
- the symbol "+" meaning that the different methods of substantiation listed are obligatory.

If another method of substantiation proves more appropriate to indicate compliance with a requirement, the auditor will take this into account and assess its validity and relevance.

### 3. Calculation of the levels attained for the certificate

#### 3.1. Calculation of the level reached by topic

Each topic is rated on a scale of 0-4 stars, depending on the score attained for each of the targets. The levels outlined hereunder are the **minimum number of targets** to be attained to approve the award of the stars.

Topics	*	**	***	****
<b>Energy and Savings</b> Targets: 4, 5 and 7	1 P	1 HP + 1 P	2 HP	2 HP + 1 P
<b>Comfort</b> Targets: 8, 9, 10 and 11	2 P	1 HP + 2 P	2 HP + 1 P	3 HP + 1 P
<b>Health and Safety</b> Targets: 12, 13 and 14	1 P	1 HP + 1 P	1 HP + 2 P	2 HP + 1 P
<b>Environment</b> Targets: 1, 2, 3 and 6	2 P	1 HP + 2 P	2 HP + 1 P	3 HP + 1 P

For example:

An operation with target 4 in HP and target 7 in P is awarded the level of two stars for Energy and Savings.

#### 3.2. Calculation of the overall level achieved

Five rankings are possible depending on the number of stars obtained on each topic.

Overall Level	Minimum levels to achieve
<b>HQE Pass</b>	14 PR targets
<b>HQE Good</b>	1 to 4 Stars
<b>HQE Very Good</b>	5 to 8 Stars
<b>HQE Excellent</b>	9 to 11 Stars
<b>HQE Exceptional</b>	≥ 12 Stars



## 4. Targets for the Environmental Performance of the Building

### Target 1: Site

1.1. Site analysis	Level
<p>✓ Conduct an analysis of the advantages and limitations of the site before the study and design phase. This analysis is the prerequisite for establishing a HQE performance assessment. It provides a list of elements to be taken into consideration for integrating buildings on the site. The level of requirements for other targets depends on this analysis and the aims of the Applicant (see additional information).</p> <p>A report of the site analysis should be distributed to all parties involved. It should contain recommendations to be implemented that are necessary for the construction of the programme by topic analysed and/or as an overall appraisal.</p> <p>⚙ <i>Pre-project audit and design audit: All documents detailing the site analysis + Proof that all points in the analysis of the site have been distributed to all parties involved (memos, emails, etc.)</i></p>	PR
<p>✓ Clarify, for each target, how the site analysis was performed, permitting the targets to be ranked. Knowledge of the site should allow advantages of the site to be taken, whilst reducing its limitations.</p> <p>⚙ <i>Design audit: Descriptive document</i></p>	PR

1.2. Layout of the plot to promote a pleasant living environment	Level
<p>✓ Include features on the ground plan to promote a pleasant living environment:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> avenues,</li> <li><input type="checkbox"/> playgrounds, relaxation areas,</li> <li><input type="checkbox"/> waste storage areas,</li> <li><input type="checkbox"/> location/selection of vegetation,</li> <li><input type="checkbox"/> inclusion of a space aimed at improving the general quality of life, etc.</li> </ul> <p>Depending on the location, the Applicant must provide reasons for the inclusion or non-inclusion of the items listed above.</p> <p>⚙ <i>Pre-project audit and design audit: Ground plan, Descriptive document</i></p> <p>⚙ <i>Execution audit: Visual checks of equipment</i></p>	1



1.3. Layout of the plot to encourage eco-mobility	Level
<p>✓ Conduct an inventory of existing modes of transport surrounding the operation (bicycle, pedestrian, public transport, etc.).</p> <p>⚙ <i>Pre-project audit and design audit: Ground plan indicating the various modes of transport, Descriptive document</i></p>	PR
<p>✓ Include information on the ground plans aimed at reducing the impacts and/or adverse effects related to transport:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> effective separation of pedestrian walkways and vehicle accesses,</li> <li><input type="checkbox"/> emergency vehicle parking, car parking, bicycle stands, disabled parking, etc.</li> <li><input type="checkbox"/> availability of one or several charging stations for electric vehicles,</li> <li><input type="checkbox"/> cycle paths, etc..</li> </ul> <p>Depending on the local area and regulations, the Applicant must provide reasons for the inclusion or non-inclusion of the items listed above.</p> <p>⚙ <i>Pre-project audit and design audit: Ground plan, Descriptive document</i></p> <p>⚙ <i>Execution audit: Visual checks of equipment</i></p>	1

### Evaluation of Target 1

<b>PR Level</b>	Compliance with PREREQUISITES
<b>P Level</b>	Compliance with PREREQUISITES and points' total ≥ 1
<b>HP Level</b>	Compliance with PREREQUISITES and points' total = 2

### Additional information Target 1

#### **Site analysis content:**

The Applicant shall perform a site analysis based on the following points:

- The ground plans and view drawings of the site, planimetry, altimetry, ground surveys;
- The consistency of the soil and subsoil, with analysis at a later date;
- Establishing legal and regulatory requirements, urban planning documents;
- Climate (sunshine hours, precipitation, prevailing winds, etc.), any possible noteworthy ecosystems on the site (rivers, trees, etc.) and its biodiversity (conservation, development, etc.);
- Local constraints and specifics (neighbourhood, social diversity, cultural heritage, construction methods, etc.);
- Potential nuisance (noise, odour, visual, etc.) ;
- Possible sources of pollution (air, soil and subsoil, water table, electromagnetic fields, etc.) ;
- Natural and technological hazards that may affect the operation (seismic, meteorological, presence of hazardous installations, etc.);
- Local resources (materials, distribution networks, drainage networks, transport, energy, etc.) ;





- Waste collection arrangements (rate of collection, methods of collection, type and volume of containers, equipment);
- Any other noteworthy points that the Applicant wishes to address regarding the site analysis.

In cases of existing construction or activity:

- The typology and key features (surface areas, technical installations) of existing buildings;
- Information about the building (year of construction, technical and sanitary quality of structures);
- Existing buried or overhead services;
- Previous activity, wherever possible.

In cases of existing construction needing to be demolished:

- An assessment made by the Applicant of the waste generated by the building demolition work.

## Target 2: Components

2.1. Technical quality of materials, products and equipment used	Level
<p>Select suitable products and equipment:</p> <ul style="list-style-type: none"> <li>- to the use of the building, common areas, rooms in residences and their occupants;</li> <li>- to their environment: resistance to pests (boring insects and rotting fungi) and climatic conditions (tropical, seaside, freezing/thawing, etc.);</li> <li>- achieving recognised quality levels (certification, proof of compliance with norms and standards, technical expertise, etc.) when these exist.</li> </ul> <p><i>Pre-project audit and design audit: Commitment of the Applicant</i></p>	PR
2.2. Environmental quality of the materials, products and equipment used	Level
<p>✓ In contracts drawn up with contractors, specify that they must be in a position to provide the Applicant with products having accompanying information on environmental impacts, when these exist. This information must conform to Standard ISO 21930 or EN 15804.</p> <p>⚙ <i>Pre-project audit and design audit: Specifications of the construction project, Works contracts</i></p>	PR
<p>✓ Study different scenarios for the contribution of products to environmental performance, according to European Standard EN 15978 (see additional information) or International Standard ISO 21931:</p> <ul style="list-style-type: none"> <li>- For the main structure OR for finishings.</li> </ul> <p>AND</p> <p>Take these scenarios into account when choosing products and building principles implemented.</p> <p>⚙ <i>Pre-project audit and design audit: Comparative study on product environmental data + Specifications of the construction project</i></p>	1
<p>✓ Study different scenarios for the contribution of products to environmental performance, according to European Standard EN 15978 or International Standard ISO 21931:</p> <ul style="list-style-type: none"> <li>- For the main structure AND for finishings.</li> </ul> <p>AND</p> <p>Take these scenarios into account when choosing products and building principles implemented.</p> <p>⚙ <i>Pre-project audit and design audit: Comparative study on product environmental data + Specifications of the construction project</i></p>	2 NCP



2.3. Sanitary quality of materials, products and equipment used	Level
<p>✓ In contracts drawn up with contractors, specify that they should not use products listed in group 1 of the carcinogenic substances classification as defined by the IARC (International Agency for Research on Cancer), an agency of the WHO (World Health Organization). (see additional information).</p> <p>⚙ <i>Pre-project audit and design audit: Specifications of the construction project, Works contract</i></p>	PR
<p>✓ Compare emissions of air pollutants for:</p> <ul style="list-style-type: none"> <li>- at least 1 floor, wall or ceiling covering product.</li> </ul> <p>AND</p> <p>Select the one with the least emissions of air pollutants (see additional information).</p> <p>⚙ <i>Pre-project audit and design audit: Comparative study on sanitary product data + Specifications of the construction project</i></p>	2
<p>✓ Specify, in contracts drawn up with contractors providing wall (e.g. paint) and floor covering materials, that the products:</p> <ul style="list-style-type: none"> <li>- residence interior floor coverings;</li> <li>- installation products for residence interior floor coverings;</li> <li>- residence interior wall and ceiling paints;</li> </ul> <p>must meet the following requirements:</p> <ul style="list-style-type: none"> <li>- formaldehyde emissions &lt;60 µg/m<sup>3</sup> at 28 days;</li> <li>- TVOC (Total Volatile Organic Compounds) emissions &lt;1000 µg/m<sup>3</sup> at 28 days.</li> </ul> <p>Whatever the choice of the Applicant, the written sections of works contract must specify that the data on air emissions as requested above must be based on Standard ISO 16000 with tests being performed by an accredited laboratory or in the process of accreditation according to Standard ISO 17025.</p> <p>⚙ <i>Pre-project audit and design audit: Specifications of the construction project, Works contract</i></p> <p>⚙ <i>Execution audit: Provision of data sheets characterising the products used</i></p>	3

### Assessment of Target 2

PR Level	Compliance with PREREQUISITES
P Level	Compliance with PREREQUISITES and points' total ≥ 3
HP Level	Compliance with PREREQUISITES and points' total = 7



## Additional information Target 2

### **Carcinogenic, mutagenic or reprotoxic substances**

IARC (International Agency for Research on Cancer) classifies carcinogens into 5 groups:

- Group 1: the agent is carcinogenic to humans.
- Group 2A: the agent is probably carcinogenic to humans.
- Group 2B: the agent may be carcinogenic to humans.
- Group 3: the agent is unclassifiable as to its carcinogenicity to humans.
- Group 4: the agent is probably not carcinogenic to humans.

At the European level, the European CLP regulation (Classification, Labelling, Packaging), which repeals European Directive 67/548/EEC, defines another classification concerning regulatory limits for substance emissions classified as CMR.

CMR signifies: Carcinogenic/Mutagenic/Reprotoxic with Category 1A: proven in humans, Category 1B: probable in humans and Category 2: possible in humans.

### **Norms and Standards References:**

ISO 21930 "Buildings and constructed works - Sustainability in building construction - Environmental declaration of building products"

ISO 21931-1 "Sustainability in building construction - Framework for methods of assessment of the environmental performance of construction works - Part 1: Buildings"

EN 15804 "Sustainability in building construction - Environmental construction product declarations - Core rules for the product category"

ISO 16000 "Indoor Air": this series of standards characterises the VOC and/or formaldehyde emissions from construction, decorating and furnishing products.

ISO 17025: "Metrology – Laboratory - General requirements for the competence of testing and calibration laboratories"

### **Environmental indicators of products (EN 15804) and buildings (EN 15978) norms and standards**

#### Impact indicators

- Contribution to climate change [kg CO<sub>2</sub>-eq]
- Destruction of the ozone layer [kg CFC-11 eq]
- Acidification of soils and water sources [kg SO<sub>2</sub> eq]
- Eutrophication [kg PO<sub>4</sub> eq]
- Ground-level ozone formation [kg C<sub>2</sub>H<sub>4</sub> eq]
- Depletion of non-renewable resources [kg Sb eq]
- Depletion of fossil-energy resources [MJ]

#### Quantification of environmental aspects

##### **Resources**

- Use of renewable energy resources [MJ]
- Use of non-renewable primary energy [MJ]
- Use of secondary materials [kg]
- Use of secondary energy (ENR - non ENR) [MJ]
- Water consumption [m<sup>3</sup>]



**Outward flows**

- Energy exported [MJ]
- Reused components [kg]
- Recycled materials [kg]
- Materials for energy recovery [kg]

**Waste**

- Inert waste [kg]
- Hazardous waste [kg]
- Radioactive waste [kg]



### 3: Worksite

3.1. Commitments and objectives of the building site	Level
<p>✓ Establish the following commitments for the building site:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> minimise environmental impact (pollution of soil, water and air);</li> <li><input type="checkbox"/> minimise nuisance caused for local residents (acoustic, visual and cleanliness of the surroundings of the building site);</li> <li><input type="checkbox"/> minimise impact on biodiversity during building-site work;</li> <li><input type="checkbox"/> limit the consumption of resources on the building site;</li> <li><input type="checkbox"/> optimise the management of building-site waste;</li> <li><input type="checkbox"/> comply with health and safety conditions for workers;</li> <li><input type="checkbox"/> apply the fundamental principles and rights at work as set out by the International Labour Organization (see additional information).</li> </ul> <p>AND</p> <p>make project management teams aware of these commitments.</p> <p>⊗ <i>Pre-project audit and design audit: Document outlining building-site commitments + Proof that these commitments have been distributed to all parties concerned (memos, emails, etc.)</i></p>	PR
<p>✓ Select contractors able to comply with the commitments outlined above in their work.</p> <p>⊗ <i>Pre-project audit and design audit: Contractor selection procedure, building regulations, Descriptive document</i></p>	PR
<p>✓ Stipulate in contracts drawn up with contractors that all companies must appoint an environmental correspondent to represent it on the site.</p> <p>AND</p> <p>Designate a person on the ground (see additional information) who will act as the point of contact for the companies' environmental correspondents to relay information concerning environmental aspects of the building site and to oversee the implementation of the contractors' commitments.</p> <p>⊗ <i>Pre-project audit and design audit: Specifications of the construction project + Document on the Organization of the building site</i></p>	1

3.2. Organization of the building site	Level
<p>✓ Set out:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> the building-site and Organization plan with volumes, ring fencing and storage areas;</li> <li><input type="checkbox"/> rules regarding the safety and hygiene of workers;</li> <li><input type="checkbox"/> the plan for the prevention of environmental risks;</li> <li><input type="checkbox"/> the plan for the prevention of nuisance (noise, dust, fire, odours, etc.).</li> </ul> <p>⊗ <i>Pre-project audit and design audit: Building-site plan + Rules regarding the safety and hygiene of workers + Plan for the prevention of environmental risks + Plan for the prevention of nuisance</i></p>	PR



3.2. Organization of the building site	Level
<p>✓ Regularly monitor the application of building-site safety, the impact of the building site on the environment, possible nuisance suffered by nearby residents as well as the objectives set.</p> <p>⚙ <i>Pre-project audit and design audit: Applicant commitment, document on the Organization of the building site</i></p>	1
<p>✓ Formulate an appraisal for the end of building-site work in order to measure the environmental processes and provisions implemented. This appraisal must include all elements chosen for this target. Thus, it should contain information about:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> a reminder of the environmental aims of the building site;</li> <li><input type="checkbox"/> the person designated by the Applicant to relay the building site-related environmental information;</li> <li><input type="checkbox"/> complaints from residents and their handling, methods of information implemented;</li> <li><input type="checkbox"/> the arrangements made to reduce nuisance;</li> <li><input type="checkbox"/> incidents or environmental accidents occurring on the building site, as well as the handling of problems;</li> <li><input type="checkbox"/> detailed results on the different types of waste and an assessment of their management (recovery, treatment and removal from the site);</li> <li><input type="checkbox"/> procedures put into place in order to manage water and energy resources.</li> </ul> <p>⚙ <i>Pre-project audit and design audit: Commitment of the Applicant</i></p> <p>⚙ <i>Execution audit: Availability of the building-site appraisal</i></p>	2

3.3. Building-site waste management	Level
<p>✓ In cases of prior demolition, produce a "waste assessment" for the structures to be demolished:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Composition and future of the waste;</li> <li><input type="checkbox"/> Sorting and management of demolition waste;</li> <li><input type="checkbox"/> Recycling chains.</li> </ul> <p>AND</p> <p>If asbestos is present, contact a company specialising in asbestos removal.</p> <p>⚙ <i>Pre-project audit and design audit: Waste assessment + Proof that a company specialising in the removal of asbestos has been contacted, if relevant</i></p>	PR
<p>✓ List the waste produced by the site and, as far as possible, the estimated quantities of waste generated throughout the progress of the work (ratio approach possible).</p> <p>⚙ <i>Pre-project audit and design audit: List of waste + Quantifying of waste</i></p>	PR
<p>✓ Specify in contracts with external companies that they must handle the storage and/or sorting of building-site waste so that recyclable waste can be conveyed to existing local chains.</p> <p>⚙ <i>Pre-project audit and design audit: Specifications of the construction project, Works contract</i></p>	1

3.3. Building-site waste management	Level
<p>✓ Demonstrate the steps taken in construction techniques to reduce waste production at the source. OR</p> <p>Ensure traceability of waste, collecting follow-up forms, or any other similar provision to justify the future of waste.</p> <p>⚙ <i>Pre-project audit and design audit: Depending on the selected requirement - Descriptive document, Applicant commitment</i></p> <p>⚙ <i>Execution audit: Provision of evidence of waste traceability</i></p>	3

3.4. Limiting nuisance and pollution on the site	Level
<b><u>Managing water and energy resources</u></b>	
<p>✓ Specify in company contracts that they commit to reduce their consumption of water and energy through worker-awareness actions, choice of equipment, building-site installation, construction procedures.</p> <p>⚙ <i>Pre-project audit and design audit: Specifications of the construction project, Works contracts</i></p>	1
<p>✓ Analyse monitoring of water and energy consumption at the building site to decide whether awareness actions need to be repeated.</p> <p>⚙ <i>Pre-project audit and design audit: Document on the Organization of the building site</i></p> <p>⚙ <i>Execution audit: Provision of monitoring documents on water and energy consumption</i></p>	2
<b><u>Noise pollution reduction</u></b>	
<p>✓ Alongside the local residents, draw up a schedule of the noisiest phases of the building-site programme and the measures taken (Organization and/or relating to equipment and powered machinery) to limit acoustic nuisance for local residents in line with the works schedule.</p> <p>⚙ <i>Pre-project audit and design audit: Building-site schedule, Document on the Organization of the site</i></p>	1
<b><u>Conservation of biodiversity during construction</u></b>	
<p>✓ Arrange the layout of the building site to conserve biodiversity during construction (procedures put in place to minimise disruption to wildlife (noise, lighting) and minimise damage to flora (pollutant emissions)).</p> <p>⚙ <i>Pre-project audit and design audit: Descriptive document</i></p>	1
<b><u>Facilitate the reuse of excavated soil on-site</u></b>	
<p>✓ Arrange for on-site reuse of soil excavated during earthworks on site, therefore avoiding its removal from the building site.</p> <p>⚙ <i>Pre-project audit and design audit: Descriptive document</i></p> <p>⚙ <i>Execution audit: Substantiation of a neutral balance in terms of earth removed/returned</i></p>	2





### Assessment of Target 3

PR Level	Compliance with PREREQUISITES
P Level	Compliance with PREREQUISITES and points' total $\geq 6$
HP Level	Compliance with PREREQUISITES and points' total = 12

### Additional information Target 3

**Definitions:**

Person on the ground in contact with environmental correspondents

The designated person may be appointed through examination of their curriculum vitae indicating sufficient experience or by training conducted by a competent third party on environmental issues.

Fundamental Principles and Rights at Work, ILO (International Labour Organization, <http://www.ilo.org>)

- Freedom of association and the effective recognition of the right to collective bargaining;
- Elimination of all forms of forced or compulsory labour;
- Effective abolition of child labour;
- Elimination of discrimination in respect of employment and occupation.

**Target 4: Energy**

4.1. Thermal design	Level
<p>✓ Carry out a Dynamic Thermal Simulation (DTS) by type of building justifying the representativeness of the chosen buildings and the input data used (climate scenario, technical characteristics of the building, occupancy and usage scenario).</p> <p>AND</p> <p>Calculate energy consumption covering 5 factors (heating, cooling, lighting, domestic hot water (DHW) and auxiliaries) applying this DTS.</p> <p>AND</p> <p>Design the building so that the energy consumption covering the 5 factors mentioned above is less than 120 kWh final energy/yr.m<sup>2</sup> of usable floor space. This value does not represent a performance objective but a ceiling not to be exceeded.</p> <p>AND</p> <p>Justify the performance of the building based on its needs related to the climatic area of the project (see annex).</p> <p>⊗ <i>Pre-project audit and design audit: Specifications of the construction project + Reasons for the selection of buildings + DTS + Calculations for energy consumption of the project and of the average level of the country</i></p> <p>⊗ <i>Execution audit: Visual check of equipment types</i></p>	<p>PR</p>
<p>✓ Justify the bio-climatic design of each of the following topics:</p> <ul style="list-style-type: none"> <li>• Structure/Envelope;</li> <li>• Orientation;</li> <li>• Management of solar gains;</li> <li>• Through-ventilation.</li> </ul> <p>AND</p> <p>Design the building so that the energy consumption covering the 5 factors listed above is less than 80 kWh final energy/yr.m<sup>2</sup> of usable floor space. This value does not represent a performance objective but a ceiling not to be exceeded.</p> <p>AND</p> <p>Include at least one renewable energy, energy recuperation or co-generation installation for detached residences.</p> <p>AND</p> <p>Select and design efficient cooling installations (if present):</p> <ul style="list-style-type: none"> <li>• EER (Energy Efficiency Ratio) &gt;3.5 for air-conditioning;</li> <li>• Thermal insulation and solar protection of air-conditioned spaces;</li> <li>• Outdoor air-conditioning units protected from the sun;</li> <li>• Night time ventilation;</li> <li>• Misting;</li> <li>• etc.</li> </ul> <p>⊗ <i>Pre-project audit and design audit: Specifications of the construction project + Explanatory document giving reasons for bio-climatic design + Diagram of the layout of external air-conditioning units</i></p>	<p>2</p>



4.1. Thermal design	Level
<ul style="list-style-type: none"> <li>⊗ <i>Execution audit: Visual observation of the position of external air-conditioning units + Inclusion of a renewable energy, energy recuperation or co-generation installation</i></li> </ul>	
<ul style="list-style-type: none"> <li>✓ Meet the requirement above Design the building so that the energy consumption covering the 5 factors listed above is less than 50 kWh final energy/yr.m<sup>2</sup> of usable floor space. This value does not represent a performance objective but a ceiling not to be exceeded.</li> </ul> <p>AND</p> <ul style="list-style-type: none"> <li>Conduct a study covering overall costs of energy supplies.</li> </ul> <p>AND</p> <ul style="list-style-type: none"> <li>Install a display panel providing information on energy consumption by factor (5 DTS factors, along with electrical outlets).</li> </ul> <p>AND</p> <ul style="list-style-type: none"> <li>Include at least one renewable energy, energy recuperation or co-generation installation for multiple-occupancy buildings.</li> </ul> <ul style="list-style-type: none"> <li>⊗ <i>Pre-project audit and design audit: Specifications of the construction project + Study covering overall costs</i></li> <li>⊗ <i>Execution audit: Visual check of the installation of a display panel in residences</i></li> </ul>	<p><b>3</b> <b>NCP</b></p>

4.2. Solar thermal energy and/or photovoltaic panels (requirements to be met if solar panels are installed)	Level
<ul style="list-style-type: none"> <li>✓ Adjust and tilt the solar panels in order to gain optimum efficiency.</li> <li>⊗ <i>Pre-project audit and design audit: Specifications of the construction project + Location diagram of solar collectors</i></li> <li>⊗ <i>Execution audit: Visual check of the installation of collectors according to the location plan</i></li> </ul>	<p>PR</p>

4.3. Thermal insulation of networks	Level
<ul style="list-style-type: none"> <li>✓ Insulate domestic hot water systems in cases of collective production to limit distribution network heat loss. The insulation should be at least Class 2 according to norm prEN12828.</li> <li>⊗ <i>Pre-project audit and design audit: Specifications of the construction project</i></li> </ul>	<p>PR</p>
<ul style="list-style-type: none"> <li>✓ Insulate cold distribution networks (air-conditioning, cooling ceiling, etc.) to limit thermal loss and condensation. The insulation should be at least Class 2 according to norm prEN12828.</li> <li>⊗ <i>Pre-project audit and design audit: Specifications of the construction project</i></li> </ul>	<p>PR</p>



4.4. Artificial lighting	Level
<p>✓ Provide the following characteristics for horizontal and vertical movements around the building (excluding external paths):</p> <ul style="list-style-type: none"><li><input type="checkbox"/> Consistent with the level of lighting selected for target 10, the consumption level of the lighting system should be less than 2.5 W/m<sup>2</sup>/100 LUX;</li><li><input type="checkbox"/> Lighting cannot be permanent except when permanent lighting is intended to meet safety needs;</li><li><input type="checkbox"/> The chosen lighting technology should be suitable for intermittent illumination;</li><li><input type="checkbox"/> Lighting must be controlled by zones of 100 m<sup>2</sup> maximum, with timers being around 3 to 5 minutes.</li></ul> <p>⚙ <i>Pre-project audit and design audit: Specifications of the construction project + Calculations note</i></p> <p>⚙ <i>Execution audit: Providing access to lighting fixture technical data sheets + Visual check of the type of lighting and the timer duration</i></p>	PR
<p>✓ Provide the following characteristics for lit outdoor spaces and pathways:</p> <ul style="list-style-type: none"><li><input type="checkbox"/> Consistent with the level of lighting selected for target 10, the consumption level of the lighting system should be less than 2.5 W/m<sup>2</sup>/100 LUX;</li><li><input type="checkbox"/> Should permanent lighting be installed, show that the design minimises electrical power consumption and that the lighting meets a security need and/or highlights architectural features;</li><li><input type="checkbox"/> Areas of lighting control should be separate depending on location and timers should be about 3 to 5 minutes;</li><li><input type="checkbox"/> Lighting must not become overgrown with vegetation and should only illuminate passageways.</li></ul> <p>⚙ <i>Pre-project audit and design audit: Specifications of the construction project + Calculations note</i></p> <p>⚙ <i>Execution audit: Providing access to lighting fixture technical data sheets + Visual check of the type of lighting and the timer duration</i></p>	PR
<p>✓ Provide the following characteristics for horizontal and vertical movements within the building as well as for all enlightened outdoor areas:</p> <ul style="list-style-type: none"><li><input type="checkbox"/> Consistent with the level of lighting selected for target 10, the consumption level of the lighting system should be less than 2 W/m<sup>2</sup>/100 LUX;</li><li><input type="checkbox"/> Activation is by a presence detector (possibly coupled with a twilight sensor if natural light is present).</li></ul> <p>⚙ <i>Pre-project audit and design audit: Specifications of the construction project + Calculations note</i></p> <p>⚙ <i>Execution audit: Visual check of lighting control</i></p>	2



4.5. Lift (if present)	Level
✓ Choose a lift model in line with its amount of use to reduce the energy consumption of the lift. AND Provide for non-permanent lighting inside the lift, apart from emergency lighting. ⚙ <i>Design audit: Characteristics of the lift (lift technical specifications, etc.)</i>	PR

4.6. Control of energy consumption	Level
✓ For all residences, provide for a meter or sub-meter specific to each of the following factors: heating and Domestic Hot Water (DHW) if production is collective. ⚙ <i>Pre-project audit and design audit: Specifications of the construction project</i> ⚙ <i>Execution audit: Visual check of the presence of meters for heating and DHW factors</i>	2

### Assessment of Target 4

PR Level	Compliance with PREREQUISITES
P Level	Compliance with PREREQUISITES and points' total $\geq 4$ with 2 mandatory points for the requirement 4.1
HP Level	Compliance with PREREQUISITES and points' total = 7



## Additional information Target 4

### **Definitions**

#### Climatic scenario

This uses statistical data for climatic conditions (temperature, hygrometry, wind speed, etc.) for a given location. This scenario provides input data for the Dynamic Thermal Simulation (see below). They are external conditions that apply to the building being modelled.

#### EER (Energy Efficiency Ratio )

Performance coefficient in air-conditioning installation cold mode.

#### Dynamic Thermal Simulation

This deals with dynamic modelling of heat transfer in the building. This helps assess the changes in temperature in each room of the building and to calculate equipment consumption. Numerous programs are available to perform this modelling, such as Pleiades Comfie, TRNSYS, etc.

#### Through-ventilation

This concerns ventilation for generating air currents in the residences through the opening of bays set in walls facing different directions.

### **Substantiation of building performance**

For example, when the outside temperature is below 14°C, heating requirements must be calculated to determine the insulation needed, domestic hot water needs will be determined according to the different water-drawing scenarios of the country and type of residence, etc.

## Target 5: Water

5.1. Metering of water consumption	Level
<ul style="list-style-type: none"> <li>✓ Plan for hot-water meters in cases of collective DHW production applying the European Measuring Instruments Directive MID and with <math>R \geq 100</math> or equivalent (see additional information).</li> <li>⊗ <i>Pre-project audit and design audit: Specifications of the construction project</i></li> <li>⊗ <i>Execution audit: Visual check of the presence of an <math>R \geq 100</math> meter</i></li> </ul>	PR
<ul style="list-style-type: none"> <li>✓ Provide for a water-consumption reading installation inside the residence (hot and cold if DHW production is collective - direct reading, report, etc.).</li> <li>⊗ <i>Pre-project audit and design audit: Specifications of the construction project</i></li> <li>⊗ <i>Execution audit: Visual check of the presence of an installation for reading water consumption</i></li> </ul>	2
<ul style="list-style-type: none"> <li>✓ Plan for a display panel indicating the various different consumptions, including water consumption (hot and cold if DHW production is collective).</li> <li>⊗ <i>Pre-project audit and design audit: Specifications of the construction project</i></li> <li>⊗ <i>Execution audit: Visual check of the installation of a display panel</i></li> </ul>	3 NCP

5.2. Reduction in consumption of water distributed	Level
<p><u>For the private areas</u></p> <ul style="list-style-type: none"> <li>✓ Use water-flow devices (plumbing, flush, etc.) with a distinguishing feature to report on their quality (certification, label, marking, etc.).</li> </ul> <p>AND</p> <p>Plan for toilet cisterns with dual-flush mechanisms.</p> <ul style="list-style-type: none"> <li>⊗ <i>Pre-project audit and design audit: Specifications of the construction project</i></li> <li>⊗ <i>Execution audit: Visual check of the installation of toilet cisterns with dual-flush mechanisms</i></li> </ul>	PR
<ul style="list-style-type: none"> <li>✓ Describe the means used to limit the consumption of water distributed.</li> <li>⊗ <i>Pre-project audit and design audit: Report indicating the measures taken to reduce water consumption</i></li> </ul>	1
<p><u>For indoor and outdoor common areas</u></p> <ul style="list-style-type: none"> <li>✓ Implement mechanisms to reduce water consumption in public areas (surface to maintain/clean: <math>m^2</math> and type, need for watering of outdoor areas - projected consumption <math>m^3/m^2</math>, description of water-flow devices, etc.).</li> <li>⊗ <i>Pre-project audit and design audit: Report indicating the measures taken to reduce water consumption</i></li> </ul>	2



5.3. Need for domestic hot water	Level
<ul style="list-style-type: none"><li>✓ Include a hot water production system (whether individual or collective) that covers the daily volume requirements necessary for occupants.</li><li>⊗ <i>Pre-project audit and design audit: Calculations note</i></li></ul>	PR

5.4. Waste water management	Level
<ul style="list-style-type: none"><li>✓ Include sanitisation to handle waste water treatment when no connection to the public sewerage network is planned.</li><li>⊗ <i>Pre-project audit and design audit: Specifications of the construction project</i></li><li>⊗ <i>Execution audit: Visual check of the installation of sanitisation for treating waste water</i></li></ul>	PR
<ul style="list-style-type: none"><li>✓ Reuse domestic waste water, following sanitisation, for suitable use according to the treatment carried out in accordance with current regulations.</li><li>⊗ <i>Pre-project audit and design audit: Specifications of the construction project</i></li></ul>	3

5.5. Rainwater management	Level
<ul style="list-style-type: none"><li>✓ Calculate the leakage rate of the plot concerned: it must not be greater than that corresponding to a sealing of 30% of the ground surface of collective areas and 20% of detached residences (see additional information).</li><li>⊗ <i>Pre-project audit and design audit: Calculations note</i></li></ul>	1
<ul style="list-style-type: none"><li>✓ Include a system of rainwater collection providing information needed to certify the maintenance of sanitary conditions for its use in the project (in accordance with local applicable regulations, if any exist).</li><li>⊗ <i>Pre-project audit and design audit: Produce a complete description of the system of rainwater recuperation in place: Dimensioning calculations note, Drawings, Technical details + Ground plans</i></li><li>⊗ <i>Execution audit: Visual check of the installation of a rainwater-recuperation system</i></li></ul>	3
<ul style="list-style-type: none"><li>✓ Calculate the leakage rate: it must not be greater than that corresponding to a sealing of 10% of the ground surface of collective areas and 5% of detached residences (see additional information).</li><li>⊗ <i>Pre-project audit and design audit: Calculations note</i></li></ul>	3





## Assessment of Target 5

PR Level	Compliance with PREREQUISITES
P Level	Compliance with PREREQUISITES and points' total $\geq 4$
HP Level	Compliance with PREREQUISITES and points' total = 9

### Additional information Target 5

#### **Definitions:**

##### European Measuring Instruments Directive - MID

European Directive 2004/22/EC on measuring instruments (MID), applicable from 30 October 2006, aims to harmonise measuring practices at the European level. Meters now meet the norm NF EN14154 and/or the recommendation OIML R49.

Meters are no longer classified as Class A, B, C, but instead using a rate Q3 (permanent flow) and a ratio R (ratio between the minimum flow Q1 and Q3).

##### Leakage rate

The leakage rate is the water flow (excluding domestic sewage) discharged at the exit of the works. The leakage rate (or water discharge flow) should not exceed the natural flow of the watershed before construction that led to the sealing of all or part of the surface.

##### Ground sealing

Ground sealing is a process that reduces the permeability of a substance or material, i.e. its ability to allow fluid to pass through it. Ground sealing therefore implies increased run-off in terms of volumes and rates and, conversely, reduced replenishment of the water table.

The ground-sealing coefficient is the ratio between the sealed surface and the total surface of land under consideration.

##### Link between ground sealing and leakage rate

Rainwater management is most often interpreted as:

- a storage volume for the plot's use,
- a low rejection rate into the water network or into the natural environment ([leakage rate](#)).

It is therefore necessary to limit the [waterproofing](#) of the plot by creating permeable surfaces to promote infiltration of water into the soil and restrict the volume of run-off water.

The higher the impermeability of the ground, the higher the leakage rate.

## Target 6: Waste

6.1. Choice of collective waste storage	Level
<p>✓ Provide internal collection suited to external collection (see additional information). The Applicant must look into the current and future practices of waste collection in order to offer the most suitable system.</p> <p>If no external collection exists, a device for composting organic waste should be provided with instructions given in the booklet for future occupants of the residences (carried out inside or outside the building).</p> <p>When a collective building is concerned, a procedure for explaining the operation of composting management must be provided. The designation of an Organization or individual to manage the device is recommended.</p> <p>⊗ <i>Pre-project audit and design audit: Proof of the collection method, Descriptive document</i></p>	PR
6.2. Reducing waste production and improving sorting	Level
<p>✓ Locate a floorspace in the housing (kitchen, pantry, garage for detached residences, etc.) for sorting and/or temporary storage of household waste. This floorspace must be represented on the plans by the designer, be greater than or equal to 0.30 m<sup>2</sup> and similar to a kitchen unit whose dimensions are around 0.60 m x 0.50 m (the space under the sink may only be considered if a specific piece of functional equipment is provided in this location).</p> <p>⊗ <i>Pre-project audit and design audit: Floor plans with identification of the sorting/storage area</i></p>	1
<p>✓ Supply, upon handover of the residence and when selective collection is used, specific equipment for storage of household waste (provision of selective sorting bins, unit with built-in compartments, etc.).</p> <p>OR</p> <p>Provide a waste composting device (with instructions) for the occupants of the residences (internal or external to the building). When collective residences are concerned, a procedure for explaining the operation of composting management must be provided.</p> <p>⊗ <i>Pre-project audit and design audit: Specifications of the construction project</i></p> <p>⊗ <i>Execution audit: Visual check on the installation of the necessary equipment</i></p>	2
6.3. Conditions of collective storage of waste	Level
<p>✓ Provide a room or area for the storage of waste. It must be easily accessible from the residences via a normal route used by the inhabitants (see additional information). In the event that one or more waste types are collected on a local voluntary basis, the occupants of the building must be informed of this via a suitable display in the room.</p> <p>⊗ <i>Pre-project audit and design audit: Ground and/or floor plans</i></p> <p>⊗ <i>Execution audit: Visual check on the provision of a room or area for waste storage</i></p>	PR



6.3. Conditions of collective storage of waste	Level
<p>✓ In the case of rooms for waste storage, ensure that the door width is suited to the passage of bins.</p> <p>⊗ <i>Pre-project audit and design audit: Specifications of the construction project</i></p> <p>⊗ <i>Execution audit: Visual check of the width of the door</i></p>	PR
<p>✓ If the waste storage area is outside, ensure there is sufficient protection from wind, rain, pests and odours.</p> <p>⊗ <i>Pre-project audit and design audit: Specifications of the construction project</i></p> <p>⊗ <i>Execution audit: Visual check of the arrangements made</i></p>	PR
<p>✓ Dimension the storage facility or area according to one of the 2 methods defined in the annex (see additional information)</p> <p>⊗ <i>Pre-project audit and design audit: Calculations note</i></p>	2
<p>✓ Provide a potential site for waste storage (internal or external) in the case of complete collection outside the influence of the operation. This site may have another function initially (e.g. bike storage).</p> <p>⊗ <i>Pre-project audit and design audit: Ground and/or floor plans</i></p> <p>⊗ <i>Execution audit: Visual check on the presence of a location that could be used for waste storage</i></p>	1
<p>✓ Provide a space or room for 'bulky items' within the enclosure of the operation.</p> <p>⊗ <i>Pre-project audit and design audit: Ground and/or floor plans</i></p> <p>⊗ <i>Execution audit: Visual check on the presence of a 'bulky items' space or room</i></p>	1

6.4. Disposal of waste outside the influence of the operation (requirement to be complied with if the storage of waste is made within the enclosure of the operation)	Level
<p>✓ Locate on drawings the area for waste collection. The Organization of the plot should ensure that this area does not, even occasionally, interfere with the free movement of occupants. Similarly, noise and odour pollution should be limited.</p> <p>⊗ <i>Pre-project audit and design audit: Ground and/or floor plans</i></p> <p>⊗ <i>Execution audit: Visual check of the presence of a waste collection area</i></p>	PR
<p>✓ Limit the drudgery of manual handling of containers - path from the point of storage to the external point of collection.</p> <p>Example of area for improvement:</p> <ul style="list-style-type: none"> <li>- Distance to be covered;</li> <li>- Possible altitude difference (increased drudgery when pushing a container uphill or for holding a container when going downhill): the slopes in all points of the path must be less than 4% in case of manual traction;</li> <li>- Number and nature of obstacles (stairs, doors, door stops, bollards, speed bumps, manhole covers, gullies, parked cars, pavement, soil characteristics, route - 90° turn or hairpin bend).</li> </ul> <p>⊗ <i>Pre-project audit and design audit: Descriptive document</i></p>	2



## Assessment of Target 6

PR Level	Compliance with PREREQUISITES
P Level	Compliance with PREREQUISITES and points' total $\geq 4$
HP Level	Compliance with PREREQUISITES and points' total = 7

### Additional information Target 6

#### **Definitions:**

##### Internal collection

Internal waste collection is the waste circuit from the point of production in the private areas up to the location of waste removal.

##### External collection

External collection is the waste circuit from the location of waste removal to the point of waste treatment.

##### Storage facility easily accessible from the dwellings

A waste storage area is deemed accessible when it is located on a commonly used route by the inhabitants of the building and:

- In the interior of the building with a maximum of three doors to open along the way and, if in the basement, one level down if there is a lift available for use;
- Outside, at a distance of less than 70 m from the entrance lobby or from the furthest detached residence (in the case of a lot with a single exit, the distance is increased to 100 m)

##### Waste

According to the French environmental code (art. L541-1), waste is "*any residue of a production, transformation or use process, any substance, material, product or more generally any property, abandoned furniture or furniture that the holder intends to abandon*".

#### **Dimensions of the waste storage room or area:**

- Either the waste storage room meets the following dimensions:
  - Room surface  $> 5.5 + (0.14 \times \text{number of inhabitants}) \text{ m}^2$ , if the number of inhabitants  $< 50$
  - Room surface  $> 8 + (0.09 \times \text{number of inhabitants}) \text{ m}^2$ , if the number of inhabitants  $\geq 50$
- Or, in the case of a waste storage room or area, or bin shelter or buried or semi-buried containers, the Applicant must dimension the place of storage depending on the specific characteristics of the project (number of inhabitants, average production of waste, collection frequency, etc.). In the case of a storage room, the Applicant will ensure that it allows the free movement of each container.

## Target 7: Maintenance

7.1. Information on maintenance	Level
<ul style="list-style-type: none"> <li>✓ Provide a maintenance manual for the future Manager that identifies elements requiring upkeep and regular maintenance and the means to be employed on the external finish and technical equipment.</li> <li>⊗ <i>Pre-project audit and design audit: Commitment of the Applicant</i></li> <li>⊗ <i>Execution audit: Availability of the maintenance manual for the future Manager</i></li> </ul>	PR

7.2. Water flow control	Level
<ul style="list-style-type: none"> <li>✓ Provide an accessible tap or shut-off valve to isolate each of the residences (collective hot and cold water).</li> <li>⊗ <i>Pre-project audit and design audit: Specifications of the construction project</i></li> <li>⊗ <i>Execution audit: Visual checks of the installations in place</i></li> </ul>	PR
<ul style="list-style-type: none"> <li>✓ Provide accessible taps or shut-off valves to isolate each wet room in the residence (collective hot and cold water).</li> <li>⊗ <i>Pre-project audit and design audit: Specifications of the construction project</i></li> <li>⊗ <i>Execution audit: Visual checks of the installations in place</i></li> </ul>	3

7.3. Maintenance of the waste storage area (if present)	Level
<ul style="list-style-type: none"> <li>✓ Provide a waste storage area, inside or outside, equipped with a water outlet (with a shut-off tap) and with drainage by a floor drain and also aerated and ventilated.</li> <li>⊗ <i>Pre-project audit and design audit: Specifications of the construction project + Floor plans</i></li> <li>⊗ <i>Execution audit: Visual checks of the area and installations in place</i></li> </ul>	PR
<ul style="list-style-type: none"> <li>✓ Use of a suitable floor covering (tiles, resin or equivalent) on the entire floor.</li> <li>⊗ <i>Pre-project audit and design audit: Specifications of the construction project</i></li> <li>⊗ <i>Execution audit: Visual checks of the presence of the suitable covering</i></li> </ul>	1
<ul style="list-style-type: none"> <li>✓ Use a coating allowing easy maintenance (tiles, resin-based paint or equivalent) up to at least 1.40 m in height around the walls of the waste storage area.</li> <li>⊗ <i>Pre-project audit and design audit: Specifications of the construction project</i></li> <li>⊗ <i>Execution audit: Visual checks of the presence of the wall coating</i></li> </ul>	1



7.4. Design to ensure efficient maintenance of other equipment	Level
<ul style="list-style-type: none"> <li>✓ Provide access to the common technical equipment (boiler, lighting system, lift, solar panels, etc.) from the common areas. Information on the accessibility of technical equipment must be given in the manual provided for the future Manager.</li> <li>⊗ <i>Pre-project audit and design audit: Specifications of the construction project + Floor plans</i></li> <li>⊗ <i>Execution audit: Availability of the booklet destined for future occupants</i></li> </ul>	PR
<ul style="list-style-type: none"> <li>✓ Provide a security system for access to common technical equipment from the common areas.</li> <li>⊗ <i>Pre-project audit and design audit: Specifications of the construction project + Floor plans</i></li> <li>⊗ <i>Execution audit: Visual checks of the accessibility of common technical equipment</i></li> </ul>	2
<ul style="list-style-type: none"> <li>✓ Ensure that all interventions for upkeep/maintenance, including the replacement of all the common equipment, can be performed without damage to the building.</li> <li>⊗ <i>Pre-project audit and design audit: Specifications of the construction project + Floor plans</i></li> </ul>	1

7.5. Technical management of the building and intelligent home systems	Level
<ul style="list-style-type: none"> <li>✓ Define the functions of the Technical Management of the Building for the collective areas (heating, ventilation, lighting, etc.) or for detached residences.</li> </ul> <p>AND</p> <ul style="list-style-type: none"> <li>Define the functions of intelligent home systems (shutters, lighting system, etc.) for the private areas.</li> <li>⊗ <i>Pre-project audit and design audit: Specifications of the construction project, Descriptive document</i></li> <li>⊗ <i>Execution audit: Visual checks of the TMB or the intelligent home system functions</i></li> </ul>	2

Note: Provision by the Applicant of a booklet for future occupants and a maintenance manual for the future Manager is integral for this target (see reference framework for the environmental management of building projects under construction - 5 - Associated services for residential buildings).

### Assessment of Target 7

PR Level	Compliance with PREREQUISITES
P Level	Compliance with PREREQUISITES and points' total ≥ 4
HP Level	Compliance with PREREQUISITES and points' total = 8

## Target 8: Hygrothermal comfort

8.1. Comfort during cold periods (if adapted to a specific country)	Level
<ul style="list-style-type: none"> <li>✓ Equip each residence containing a heating system with a room thermostat.</li> </ul> <p>AND</p> <p>Dimension heating sources according to heat loss from the residence (applying local standards or by default according to standards NF EN 12831 for the calculation of losses and NF EN 14337 for the dimensioning of electrical heating sources and NF EN 12828 for the dimensioning of hot water heating sources).</p> <ul style="list-style-type: none"> <li>⊗ <i>Pre-project audit and design audit: Specifications of the construction project + Justification of dimensioning</i></li> <li>⊗ <i>Execution audit: Visual checks of the installations in place</i></li> </ul>	PR
<ul style="list-style-type: none"> <li>✓ Use heat sources that limit the effects of temperature gradient (sources using low temperatures and a greater exchange surface).</li> </ul> <ul style="list-style-type: none"> <li>⊗ <i>Pre-project audit and design audit: Specifications of the construction project, Product technical data sheets</i></li> </ul>	2
<ul style="list-style-type: none"> <li>✓ Install heat sources in the building structure (for example: underfloor heating).</li> </ul> <ul style="list-style-type: none"> <li>⊗ <i>Pre-project audit and design audit: Specifications of the construction project</i></li> </ul>	3

8.2. Comfort during hot periods (if adapted to a specific country)	Level
<p><b><u>Dwellings with air conditioning</u></b></p> <p>A dwelling is considered air conditioned if its main rooms (living room and bedrooms) are air conditioned.</p>	
<ul style="list-style-type: none"> <li>✓ The units are air-conditioned and meet consumption levels as defined in target 4.</li> </ul>	2
<p><b><u>Dwellings with no air conditioning</u></b></p> <p>For dwellings partially equipped with air conditioning (ie in the bedrooms or in the living room), the following requirements apply to the main rooms without air conditioning.</p>	
<ul style="list-style-type: none"> <li>✓ For the main rooms of the residences (living room and bedrooms), the resulting temperature couple and hygrometry should not be outside of the GIVONI polygon for more than 40% of the annual occupancy time for the country concerned (see additional information). This value is a safeguard and not a performance objective.</li> </ul> <ul style="list-style-type: none"> <li>⊗ <i>Pre-project audit and design audit: calculations note</i></li> </ul>	PR
<ul style="list-style-type: none"> <li>✓ Adhere to the following requirement: for the main rooms of the residences (living room and bedrooms), the resulting temperature couple and hygrometry should not be outside of the GIVONI polygon for more than <math>N^2 \times \frac{1}{10000}</math> outside of the Givoni comfort zone in the main rooms of the residences (with N being the number of hours of the year outside of the Givoni zone outside of the building for the country in question, source METEONORM or equivalent).</li> </ul> <ul style="list-style-type: none"> <li>⊗ <i>Pre-project audit and design audit: calculations note</i></li> </ul>	2

<p>✓ Adhere to the following requirement: for the main rooms of the residences (living room and bedrooms), the resulting temperature couple and hygrometry should not be outside of the GIVONI polygon for more than <math>N^2 \times \frac{1}{10000}</math> outside of the Givoni comfort zone in the main rooms of the residences (with N being the number of hours of the year outside of the Givoni zone outside of the building for the country in question, source METEONORM or equivalent).</p> <p>⚙ <i>Pre-project audit and design audit: calculations note</i></p>	3
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8.3. Hygrometry measurement	Level
<p>✓ Equip each residence with a thermo-hygrometer. The Applicant will provide the necessary explanations for displays in the guide intended for future occupants (see additional information).</p> <p>⚙ <i>Pre-project audit and design audit: Specifications of the construction project</i></p> <p>⚙ <i>Execution audit: Visual checks of the installations in place</i></p>	1

### Assessment of Target 8

PR Level	Compliance with PREREQUISITES
P Level	Compliance with PREREQUISITES and points' total $\geq 2$
HP Level	Compliance with PREREQUISITES and points' total $\geq 3$

### Additional information Target 8

#### Definitions

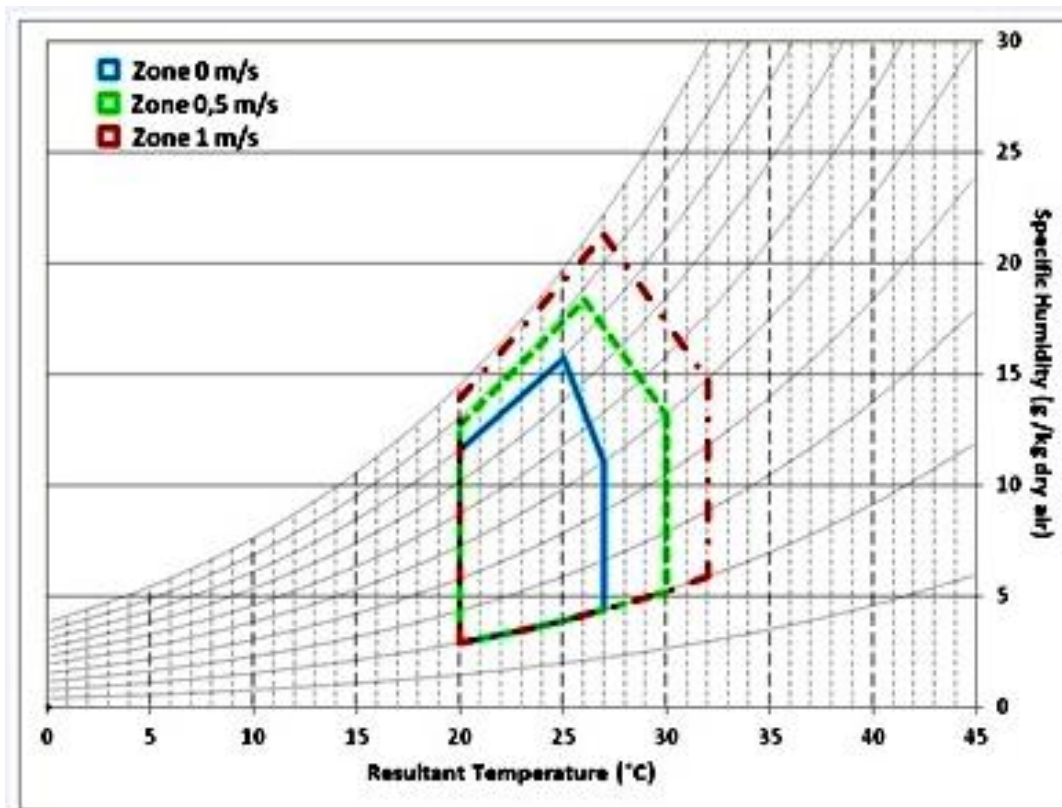
#### Givoni Zone

The calculation of the DTS allows the temperature and hygrometry conditions within interior spaces to be known at an instant t, which can be positioned on a diagram.

The Givoni zone must also be represented on the same diagram. Temperature/hygrometry couples give a representation of the number of annual hours in the Givoni zone.

The Givoni comfort zone is represented by the inner surface of the polygon below, depending on the airflow speed chosen. The





### Hygrometry level

The hygrometry level is the percentage of water vapour that the air absorbs compared to the maximum that can be absorbed at a given temperature. It is generally recommended to have a hygrometry level of between 30% and 70% (the medical community recommends between 40% and 60%). The best way to regulate the hygrometry level is by opening the windows. If the air is still too dry, use of a humidifier is advised; if it is too damp, a dehumidifier should be used.

**Target 9: Acoustic comfort**

9.1. Including acoustics in the architectural provisions	Level
<ul style="list-style-type: none"> <li>✓ Protect residences with regard to external noise through the positioning of the building or buildings on the plot (see additional information, section 1).</li> <li>AND</li> <li>✓ Protect bedrooms and studios from external noise by taking into consideration the situation of service rooms in the building (see additional information, section 1).</li> <li>AND</li> <li>✓ Protect bedrooms and studios from internal noise by taking into consideration the situation of service rooms in the building (see additional information, section 1).</li> <li>⊗ <i>Pre-project audit and design audit: Descriptive document + Ground and floor plans</i></li> </ul>	PR

9.2. Acoustic quality	Level
<ul style="list-style-type: none"> <li>✓ Meet the regulatory level, supported by an acoustic study (see additional information, section 2).</li> <li>OR</li> <li>✓ In the absence of regulations, indicate local practices in a report relating to construction methods and equipment,</li> <li>AND                             <ul style="list-style-type: none"> <li>Improve local practices by at least two topics from the list given under additional information in section 3, providing supporting evidence for the pertinence of each choice.</li> </ul> </li> <li>⊗ <i>Pre-project audit and design audit: Depending on the scenario: Regulatory reference + Acoustic report</i></li> <li><i>OR Report describing local practices + Points for improvement</i></li> <li>⊗ <i>Execution audit: Availability of the acoustic measurements report</i></li> </ul>	PR
<ul style="list-style-type: none"> <li>✓ Meet the requirements listed in section 4, additional information below, backed up by a study (for countries with acoustic regulations the PR level needs to be met).</li> <li>⊗ <i>Pre-project audit and design audit: Acoustic Report</i></li> <li>⊗ <i>Execution audit: Availability of the acoustic measurements report</i></li> </ul>	1
<ul style="list-style-type: none"> <li>✓ Improve at least three topics among the list defined in section 3 of additional information, compared to the requirements mentioned in section 4 of additional information</li> <li>AND</li> <li>✓ Justify of the pertinence of each choice.</li> <li>⊗ <i>Pre-project audit and design audit: Acoustic Report</i></li> <li>⊗ <i>Execution audit: Availability of the acoustic measurements report along with indication of the topics improved upon</i></li> </ul>	2



## Assessment of Target 9

PR Level	Compliance with PREREQUISITES
P Level	Compliance with PREREQUISITES and points' total $\geq 1$
HP Level	Compliance with PREREQUISITES and points' total $\geq 2$

### Additional information Target 9

#### **1 - Including acoustics in the architectural provisions**

This section proposes an approach to improve acoustic comfort, while reducing the economic impact on the construction by making judicious choices when locating the building in its environment and in the layout of rooms in the building.

If other constraints apply to the building, it is not always possible to meet all these requirements; in this case, the choices made must be justified.

#### **Protect the residences with regard to external noise through the positioning of the building or buildings on the plot**

This may include, for example, distancing the buildings from noisy thoroughfares, or positioning that takes advantage of natural protection or acoustic screens: mounds and hillocks, neighbouring buildings, noise barriers, etc.

#### **Protect bedrooms and studios from external noise by taking into consideration the situation of service rooms in the building**

For example, the Organization of service rooms in the building situates bedrooms at the rear, protected from the noise of transport infrastructure.

#### **Protect bedrooms and studios from internal noise by taking into consideration the situation of service rooms in the building**

For example, avoid placing:

- technical ducting containing falling water against a bedroom
- a kitchen or bath/shower room against the bedroom wall of other residences
- internal stairways or lifts next to bedrooms
- etc.

#### **2 - Acoustic Regulations**

A country with "acoustic regulations" indicates that there are requirements on residential premises at least covering sound insulation topics with regard to airborne noise, impact noise levels and noise levels of equipment, described by the international indices defined in standards ISO 140-4, ISO 140-5 and ISO 140-7 and calculated according to standards ISO 717-1 and ISO 717-2.

The PR level requires that an acoustic study be conducted. When the structure is heavy, the study may include simulations based on French and European norms and standards for calculations: NF EN 12354-1, NF EN 12354-2, NF EN 12354-3 (or international standards: ISO 15712-1, ISO 15712-2, ISO 15712-3). Other approaches are possible and must be justified.



### 3 - Points for improvement

Improvements in levels can be selected from the following non-exhaustive list:

Examples of topics to improve
Airborne noise from outside within residences
Airborne noise from other areas of the building in residences
Impact noise from other areas of the building in residences
Noise of individual and collective equipment
Acoustic treatment of the common areas
Comfort within the same residence (airborne and/or impact noise)
Noise originating from vibrations (trains, metro, tram, etc.)
Etc.

The improvement of a topic is understood to mean improving the topic in its entirety or a portion thereof. For example, the Applicant may choose to improve the topic "Insulation of residences vis-à-vis airborne noise from other areas of the construction" by increasing all requirements by 3 dB (for example, if the project environment is quiet) or by increasing the insulation of only one main room vis-à-vis common areas of movement (to enhance privacy in the residences).

The choice(s) of the topic(s) selected must be justified in order to demonstrate their relevance in relation to the level to be improved.

Improvements should be significant and suitable according to the level considered: for example, to improve the efficient level, improvement of a criterion of 3 dB is a minimum, whereas at PR level for a country without regulations, higher gains may be required ( $\geq 10$  dB for example).

### 4 - Requirements for the P Level of the target 9:

#### Airborne noise in a residence coming from outside

A study should be carried out to determine façade insulation, vis-à-vis the exterior, required for rooms that will make it possible to achieve an equivalent level of noise due to transport infrastructure  $L_{Aeq\ 22h-6h}$  of 30 dB(A) and  $L_{Aeq\ 6h-22h}$  of 35 dB(A) maximum in the main rooms and kitchens. This insulation is expressed by the index  $D_{nT,w}+C_{tr}$ .

In all cases, insulation  $D_{nT,w}+C_{tr}$  in the main rooms and kitchens vis-à-vis the outside must be greater than or equal to 30 dB.

Airborne noise in a residence from other areas of the construction

In collective residences, adjoining individual residences and student accommodation, this is the airborne noise entering a residence and emitted into other areas in the building.

**Weighted standardised acoustic insulation to airborne noise  $D_{nT,w}+C$  in dB**

Nature of the emitting area (excluding external areas)		Reception room: main rooms	Reception room: kitchens and shower/bathrooms
Residences (main and utility rooms, corridors and out-buildings) excluding individual garages		$D_{nT,w}+C \geq 53$ dB	$D_{nT,w}+C \geq 50$ dB
Common circulating areas	Via the landing door (+ 1 potential inner door)	$D_{nT,w}+C \geq 40$ dB	$D_{nT,w}+C \geq 37$ dB
	Other cases	$D_{nT,w}+C \geq 53$ dB	$D_{nT,w}+C \geq 50$ dB
Collective or individual garages for residences		$D_{nT,w}+C \geq 55$ dB	$D_{nT,w}+C \geq 52$ dB
Activity areas		$D_{nT,w}+C \geq 58$ dB	$D_{nT,w}+C \geq 55$ dB

Impact noise in a residence coming from other areas of the construction

In collective residences, adjoining individual residences and student accommodation, this is impact noise entering the main rooms of a residence and emitted into other areas in the building outside the residence in question, including exterior passageways.

**Weighted standardised pressure level of the impact noise  $L'_{nT,w}$  in dB**

Nature of the emitting area		Assessment level for the main reception room
Residences (excluding balconies and loggias not located directly above a main room)	Out-buildings (except unconverted attics), car parks	$L'_{nT,w} \leq 58$ dB
	Main rooms, utility rooms, corridors	$L'_{nT,w} \leq 55$ dB
Common circulating areas including exterior passageways (except collective stairways if a lift is provided in the residence)		
Activity areas, except car parks		

Noise from individual heating and air-conditioning equipment internal to the residence being examined

In collective residences, adjoining individual residences and student accommodation, this is noise created by individual heating equipment and air-conditioning installed in an internal area of the residence being examined.

**Standardised level of sound pressure  $L_{nAT}$  in dB(A)**

Nature of the equipment belonging to the residence being examined	Nature of the reception room in the residence being examined	Evaluation level
Heating	Closed main room	$L_{nAT} \leq 35$ dB(A)
	Main room open to a kitchen by an open bay	$L_{nAT} \leq 40$ dB(A)
	Kitchen	$L_{nAT} \leq 50$ dB(A)
Air-conditioning	Main room	$L_{nAT} \leq 35$ dB(A)
	Kitchen	$L_{nAT} \leq 50$ dB(A)

Noise from individual and collective equipment

In collective residences, adjoining individual residences and student accommodation, this is the noise created by individual or collective equipment.

For individual equipment external to the residence being examined, the following facilities are studied:

- ✓ plumbing and sanitary equipment;
- ✓ falling water (discharge-pipe water for sanitation facilities and rainwater).

For collective equipment external to the residence being examined, the following facilities are studied:

- ✓ lifts;
- ✓ collective boiler room;
- ✓ other collective utilities (electric transformer, automatic door for collective garages, waste compactors, water softeners, water suppressors, rubbish chutes, etc.).

For individual or collective equipment internal or external to the residence being examined, the following facilities are studied:

- ✓ controlled mechanical ventilation (CMV) (possibly incorporating air-duct heating);
- ✓ thermodynamic domestic hot water system (thermodynamic DHW).

**Standardised level of sound pressure  $L_{nAT}$  in dB(A)**

Nature of the equipment	Reception room		
	bedrooms and main rooms in a studio	other main rooms (living room, lounge)	kitchens
Individual equipment located in a residence other than that being examined Collective equipment Individual CMV single-stream equipment located in the residence being examined Individual thermodynamic DHW equipment located in the residence being examined	$L_{nAT} \leq 30$ dB(A)		$L_{nAT} \leq 35$ dB(A)
Collective or individual dual-stream CMV and/or air-duct heating located in the residence being examined	$L_{nAT} \leq 25$ dB(A)	$L_{nAT} \leq 30$ dB(A)	

### Acoustic treatment of the common areas

This subsection applies only to collective operations and student housing.

It concerns ensuring a minimum level of acoustic treatment in common areas by the use, in particular, of wall coverings, floor coverings and/or insulated ceilings having certain acoustic absorption properties.

This acoustic treatment in common areas must be sufficient to reduce ambient noise in them and thus improve acoustic comfort in the residences served by these circulating areas.

Location of equivalent absorption areas	Level of assessment in common circulating areas
Equivalent absorption area in all common closed circulating areas and those passed through during normal entry from outside to an entrance door of a residence; Example: entrances, vestibules, halls and circulating areas	$\Sigma A \geq 1/2$ of the floor area of the corresponding circulating areas
Equivalent absorption area in stairwells, in the absence of lifts to residences	$\Sigma A \geq 1/4$ of the floor area of the corresponding circulating areas

### Product requirements

#### **Floating screeds or tiling on fine acoustic underlay:**

In addition to their acoustic performance, under-tiling of less than 10 mm should justify their continued performance over time.

The underlay may be CSTBat certified or underlay insulation processes used with the aid of French technical advice.

Otherwise, the product must demonstrate that its dynamic stiffness after creep does not increase by more than 60% (tests according to French standard NF P 61-203). In other words, this corresponds to a loss in efficiency  $\Delta L_w$  of 3 dB maximum after 10 years.

#### **Vibration-mounted stairs**

Collective or individual wood or metallic stairs located against a wall or on a landing adjoining a main room of another residence must be vibration-mounted to reduce the transmission of impact noise at low frequencies.

#### **Definitions:**

Most indices used are defined in standards ISO 140-4, ISO 140-5 and ISO 140-7, and calculated according to standards ISO 717-1 and ISO 717-2.

#### **$D_{nT,w}+C$ :**

The values of  $D_{nT,w}+C$  correspond to standardised acoustic insulation in dB for a reverberation time of 1.5 s at any frequency in the reception room. Each value of  $D_{nT,w}+C$  is measured according to standard ISO 717-1 as being equal to the sum of the weighted standardised acoustic insulation  $D_{nT,w}$  and the C-term adaptation to a spectrum of A weighted pink noise.

**L'<sub>nT,w</sub>:**

The values of L'<sub>nT,w</sub> correspond to weighted pressure levels of the standardised impact noise in dB for a reverberation time of 0.5 s at any frequency in the reception room. Each value of L'<sub>nT,w</sub> is evaluated according to standard ISO 717-2.

**L<sub>nAT</sub>:**

The values of L<sub>nAT</sub> correspond to standardised sound pressure levels expressed in dB(A), for a reverberation time of 0.5 s at any frequency, in the reception room.

**L<sub>Aeq</sub>:**

The values of L<sub>Aeq</sub> correspond to the weighted equivalent sound pressure level A.

Equivalent absorption area A:

The equivalent absorption area A of an absorbent coating is given by the formula:

$$A = S \times \alpha_w$$

where S is the surface of the absorbent coating and  $\alpha_w$  its evaluation index of absorption (measured according to standard NF EN ISO 11654).

Only materials having an index  $\alpha_w$  greater than or equal to 0.2 are considered.

The index  $\alpha_w$  will be used for surfaces in open-air movement areas equalling 0.8.

The value of  $\Sigma A$  corresponds to the sum of the equivalent areas of absorption of each of the absorbent coatings situated in the common areas of movement internal to the building, expressed in m<sup>2</sup>.

**Definition of the categories of areas in a building:**

<b>Residences (including business premises)</b>	Main rooms	Rooms intended for use as living rooms or sleeping, areas destined for professional use within the residence. If a kitchen is open to a main room through an open bay, it is then considered a main room.	
	Utility rooms	Wet rooms	kitchens, shower/bathrooms, lavatories
		Other utility rooms	rooms such as cupboards, airing cupboards, store rooms and laundries
	Corridors	Horizontal and vertical movement areas internal to the residence such as entry halls, vestibules, stairways, interior corridors	
	Out-buildings	Rooms such as cellars, unconverted attics, pyres, greenhouses, verandas, bicycle/pram areas, rubbish bin areas, rubbish chute areas, detached garages	
<b>Common areas of movement</b>	Horizontal or vertical movement areas serving all public and private areas and service areas such as halls, corridors, stairs, landings, passageways		
<b>Technical rooms</b>	Rooms containing technical equipment necessary for the functioning of the building, accessible only to persons carrying out their maintenance, in particular lift, ventilation and heating installation		
<b>Activity areas</b>	All areas of a building other than those defined under the categories of 'residences', 'common areas of movement' and 'technical rooms'		





**Execution audit:**

Unless otherwise indicated by the regulations of the country concerned, verification by the measurement of requirements is governed according to the following norms and standards: NF EN ISO 10052:2005 and NF EN ISO 3382-2:2010

It is understood that the standardised sound pressure levels  $L_{nAT}$  correspond to the index  $L_{ASmax}$ , measured directly in overall dB(A) across a frequency range from at least 50 Hz to 1000 Hz.

To account for uncertainties in the measurements, the value 3 dB is set for airborne noise and impact noise and 3 dB(A) for equipment noise. This tolerance should not be taken into account during the study phase, but only in acoustic measurements.

**Target 10: Visual comfort**

10.1. Exterior visual context	Level
<ul style="list-style-type: none"> <li>✓ Analyse the limitations and benefits related to the site and its environment (orientation, historical monuments, panoramic views: monuments, gardens, etc.) in connection with the site analysis.</li> <li>⚙ <i>Pre-project audit and design audit: All the documents covering additional detailed information</i></li> </ul>	PR
<ul style="list-style-type: none"> <li>✓ Analyse the context in relation to the analysis of the site:                             <ul style="list-style-type: none"> <li>✓ Analyse the internal/external relationship limitations (visual perceptions of the internal space, outward-looking views);</li> <li>✓ Deal with daylight inside the housing.</li> </ul>                             This work should provide reasons for the choice of the architectural layout of the building.                         </li> <li>⚙ <i>Pre-project audit and design audit: Document entitled "Contextual analysis" dealing with sections on the internal/external relationship and daylight within the residences.</i></li> </ul>	1

10.2. Natural lighting	Level
<ul style="list-style-type: none"> <li>✓ Have an aperture index (see additional information) greater than or equal to 15% for at least one room (living room or bedroom) in each residence.</li> <li>⚙ <i>Pre-project audit and design audit: Document containing the calculation of the aperture indices carried out by the Applicant (Excel spread sheet, for example)</i></li> </ul>	PR
<ul style="list-style-type: none"> <li>✓ Prove that the residences fulfil the following conditions: Avg DF ≥ 2% in the living room and Avg DF ≥ 1.5% for the bedrooms (see additional information). A technical study may be carried out by residence typology justifying their representativeness in the project, preferably based on ground floor or first floor residences. The thresholds can be reduced upon the provision of proof of certain specific conditions (e.g: sky rarely overcast).</li> <li>⚙ <i>Pre-project audit and design audit: DF calculations note</i></li> </ul>	2
<ul style="list-style-type: none"> <li>✓ Include natural lighting in horizontal areas of movement in collective buildings, OR Include natural lighting in stairwells in collective buildings.</li> <li>⚙ <i>Pre-project audit and design audit: Architectural drawings</i></li> <li>⚙ <i>Execution audit: Visual observation of the presence of natural lighting in common areas of movement</i></li> </ul>	1



10.3. Artificial lighting	Level		
✓ Adhere to norms and standards setting lighting levels if they exist or fulfil the lighting levels specified below for collective buildings: <ul style="list-style-type: none"> <li>✓ A minimum of 100 lux for entrances and horizontal areas of movement in the buildings, except for stairs, which have a minimum of 150 lux;</li> <li>✓ A minimum of 20 lux for outdoor pathways and outdoor spaces, and car parks.</li> </ul> ⚙ <i>Pre-project audit and design audit: Commitment of the Applicant</i>			

### Assessment of Target 10

PR Level	Compliance with PREREQUISITES
P Level	Compliance with PREREQUISITES and points' total ≥ 1
HP Level	Compliance with PREREQUISITES and points' total ≥ 2

### Additional information Target 10

#### Definitions:

#### Aperture index (Ai)

The aperture index is the ratio between the aperture surface area (including carpentry and glazing) and the surface area of the room.

Special cases:

- for a window with a tilt of ≤ 50° in relation to the horizontal, the index must be multiplied by 1.5 to account for the improvement provided by the tilt of this bay;
- for a dormer window, the aperture index must be multiplied by 0.75 to account for the decrease caused by the presence of side walls;
- for rooms having numerous apertures, the sum of the aperture indices will be used.

#### Daylight factor DF

It is possible to quantify the natural lighting in a room with the daylight factor, at an internal point in the room of the residence in question: this is the ratio of natural light reaching this point (Eint) compared to external lighting (Eext) simultaneously on a horizontal surface, in a completely open location with a uniform overcast sky.

$$DF = E_{int}/E_{ext} (\%)$$

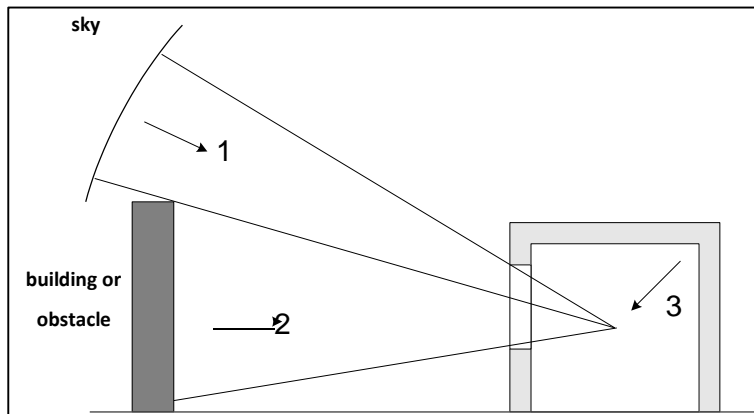


Image - Definition of daylight factor (1: direct component, 2: external reflection component, 3: internal reflection component)

It is possible to evaluate the daylight factor of a room using dedicated software (DIALux, PHANIE).

### **Method of substantiation**

#### **Issue 1 "External visual context" – PR Level:**

All documents including the following points:

- Views and ground plans of the site, planimetry, altimetry;
- Climate (sunshine hours, precipitation, prevailing winds, etc.), any possible noteworthy ecosystems on the site (rivers, trees, etc.);
- Local constraints and specifics (neighbourhood, cultural heritage, construction methods, etc.);
- etc.

## Target 11: Olfactory comfort

11.1. Controlling sources of unpleasant odour	Level
✓ Provide architectural and technical solutions to limit the effects of sources of unpleasant odours from outside identified through the site analysis carried out by the Applicant, taking into account prevailing winds. ⚙ <i>Pre-project audit and design audit: Ground plan + Descriptive document</i>	PR
✓ Plan for the eventuality of connecting an extractor fan to an air extraction duct installed for this purpose in the kitchen (separate to the conduit to be installed for the mechanical ventilation), while respecting the rules of construction and installation of gas appliances that are not airtight and wood stoves. ⚙ <i>Pre-project audit and design audit: Specifications of the construction project</i>	1
✓ Install all air intakes more than 10 meters from: <ul style="list-style-type: none"> <li><input type="checkbox"/> areas where vehicles may be parked;</li> <li><input type="checkbox"/> a location producing odours (storage area for household waste, factories, etc.);</li> <li><input type="checkbox"/> openings of exhaust-air discharge;</li> <li><input type="checkbox"/> smoke flues (boiler pipe, chimneys, etc.).</li> </ul> ⚙ <i>Pre-project audit and design audit: Descriptive document (analysis of the positions of air inlets), ground, floor and elevation plans</i>	2

11.2. Ventilation	Level
✓ Meet the requirements of PR level of the "ventilation" section for target 13, dependent on the ventilation system.	PR
✓ Meet the requirements of PR level and $\geq 2$ of applicable points of the "ventilation" section for target 13, dependent on the ventilation system.	2
✓ Meet the requirements of PR level and $\geq 3$ of applicable points of the "ventilation" section for target 13, dependent on the ventilation system.	3

### Assessment of Target 11

PR Level	Compliance with PREREQUISITES
P Level	Compliance with PREREQUISITES and points' total $\geq 3$
HP Level	Compliance with PREREQUISITES and points' total $\geq 5$

## Target 12: Spaces quality

12.1. Spaces quality and health	Level
<ul style="list-style-type: none"> <li>✓ Include a suitable coating around sanitary fittings (kitchen sink, bath, shower, bathroom sink, wash basins).</li> <li>⊗ <i>Pre-project audit and design audit: Specifications of the construction project</i></li> <li>⊗ <i>Execution audit: Visual check of the inclusion of a suitable coating</i></li> </ul>	PR
<ul style="list-style-type: none"> <li>✓ Identify sources of electromagnetic wave emission of the project (see additional information).</li> <li>⊗ <i>Pre-project audit and design audit: Descriptive document</i></li> </ul>	PR
<ul style="list-style-type: none"> <li>✓ Do not install meters and electrical panels on a bedroom wall in a given residence or adjoining residence.</li> <li>⊗ <i>Pre-project audit and design audit: Floor plans with identification of electrical panel</i></li> <li>⊗ <i>Execution audit: Visual check of the positioning of meters or electrical panel</i></li> </ul>	1
<ul style="list-style-type: none"> <li>✓ Demonstrate that at least one provision has been taken in order to decrease electromagnetic fields in the project (see additional information).</li> <li>⊗ <i>Pre-project audit and design audit: Descriptive document</i></li> </ul>	2

12.2. Home amenities	Level
<ul style="list-style-type: none"> <li>✓ Establish an amenities plan for each residence. This must represent the equipment supplied, or not (dishwasher, washing machine, refrigerator, tables, beds, storage spaces, etc.), specifying their dimensions (by default leaving a minimum space of 60 x 60 cm or more for the dishwasher, the washing machine and refrigerator). It should also illustrate the various connections needed for water (inlet and outlet) and electricity.</li> <li>⊗ <i>Pre-project audit and design audit: Plans with home amenities</i></li> </ul>	PR

12.3. Safety/Security	Level
<p><b><u>Electrical Safety</u></b></p> <ul style="list-style-type: none"> <li>✓ Apply the series of IEC 60364 norms and standards for low voltage electrical installations.</li> <li>⊗ <i>Pre-project audit and design audit: Specifications of the construction project</i></li> </ul>	PR
<p><b><u>Fire Safety</u></b></p> <ul style="list-style-type: none"> <li>✓ Produce a fire-safety notice based on local regulations, where they exist, or based on the points defined in additional information.</li> <li>⊗ <i>Pre-project audit and design audit: Fire-Safety Notice</i></li> </ul>	PR
<ul style="list-style-type: none"> <li>✓ Equip each residence with a smoke detector.</li> <li>⊗ <i>Pre-project audit and design audit: Specifications of the construction project</i></li> <li>⊗ <i>Execution audit: Visual check that a smoke detector has been installed</i></li> </ul>	2

12.3. Safety/Security	Level
<b><u>Safety regarding the risk of intrusion</u></b>	
<b><u>Collective building and Detached residence</u></b>	
<p><u>Ensure adequate night-time outdoor lighting:</u></p> <ul style="list-style-type: none"> <li>✓ Make justified and satisfactory provisions to maximise the sensation of comfort and safety (sufficient level of illumination) for:                             <ul style="list-style-type: none"> <li><input type="checkbox"/> Entrances;</li> <li><input type="checkbox"/> Parking areas (if present);</li> <li><input type="checkbox"/> External circulating areas (if present).</li> </ul> </li> <li>⊗ <i>Pre-project audit and design audit: Specifications of the construction project, Descriptive document</i></li> <li>⊗ <i>Execution audit: Visual check on the presence of bright spots</i></li> </ul>	PR
<p><u>Limiting the risk of access to residences:</u></p> <ul style="list-style-type: none"> <li>✓ Provide door assemblies meeting level 3 of standard EN 1630 equipped with a 3-point locking system.</li> <li>⊗ <i>Pre-project audit and design audit: Specifications of the construction project</i></li> <li>⊗ <i>Execution audit: Visual check, Technical data sheet</i></li> </ul>	PR
<ul style="list-style-type: none"> <li>✓ Equip ground-floor windows and those to which easy access is made by the inclusion of structural installations (walls, fences, climbable façade elements, etc.) with outdoor protection (bars, burglary-proof glazing, shutters, blinds, etc.).</li> <li>⊗ <i>Pre-project audit and design audit: Specifications of the construction project</i></li> <li>⊗ <i>Execution audit: Visual check, Technical data sheet</i></li> </ul>	2
<ul style="list-style-type: none"> <li>✓ Provide door assemblies meeting level 4 of standard EN 1630 equipped with a 3-point locking system.</li> <li>⊗ <i>Pre-project audit and design audit: Specifications of the construction project</i></li> <li>⊗ <i>Execution audit: Visual check, Technical data sheet</i></li> </ul>	2
<ul style="list-style-type: none"> <li>✓ Provide door assemblies meeting level 5 of the EN 1630 standard, equipped with a 5-point locking system (level TP for detached residences may be achieved by selecting this requirement or by selecting the requirement of remote transmission alarms).</li> <li>⊗ <i>Pre-project audit and design audit: Specifications of the construction project</i></li> <li>⊗ <i>Execution audit: Visual check, Technical data sheet</i></li> </ul>	3 NCP
<b><u>Collective building only</u></b>	
<p><u>Reduce the risk of access to the building:</u></p> <ul style="list-style-type: none"> <li>✓ Provide an access control installation at the building entrance (lockable door, badge, key-pad, intercom, videophone, etc.).</li> <li>⊗ <i>Pre-project audit and design audit: Specifications of the construction project, Technical data sheet</i></li> <li>⊗ <i>Execution audit: Visual check on the presence of the central installation at the building entrance</i></li> </ul>	2
<ul style="list-style-type: none"> <li>✓ Include access controls for the circulating areas from the car park to the residences (controlled access or equivalent) if the building has an interior parking area. If this area is served by a lift, it must also limit access.</li> <li>⊗ <i>Pre-project audit and design audit: Specifications of the construction project, Technical data sheet</i></li> <li>⊗ <i>Execution audit: Visual check on the presence of the control installation</i></li> </ul>	1



12.3. Safety/Security	Level
<b><u>Detached residence only</u></b>	
<p><u>Limiting the risk of access to residences:</u></p> <ul style="list-style-type: none"> <li>✓ Provide alarm equipment.</li> <li>⊗ <i>Pre-project audit and design audit: Specifications of the construction project, Technical data sheet</i></li> <li>⊗ <i>Execution audit: Visual check on the presence of alarm equipment</i></li> </ul>	2
<ul style="list-style-type: none"> <li>✓ Provide an alarm with remote transmission (level TP for detached residences may be achieved by selecting this requirement or that for the level 5 door assemblies in standard ENV1630).</li> <li>⊗ <i>Pre-project audit and design audit: Specifications of the construction project, Technical data sheet</i></li> </ul>	1

12.4. Accessibility and adaptability of the building	Level
<b><u>Countries with regulations on accessibility and adaptability of buildings for people with disabilities and the elderly</u></b>	
<ul style="list-style-type: none"> <li>✓ Comply with the regulations of the country in terms of accessibility and adaptability of buildings for the elderly and people with disabilities.</li> <li>⊗ <i>Pre-project audit and design audit: Commitment of the Applicant</i></li> </ul>	PR
<ul style="list-style-type: none"> <li>✓ Identify at least two points for improvement beyond the regulations concerning internal or external common areas and two points for improvement beyond the regulations concerning private areas.</li> </ul> <p>OR</p> <p>Demonstrate the adaptation possibilities of the building (see additional information).</p> <p>OR</p> <p>Provide specific shared spaces (e.g. laundry, gym, guest room, playground, etc.) in the case of collective housing. In all cases, the Applicant must draw up the following elements:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> proof of the need for this type of shared space for future occupants;</li> <li><input type="checkbox"/> estimated management costs (upkeep and maintenance costs);</li> <li><input type="checkbox"/> propose a management/operational method (who will be responsible, who will have access, etc.).</li> </ul> <ul style="list-style-type: none"> <li>⊗ <i>Pre-project audit and design audit: Specifications of the construction project + Descriptive document</i></li> <li>⊗ <i>Execution audit: Visual observation of the presence of specific shared spaces.</i></li> </ul>	2
<b><u>Countries without regulations on accessibility and adaptability of buildings for people with disabilities and the elderly</u></b>	
<ul style="list-style-type: none"> <li>✓ Detail the planned, or unplanned, alterations for the accessibility and adaptability of the building for people with disabilities and the elderly with respect to: <ul style="list-style-type: none"> <li><input type="checkbox"/> external pathways;</li> <li><input type="checkbox"/> car parking;</li> <li><input type="checkbox"/> access to the building;</li> </ul> </li> </ul>	2





12.4. Accessibility and adaptability of the building	Level
<ul style="list-style-type: none"> <li><input type="checkbox"/> horizontal internal circulating areas;</li> <li><input type="checkbox"/> vertical internal circulating areas (stairs and lifts);</li> <li><input type="checkbox"/> coatings for floors, walls and ceilings;</li> <li><input type="checkbox"/> doors;</li> <li><input type="checkbox"/> equipment and control devices;</li> <li><input type="checkbox"/> toilets;</li> <li><input type="checkbox"/> exits.</li> </ul> <p>OR</p> <p>Demonstrate the adaptation possibilities of the building (see additional information).</p> <p>OR</p> <p>Provide specific shared spaces (e.g. laundry, gym, guest room, playground, etc.) in the case of collective housing. In all cases, the Applicant must draw up the following elements:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> proof of the need for this type of shared space for future occupants;</li> <li><input type="checkbox"/> estimated management costs (upkeep and maintenance costs);</li> <li><input type="checkbox"/> propose a management/operational method (who will be responsible, who will have access, etc.).</li> </ul> <p>⚙ <i>Pre-project audit and design audit: Specifications of the construction project + descriptive document + floor plans</i></p> <p>⚙ <i>Execution audit: Visual observation of the presence of specific shared spaces.</i></p>	

### Assessment of Target 12

PR Level	Compliance with PREREQUISITES
P Level	Compliance with PREREQUISITES and points' total ≥ 9
HP Level	Compliance with PREREQUISITES and points' total ≥ 13

### Additional information Target 12

#### Electromagnetic fields

Potential **sources for transmitting electromagnetic waves** of the project might be:

- Common machinery/lifts
- Meters and electric panels
- Heating (electric radiant floor and ceiling heating, etc.)
- Specific power supply for the building (transformer, etc.)
- Power supply risers
- Fluorescent lights
- Wireless intelligent home systems
- etc.

**Meters and electric panels** are powerful emitters of electromagnetic fields. Therefore, their location away from the busiest areas should be preferred.

In order to **reduce the electromagnetic field of the project** the Applicant has some flexibility in the choice of equipment and construction systems to reduce their electromagnetic impact, such as:

- use shielded cables in the bedrooms and living room which can eliminate the electric field or twisted shielded cables (with double shielding) to reduce magnetic fields;
- if shielded electrical wiring is not possible, shielded sheaths for cable runs should be preferred;
- do not install sockets intended for internet connection in walls next to sleeping areas within a given residence or an adjoining residence: modems are powerful emitters of electromagnetic fields. Therefore, their location away from the busiest areas should be preferred.
- it is preferable to position power supply risers away from rooms with prolonged or sensitive occupation;
- in cases of the installation of radiant electric floor heaters, systems with two-wire cabling are preferable. A two-wire cable consists of two conductors carrying a current of the same strength, but in opposite directions. The magnetic fields of the two conductors cancel each other out.

**Issues to be dealt with in the safety notice:**

- rapid and safe evacuation of residents (alarms, evacuation plans, marked corridors sufficient in number and width that are easily manoeuvrable, security lighting, fire resistance, smoke extraction);
- limiting causes of incidents (heating means, cooking appliances, inspection of technical installations);
- limiting propagation of incidents (distance from third parties, isolating risk areas, interior partitions, fire behaviour of materials, smoke extraction);
- measures to aid emergency intervention (roads suited for emergency vehicles, accessible façades, smoke extraction, fire extinguishers, detection equipment, security services, warnings).

If necessary, refer to the French regulatory order of 31 January 1986.

**Definition:**

Adaptability of the building

Demonstrating the adaptability of the building comprises indicating possible modifications enabling changes to the scale of a given residence, several residences and/or the entire building: removal/addition of partitions without altering the electricity or water networks, converting the roof space, grouping housing together, possible changes to the use of common areas, etc.

## Target 13: Air quality

13.1. Control pollution sources	Level
<p>✓ Identify sources of external pollution. AND Describe reasoned and satisfactory arrangements made for the project to reduce the effects of air pollution (see additional information).</p> <p>⚙ <i>Pre-project audit and design audit: Explanatory document</i></p>	PR
<p>✓ Carry out thorough decontamination or treatment of the site prior to construction where soil pollution has been detected during site analysis (industrial pollution, radon pollution) (see additional information). AND Ensure that housing is thoroughly ventilated for a period of at least 15 days before handover (see additional information).</p> <p>⚙ <i>Pre-project audit and design audit: Specifications of the construction project, Explanatory document</i></p>	PR

13.2. Ventilation	Level
<p>✓ Describe the manner in which residential ventilation is provided (natural, natural fan-supported or controlled mechanical ventilation).</p> <p>⚙ <i>Pre-project audit and design audit: Descriptive document, Diagram, Drawings</i></p>	PR
<p>✓ Provide apertures in each of the following rooms: toilets, shower room and bathroom.</p> <p>⚙ <i>Pre-project audit and design audit: Specifications of the construction project + Ground, floor and elevation plans</i></p> <p>✓ <i>Execution audit: Visual check on the presence of apertures</i></p>	2
<p>✓ Provide apertures to the outside on different façades or over two levels in the case of split-level residences for 80% of these residences. For the remaining 20% of residences, the possibility of increased ventilation by the occupant must be demonstrated (such as forced mechanical ventilation).</p> <p>⚙ <i>Pre-project audit and design audit: Floor and façade plan</i></p> <p>⚙ <i>Execution audit: Visual checks of the presence of apertures</i></p>	2



13.2. Ventilation	Level
<p><b>Mechanical or natural fan-supported ventilation system</b></p> <p>✓ Comply with local regulations if they exist, referring to the minimum air-renewal rates, or if no such regulations exist, allow for an air-renewal rate of:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> 0.5 vol/h from a studio to a residence with three living spaces</li> <li><input type="checkbox"/> 0.7 vol/h for residences with 4 living spaces or more.</li> </ul> <p>AND</p> <p>Place the extraction vents near sources of pollution and in wet rooms.</p> <p>AND</p> <p>Situate air inlets in relation to the site analysis and configuration of the residence. Fittings providing shade for windows when closed (shutters, etc.) should not prevent the proper functioning of the air inlets.</p> <p><i>Pre-project audit and design audit: Specifications of the construction project + Calculations note + Ground, floor and elevation plans</i></p>	PR
<p>✓ Where dual-flow ventilation is installed, at least one class M5 filter, according to norm EN 779, or a filter having an equivalent efficiency level according to local standards, must be used. It must be fitted with a dirt warning sensor (audible or visual) connected to an audible or visual indicator. The owner's manual will indicate the specific characteristics of the dual-flow ventilation, especially with regard to maintenance.</p> <p>⚙ <i>Pre-project audit and design audit: Specifications of the construction project</i></p>	PR
<p>✓ Check on the building site ventilation installation effectiveness (flow measurements, pressure, power consumption).</p> <p>⚙ <i>Pre-project audit and design audit: Specifications of the construction project</i></p> <p>⚙ <i>Execution audit: Provision of the verification report for the ventilation installations</i></p>	2
<p>✓ Where dual-flow ventilation is installed, at least one class M6 filter, according to norm EN 779, or a filter having an equivalent efficiency level according to local standards, must be used.</p> <p>⚙ <i>Pre-project audit and design audit: Specifications of the construction project</i></p>	1
<b>Natural ventilation</b>	
<p>✓ Provide ventilation that does not affect the building or occupants during periods of occupancy or vacancy (mould, poor air quality, damp, etc.) and describe the air flows in residences.</p> <p>⚙ <i>Pre-project audit and design audit: Specifications of the construction project + Descriptive document</i></p>	PR

13.3. Measuring air quality	Level
<p>✓ Measure indoor air quality upon delivery of the housing and before providing the keys (see additional information).</p> <p>⚙ <i>Pre-project audit and design audit: Specifications of the construction project</i></p> <p>⚙ <i>Execution audit: Availability of the measurements report</i></p>	1

## Assessment of Target 13

<b>PR Level</b>	Compliance with PREREQUISITES
<b>P Level</b>	Compliance with PREREQUISITES and points' total $\geq 2$
<b>HP Level</b>	Compliance with PREREQUISITES and points' total $\geq 4$

### Additional information Target 13

#### Definitions:

##### Forced ventilation

For natural fan-supported or controlled mechanical ventilation, forced ventilation may be obtained by pushing air flows to their maximum.

For a project with no mechanical ventilation, or whose system is not connected before delivery, it is possible to create forced ventilation by opening apertures, managed depending on weather conditions and construction-site opening times.

##### Norm EN 779: 2012

Determining filtration performance of air filters for general ventilation.

#### Sources of external pollution:

Sources of external pollution refer to all areas or establishments with the presence of hazardous substances (chemical plants, motorways, refineries, thermal and nuclear power stations, etc.).

If the country has regulations on these areas or establishments at risk, these regulations must be enforced.

For countries without regulations, the Applicant must describe the reasoned and satisfactory arrangements made for the project to reduce any effects of pollution.

Carrying out measurements of the sanitary quality of the air external to the plot is recommended when it is situated close to an area or establishment with the presence of hazardous substances.

These values should be compared to the recommended levels set by the World Health Organization (WHO):

Most common air pollutants	Levels recommended by the WHO
PM 2.5 particles	<10 $\mu\text{g}/\text{m}^3$ annual average or <25 $\mu\text{g}/\text{m}^3/24\text{h}$
PM 10 particles	<20 $\mu\text{g}/\text{m}^3$ annual average or <50 $\mu\text{g}/\text{m}^3/24\text{h}$
Ozone	<100 $\mu\text{g}/\text{m}^3$ average over 8 hours
Nitrogen dioxide (NO <sub>2</sub> )	<40 $\mu\text{g}/\text{m}^3$ annual average <200 $\mu\text{g}/\text{m}^3$ hourly average
Sulphur dioxide (SO <sub>2</sub> )	<20 $\mu\text{g}/\text{m}^3$ average over 24 hours <500 $\mu\text{g}/\text{m}^3$ average over 10 minutes

**Radon prevention:**

In areas where high radon concentrations are detected, it is advisable to perform a radon measurement according to ISO standard 11665 - 2012 "Measurement of radioactivity in the environment - Air radon222" .

The WHO recommends a reference level of 100 Bq/m<sup>3</sup> and advises that the threshold of 300 Bq/m<sup>3</sup> not be exceeded.

Technical solutions can be implemented to overcome a high concentration of radon in indoor air such as:

- ensuring proper sealing of the ground-building interface (e.g. films with high sealing properties and high puncture resistance);
- providing ventilation (natural or mechanical) of the base (crawl space, basement, etc.);
- increasing ventilation or creating a slight overpressure.

**Measurements for the assessment of air quality:**

Applicants may include indoor air quality measurements according to the protocol established by the HQE Performance Working Group.

([http://assohqe.org/hqe/IMG/pdf/HQE\\_Performance\\_Regles\\_d\\_application\\_pour\\_l\\_evaluation\\_de\\_la\\_QAI\\_d\\_un\\_batiment\\_neuf\\_ou\\_renové\\_a\\_reception.pdf](http://assohqe.org/hqe/IMG/pdf/HQE_Performance_Regles_d_application_pour_l_evaluation_de_la_QAI_d_un_batiment_neuf_ou_renové_a_reception.pdf))

The table below lists the pollutants taken into consideration.

Concentrations obtained can then be compared with sanitary reference values recommended by the World Health Organization (WHO), German Federal Environment Agency, the High Council of Public Health (HCSP).

Pollutant considered	Sanitary reference values
Benzene	Long-term value: 1.7 µg/m <sup>3</sup> - WHO reference
Total volatile organic compounds (TVOC)	<p>Level 1: &lt;300 µg/m<sup>3</sup>: target value, no health impact</p> <p>Level 2: &gt; 300 - 1000 µg/m<sup>3</sup>: no specific impact but increased ventilation recommended</p> <p>Level 3: &gt; 1000 - 3000 µg/m<sup>3</sup>: some impacts on health. Level tolerated for a maximum of 12 months. Locate sources, increase the recommended ventilation.</p> <p>Level 4: &gt;3000 - 10,000 µg/m<sup>3</sup>: major impacts. Cannot be tolerated for more than one month. Locate sources, intensified ventilation required</p> <p>Level 5: &gt;10,000 – 25,000 µg/m<sup>3</sup>: unacceptable situation. Use only if unavoidable for short periods (hours) and only with intensive ventilation.</p> <p>Reference: Indoor Air Hygiene Commission of the German Federal Environment Agency</p>
Nitrogen dioxide (NO <sub>2</sub> )	40 µg/m <sup>3</sup> - WHO reference



Formaldehyde	<p>30 <math>\mu\text{g}/\text{m}^3</math>: point of reference value for air quality (the High Council of Public Health, HCSP)</p> <p>50 <math>\mu\text{g}/\text{m}^3</math>: maximum admissible value for long-term exposure (HCSP)</p> <p>100 <math>\mu\text{g}/\text{m}^3</math>: long-term value - WHO reference</p>
Radon (for affected areas)	<p>100 <math>\text{Bq}/\text{m}^3</math>: reference level recommended 300 <math>\text{Bq}/\text{m}^3</math>: reference level the exceeding of which is not desirable</p> <p>WHO reference</p>
Carbon monoxide (CO) if source	<p>7 <math>\text{mg}/\text{m}^3</math> for exposure over 24 hours 10 <math>\text{mg}/\text{m}^3</math> for exposure over 8 hours 35 <math>\text{mg}/\text{m}^3</math> for an hour of exposure 100 <math>\text{mg}/\text{m}^3</math> for an exposure of 15 min Reference: WHO</p>
Particulate matter (PM 2.5 and PM 10)	<p>Short term: PM 10: &lt;50 <math>\mu\text{g}/\text{m}^3</math> and PM 2.5: &lt;25 <math>\mu\text{g}/\text{m}^3</math></p> <p>Long term: PM 10: &lt;20 <math>\mu\text{g}/\text{m}^3</math> and PM 2.5: &lt;10 <math>\mu\text{g}/\text{m}^3</math></p> <p>Reference: WHO</p>

**Target 14: Water quality**

14.1. Water quality	Level
<ul style="list-style-type: none"> <li>✓ Plan flushing and disinfection of all conduits after their introduction to use and before the installation of plumbing, to be charged to the company installing the plumbing.</li> <li>⊗ <i>Pre-project audit and design audit: Specifications of the construction project</i></li> </ul>	PR
<ul style="list-style-type: none"> <li>✓ For any contact with water intended for human consumption, the products are selected from the following materials:                             <ul style="list-style-type: none"> <li>- Metals, alloys and metallic coatings based on copper, iron, aluminium and zinc</li> <li>- Materials based on hydraulic binders, enamels, ceramics and glass,</li> <li>- Organic materials with a certificate of compliance (equivalent to the Health Conformity Attestation validated by a recognized scientific body).</li> </ul> </li> </ul>	1
<b><u>For countries where the water distributed by the network is intended for human consumption</u></b>	
<ul style="list-style-type: none"> <li>✓ Each residence is fitted with a non-return system (backflow, check valve system, etc.) on the cold water supply and, if necessary, hot water supply where collective DHW is concerned.</li> <li>⊗ <i>Pre-project audit and design audit: Specifications of the construction project</i></li> </ul>	PR
<ul style="list-style-type: none"> <li>✓ Perform an analysis of the water at the general meter at the ground floor of buildings or residences and perform an analysis of the water at the plumbing outlet after works, rinsing and disinfection. In case of discrepancies from local regulations or, where appropriate, from standard ISO 147 Water Quality, the Applicant must take the necessary steps to resolve them. These results must be provided to future occupants. The tests will be done by building, in the residence farthest from the point of water supply of the building as well as on a randomly chosen residence. For detached residences, a sampling rate of 5% of the residences is applied with a minimum of one residence.</li> <li>⊗ <i>Pre-project audit and design audit: Descriptive document</i></li> <li>⊗ <i>Execution audit: Provision of the results of the water analysis</i></li> </ul>	1
<b><u>For countries where the water distributed by the network is not intended for human consumption</u></b>	
<ul style="list-style-type: none"> <li>✓ Include a system for water treatment to make it suitable for human consumption. This treatment must be checked by an analysis of the water.</li> </ul> <p>AND</p> <p>Perform an analysis of the general water meter at the ground floor of buildings or residence and perform an analysis of the water outlet valve after works, rinsing and disinfection. In case of discrepancies from local regulations or, where appropriate, from ISO 147 Water Quality, the Applicant must take the necessary steps to resolve them. These results must be provided to future occupants. The tests will be done by building, in the residence farthest from the point of water supply of the building as well as on a randomly chosen residence. For detached residences, a sampling rate of 5% of the residences is applied with a minimum of one residence.</p> <ul style="list-style-type: none"> <li>⊗ <i>Pre-project audit and design audit: Specifications of the construction project, Descriptive document</i></li> <li>⊗ <i>Execution audit: Provision of the results of the water analysis</i></li> </ul>	1





14.2. Reducing the risk of legionella	Level
✓ Maintain a feedback system up to the entry point for hot water supplied to collective buildings when collective DHW is concerned. ⚙ <i>Pre-project audit and design audit: Specifications of the construction project</i>	PR
<b><u>Countries with regulations to reduce the risk of legionella</u></b>	
✓ Compliance with local regulations ⚙ <i>Pre-project audit and design audit: Commitment of the Applicant</i>	PR
<b><u>Countries without regulations to reduce the risk of legionella</u></b>	
✓ Limit the risks associated with the development of legionella at consumption points at risk (shower and bath) in the production and distribution facilities for hot water (see additional information). ⚙ <i>Pre-project audit and design audit: Specifications of the construction project</i>	PR

### Assessment of target 14

PR Level	Compliance with PREREQUISITES
P Level	Compliance with PREREQUISITES and points' total $\geq 1$
HP Level	Compliance with PREREQUISITES and points' total $\geq 2$

### Additional information for Target 14

#### Reducing the risks of legionella:

The main principles are:

In order to limit the risks associated with the development of legionella at water drawing points presenting risks (shower and bath) in the production and distribution facilities for hot water:

- when the total volume of storage facilities for hot water is higher or equal to 400 litres, the water temperature at the point of distribution should be set permanently to at least 55°C or be brought to a suitable level for at least once every 24 hours. The point of distribution is located at the exit of the final storage tank when several tanks are installed in series,
- whatever the type of production of domestic hot water (with or without storage), when the volume between the point of distribution and the greatest consumption point is more than 3 litres, the temperature of the water in circulation must be at least 50°C at all points in the distribution system, with the exception of the final pipes feeding the taps at the point of consumption, whose volume should be as small as possible and must be inferior or equal to 3 litres;

If necessary, refer to the French regulatory order of 30 November 2005.