RT/DPE
Réglementation Thermique / Diagnostic Performance Energétique
Guadeloupe 2020'

REGION GUADELOUPE

Understanding and Applying **RTG 2020** (Guadeloupe's Thermal Regulations)

- ***New RTG Calculation:*** *resolution 19-1155 of 31/10/2019*
  - ***DPEG:*** *resolution 19-1156 of 31/10/2019*
    - ***RTG/DPEG Online Platform***

Revisions:

Original version 10/05/2011 by CSTB
Version A 21/06/2011 by CSTB
Version B 29/08/2011 by CSTB
Version C 23/09/2011 by CSTB: version 1 was published
Version D 31/08/2013 by CSTB: version 2 was published per the resolutions of 2013 and V2.0 of the RTG tool
Version E 15/11/2013 by CSTB
Version F 07/01/2014 by CSTB
Version G 28/01/2014 by CSTB
Version H 17/04/2020 by CSTB, adapted to RTG 2020 + DPEG section
Version I 27/05/2020 by CSTB: changes to the data model
Version J 01/06/2020 by CSTB: minor corrections

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1 INTRODUCTION

This document is a practical guide to applying Guadeloupe's Thermal Regulations. It concerns all new buildings (RTG calculation) but also addresses particularities about Guadeloupe Energy Performance Diagnostics (DPEG) which now uses the same tool. It is for directors of works, project owners, DPEG inspectors, and more generally, anyone who would like additional information for these regulatory texts.

The **'Process'** chapter provides an operational process for regulatory verification and can be considered as a 'getting started tutorial'.

2 UNDERSTANDING THE REGULATORY SYSTEM

2.1 General Principles of the RTG 2020

In 2011, the Guadeloupe region drafted Guadeloupe's Thermal Regulations (RTG), which are a set of laws and regulations that are adapted to our local particularities, and namely includes an 'RTG New Building' section. The RTG prioritises the development of high thermal performance building envelopes (heat loads and indoor comfort).

To support the region's energy transition goals as outlined in Guadeloupe's multi-annual energy programming (PPE) in April 2017, namely in terms of energy demand management, the Region revised its thermal regulations to both increase performance requirement levels, adapt application tools for professionals and to build on data from RTG application to strengthen knowledge of Guadeloupe's building stock by contributing to the Regional Observatory for Energy and Climate, *ahead of the loi Energie [Energy and Climate Law]*.

This revision process, which began in 2017, was based on a consultation programme with actors in Guadeloupe's construction sector. This consultation resulted in a consensus that considered both the needs expressed by the professionals to raise energy performance thresholds and the inherent limitations of the territory in terms of cost and available technical means.

2.2 Reference Texts

The regulatory texts to which this guide refers are:

- Main text: resolution no. 19-1155 of 31/10/2019 pertaining to Guadeloupe's Thermal Regulations (RTG calculation) and the thermal characteristics of envelopes in new buildings and new parts of buildings, which was published in the Official Journal of 8 April 2020. *Henceforth, the term 'resolution' will refer to this text*
- Resolution no. 19-1156 of 31/10/2019 pertaining to Guadeloupe Energy Performance Diagnostics (DPEG), which was published in the Official Journal of 8 April 2020

2.3 What Has Changed in the RTG 2020?

This paragraph gives a quick and non-exhaustive overview of the changes in the RTG 2020 in comparison to the previous RTG system.

- 100% performance: previous minimal requirements have been abolished. Specifically, the RTG 2020 does not impose anything on the project owner if the values of the performance indicators remain below the regulatory thresholds. It is up to the project owner to make the appropriate project adjustments (structure, envelope, components, systems, etc.) to meet compliance requirements.
- Regulatory indicators: calculation of the RTG is now based on 3 performance indicators:
    - **ICT** = Thermal Comfort Indicator (comfort when not an air-conditioner) – *whose formula has been improved*
    - **BBIO** = Energy Requirement Indicator for air-conditioning and lighting – *unchanged*
    - **PRECS** = Share of energy drawn from the electricity grid (or hydrocarbons) to produce domestic hot water – *new indicator*
- Regulatory thresholds: threshold limits are no longer calculated via the reference building (ex: ref_{BBIO}) but are expressed as absolutes (max_{BBIO}). This new approach is used to better consider the building's bioclimate architectural design;
- Domestic hot water (DHW): the regulatory obligation concerning domestic hot water in buildings, subject to the new RTG, is now integrated in a performance-related manner into the RTG calculation's resolution through the new PRECS indicator;
- RTG/DPEG Calculation Platform: the Guadeloupe region has made a new, free-to-use digital tool that can be used to carry out RTG calculations as well as receive certifications (building permits and DPEG). This online (full web) tool has several features that address the needs expressed by professionals. The core of the calculation (meaning all mathematical and physical calculation formulae) was completely redeveloped for RTG 2020;
- RTAADOM: equivalence with the thermal section of the RTAADOM was not renewed in the RTG 2020. This has provided additional flexibility in designing the new local scheme;
- Building permit: the certificate of RTG conformity that is required when applying for a building permit can now be downloaded on the RTG/DPEG calculation platform;
- Guadeloupe Energy Performance Diagnostics (DPEG): three changes should be kept in mind:

- The DPEG is now mandatory for all new buildings that are subject to the RTG calculation, whether the buildings are air-conditioned or not;
- Issuing a **new** DPEG no longer requires the use of a certified diagnostician. The DPEG can be issued with just 1 click on the RTG/DPEG calculation platform by the author of the RTG study. Furthermore, the DPEG document is proof that the regulatory study has been completed.

2.4 What Has Not Changed

- Results obligation: this means imposing overall building performance by letting the designer choose solutions. This provision can optimise the technical and economic aspects of projects
- Changes to the required level: through consideration of the different microclimates found throughout Guadeloupe, of the altitude, and densely urbanised areas. Regulatory thresholds have therefore been adapted to the location of the building;
- Guadeloupe Energy Performance Diagnostics (DPEG): the DPEG continues to be applied to new builds that are subject to the RTG, as well as existing buildings, in compliance with resolution no. 19-1156.

3 IMPLEMENTING RTG 2020 IN NEW BUILDINGS

3.1 Scope of Application

The scope of application (outlined in Chapter I of the resolution) and compliance conditions (outlined in Chapter III of the resolution) have been summarised in the following table:

		individual house	Part of the building is made up of: living units & living environment community	offices	commercial spaces	other uses
completely new building		applicable	applicable	applicable	applicable	not applicable
extension/increased height of an existing building	New floor surface is <150 m² and new/existing floor surface is <30%	not applicable	not applicable	not applicable	not applicable	not applicable
	other cases	applicable for the extension	applicable for the extension	applicable for the extension	applicable for the extension	not applicable
renovated existing building without an extension/height increase		not applicable	not applicable	not applicable	not applicable	not applicable
Regulatory compliance conditions		$ICT \leq_{max} ICT + BBIO \leq_{max} BBIO + PRECS \leq 50\%$		$BBIO \leq_{max} BBIO + PRECS \leq 50\%$		not applicable

Note 1: whether there is air-conditioning is not an applicability criterion in the new RTG. Any new parts of the building – air-conditioned, partially air-conditioned, or not air-conditioned – are subject to the new RTG as soon as they are in line with one of the blue cells in the table below;

Note 2: changes in use to the building or major renovation of a building will in no way give the building the status of a 'new build' under the RTG; in this situation, the new RTG is not applicable.

3.2 Process

No matter the type of new build in question, the process to be followed by the project owner or their representative is:

1. **Initial Decisions**
    a. Verify that the RTG applies to the building, see 3.1
    b. [optional] Give the RTG study to a relevant authority (thermal consulting office, code inspectors, etc.):

Considering the technical nature of the RTG study, this is highly recommended, but is not mandatory. In the event of an inspection, the Project Owner is responsible for the validity of the calculation's input data

2. **Gathering information** (non-exhaustive list)
    a. Blueprint, in terms of preliminary designs or final designs (building permit)
    b. Technical choices for the building's envelope and systems (material, type of components, etc.)
    c. [Optional] assessment of distant solar protection around the building
3. **Preliminary Studies**
    a. Identify building zones: see 4.1. *We recommend identifying each zone with specific names to make the rest of the study easier.*
    b. [For the living unit] Analyse natural ventilation flow and calculate the The internal open surface area sees4.5.2
    c. Measure surface areas:
        i. Floor surface by zone
        ii. Surface areas by facade and roofing
    d. Calculate U values (heat transfer) of facade and roof walls, see 4.6.5.3 and 12
    e. Input these calculations and choices in the project calculation note, see 0: *a supporting document (Word format) should be provided by the study's author. This document should explain how the results were obtained and will be analysed in the event of an inspection.*
4. **Modelling on the RTG/DPEG platform** see 5
    a. Project creation, see 5.5
    b. Zone input (according to instructions 4.1)
    c. Object creation: walls, openings, protection, generators, production, and more. 4.6.6
    d. Input the characteristics of the objects: by filling in related forms
    e. Finalise and upload the explanatory calculation note see **Error! Source of reference not found.**
5. **Verification of project compliance** see **Error! Source of reference not found.**

6. **Downloading the Building Permit certification** see **Error! Source of reference not found.**
7. [if required] **update the model** according to project changes
8. **Download the DPEG** for the new building, see **Error! Source of reference not found.**: *this operation will close the study. The building file will then be input into the Regional Observatory for Energy and Climate's (OREC) database. In the event of an inspection, there will be a check that the building that has been built complies with the model. A study that has not been completed cannot be compliant with RTG regulations*

3.2.1 Technical Conditions for Regulatory Compliance

Regulatory compliance conditions take the form of 3 performance obligations:

1) **Project$_{ICT}$ ≤ max$_{ICT}$**
2) **Project$_{BBIO}$ ≤ max$_{BBIO}$**
3) **Project$_{PRECS}$ ≤ 50%**

With:

- **ICT**: Hygro-Thermal Comfort Indicator (in °C)
- **BBIO**: Energy Requirement Indicator for air-conditioning and lighting (no unit)
- **PRECS**: Share of energy drawn from the electricity grid (or hydrocarbons) to produce required domestic hot water
- **Max$_{ICT}$ and max$_{BBIO}$** are threshold values that change depending on where the project is located.
- The **max$_{PRECS}$** threshold value has been fixed by resolution

to 50%. These indicators are calculated by the RTG/DPEG

calculation platform.

The 3 obligations vary by zone depending on use and if there is air-conditioning. The following tables summarise the specificities in Articles 5 and 6 in the RTG resolution:

For Residential Projects:

Calculation scale	Project$_{ICT ≤ max}$ICT	Project$_{BBIO}$ ≤ max$_{BBIO}$	Project$_{PRECS}$ ≤ 50%
Building			**yes**
Living unit	**yes**	Only if daytime areas **and** night-time areas are air-conditioned	

Air-conditioned daytime/night-time zone		**yes,** only if one of the zones is air-conditioned (on a living unit scale of the daytime and night-time areas are air-conditioned)	

Air-conditioned daytime/night -time zone	**yes**		

In Offices and Commercial Spaces:

Calculation scale	Project$_{ICT \leq max}$ICT	Project$_{BBIO} \leq max_{BBIO}$	Project$_{PRECS} \leq$ 50%
Building			
Use zone		**yes**	**yes**

Note: calculation sequencing is now automatically handled by the RTG/DPEG platform

3.2.2 Administrative Conditions for Regulatory Compliance

Reminder of the regulatory requirement (summaries of Articles 7 and 8):

1. (…) the file attached to the building permit request should include a document certifying the execution of a provisional RTG calculation that complies with
this resolution, and has been issued by the RTG/DPEG calculation platform that is the object of

   Appendix 2 of this resolution. This provision does not apply to residential use zones made up of

   social housing.

2. At the very latest of the date the works start, the project owner of a building that is subject to the application of this resolution should:
   a. Have validated, using the RTG/DPEG calculation platform, the RTG calculation of their building in the *définitif* [definitive] status, based on the characteristics that correspond to those of the building as it was designed at the end of project studies, under the *code de la commande publique* [Public Order Code].
   b. Provide the competent administrative authority with an 'RTG Calculation Note' in the project file on the RTG/DPEG calculation platform, which outlines the building' s zoning and justifies the input data for the calculation method described in Appendix 4 of the present resolution.

3. During building construction, if there is a change to the project that affects the thermal performance of the building, the project owner is required to update the RTG calculation using the RTG/DPEG calculation platform.

We can see that:

- *Social housing is exempt from the certification obligation at the building permit stage*
- *A calculation in a 'definitive' status can be changed. The RTG/DPEG calculation platform can be used to include changes to works, <u>for 2 years</u> after validation of the 'definitive' status*
- *Obligations will arise at different stages of the project*

The following diagram shows these obligations over the timeline of a construction project:

Building Permit

Certification (downloaded from the RTG platform)

Except social landlords

Beginning of Works

RTG Calculation Note

(Upload onto the RTG platform)

Beginning of Works

Validation & study completion

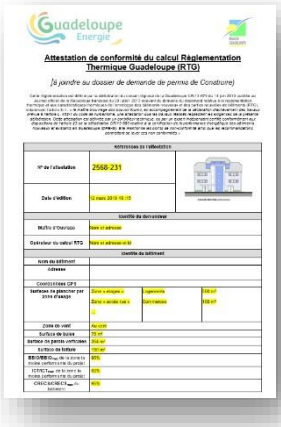
(Input onto the RTG platform)

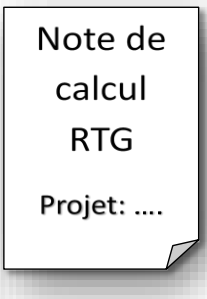
End of Works

(if there have been changes to the project) update the RTG calculation

(Input onto the RTG platform)

2-year time limit





FR	EN
Note de calcul RTG	RTG Calculation Note
Projet :	Project:

3.3 Drafting Guide for the RTG Calculation Note

Reminder of the regulatory requirement (Article 8-II):

No later than the date of the start of the works, the project owner of a building falling within the scope of this resolution must provide the competent administrative authority with an 'RTG Calculation Note' in the project file on the RTG/DPEG calculation platform, which outlines the building' s zoning and justifies the input data used for the calculation method described in Appendix 4 of this resolution.

Comments:

- This note aims to explain certain input data in the RTG calculation
- It allows the author to record and archive this information, which will always be available for their company (via a company account)
- It allows the inspector to verify the RTG calculation

This note is drafted as soon as RTG calculation preliminary studies begin. No forms are imposed, but please comply with the following instructions:

Format: digital document in a .PDF or Microsoft Word format. We recommend not exceeding 10 pages.

Mandatory information:

- General information: with, at a minimum, the project ID, the date the note was drafted, and the identity of the author of the technical note.
- Building Zoning**:** use zone, daytime/night-time areas. Describe the different uses of the building, describe how resulting use zones have been laid out. Include a diagram of the area boundaries on an architectural plan.
- U Coefficients (heat transfer): to be applied to facade walls and roofing. Describe what the walls are made up of, specifying each layer: type of material, thickness, and λ thermal conductivity.
- Direct input performance characteristics: *These are, essentially, characteristics that have a direct or indirect impact on the solar gain of the envelope (Cm, U, S, α, etc.) or the generation yield (EER and COP).* The platform has a 'simplified' input mode that automatically generates detailed performance characteristics using design choices; in this case, no additional explanation is required. You can also directly input performance characteristics in 'detailed' mode; with this, you need to explain number values (calculations, particularities of chosen products, etc.)
- [For living units] Natural Ventilation: describe how natural ventilation works in living units according to the method proposed in 4.5.2. Define the two main facades (with the largest clear-span surface areas), draw the air flows between these facades, detail the calculation of the internal open surface area. If possible, include a flow diagram based on an architectural plan, at least for the main living unit layouts.

Compulsory additions related to the specificities of the project:

- Additional solar protection measures: to be applied on opaque walls that face outside: specific the related colour (value α).

- For components with 'verified thermal characteristics' (according to the definition in Appendix 2): these performance values (U, S, α, porosity, etc.) can be directly input in detailed mode and can be used to explain values by supporting documents (certificate, ATEX, ATE, etc.)
- For trapped energy recovery systems: if such a system is used to produce domestic hot water, please explain the DHW COVERAGE RATE. It should be noted that this size quantifies the share of DHW needs that are covered for free using a trapped energy recovery system. It is represented by a coefficient whose value is between 0 (0%) and 1 (100%). This coefficient should be explained using calculations (or laboratory testing) carried out by the manufacturer supplying the system by using the rules of calculating the RTG
- For buildings that are delivered before all finishings are completed: comprehensively describe later layout hypothesis as well as related performance characteristics. This note aims to specify the minimum thermal performances of components that need to be fitted in the building. *For example, for buildings that are delivered without openings, one would specify U and S coefficients*. To continue to comply with the RTG, the buyer can:
    - Either fit thermal performance components that are better or the same as these instructions (without any additional verification calculation),
    - Or carry out a new RTG compliance verification calculation using the characteristics of planned components.

Optional Information:

- Surface area measurements: explain the hypotheses made in the calculation, namely for included and excluded spaces. You may explain measurement calculations in detail, principally the following sizes:
    - Floor surface by zone
    - Surface areas by facade and roofing
- Technical Documents available about building components: to be limited to components that impact thermal performance: openings, solar protection, thermal insulation and air-conditioning
- Any other information that will be useful in understanding modelling

3.4 Alternative Methods in Calculating the ICT

Reminder of the regulatory text: Article 10

I. The RTG calculation method is implemented using the RTG/DPEG calculation platform described in Appendix 2 of this resolution, the authoritative version being that in force on the date of the building permit application.

II. In the special case of ICT calculations, the project owner may, if they wish, prove that their project is compliant by carrying out additional studies such as ventilation calculations or wind tunnel measurements, provided that they comply with the calculation conventions of the RTG calculation method.

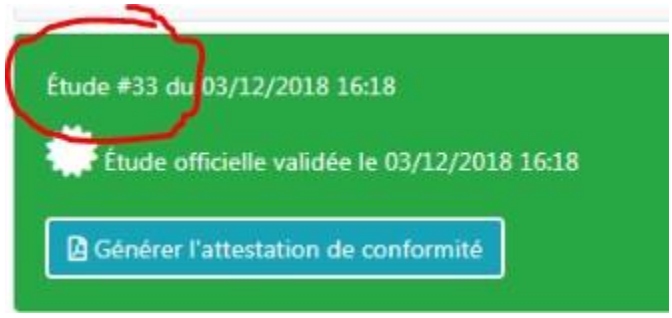
Comments

- This method can optimise projects by carrying out calculations or tests that are more precise than those proposed by the RTG method;
- This method is to only be used for constructions that have special sizing or characteristics;

- Regulatory certifications (RTG compliance at the building permit stage and DPEG) are in this instance issued directly by the Guadeloupe Region after analysis of the technical file submitted by the Project Owner;
- The project, however, should be modelled on the RTG/DPEG platform. Even if the RTG calculation does not show compliance with the 'project ICT≤ max ICT', other technical compliance conditions should be verified.
- Inspection rules are not specified in the resolution; therefore, we recommend getting in contact with the Region's energy department before drafting the technical file.

The process to follow to use this method:

- Contact the Region's energy department beforehand. The department will tell you what to do and will provide you with information about how you should calculate. You can directly contact the department or get in touch via the RTG hotline: info@guadeloupe-energie.fr
- Carry out complete project modelling on the RTG/DPEG platform
- Draft an RTG calculation note (see 0) and upload it into the project file on the RTG/DPEG platform
- (Carry out ICT calculations according to the chosen alternative method: CFD, testing, another model, etc.)
- Draw up a specific calculation note for $_{project}$ ICT and $_{max}$ ICT values for all scales of application, in compliance with the table in paragraph 3.2.1 and the calculation method. Specify the calculation method used, the calculation's input data and intermediate results such as inside wind speed. This note should also be uploaded into the project file on the RTG/DPEG platform
- Submit project references to the Guadeloupe region online



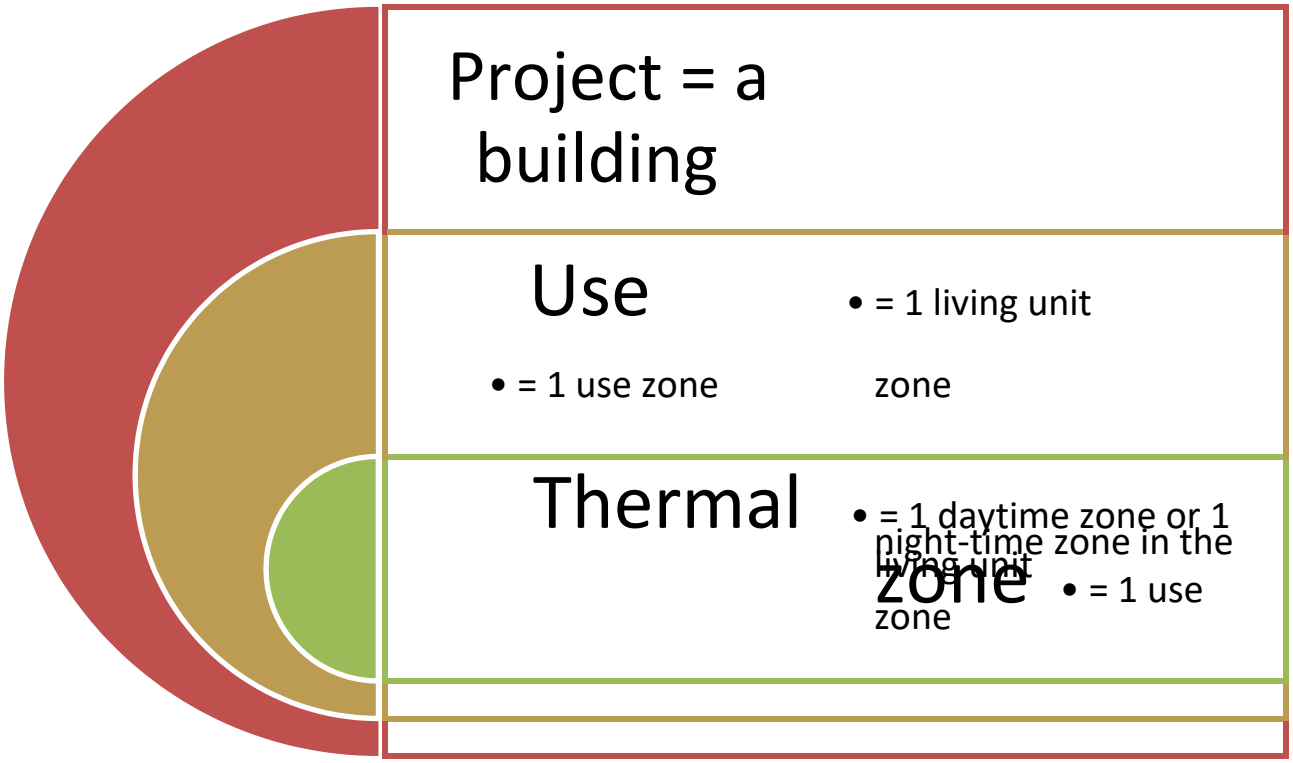
The file will then be analysed by the Guadeloupe region, which will then issue its opinion and certifications.

4 CLARIFICATIONS ABOUT INPUT DATA FOR RTG CALCULATIONS

4.1 Identifying Building Zones

4.1.1 General Principles

The RTG2020 calculation method is based on breaking down the project into different working scales. This principle is shown in the following diagram:



These different working scales are found in the building description tree diagram on the RTG/DPEG platform:

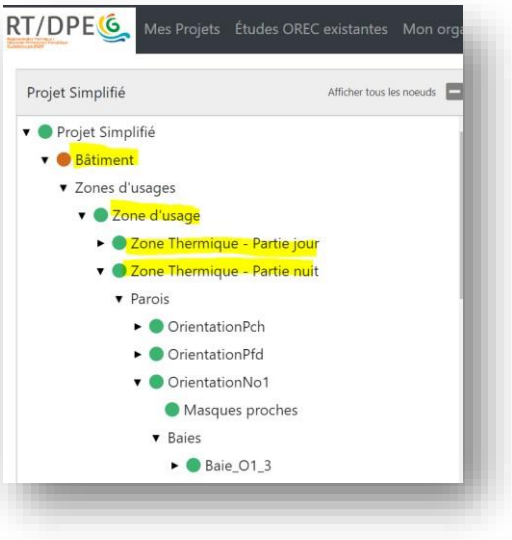


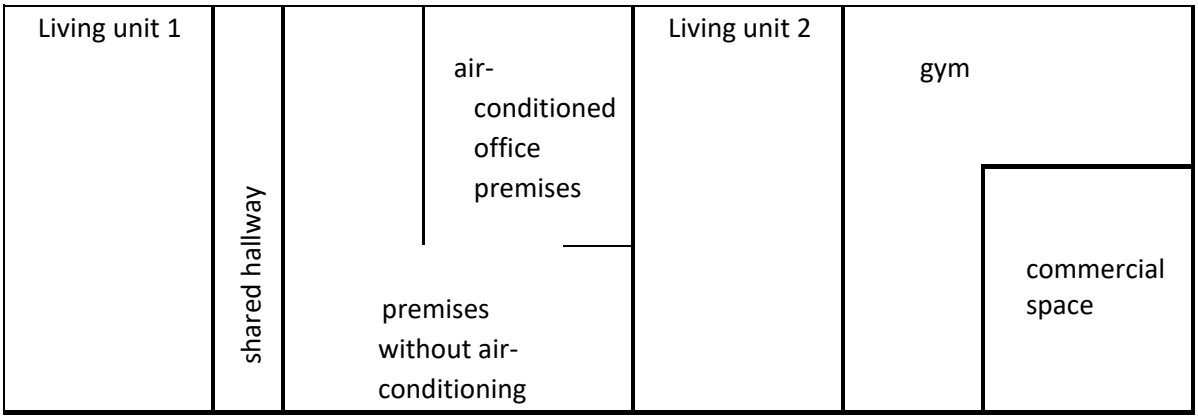
Figure 1 – Illustration for a living zone

Note 1:

- Project scale: an RTG project can only have one unique building
- For residential uses:
    - Use zone: each living unit is one specific development zone [***please note that this new rule is specific to the RTG 2020***]
    - Thermal zone: there are up to two thermal zones per living unit: daytime zones and night-time zones in the living unit. If the living unit is completely air-conditioned or has no air-conditioning whatsoever in RTG2020, daytime and night-time zones are not differentiated and, in this instance, only one thermal zone will be considered (corresponding to the same surface area as the use zone)
- In offices and commercial spaces:
    - Use zone scale: for new projects, a new use zone should be created for each use
    - Thermal zone scale: create a thermal zone per use zone, corresponding to the same surface area.

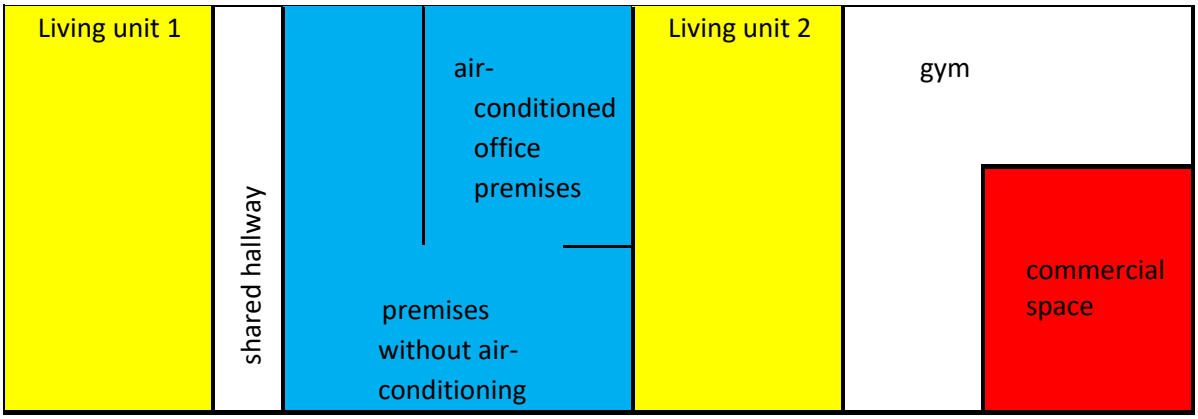
Note 2: you can attribute a name to each zone on the RTG/DPEG platform. We recommend using this feature by choosing specific terms, to make the study easier.

The principle of zoning a building is outlined in Appendix 3 of the resolution. In this guide, we provide some illustrative examples about multi-use buildings:



4.1.2 Use Zone

- Utility: required to define compliance technical conditions (see 3.2.1);
- Reminder of different possible uses according to the RTG:
    - **Residential use zone** *(Reminder: includes retirement homes, boarding schools, and university accommodation; excludes care homes, hotels, and tourist residences in which the average rental duration [per lease] is less than 1 month);*
    - **Office use zone** *(Reminder: includes hallways, service areas, archives if they are adjacent to offices on the same floor; includes administrative, bank, and office (type W) public access buildings under [fire regulations for public access buildings] if they adjoin offices)*;
    - **Commercial use zone** (*Reminder: this is about shops, sales areas, and shopping centres (type M) buildings under [fire regulations for public access buildings]; excludes bars, hotels, restaurants, storerooms except for storerooms adjoining commercial spaces that do not have a ventilation system that can dissipate overheating*). By 'adjoining storeroom that has a ventilation system that can dissipate overheating', we mean a storeroom in which the difference in interior and exterior temperature does not exceed 3 °C with any cooling being necessary.
    - Other use zones (not covered by the RTG)
- In our test case, we have 5 use zones. Please note that both living units each form a different use zone [*new part of RTG 2020*], and that communal hallways are excluded.



zone for residential use
zone for office use zone
for commercial use zone
for other uses

Rule: **in new builds, an 'office' or 'commercial' use zone is inseparable.**

This means that you can create only one 'office' use zone and/or only one 'commercial' use zone. This rule, which is specific to new builds, is still applicable, including when:

- The zone is partially air-conditioned;
- The zone is made up of separated areas.

In our example, the office area which is not air-conditioned is an integral part of the office use zone (in blue). Calculating the BBIO should be carried out once for the whole of this zone.

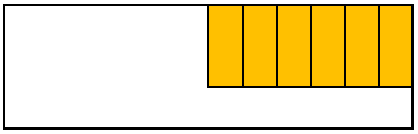
Note: *when calculating the DPEG for an existing building, you can split an office/commercial use zone according to property boundaries to draw up a DPEG per owner.*

Special case for offices included in building wherein the main use is not subject to the RTG:

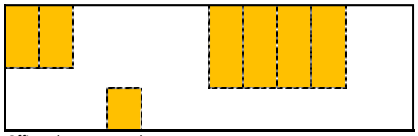
Some non-residential buildings used for purposes other than offices or commercial spaces have an office zone. This is the case for administrative offices in educational institutions, or even offices connected to an industrial building. In this test case, the office zone is subject to the RTG, but the rest of the building is not. Therefore, we have identified 1 office use zone. Only the walls and openings that are exterior facing will be modelled, and indoor walls will be ignored. Yet this approach is less useful when the relative size of the office zone decreases. Therefore an office could be ignored (no RTG inspection) in this extreme case: the total surface area of the office is less than 5% of the building's total surface area **or** has fewer than 5 workstations.

Special case of offices that are spread out:

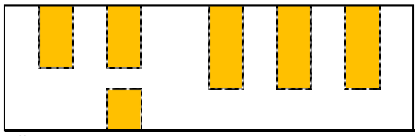
Certain non-residential buildings used for commercial or other purposes (for example, schools) can have offices that are spread out across their surface area. Narrow application of the resolution's text would lead to outlining an office use zone made up of adding basic and isolated office zones. Yet this approach can become increasingly complex when the separated nature of the division grows; the relevance of thermal modelling is also affected because the envelope is only partially considered. Therefore
the presence of offices can be ignored (no RTG inspection) in this extreme situation: the offices are 'very spread out' (see the image below) **and** the total surface area of offices is less than 30% of the building's total surface area.



Grouped offices



Offices that are spread out



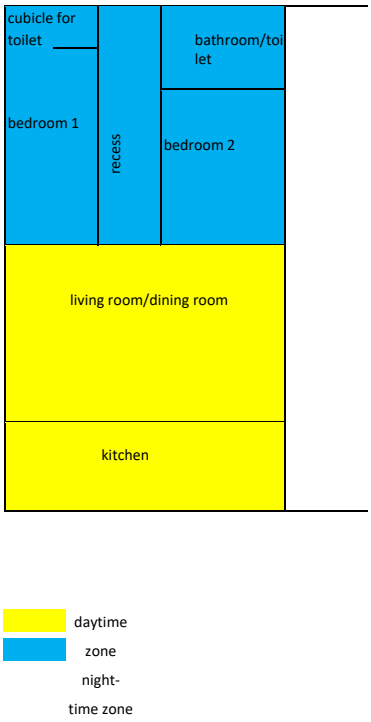
Offices that are very spread out

4.1.3 Thermal Zone – 'Daytime Zone' and 'Night-time Zone' [in a Living Unit]

Each living unit is subdivided into 1 daytime zone + 1 night-

time zone; Reminder of the definition:

- The night-time thermal zone in a living zone covers all the bedrooms in the living unit 'added' to rooms in this living unit which have a permanent opening into at least one of the rooms. A permanent opening is an indoor opening that cannot be closed, be it with a door, window, shutter, etc. To comply with volume continuity, you should include secondary premises adjoined to bedrooms, such as hallways, toilets, washrooms, and bathrooms.
- The daytime thermal zone in a living unit covers all areas that are not part of the night-time zone.
- In living unit 1 of our test case, we have:



For living units that are completely air-conditioned or that do not have air-conditioning, the distinction between the daytime zone and the night-time zone is no longer necessary and only one thermal zone is therefore considered,
corresponding to the whole of the living unit (= to the use zone).

4.2 Measuring Instructions

4.2.1 Surface Areas to be Measured

The zones within the scope of a quantity survey are:

- The use zone;
- [for residential zones only]: the daytime thermal zone and night-time thermal zone in each living unit

In any case, the calculation zone is likely to be a subset of the building that is possibly made up of non-adjoining spaces.

Additionally, calculation input data include surface areas of:

- openings, broken down at a minimum by direction
- opaque facade walls, broken down at a minimum by direction. The

rule to be followed to carry out these measurements in compliance with

zoning rules is:

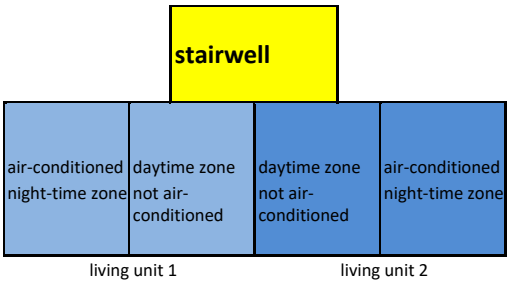
Only openings and opaque walls that separate outside space from one of the interior spaces in the calculation area.

This namely implies that walls (opaque walls or openings) that separate two indoor spaces should in no way be considered when measuring. Only parts of the envelope that face outwards are to be considered. Permanently open spaces that face outwards (such as

passageways, open staircases, ventilated garages, etc.) should not be indoor spaces (see below).

4.2.2 Special Case For A Stairwell or Passageway

Stairwells and passageways located between the zone in question and the outside make modelling more complicated.



Test case example

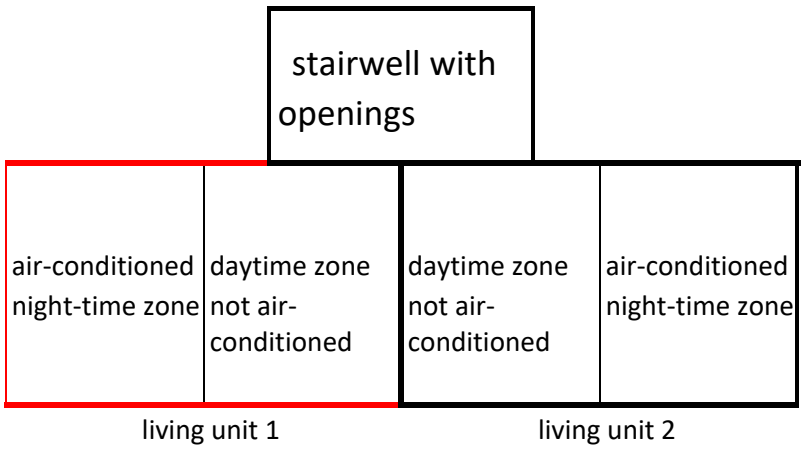
In this test case, one would model the project according to the following rule:

> *A. An adjoining space (stairs, passageway, etc.)* ***with permanent openings*** *towards the outside is considered to be an outdoor space. Its presence creates a solar protection and clear span surface area (of natural ventilation) effect.*
>
> *B. An adjacent space (staircase, passageway, etc.) with* ***no permanent openings*** *to the outside is considered to be the external facade transmitting all of its heat exchange with the outside to adjacent living units.*

In practice, the process is as follows:

A – Adjacent space with permanent openings to the outside:

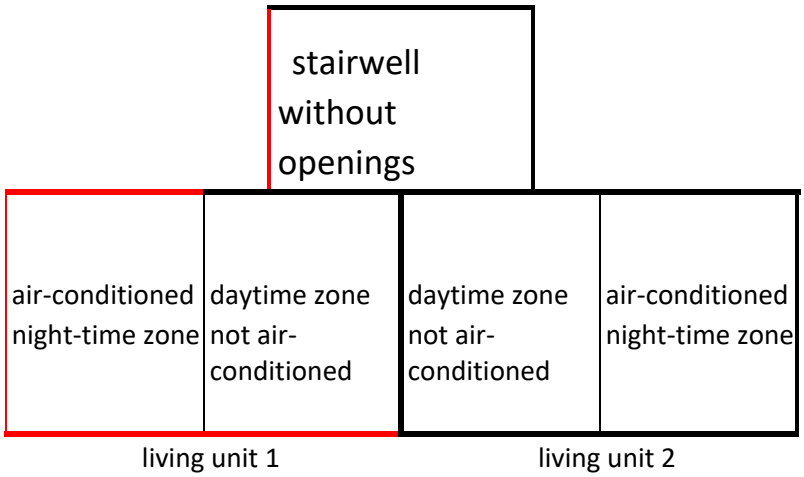
1. The walls (whole and openings) separating the area of study from the adjacent space are considered to be walls facing the outside. They are measured and input in the RTG calculation tool without modifying their surface area (whether they are opaque walls or openings);
2. The shade effect produced on these walls by the adjacent space can be increased either by close solar protection or by an additional Cm coefficient (for a wall) and a Cm Brise soleil (for an opening) to be estimated according to the geometric characteristics of the project;
3. Coefficients U and α (or *Couleur* [Colour] in the interface) of these walls are presumed to not be impacted by the adjacent space.
4. The cumulative clear span surface area of these walls is equal to the smallest of clear span surface areas:
    a. Between the living unit in question and the adjoining space
    b. Between the adjoining space and outside (if the same space adjoins several living units, its clear span surface area will be allocated to living units on a pro-rata basis depending on their surface area of contact)



Modelling living unit 1 (in red: facades input in the calculation tool)

B – Adjacent space without permanent openings to the outside:

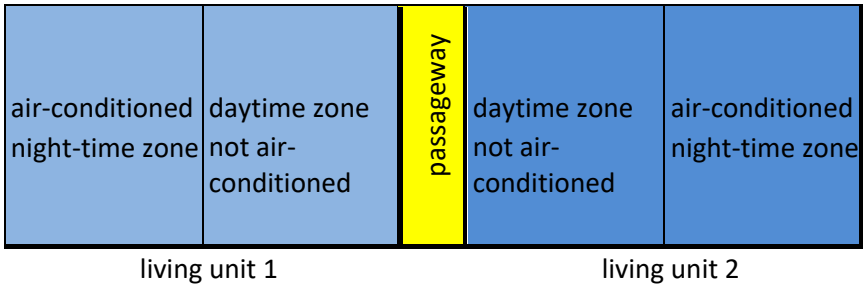
1. The walls (opaque and openings) separating the zone in question from the adjacent space are not considered in the RTG calculation tool;
2. The walls (opaque and openings) separating the adjoining space from the outside are walls that face outside for the zone in question. They are measured and input in the RTG calculation tool (if the same space adjoins several living units, the surface area of its facade walls will be allocated to the living units on a pro-rata basis depending on the surface area of contact);
3. Coefficients U and α (or *Couleur* [Colour] in the interface) of these walls are input in the tool for RTG calculation;
4. The wall [*paroi*] separating the zone in question and the adjoining space is not input in the RTG tool
5. The floor surface area of the adjoining space is considered null in the RTG calculation tool.

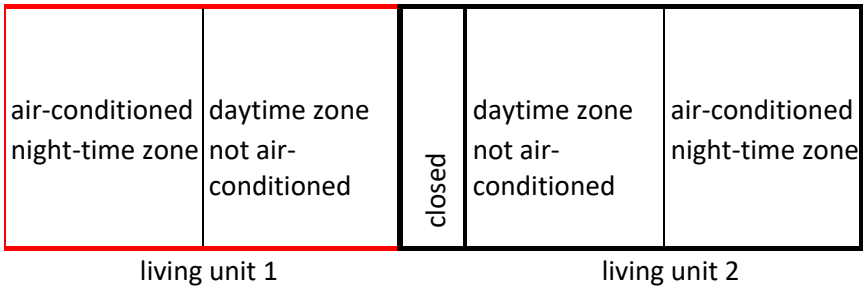


Modelling living unit 1 (in red: facades input in the calculation tool)

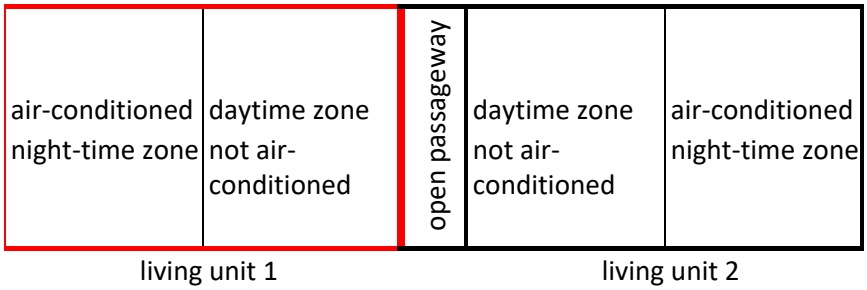
Warning: these rules only apply when the adjoining space serves as a screen between the zone in question and outside. For example, the following test case uses more traditional modelling:

- *If the passageway is closed: the interface between the zone in question and the passageway is handled in the same way as continguity with an adjoining living unit: no wall modelling (adiabatic);*
- *If the passageway opens out to the outside on both ends: the passageway is outside but with complete solar protection (additional Cm = 0 for a wall and Brise soleil Cm=0 for an opening);*



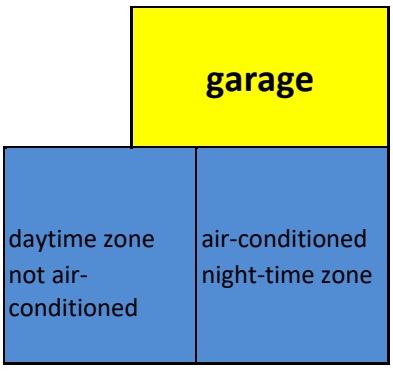


Modelling living unit 1 (in red: facades input in the calculation tool)



Modelling living unit 1 (in red: facades input in the calculation tool)

4.2.3 Special Case: A Shared Garage



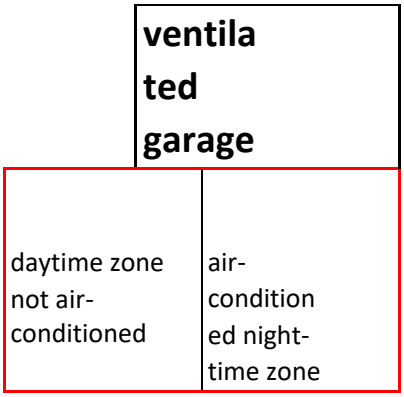
In this test case, in an individual house, ('**Error! Source of reference not found.**' is namely in this layout), one should model the project according to the following rule:

A. *A shared garage **with permanent openings** onto the outside is considered to be an outdoor space wherein its presence creates a solar protection effect.* B. *A shared garage with **no permanent openings** to the outside is considered to be the external facade transmitting all of its heat exchange with the outside to adjacent living units.*

In practice, the process is as follows:

A – Shared garage with permanent openings to the outside:

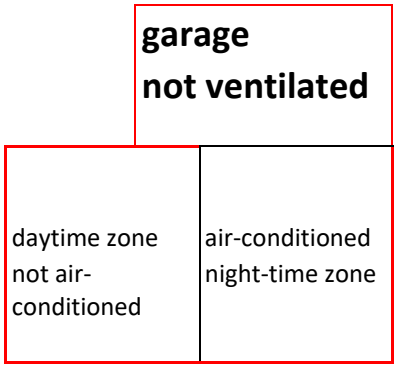
1. The walls (opaque and openings) separating the zone in question from the garage are walls facing the outside. They should be measured and input into the RTG calculation tool without modifying their surface area (whether they are opaque walls or openings);
2. The shadow effect caused by these walls by the adjoining space is highlighted using an **additional Cm (on the wall)** coefficient **whose value is the same as 0.3** (simplifying convention permitted by the RTG);
3. Coefficients U and α (or *Couleur* [Colour] in the interface) of these walls are presumed to not be impacted by the adjacent space.
4. Natural wind flow in the living unit can pass through the garage



Modelling living units (in red: facades input in the calculation tool)

B – Shared garage without permanent openings to the outside:

6. The walls (opaque and openings) separating the zone in question from the garage are not considered in the RTG calculation tool;
   RTG calculation;
7. The walls (opaque and openings) separating the garage and the outside are walls that face towards the outside for the zone in question. Between the adjoining space and outside (if the same garage adjoins several living units, its facade will be allocated to living units on a pro-rata basis depending on their surface area of contact);
8. Coefficients U and α (or *Couleur* [Colour] in the interface) of these walls are input in the tool for RTG calculation;
9. The wall separating the zone in question and the garage should not be input in the RTG tool
10. The garage's floor surface is null in the RTG calculation tool.



Modelling living units (in red: facades input in the calculation tool)

4.2.4 Measuring The Surface Area of Outside Walls

The surface areas of facade opaque walls, covering walls or walls with windows are measured as being **seen from inside**, which means the facade surface area covered by the thickness of inside partition walls, crosswalls or floors are not considered.

4.2.5 Measuring Floor Surface Area

In the RTG, unit for an area's floor surface area is the FLOOR SURFACE AREA (Spl). This value is given for the entire building, as it is included in the application for a building permit. It is outlined in Article R112-2 of the planning code (see boxed text below). A
For part of the building (e.g.: night-time thermal zone of a living unit), this size may not be available and should therefore be calculated. It can be calculated using one of the following methods (by decreasing order of preference):

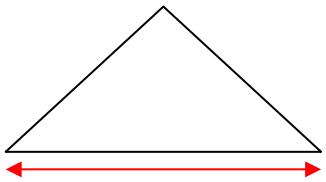
- Precise calculation according to the definition of the Spl (in particular, the space taken up by partition walls –partition walls separating two areas counting for half of each area);
- Approximate calculation – for residential use zones: **Spl≈Shab**, S being the liveable surface area, or even **Spl≈0.9.SHON**, SHON being the net floor area.
- Approximate calculation – for non-residential use zones: **Spl≈Su**, Su being the floor space, or even **Spl≈0.9.SHON**, SHON being the net floor surface area.

Definition of floor surface (Article R 1122 of the French town planning code) – 01/03/2012 version

The floor surface of a building is equal to the sum of floor surfaces of each enclosed and covered level, which is calculated using the interior side of the facade wall after deduction:
1° Surface areas corresponding to the thickness of the walls surrounding door and window frames that face outside;
2° Empty spaces and lift shafts for stairs and lifts;
3° Floor surfaces with a ceiling height of 1.80 metres or less;
4° Developed floor surfaces for motor/non-motor vehicle parking, including access ramps and manoeuvring areas;
5° Floor surfaces of attics that cannot be developed for residence or for professional, artisan, industrial or commercial activities;
6° Floor surfaces of machine rooms that are needed for the correct workings of a group of buildings or a building other than an individual house under in Article L. 2311 of the French building code, including waste storage facilities;
7° Floor surfaces of cellars that are joints to living units from the moment they can only be accessed via a shared part;
8° A surface area equal to 10% of the floor surfaces allocated to the living unit, as they result, where applicable, from the application of the preceding paragraphs, provided that the living units are served by internal shared areas

4.2.6 Measuring The Covered Surface Area

To simplify calculations, the surface area of an H (horizontal) envelope element to be input into the RTG tool, whether it is for an opaque wall or a window, is equal to the horizontal projection of this element (view from the interior, much like facade walls).



Surface area to be input into the RTG calculation tool

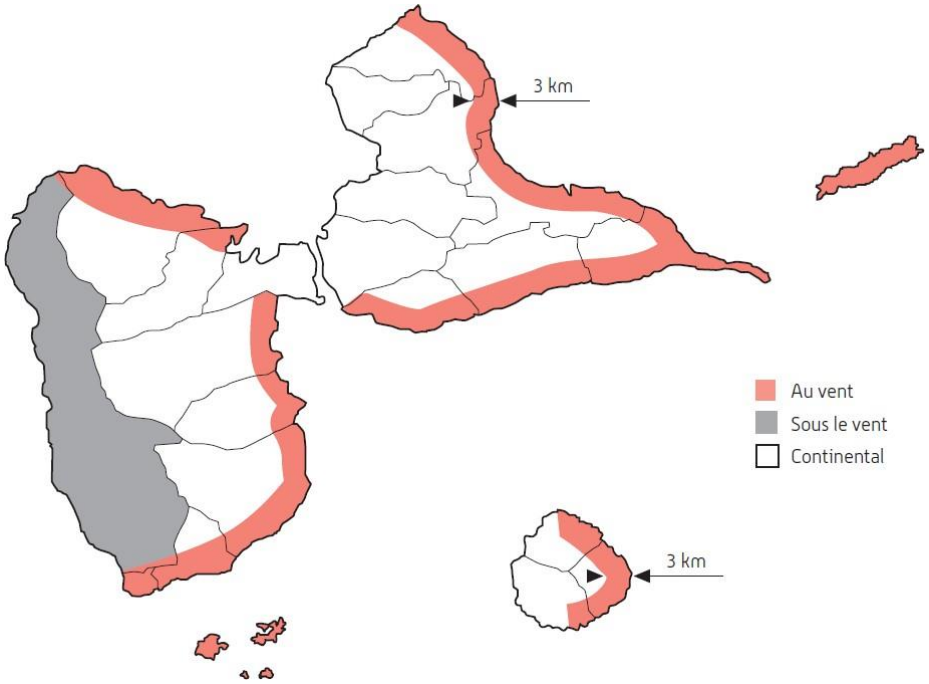
Note: covered surface areas opening onto toilets, bathrooms and washrooms should not be deducted from the total covered surface area.

4.3 PROJECT

The project object namely outlines the following parameters: Wind load and Direction of prevailing wind.

4.3.1 Wind Load

Wind loads (listed town by town in the table in Appendix 1 of the resolution) are shown in the following figure:



FR	EN
Au vent	Windward
Sous le vent	Leeward
Continental	Continental

- The three-kilometre zone is measured from mean sea level as the crow flies. To assess the distance from the sea, we recommend using www.geoportail.fr website as a tool to work out this distance, or even an IGN map;
- For the city of Pointe-à-Pitre, it is necessary to know the FAR (floor area ratio) of the plot to know if it is in a densely urban zone (FAR>1.2).

For your information: the wind load has an impact on the regulatory calculation. The wind intensity described in the meteorological file is adjusted during project calculation and then during threshold calculations for $_{max}$ *BBIO and* $_{max}$ *ICT. Therefore, the building's required energy performance is adjusted depending on wind load. The adjustment coefficient* is *explained in the table in Article 12 of the resolution:*

	Zone A – windward	Zone B – continental	Zone C – leeward, or dense urban zone
M_{wind}	0.98	1	1.02

Lastly, please note that this impact is noticeable for ICT calculation but is negligible for BBIO calculation.

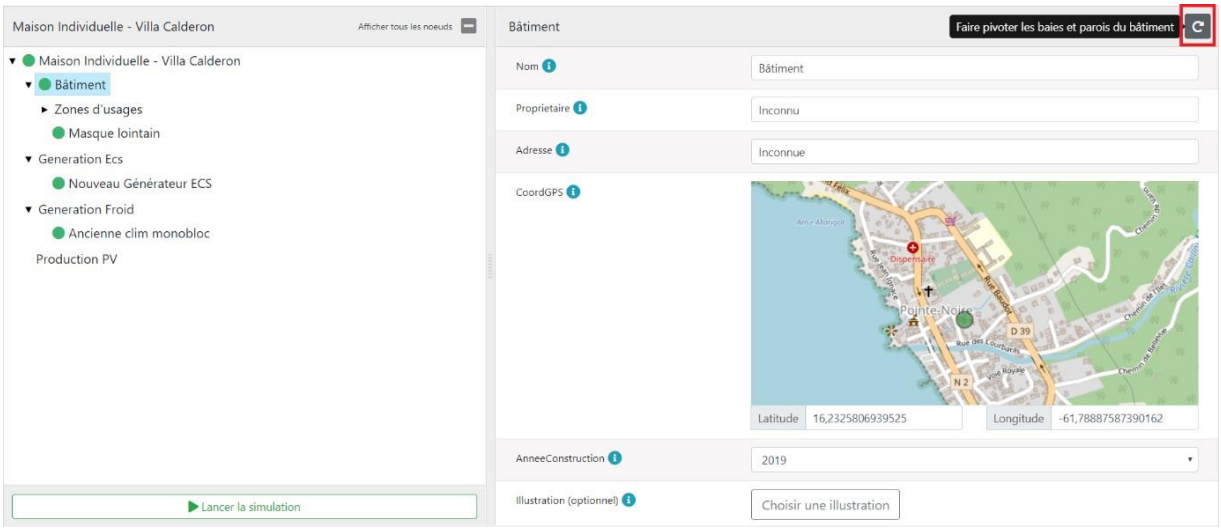
4.3.2 Direction of Prevailing Wind

- In leeward wind load areas, the prevailing wind is by default from the EAST *(i.e.: coming from the EAST and therefore affects surface areas facing EAST)* but should be manually input by the design office that is carrying out the simulation. It is, therefore, an optional input datum, which can take the following values:
  - North
  - South
  - East
  - West
- In the other wind load areas (windward, continental, or dense urbanisation): the prevailing wind is EAST, a norm that cannot be changed by the user.

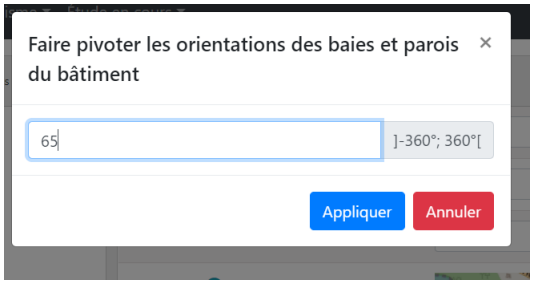
Note: the impact of the direction of the prevailing wind is highly important for ICT calculation, and less so for BBIO calculation.

4.4 BUILDING

Data about the year of construction, address, and the geolocation of the building project are input in this building object. It is in this section that different use zones, as well as the distant solar protection that applies, are described.



It is also possible to **rotate the whole building** by clicking on the rotation icon on the top right of the page (in the red box in the image below). This will update the direction for all openings and walls in the project by the chosen angle of rotation.



4.4.1 Geolocation

The building's address is required to precisely determine the building's location. Inputting the correct address will centre the GPS coordinates map.

In the event of ambiguity or an incomplete address, please double click on the map for the relevant building to indicate (using the green button) the exact location of the building in question (new or existing in the event of a DPEG).

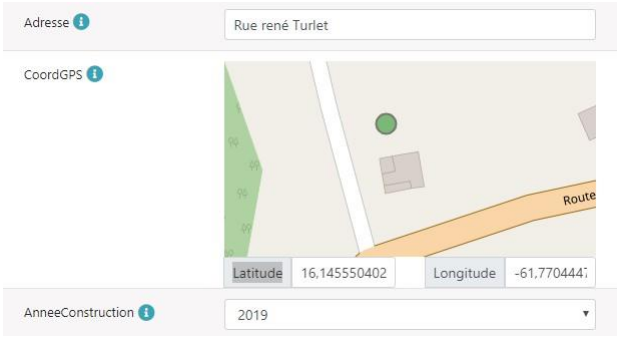
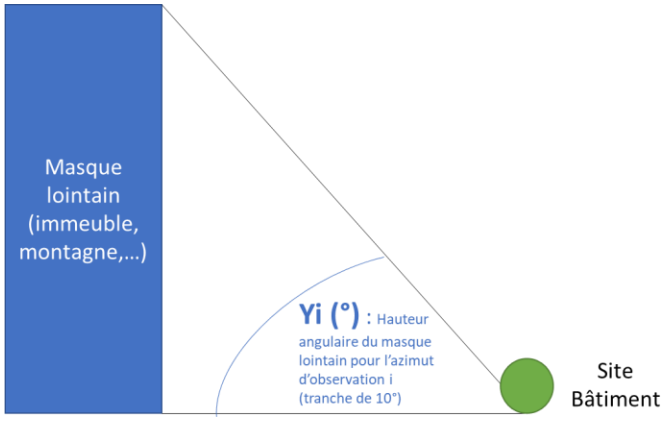


Figure 2 – In the example above, the construction project is located on the plot next to an existing building on Rue René Turlet.

4.4.2 Distant Solar Protection

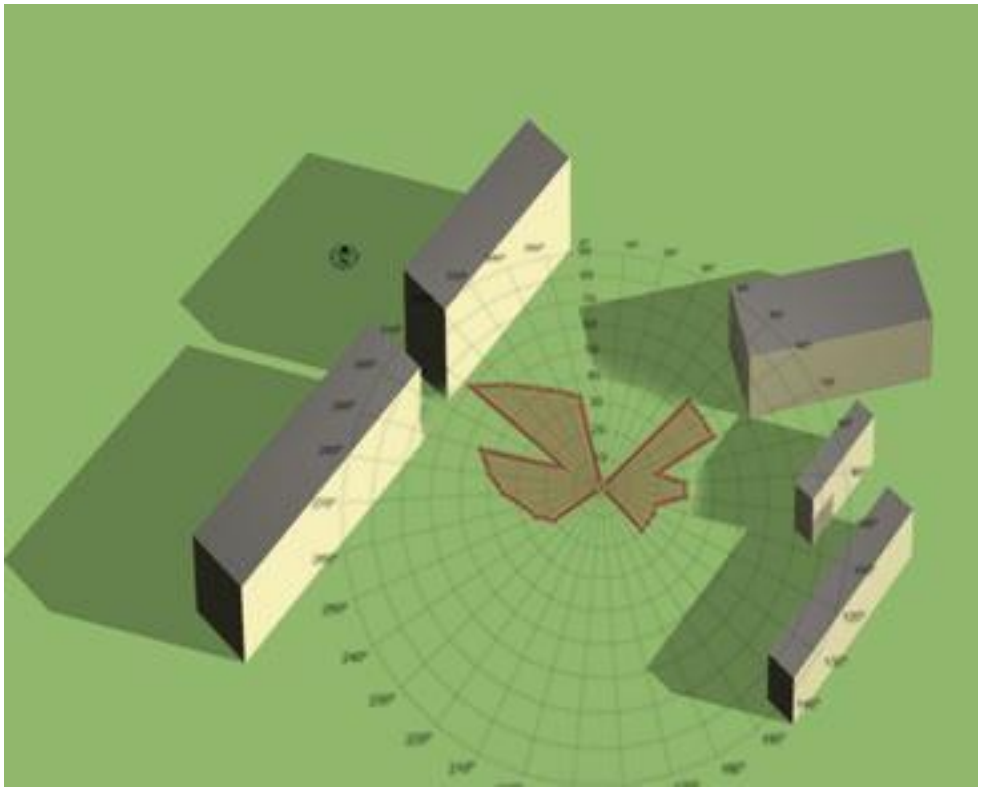
The distant solar protection section can be used to input information about protection in terms of the sunshine that is coming from the topography and/or existing buildings around the project.

This is completed by zooming into the centre of the future building and by inputting the **yi** angular height of the horizon as can be seen per 10° azimuthal range around the building (36 values). This value is between 0°: totally clear horizon, to 90°: completely obstructed horizon, complete and permanent protection)



FR	EN
Masque lointain (immeuble, montagne,…)	Distant solar protection (buildings, mountains, etc.)
Hauteur angulaire du masque lontain pour l'azimut d'observation i (tranche de 10°)	Angular height of the distant solar protection for the observation azimuth i (10° range)
Site Bâtiment	Building Site

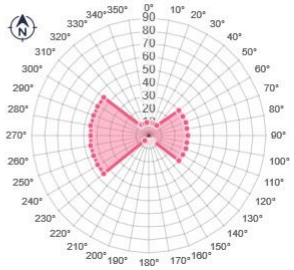
A simplified approach is available in the RTG tool. With this, all that is needed is to input the 4 average protection angles that correspond to the average protection in the North, East, South and West.



Simplified approach:

yi : Hauteur du masque lointain (par tranche azimutale Az de 10°)

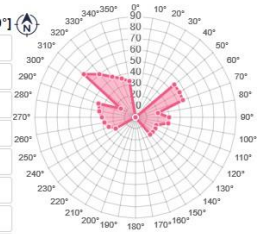
Orientation [0;90°]	
Nord	10
Est	30
Sud	5
Ouest	45



Detailed approach:

yi : Hauteur du masque lointain (par tranche azimutale Az de 10°)

az	[0;90°]	az	[0;90°]	az	[0;90°]	az	[0;90°]
0°	0	90°	30	180°	0	270°	30
10°	0	100°	30	190°	0	280°	33
20°	0	110°	20	200°	0	290°	35
30°	0	120°	20	210°	0	300°	15
40°	0	130°	20	220°	0	310°	60
50°	45	140°	20	230°	0	320°	50
60°	45	150°	0	240°	20	330°	42
70°	45	160°	0	250°	25	340°	37
80°	20	170°	0	260°	28	350°	33



FR	EN
Hauteur du masque lointain (par tranche azimutale Az de 10°)	Height of distant solar protection (per 10° azimuthal (Az) range)
Orientation	Direction
Nord	North
Sud	South
Est	East
Ouest	West

4.5 ZONE

It is in this field that you can input data about, **depending on the chosen use**, airflow, floor surface, internal open surface area, the number of storeys as well as 'construction type' informative data that do not impact the calculation.

It is in the zone field that thermal zone(s) in the construction are input: between 1 thermal zone (the whole living unit is completely air-conditioned or does not have air-conditioning at all, or other uses apart from residential use) and 2 thermal zones (air-conditioned living unit only in the daytime or night-time zone).

4.5.1 Ventilation

Residential cases (use =individual Houses, multiple living units or community houses):

You cannot input ventilation rates nor systems (mechanic or not) in this case.

The calculation applies a conventional air distribution rate per window opening corresponding to 1.2 m3/h.m²sdp when occupied and 0 m3/h/m²sdp when unoccupied. These rates correspond to typical clean air flow rates. Therefore, it is no longer necessary to describe the number of rooms of each type in the RTG2020.

Non-residential cases (other uses including offices and commercial spaces):

It is necessary to input data about clean air distribution rates for the zone in question in this case when occupied and unoccupied. These rates should come from the BET fluids study. They are represented in m3/h and correspond to overall rates for the modelled zone. *Reminder: these rates should comply with the RSDT and with regulatory texts concerning the use of the building in question.*

By default, these rates are pre-completed with the following usual values: 2.5 m3/h.m²sdp when occupied and a reduced rate to 15% when unoccupied (0.15*2.5 m3/h.m²sdp in this case).

These default values are essentially used when inputting data about an existing building (DPEG mode) when no information is available. They cannot be used without an explanation for new calculations (RTG2020).

The ventilation system should be added for non-residential uses in
the 'Ratio VMC' field. This ratio is 0% if there is no mechanical ventilation system. Otherwise, the input percentage corresponds to the share of the zone in question that is ventilated using a mechanical ventilation system.

In the event a mechanical system is used, it is necessary to input the total consumption of the fans in the mechanical system (in W per m3/h of mixed air) via
the 'Puissance VMC' setting. This value does not impact the RTG2020 result but is required for consumption calculation for the DPEG. By default, this power is 0.25 W/(m3/h) in the interface.

4.5.2 Interior Open Surface Area

4.5.2.1 Preface: recommendations about designing cross-ventilation system in living units

Thermal comfort ventilation describes adequate air circulation in a living unit to
reduce perceived temperatures. It is different from clean air ventilation
(ventilation order) which aims to expel interior pollution and steam to ensure that the building has an adequate air quality. Natural cross-ventilation air circulation requires:

1. Openings to the outside through sufficient facade openings;
2. Efficient air sweeping in each main room through airflow;
3. Sufficiently large interior openings (which can allow for efficient air sweeping of the main rooms).

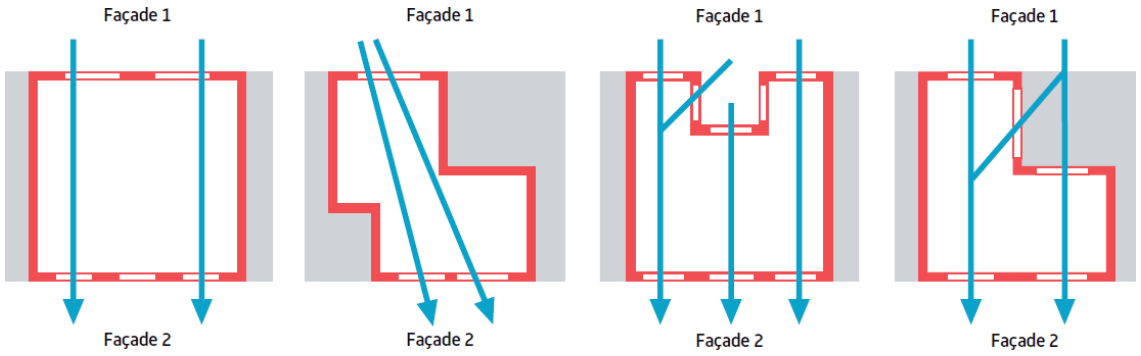
Note 1: for ICT calculation, and each living unit, the cumulative value of clear span surface areas for the leeward prevailing wind facade are capped to the internal open surface area. This operation is carried out automatically by the calculation tool.

Note 2: Fitting ceiling fans (generally in main rooms) can improve thermal comfort ventilation or mitigate shortcomings in natural cross-ventilation.

The recommended design process is as follows:

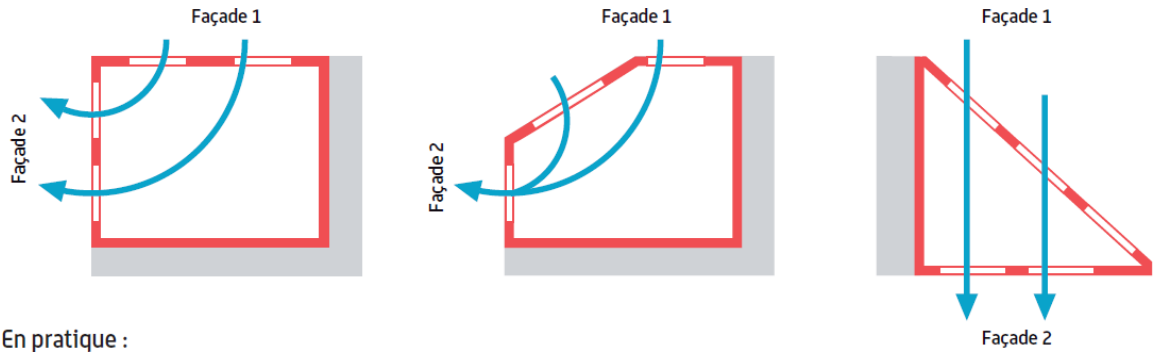
1. Position each exterior opening carefully, to ensure airflow sweeping for each main room;
2. Design a partition wall and inside opening partitioning system that will not impede airflow as much as possible

Cross-ventilation through the two opposing facades is the most efficient layout and should be preferred:



FR	EN
Façade	Facade

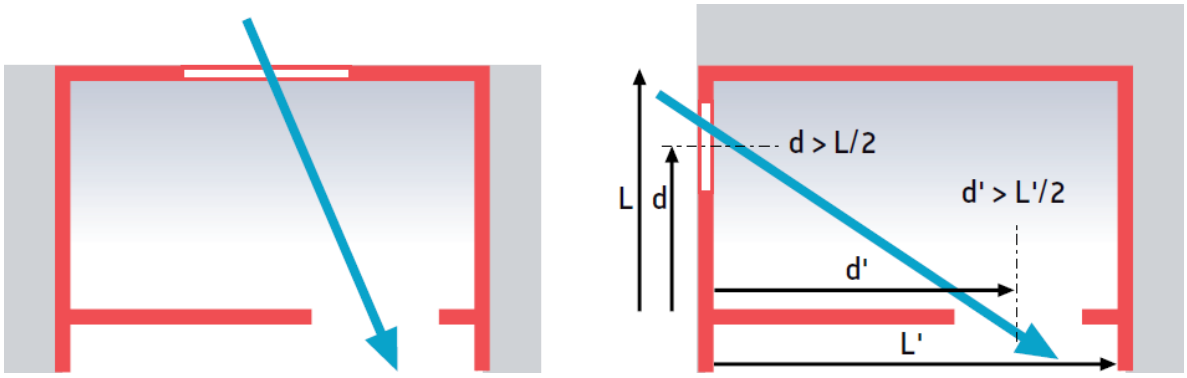
Cross-ventilation through the adjoining facades is possible but is generally less efficient.



En pratique :

For adjoining facades, we highly recommended putting the opening on opposite walls, or at least complying with the following rule (inspired by RTAADOM):

If the only openings for the premises airflow are located on adjacent walls, the axis of these walls should be away from the angle formed by the two walls by at least half of the length of each wall.



4.5.2.2 Definition

Reminder: defining the internal open surface area (Appendix 2):

The internal open surface area of a living unit is the limiting area of airflow between the prevailing wind facade and the prevailing leeward facade, calculated according to the most limiting cross-section, with doors and openings in an open position. It is written in metres squared.

Warning: *the concepts of 'windward facade' and 'leeward facade' are to be considered relative to the natural interior air ventilation, assumed to flow mainly through the two facades with the largest clear span surface areas. Therefore the 'windward facade' corresponds to the facade that has the largest clear span surface area and the 'leeward facade' is the facade that has the second-largest clear span surface area.*

This size only applies to living units.

Calculating the internal open surface area should be detailed in the supporting calculation note.

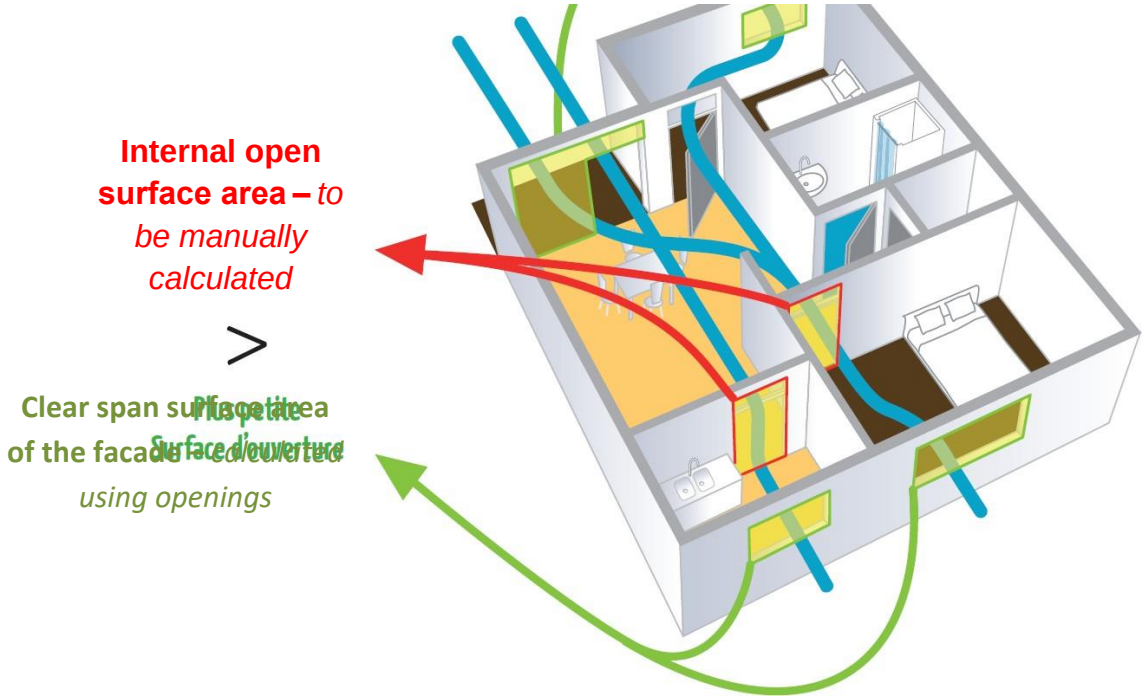
4.5.2.3 Calculation method for the internal open surface area

The internal open surface area is calculated according to the following method (to be explained in the supporting calculation note):

1. Identify the two main facades (in different directions/with the largest clear-span surface area);
2. Trace the airflow path from one main facade to the other;
3. By following each airflow profile, it is necessary to find the smallest interior opening by which it flows

Often, airflow separates into parallel airflows. In this case, it will be necessary to add limiting sections for each of these flows.

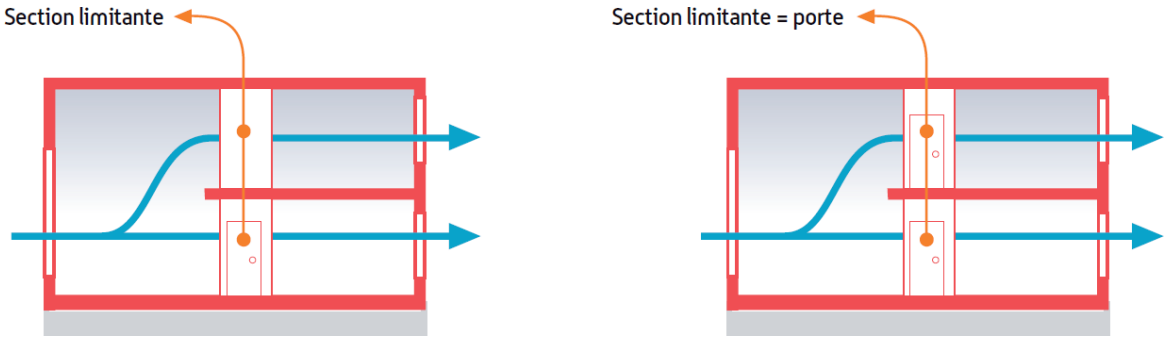
Important to note: this process should be carried out separately to the direction of prevailing wind



Note 1: airflows passing through a bathroom, or a toilet (WC) will automatically be disregarded during the calculation of the clear span surface area of a facade. An opening separating a toilet or a bathroom from another room is closed during the calculation of the section of interior airflow.

Note 2: while calculating sections of interior air flows, mobile interior opening, and inside doors are considered to be completely open.

Note 3: for special cases of multi-storey houses, the opening in the intermediate slab perpendicular to the staircase allowing passage of air is to be included in the calculation of the internal open surface area. For maisonettes, if the airflow is not limited by doors or openings, the internal open surface area to be considered is the smallest vertical surface area separating the floor from the ceiling.



FR	EN
Section limitante	Limiting section
Porte	Door

4.6 THERMAL ZONE

It is within this context that thermal calculations (Bbio and ICT) are carried out, depending on the inertia of the thermal zone of the walls and openings in it. The lighting system,

whose correct working also depends on envelop components (walls/openings) is also declared in the thermal zone section.

The Thermal zone field itself can be used to input information such as if the zone is air-conditioned, its surface area (equal to the surface area of the daytime and/or night-time zone for living units, identical to the use zone for other uses), the inertia of these envelope components (lower floor, upstairs floor and vertical wall), and possible fans.

4.6.1 Air-Conditioning

Non-residential cases (other uses including offices and commercial spaces):

A thermal zone in an office or commercial use zone is *de facto* considered to be air-conditioned during RTG calculation;

Residential cases (use = individual houses, multiple living units or community houses):

For residential uses, each use zone (living unit) can have one (where daytime and night-time zones are both air-conditioned or where neither have air-conditioning) or two thermal zones (in other situations).

- A daytime/night-time zone is 'air-conditioned' when at least one of its main rooms fitted with an air-conditioner or a dedicated space for an air-conditioning system. By 'dedicated space for an air-conditioning system',
  it is understood be to a set of fittings that will allow for later installation of an air-conditioning system without the need for professional electrical, plumbing or masonry work.
- For information: BBIO calculation is now calculated on an individual living unit scale

Note: The *Part climatisée* [air-conditioned share] (can be accessed in *détaillé* [detailed] mode and by default, is at 100%) corresponds to the *Part de la zone thermique effectivement climatisée* [share of the thermal zone that is air-conditioned] is used only for DPEG calculation. During RTG2020 calculation for a thermal zone that is declared to be air-conditioned, the air-conditioned share is conditionally set at 100%, no matter the value input by the user.

4.6.2 Ceiling Fans

Reminder 1: each thermal zone in a living unit (day and night), and each *office* or *commercial* use zone should have one of the 3 following statuses:

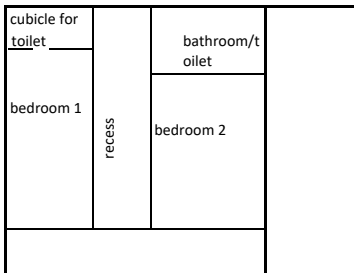
- Fitted for installation (input: *attentes*);
- Fitted with ventilation (input: *oui*);
- Not fitted (input: *non*).

Reminder 2: regulatory text (resolution – Appendix 2) definition of a 'space for a ceiling fan':

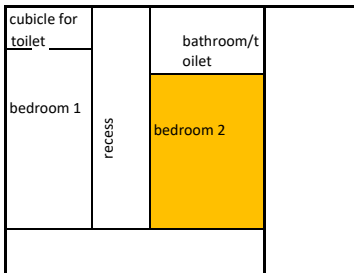
> Describes a mechanical hanging system on the ceiling for a ceiling fan with horizontal blades with a diameter of at least 0.80 metres, with its own power supply and a wall-mounted control unit, which can be identified and used by any users to turn on fan rotation.

Reminder 3: in a living unit:

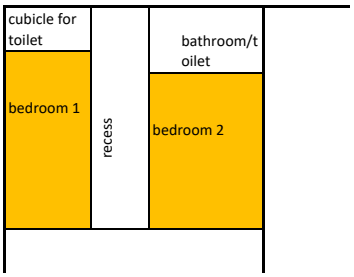
- For a 'fitted' daytime/night-time thermal zone (with fans or or dedicated space), every main room in this zone needs to be fitted;
  - For a room to be fitted, it should:
    - Living room: 1 point per 20 m² section (of floor surface);
    - Other main rooms: 1 point per 30 m² section (floor surface).
- In our test case, we can see the following examples:



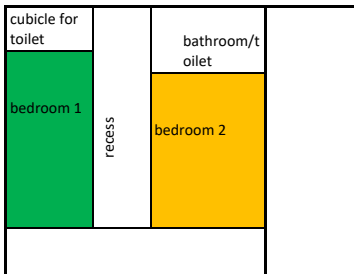
Not fitted night-time zone



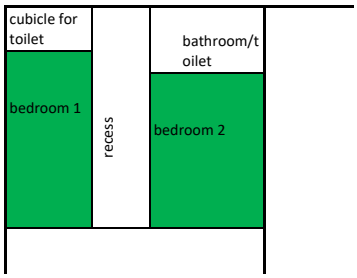
not fitted night-time zone



night-time zone with dedicated space



Night-time area with dedicated space



night-time zone with ceiling fans

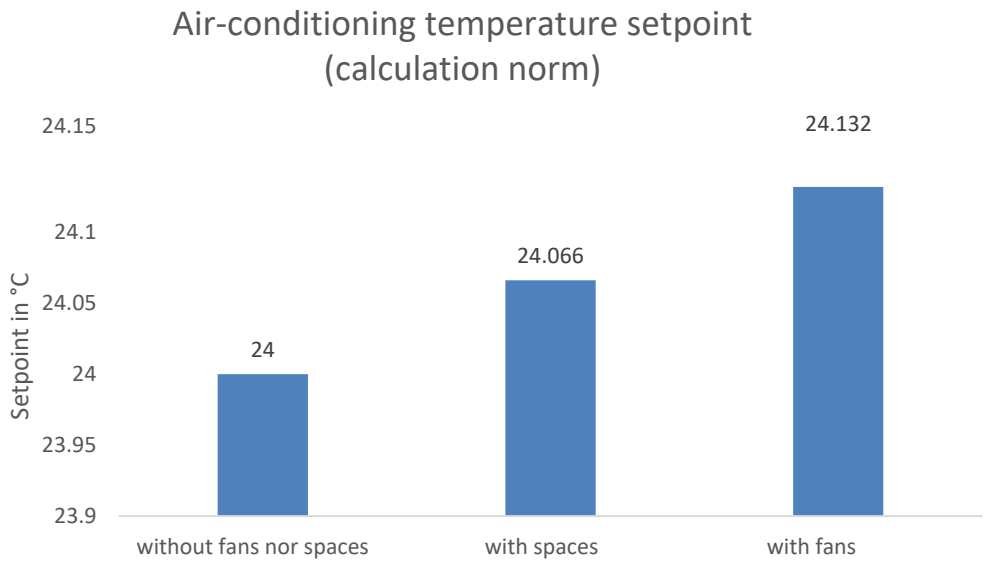
there are dedicated spaces for enough ceiling fans there are a sufficient number of ceiling fans

no dedicated space nor ceiling fans (or insufficient number)

Reminder 4: in offices and commercial spaces:

- For a use zone to be 'fitted' (with fans or dedicated spaces), it needs to be fitted on average and with a minimum density of 1 point per 20m² section of floor surface used by workstations or public service areas;

***For information**: in offices or commercial spaces, actual ceiling fans are considered in BBIO calculation; dedicated spaces alone will also have an impact but to a lesser extent. Fans are valued in the calculation by a slightly higher usual air-conditioning setpoint temperature. This measure was developed by the consultation group and is based on the observation that air circulation coupled with air conditioning tends to reduce air-conditioning consumption because the perceived temperature is lower and the temperature setpoint is therefore higher.*



Recommendations for installing ceiling fans: ceiling height requirements for ceiling fans or dedicated spaces for ceiling fans:

- We recommend that the blade height specified in IEC 60335280 be observed, i.e., at least 2.30 m;
- The height of the fan (distance between blade and ceiling), which varies from model to model, must also be considered when determining the ceiling height;
- In the case where dedicated spaces are available, the height of the fan is not known at the time of construction. In this case, we recommend planning for a fan height of 0.3 m at a minimum (distance between the ceiling and the lower part of the fan), or give the occupant a list of fan models that are compatible with the living unit;

4.6.3 Lighting

4.6.3.1 Distinction between uses

Residential cases (use = individual houses, multiple living units or community houses):

Natural lighting in an individual house or a living unit is based on the following conventional assumption: all ground surface areas in these buildings are considered to have access to natural light. The regulatory calculation is therefore based on this assumption, and no calculations or input are required.

In the same way, installed lighting conventional power is conventionally defined for DPEG calculation (corresponding to 2W/m²).

Non-residential cases (other uses including offices and commercial spaces):

In this case, the user should the surface area which has natural light (defined by the ratio: surface area of the premises with daylight access/total surface area of the premises):

- **In simplified mode** with only one natural light access ratio for the whole of the thermal zone. In this case, only one type of the main lighting (type of lamp) and management can be described for all the thermal zone.
- **In detailed mode** by specifying a different proportion of access to natural light depending on the type of premises: activity rooms, washrooms or hallways. In this case, it is possible to specify the type of lighting systems (switch, presence detector, dimmer, etc.), the types of light (by their efficiency) and the different installed powers for each type of premises.

The following table can be used to make filling in the *Efficacité éclairage* [lighting efficiency] field easier when this datum is not supplied by the manufacturer:

Type of lamp	Lighting efficiency (in W/m².100 lux)
Halogen	5
Compact fluorescent	1.45
Fluorescent	1.25
Metal-halide	1.1
High-pressure sodium	0.9
LED	0.55

4.6.3.2 Support for the determination of areas with access to natural light in premises

For each site, the surface area with access to natural light is estimated according to one of the following simplified methods:

1. **Fixed method:**
    a. For premises fitted with window sections in the roof (zenithal lighting, saw-tooth roofs, roof lights, etc.): the natural light surface area is the same as the premises' useable area;
    b. For other premises: the natural light surface area is the same as the premises' floor surface at least 5 metres (top view) from an opening;
2. **More precise method:**
    a. For premises fitted with window sections in the roof (zenithal lighting, saw-tooth roofs, roof lights, etc.): the natural light surface area is the same as the premises' useable area;
    b. For other premises:
        i. If they are fitted with vertical openings in facades and whose depth is less or equal to:

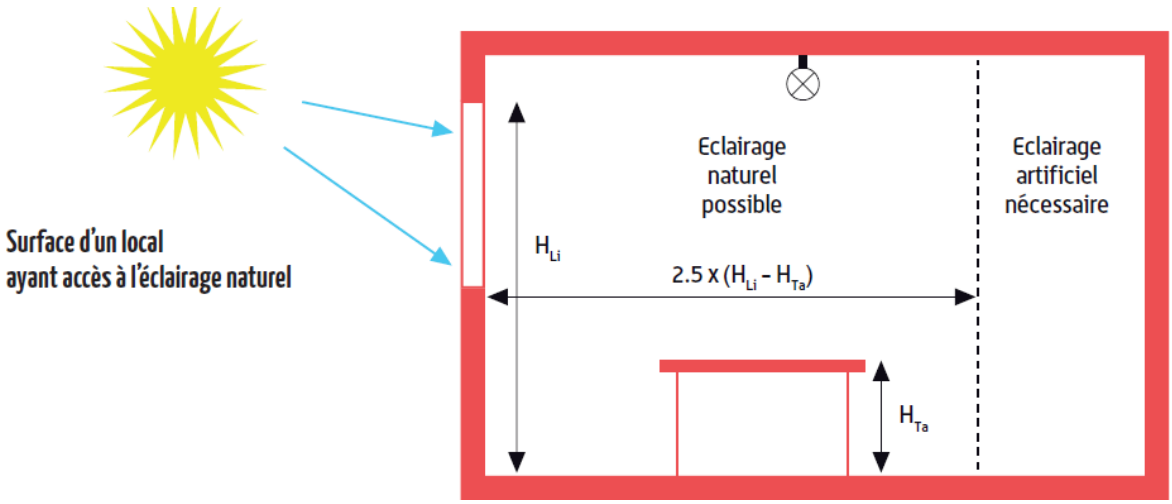
$$2.5*(H_{Li} - H_{Ta}) \quad [m]$$

H_{Li} being the height of the lower part of the lintel regarding the ground [m] and H_{Ta} being the height of the work surface (plane of reference) in regard to the ground [m], the surface area in natural lighting is equal to the useable surface area of the premises;

ii. If they have vertical openings in the facade and greater depth, the surface area in natural light is equal to the useable surface area of the parts of the premises located at a distance from an opening that is less than or equal to 2.5*(HLi – HTa);

iii. If they do not have openings, the natural lighting surface area is equal to 0.

FR	EN
Surface d'un local ayant accès à l'éclairage naturel	Surface area of premises with natural lighting
Eclairage naturel possible	Natural lighting possible
Eclairage artificiel nécessaire	Artificial lighting necessary



4.6.4 Inertia

4.6.4.1 Simplified input of the inertia

Inertia is calculated by the tool in the *Zone Thermique* [Thermal zone] section in simplified mode depending on the inertia of vertical walls, the upstairs floor and the lower floor ('light or medium' or 'heavy').

Definition of 'heavy upstairs floor':

- the floor under roofing (patio, lost roof space, steep slope, etc.):
– *solid concrete* over 8 cm insulated from the outside and without a dropped ceiling (**);
- intermediate floor underside:
– *solid concrete* over 15 cm without insulation from the outside and without a dropped ceiling (**);
- any floor with 5 or more inertia points (according to *TH-I §II-3*) on its underside.

(**) Only dropped ceilings with an un-ventilated or poorly ventilated air gap (less than 1,500 mm^2 of opening per m^2 of surface area) covering more than half of the surface area of the storey floor in question are considered.

Definition of 'heavy lower floor':

- the upper side of the intermediary floor with a *coating that does not have a thermal effect (tiles, painted concrete, polished concrete, etc.)*:
– solid concrete over 15 cm without insulation,
– screed or concrete slab of 4 cm or more on heavy joists (concrete or terracotta), on reinforced cellular concrete or hollow-core slabs.
- lower floor with a *coating with no thermal effect*:
– solid concrete over 10 cm in thickness.
– screed or concrete slab of 4 cm or more on heavy joists (concrete or terracotta), on reinforced cellular concrete or hollow-core slabs.
– 5cm or more concrete slab in space between joints in insulating material.
- any floors with 5 points of inertia *(according to TH-I §II-3*) or more for its upper side.

Definition of a 'heavy vertical wall': a building storey has a heavy vertical wall if it meets **either** of the following conditions:

- when the wall's surface area [crosswall + facade view from the inside] is **at least equal to 0.9 times the surface area of the floor surface**, non-insulated facades and gables from the inside, with:
– 7 cm or more *solid concrete* (banked, block or precast),
– 11 cm or more of solid concrete block,
– 10 cm or more of perforated concrete block,
– 11 cm or more of hollow block,
– 10.5 cm or more of full or perforated brick
- external walls with distributed insulation of at least 30 cm, with a concrete block, coated plastered brick or plaster block partition wall of 5 cm or in cellular concrete of at least 7 cm.
- for the interior lining of outside walls and partitions, at least 5 cm made from concrete block, coated brick or plaster block.
- when the average size of the premises is less than 30 m^2 (residential buildings, offices):
– heavy internal partition wall, made from:
    - solid concrete of at least 7 cm,
    - hollow or perforated concrete blocks of at least 10 cm,

- solid or perforated brick of at least 10.5 cm,
- other bricks of at least 15 cm with a plaster coating on each side.

- a set of facade and gable walls and partitions with a total of 7 inertia points (*according to TH-I §II- 3*) or more.

Other walls are 'light or medium'.

4.6.4.2 Detailed input of the inertia

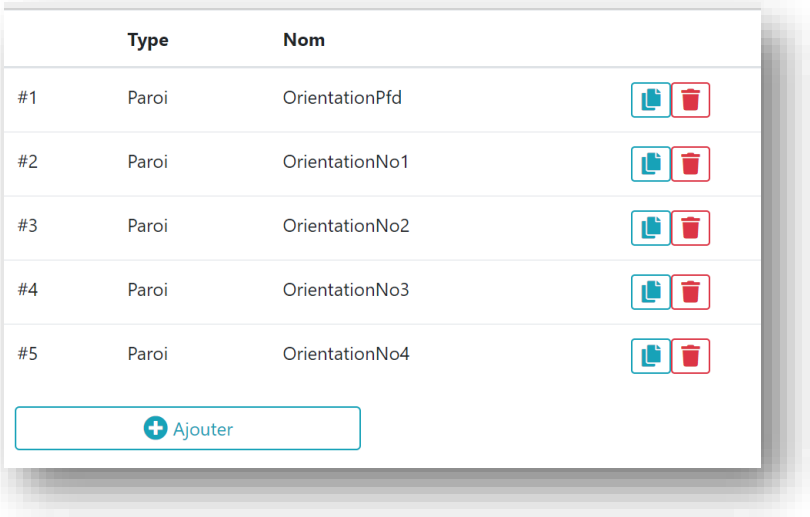
If the user wishes, inertia can be calculated outside the software and then Am inertia coefficient (equivalent exchange surface area of the heavy walls with the environment) and Cm coefficient (thermal capacity of the zone studied for a 24-hour wave) can be directly input according to TH-Bât rules in 'detailed' mode.

4.6.5 Opaque Walls

Input of opaque walls is to be carried out by elementary facet according to a division to be made on a case-by-case basis so that each facet has:

- 1 unique direction
- 1 unique composition
- 1 unique close solar protection

A wall '***paroi***' object should be created for each facet. We recommend allocating it a clear name.



Reminders:

- The roof should also have one or more opaque walls.
- Surface areas adjoining another building are not subject to walls (the walls separate the interior space from the outside)

4.6.5.1 Net surface area

During the input of an opaque wall, the width and height of the side are required. This width and height are used during the calculation of solar protection given by close solar protection but do not define the surface area of the opaque component.

It is necessary to specify the net surface area of the opaque wall, meaning **the surface area of the facade from which we have derived opening elements**.

Therefore, we have:

Net surface area (wall) = Width (wall) * Height (wall) – Sum of the surface areas of the opening (of the

4.6.5.2 Solar gain and colour of the wall

In simplified input, the calculation tool automatically deducts the wall's solar gain using its colour and the U heat transfer coefficient according to the following formula:

$$: = \qquad \underline{\qquad * h}$$

With he = 25 W/m².K

Alpha is calculated depending on the colour in the following table:

Colour	**Value of**
Light (white, yellow, orange and light red) or by default	0.4
Medium (Dark red, light green, light blue and light grey)	0.6
Dark (Brown, dark green, bright blue and medium grey)	0.8
Black (Black, dark brown, dark blue and dark grey)	1.0

4.6.5.3 U coefficient of an opaque wall

Reminder 1: regulatory text (Appendix 2 – definitions – 'U coefficient'):

The average heat transfer coefficient, 'U', is an input datum for each (…) opaque wall in the envelope. It is written in W/m².K.

The U coefficient of an opaque wall in the envelope should be calculated using either of the following methods:

- Manual calculation, layer by layer according to the simplified formula: U=1/(R+0,20): where R is the wall's resistance in m².K/W. R thermal resistance is either known or calculated using the thermal conductivity and thickness of the material. The term 0.2 represents the superficial thermal resistance of the inner and outer sides of the wall.
- *Th-Bât* rules in force in mainland France, in the ' *parois opaques* section, with the following conventions:
    - Superficial thermal resistances Rse=0,07 m2.K/W and Rsi= 0.13 m2.K/W,
    - Superficial exchange coefficient (he) for a null wind (he summer = 25 W/m2.K);
- Reusing the numerical values in the supporting document about the construction process, if the U coefficient is a verified thermal characteristic
  under Appendix 2, and that the U-value was generated with a null wind hypothesis (he summer = 25 W/m².K).

Important to note: the **technical** conditions for establishing verified thermal conditions are explained in the *Caractéristiques thermiques vérifiées des components* [verified thermal characteristics of components] provided by the region, and which cancels and replaces the specifications in the resolution (summer, null wind, etc.).

Reminder 2: regulatory text (Appendix 2 – definitions – 'verified thermal characteristic'):

A thermal characteristic is verified for a product, system or construction process if the numerical value of this characteristic is specified in a supporting document from the following list:

- a certificate issued by an organisation accredited by a European Accreditation member;
- a *Pass Innovation* – green light – issued by the CSTB;
- an ETA (European technical assessment);
- an ATEx – *Appréciation Technique Expérimentale* [technical experimentation evaluation];
- a DTA - *Document Technique d'Application* [Technical Application Document];
- a technical opinion (AT or Atec), either directly or resulting from ' confirmation of authorisation by a UEAtc's member (European equivalent).

Comments:

- The RTG accepts 'verified thermal characteristics' without the need for an explanation from a supervisor of works.

In practice:

The simplified calculation method's formula is: $= \frac{1}{+0.20}$

where R is the wall's resistance in m².K/W. R thermal resistance is either known or calculated using the thermal conductivity and thickness of the material. *Note: The term 0.2 represents the superficial thermal resistance of the inner and outer sides of the wall*.

Supervisors of works that would like to carry out a detailed calculation by applying Th-U rules should use the Rse=0.07 m².K/W and Rsi= 0.13 m².K/W calculation conventions.

4.6.5.4 Additional Cm Of An Opaque Wall

Two types of wall solar protection can be modelled:

Sides or sunshades (fixed)

Sides or sunshades (that serve as solar protection should be modelled using *close solar protection*(see 4.6.7 Close solar protection) whereas distant solar protection (buildings from another new construction programme, mountainous areas, vegetation, etc.) should be considered by the object that corresponds to the building section (see 4.4.2 Distant solar protection).

Additional solar protection

However, additional opaque wall solar protection can be available and correspond, for example, to ventilated walls (the illustration below shows a ventilated shading roof). They are therefore added through an average and constant protection coefficient called *Cm additionnel* in the interface.

The user should specify the additional protection coefficient (between 0: complete blocking and 1: no protection). In this case, the additional Cm value used should be explained using either of the following methods:

- manual calculation of additional protective measures: ventilated wall, brise soleil, etc.

- *Th-Bât* rules in force in mainland France, in the *parois opaques* section and 'glass walls';

- reusing the numerical values in the supporting document for the construction process of the product, if the Cm coefficient is a verified thermal characteristic under Appendix 2.

In the special case of ventilated walls, you may also use the recommendations in the *RTAADOM 2016 – Protection contre les rayonnements solaires' § « les pare- soleil ventilés* document.

4.6.6 Openings (Windows and Doors)

Openings are now joined to an opaque wall.

4.6.6.1 The Thermal, Energy And Light Characteristics Of Openings And Their Movable Protective Devices

RTG2020 introduces a dynamic opening model for openings and movable protective device management according to external conditions and if the premises is occupied. It is now required to **specify opening performance (U heat transfer coefficient, S solar gain coefficient and TI light transmission factor** in 4 opening/movable protective device layouts (an interpolation will then be carried out to deduct performance in all intermediary positions of the window and its movable protective device):

- **ict_PMouverte layout:** Opening completely open (natural ventilation mode, called 'ict' in the interface) and unused movable protective device (open MP)
- **ict_PMferme layout:** Opening completely open (natural ventilation mode, called 'ict' in the interface) and movable protective device completely used (MP closed)
- **bbio_ Pmouverte layout:** Completely closed opening (air-conditioning mode, named 'bbio' in the interface) and movable protective device not used (open MP)
- **bbio_ Pmferme layout:** Completely closed opening (air-conditioning mode, named 'bbio' in the interface) and movable protective device completely used (closed MP)

Simplified input of openings in the RTG2020 tool allows for pre-calculated values of these performances to be used for a set of openings/movable protective device combinations.

It is highly recommended to use simplified input to complete information about the project's

However, the user could choose to provide information about the opening-movable protective device system in detail if they decided that no combination in simplified mode reflects choices made for their project. In this case, they will need to provide a calculation note that explains the U, S and TI coefficients that have been input for each of the 4 layouts (see above). This calculation note can be the simulation results of the opening/movable protective device section generated by a specialist software such as *ULYS paroi vitrée* (available on the CSTB website or equivalent).

Important: skylights must be input in the regulatory calculation tool as *fenêtre de toit* [skylight] or *puits de lumière* [light tubes] (*inclinaison* field). Designers should be aware of the highly penalising impact of these windows for BBIO and ICT calculated values. Designing buildings with such amenities and calculating their solar gain should be carefully studied as to not compromise the project's regulatory compliance or economic optimisation. These windows do not contribute to the building's natural ventilation (for the RTG2020, they cannot be opened).

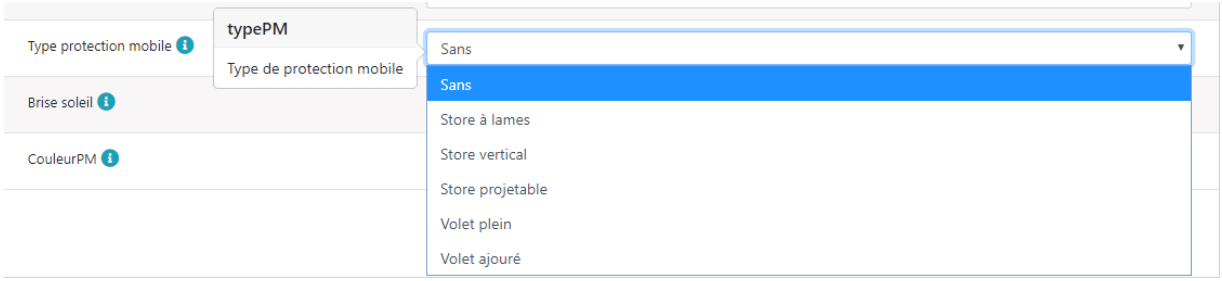
Important 2: Doors with glass panes should be modelled as windows and not as doors (*portes* [doors] is reserved for whole/opaque doors)

4.6.6.2 Brise Soleils, Shading Devices And Solar Protection

Three types of opening solar protection can be modelled:

Movable protective device

For protection considered to be attached to openings, they are input in the *type protection mobile* [movable protective device] field in the *baie* [opening] section.



Brise soleils

Additional brise soleils can be modelled using an average and constant protection coefficient called *Cm Brise soleil*.

The most common situation is adding fixed blades in front of the opening (case preset in the simplified opening interface with a default value of Cm Shading = 0.47 – modifiable -). For other situations, the user should input the additional protection coefficient (between 0: completely blocking and 1: no protection). In this case, they should explain the value of the Cm Brise soleil used, using either of the following methods:

- manual calculation of additional protective measures: ventilated facade, brise soleil, etc.

- *Th-Bât* rules in force in mainland France, in the *parois opaques* section and 'glass walls';

- reusing the numerical values in the supporting document for the construction process of the product, if the Cm coefficient is a verified thermal characteristic under Appendix 2.

Sides or sunshades (fixed)

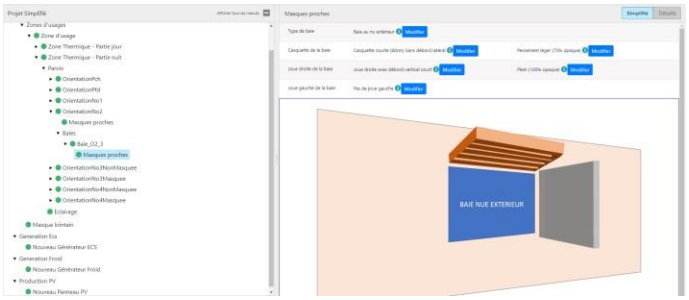
Sides or sunshades (that serve as solar protection should be modelled using *close solar protection*(see 4.6.7 Close solar protection) whereas distant solar protection (buildings from another new construction programme, mountainous areas, vegetation, etc.) should be considered by the object that corresponds to the building section (see 4.4.2 Distant solar protection).

4.6.7 Close solar protection

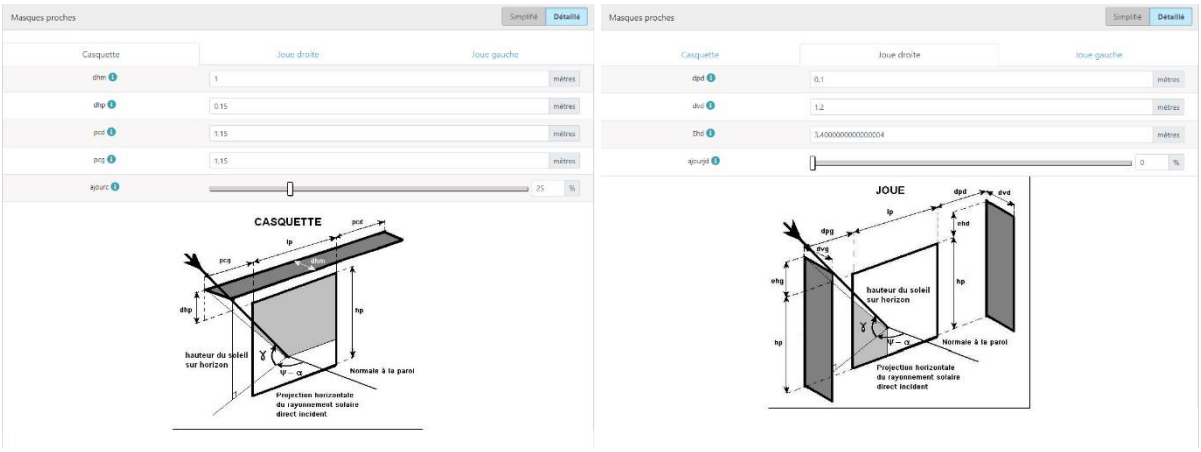
Close solar protection can be added to openings and walls individually.

There are two ways to input:

- **In simplified mode** by selecting typical overhangs, sunshades and sides, and related rates of opening allowing the best possible approach to most of the protection found in the field. You can schematically view each protection described in the preview window.



- **In detailed mode** by closely inputting the sizes of close solar protection when the real protection is too different from the suggested simplified protection. In this case, a diagram located below the data input field can be used to precisely input geometric data about the protection for 3 parts of the protection (by moving through the tabs): the left side, the right side and the sunshade. If all input values are 0, this means that there is no protection for the type in question (sunshade, left and right side). A 0% opening (ajourX) means full protection, a 100% opening means transparent protection (no protection).



N.B.: In the event where the close solar protection is smaller than the wall on which it is found, it is impossible to consider pcg and pcd <0. It is, therefore, necessary to slice the opaque wall into 2 opaque walls: one with protection and one without protection.

4.7 Systems (Energy Consumers)

4.7.1 Lighting

Lighting is the only system that is input in the use zone section (see 4.6.3 Lighting) and used when calculating RTG2020 and DPEG indicators.

Other systems (generators and solar production of DHW, cooling generators and photovoltaic solar production) are only used when calculating DPEG indicators and are input in the project section because they can apply to several use- and thermal-zones or because their production supplies the whole building and not one zone.

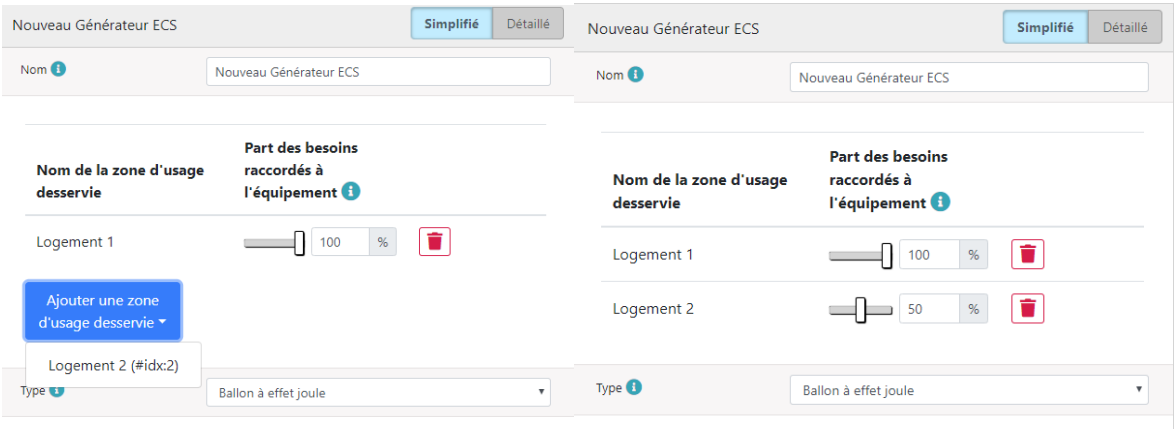
4.7.2 DHW Production

4.7.2.1 Connecting DHW Boilers To Use Zones

A DHW boiler can be used to provide domestic hot water to one or several use zones. It is, therefore, necessary to specify:

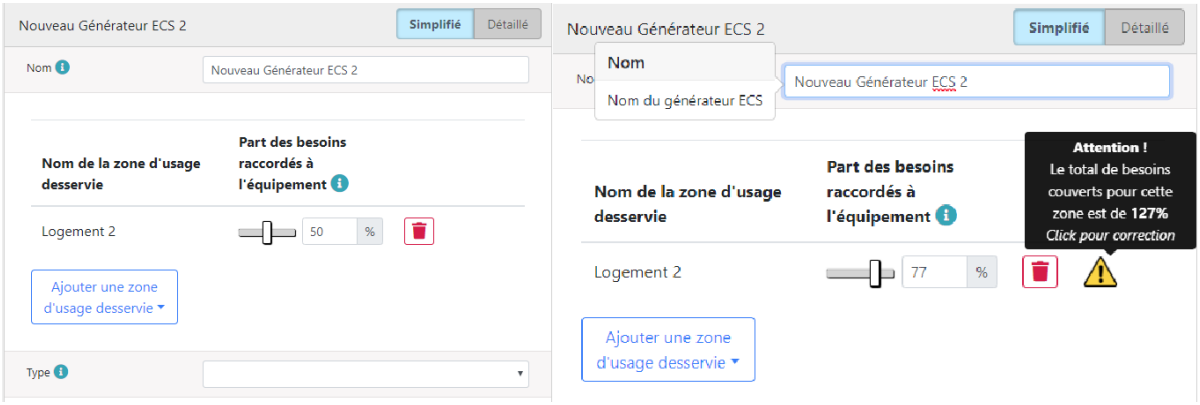
- Which use zones are supplied by the system in question
- What share of needs in each use zone is provided by the system in question.

Note: The share of the needs connected to the amenity is the share (area and/or time) of the use zone served by the amenity. This does not correspond to actual 'coverage rates' of the needs of the system (which will be dynamically calculated). (see examples in 4.7.3.1 Connecting cooling generators to thermal zones)



In the example below, we can see that the 'Nouveau générateur DHW' [new DHW generator] system, which is an electrical hot water tank, supplies living unit 1 and living unit 2. It is the only system in living unit 1 and supplies 100% of DHW needs. It supplies 50% of DHW needs in living unit 2. This means that there is a second (or several!) system producing domestic hot water that is also connected to living unit 2 and supplies the other share of needs.

IMPORTANT: The user can input as many systems as necessary. However, all these systems must ultimately provide 100% (no more and no less) of the needs of the use zones in the project. The interface has input assistance (by automatically updating percentages of needs that need to be covered by zone when adding a new system) and an input verification will warn the user if this does not add up to 100%.



Let's continue with our example. If we create a second DHW boiler that supplies living unit 2, the share of needs connected to the amenity is automatically set at the remaining value (here, 50%). In the event where this value is modified incoherently, an ***attention !*** *[warning!] pictogram will appear, and calculation will not start.*

4.7.2.2 Tank Volumes

The volume of the storage tank corresponds to the volume of the unitary system.

Let's reuse the previous example. If living unit 1 and living unit 2 each produce domestic hot water with an individual 150L hot water tank, it should be input in the detailed field for the DHW generator: 'Volume of the storage tank' = 150L (and not 150L*2=300L).

In simplified mode, the volume of the domestic hot water generator tank is automatically deducted from the needs of zones that are connected to it by assuming, by default, collective production (one tank for all connected zones).

On the contrary, if the user would like to indicate that the same system is used for all living units, they should:

- Either correct the calculated volume of the storage tank in detailed mode to input the volume corresponding to a unitary tank (150L for example).
- Or stay in simplified mode to avoid having to input the volume of the tank, but in this case, duplicate the domestic hot water generator as many times as there are living units that use this type of generator, and connect each living unit to each generator (one living unit per boiler).

4.7.2.3 Surface Area Of Solar Thermal Panels

When inputting a solar thermal system in simplified mode, sizing is automatically executed to calculate the surface area of solar panels installed depending on the number of occupiers (automatically calculated based on use and surface area) of use zones supplied by this system:

Surface area of solar thermal panels (m²) = max (2; 0.45*Number of occupants + 1.225)

Source: Guide du dimensionnement d'un CESI (CSTB) adapted to Guadeloupe's sunshine

. You can change this value (if known) by using detailed mode.

4.7.2.4 Coverage Rate By Trapped Energy Recovery

If there is a trapped energy recovery system, it is necessary to explain the recovery coefficient in a document such as a calculation note or a laboratory test report – to be produced by the manufacturer of the system. This note should be submitted on the RTG/DPEG platform in the same way as the project calculation note.

4.7.2.5 Special Cases

If you are using a domestic hot water boiler that is not proposed in the *type* drop-down menu, we recommend modelling it using an electric heater with a trapped energy recovery system. This modelling should be indicated in the RTG calculation note and the rate of recovery input should be explained.

Example: photovoltaic solar panel powered domestic hot water tank:

- *If the tank is only PV panel powered: the recovery coefficient is equal to 1*
- *If the tank is powered via a PV panel + network: the recovery coefficient should be estimated based on the hourly DHW need cross-calculated against hourly PV production. A simplified calculation is enough. In this example, a calculation over an example day would be enough.*

4.7.3 Cooling Generation

4.7.3.1 *Connecting cooling generators to thermal zones*

A cooling generator can be used to address air-conditioning needs in one or several thermal zones. It is, therefore, necessary to specify:

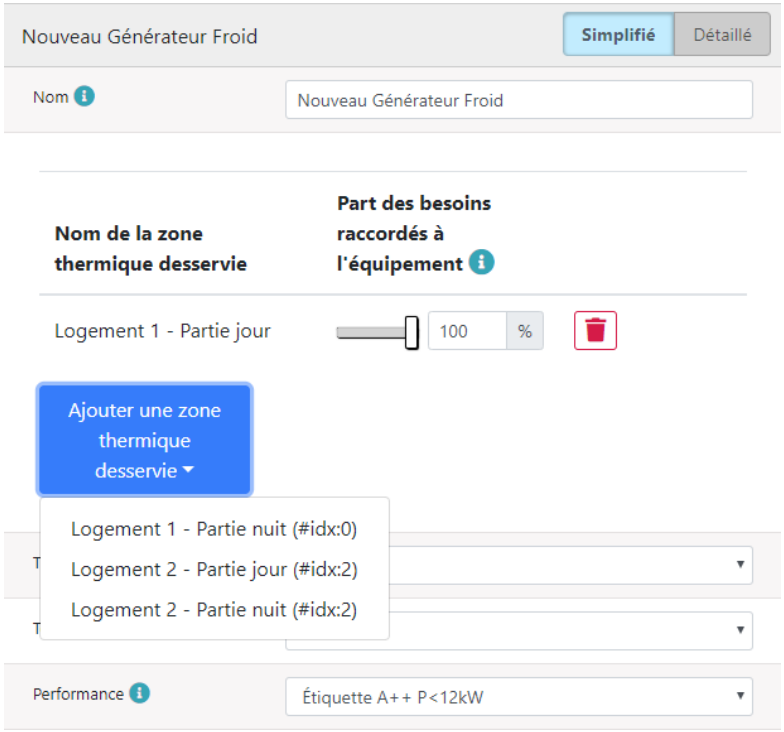
- Which thermal zones are supplied by the system in question?
- What share of needs in each thermal zone is provided by the system in question.

Note: the share of the needs connected to the amenity is the share (area and/or time) of the use zone served by the amenity. This does not correspond to the actual 'coverage rates' of the needs of the system (which will be dynamically calculated).

Examples:

1. An office building with 60% of its premises (in surface area) supplied by split air-conditioners and 40% by contained air-conditioners. In this case, the share of needs connected to the split air-conditioner is 60% for the thermal zone (only one thermal zone for the office). The share of needs connected to contained units is 40%.

2. An office building with 100% of its premises cooled by split water loop air-conditioners but also has 50% of its premises supplied by ancillary contained heat pumps to be used 20% of the time (supplementary). In this case, the share of needs connected to the split water loop air-conditioner is 100% – (50%*20%) = 90% for the thermal zone (only one thermal zone for the office). The share of needs connected to contained units is 10%.



Unlike domestic hot water boilers which are connected to use zones (and thus are shared amongst thermal zones – daytime and night-time), cooling generators are connected to thermal zones – (therefore possibly for daytime and night-time areas for living units).

4.7.3.2 Average annual yield

In detailed mode, you can specify the average annual yield of the system in question. This yield is otherwise automatically calculated in simplified mode using the description of the system coupled with an example database of values.

The average annual yield is not the system's nominal yield but rather its actual yield in real conditions across the year.

It is highly recommended to use simplified input to complete information about cooling systems.

In the event where detailed input is used, the user should be able to explain the average annual yield input for the project in the calculation note (for example, using results of an hourly simulation in a dynamic energy simulation tool, using Guadeloupe's climate, laboratory testing, or specific studies).

4.7.4 PV Production

Warning: an electric photovoltaic production system is to be specified at a **module** level.

Therefore, the peak power and unit surface area required by the interface are the power and the surface area of A module and not the whole system.

The input field *Nombre de modules* [Number of modules] is used to switch to the complete installation.

Where an installation has been carried out using different modules or directions, you can create as many *Production PV* [PV Production] objects as there are types of modules and/or directions and/or inclinations.

4.7.5 Lighting system

Lighting systems should be input for each use zone: see 4.6.3 Lighting.

5 GUIDE FOR USING THE RTG/DPEG CALCULATION PLATFORM

5.1 Reminder of the platform's features

The RTG platform is an internet platform in which there is a calculation tool dedicated to regulatory calculations, which can be used by any operating system (Windows, Android, OS, etc.).

It was designed alongside Guadeloupe's professional community, with the wish to be both intuitive and to make calculations dependable, all while reducing study time.

Additionally, it can be used, for RTG compliant projects, to receive a **compliance certificate for Building Permit applications** as well as **the DPEG certificate**.

Any studies carried out on the platform will be transferred to the OREC database, namely for reuse in later DPEG studies.

5.2 Access the platform

The latest RTG calculation tool can be accessed online via Guadeloupe region's website: www.guadeloupe-energie.gp. (or direct link: http://rtg.dimn-cstb.fr/)

It can be accessed via a variety of devices (tablet, smartphone and computer) and by various operating systems (PC, Apple and Android).

It is aimed at the project owner and the supervisor of works for new projects, but also DPEG diagnosticians and info-énergie advisors.

As part of the RTG calculation (thermal regulations for new builds), the tool is freely accessible by anyone who opens an RTG account.

DPEG features about an existing building are only available to accredited organisations and bodies that have been approved by these organisations.

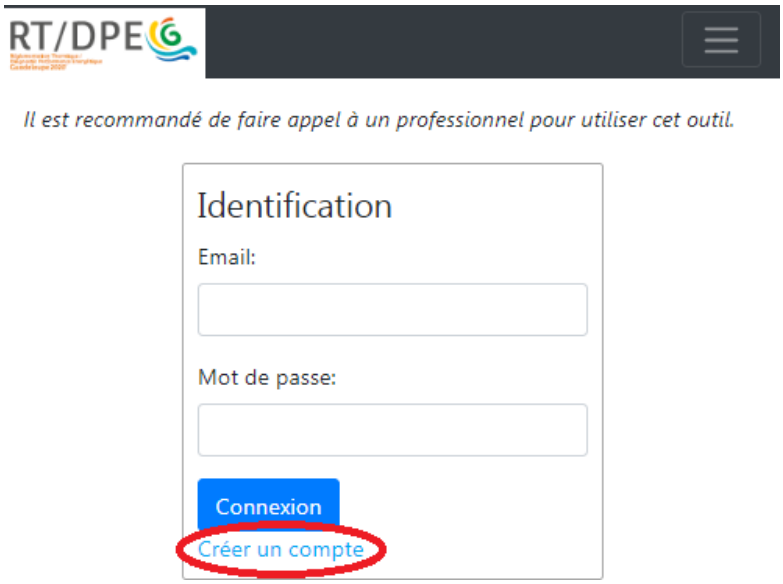
5.3 Create an account

There are several types of accounts, depending on the type of use.

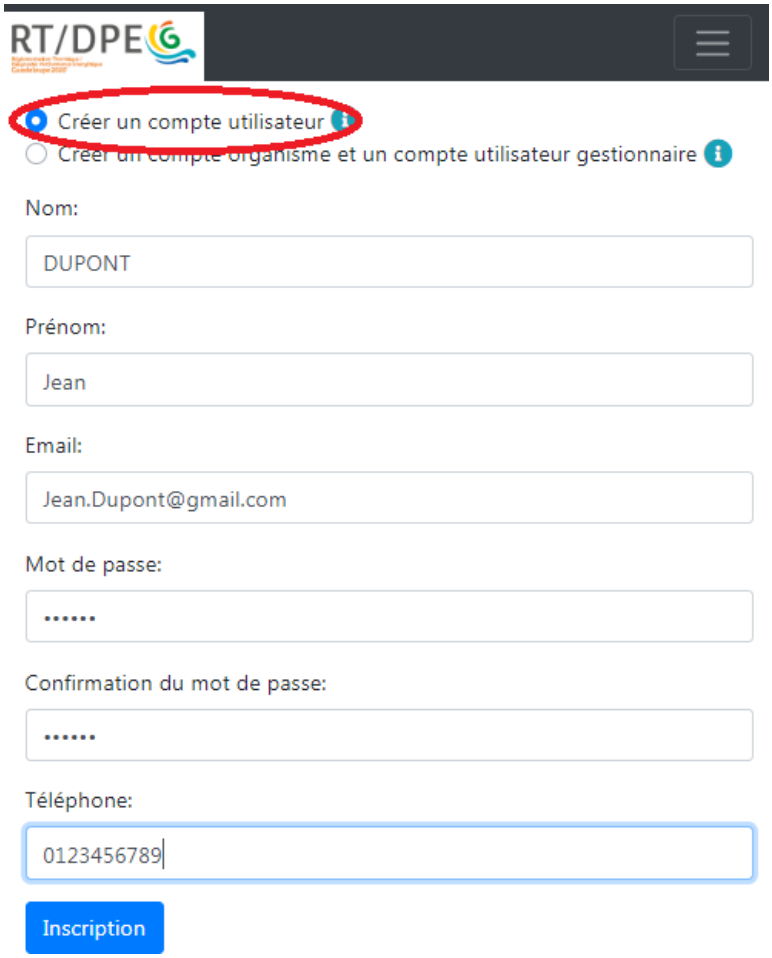
5.3.1 User account

The classic user account is an individual account and can be used to carry out RTG calculations (new build). It can be easily created:

On the homepage, click on *Créer un compte* [Create an account]



Then click on *Créer un compte utilisateur* [Create a user account] and fill on the different fields.



Once you have registered, the platform will tell you that your account was successfully created.

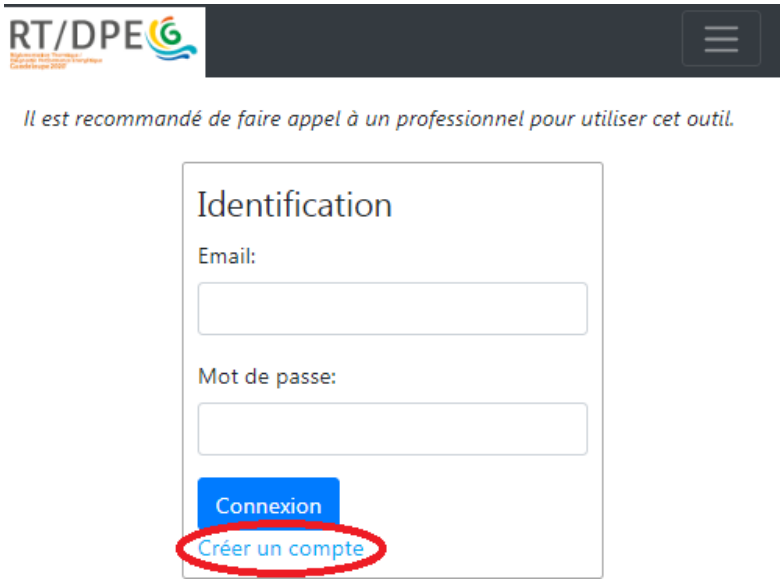
You can now log in.

A user account can at any point be connected to an existing organisation by the manager of the latter.

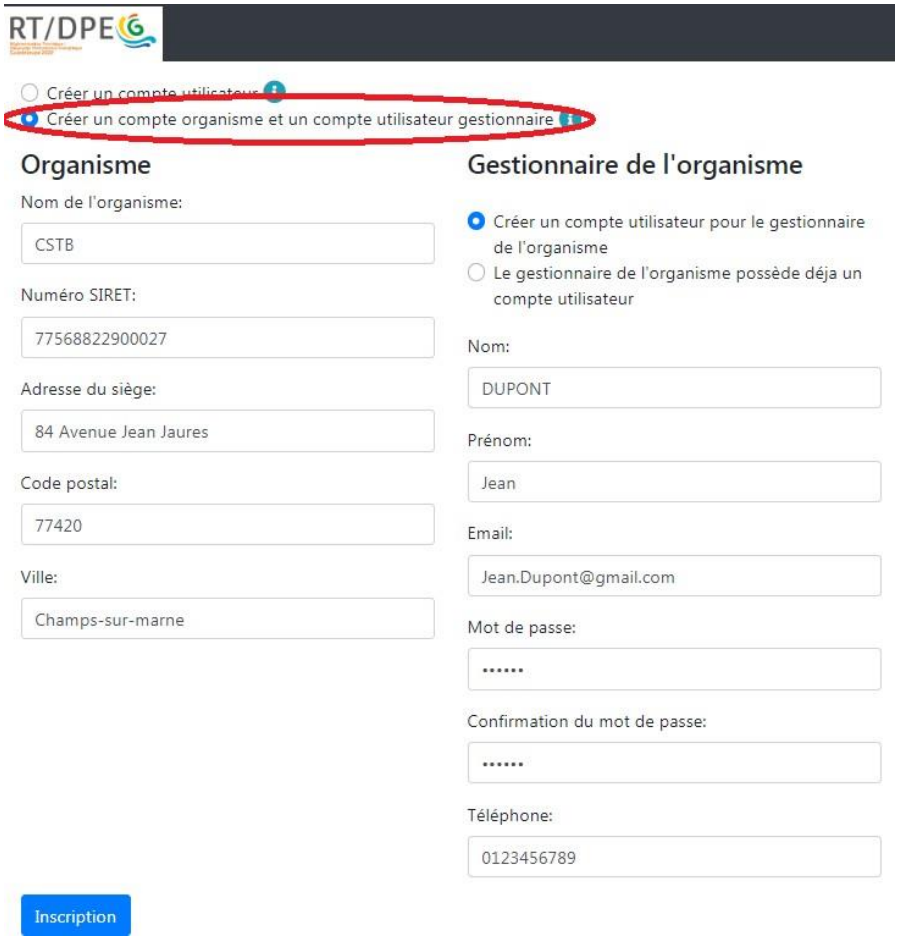
5.3.2 Organisational Account

An *Organisme* [Organisational] account is a collective account for companies. It can be used to manage users internally (individual user accounts) and to make projects available to the whole team. This is how it is created:

On the RTG 2020 homepage, click on *Créer un compte* [Create an account]



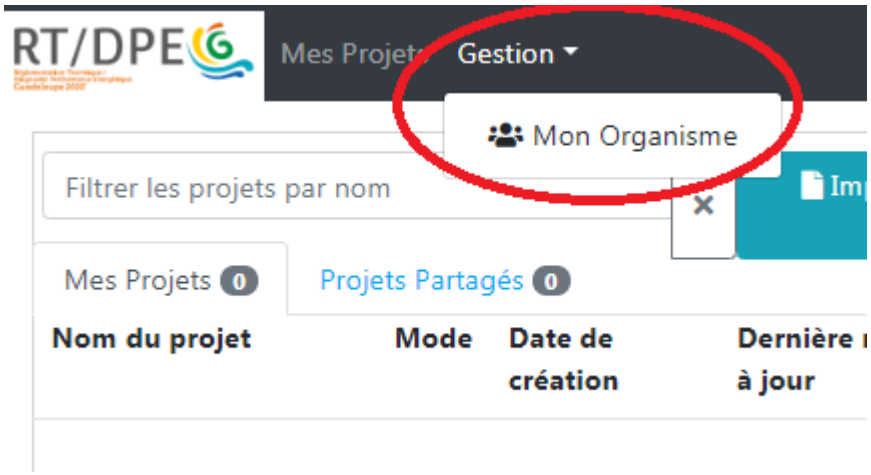
Then click on *Créer un compte organisme* [Create an organisational account] and fill on the different fields.



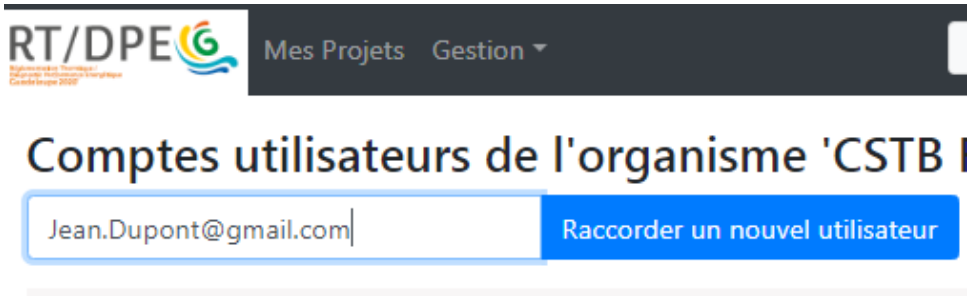
Once you have registered, the platform will tell you that your account was successfully created.

You can now log in. and add pre-existing *comptes utilisateurs* [user accounts] to your organisation:

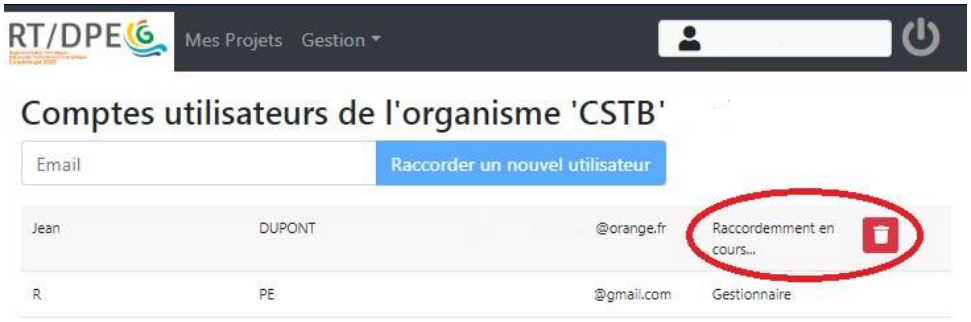
In *Gestion* [Management], click *Mon Organisme* [My Organisation].



Enter the e-mail address of the user account.



Once this has been done, the account will be added to the list of organisation users with a *Raccordement en cours…* [currently connecting] note.



The user must then accept the connection the next time they log in.

An account can be removed from the organisation by clicking on the bin icon next to the user's name.

5.4 General Ergonomic Principles

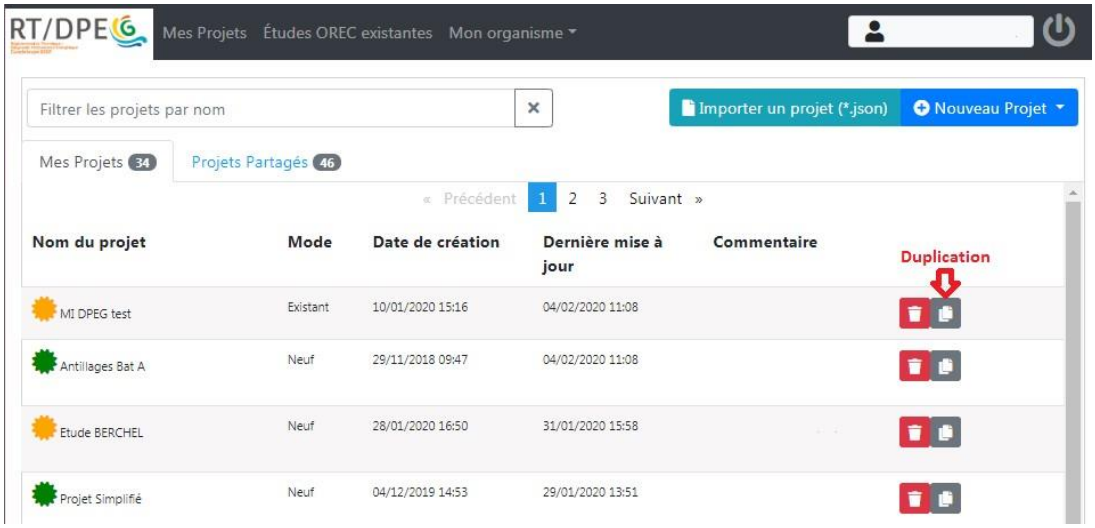
- **Automatic backup:**

All open and modified projects are saved in real-time on the platform. If there is a change to the project, it is automatically saved every minute. This prevents data loss if there is an internet problem.

Warning: in contrast, this needs certain projects to be duplicated if the user would like to try different set-ups without losing the original project.

- **Duplicating:**

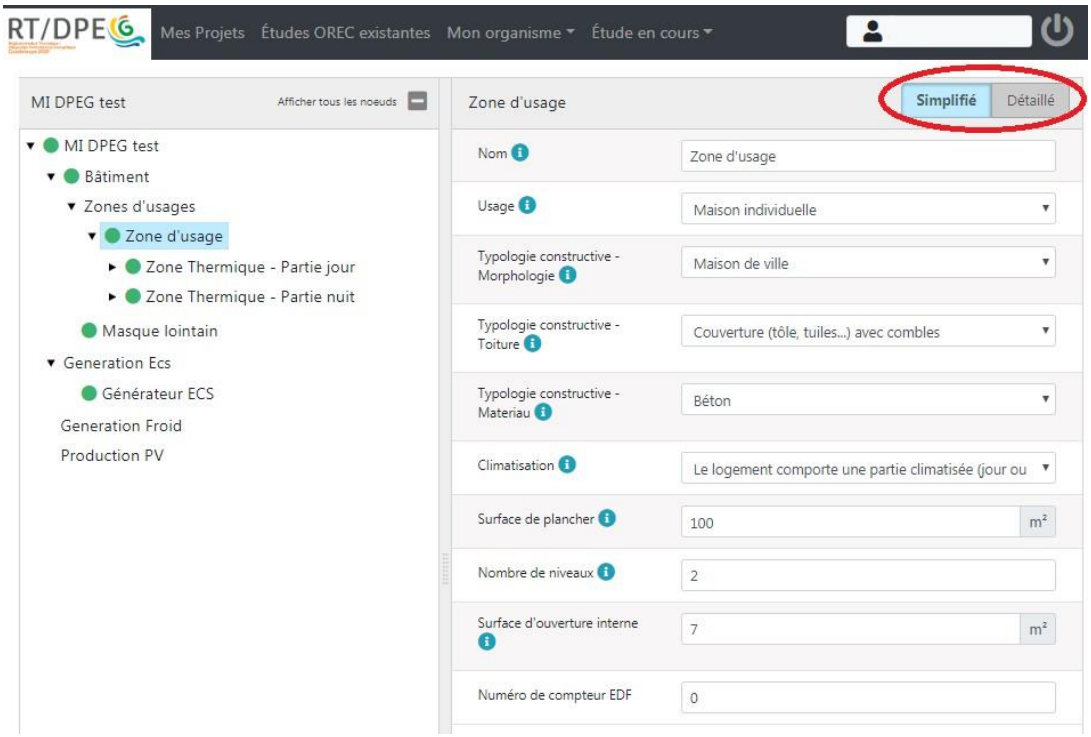
Duplicating a project can be done directly on the project homepage using the copy icon.



- **Simplified/Detailed mode:**

When inputting information about the project, most data can be input in simplified mode or detailed mode, depending on your choice.

Switching from one to the other is done using the tabs on the top right of each item when it has been selected.



If this option does not appear, this means that simplified mode cannot be used for this part.

When the simplified form has been chosen, the form in detailed mode is automatically filled in by the tool (averaging some calculation assumptions)

You can use this system in three different ways:

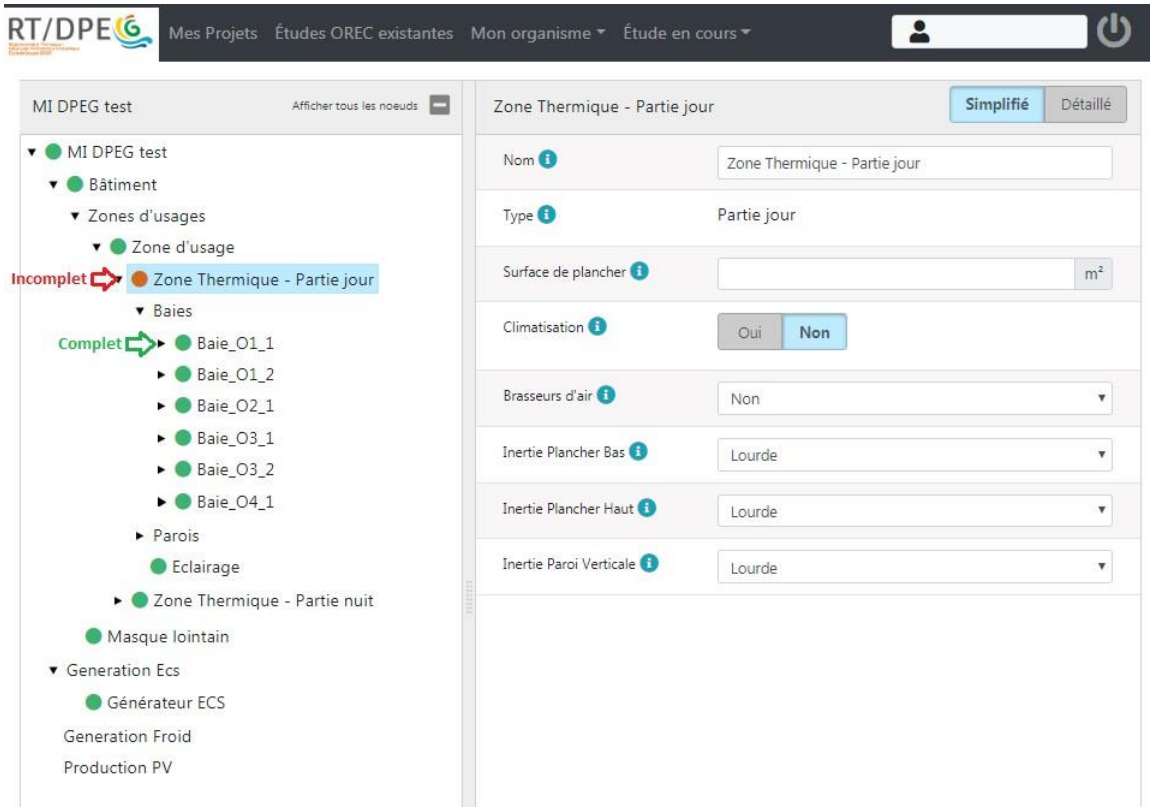
- Input data in simplified mode (fastest but less precise)
- Input data directly in detailed mode (more precise but more time consuming)
- Input data in simplified mode then switch to detailed mode to confirm and modify values. *This method is a good compromise between speed/precision.*

Warning: *switching from simplified mode to detailed mode does not remove information that has already been input in simplified mode. The opposite is not true: if you switch from detailed mode to simplified mode, new data that has been input in simplified mode will overwrite the data input in detailed mode.*

- **Complete/Incomplete Indicators:**

Completion indicators of fields can be seen next to each part of your project.

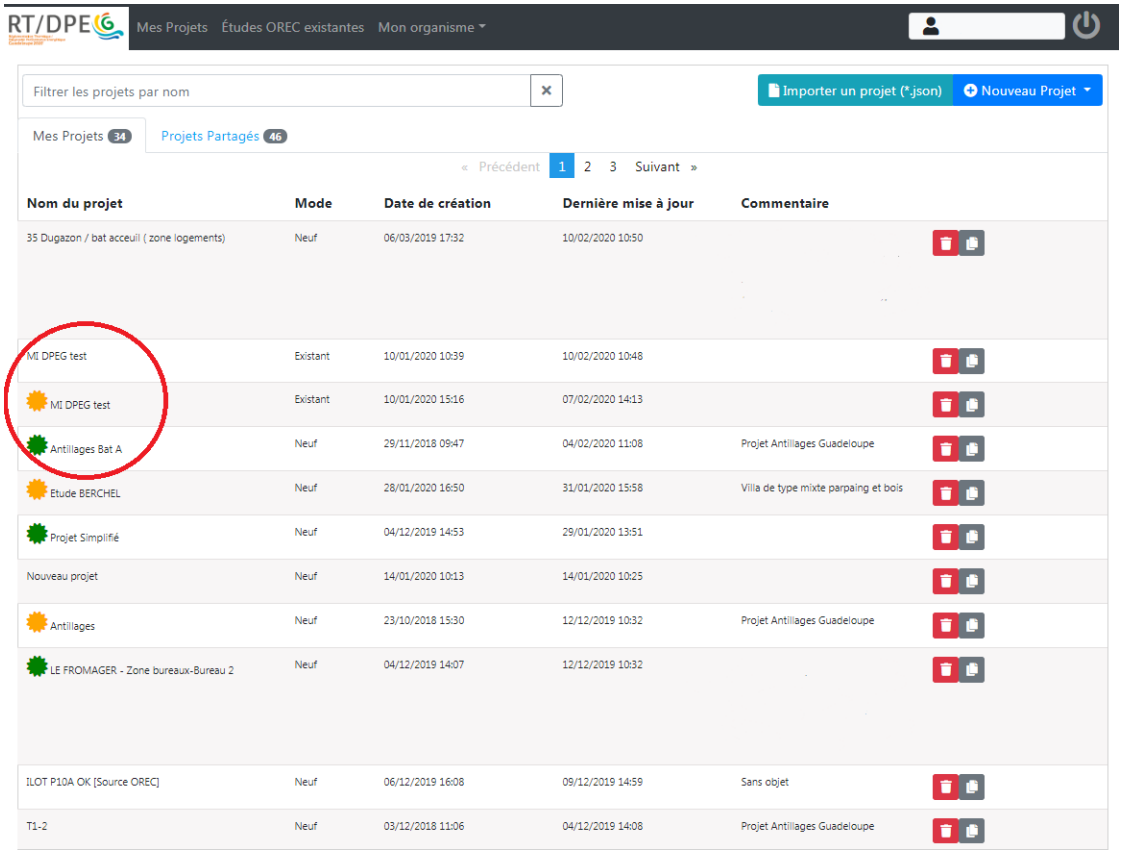
A green dot indicates that the item is complete whereas a red dot means that it is incomplete.



- **Progress Indicators:**

Progress indicators are also available. An icon
has been added in front of the project's name in the list of projects.

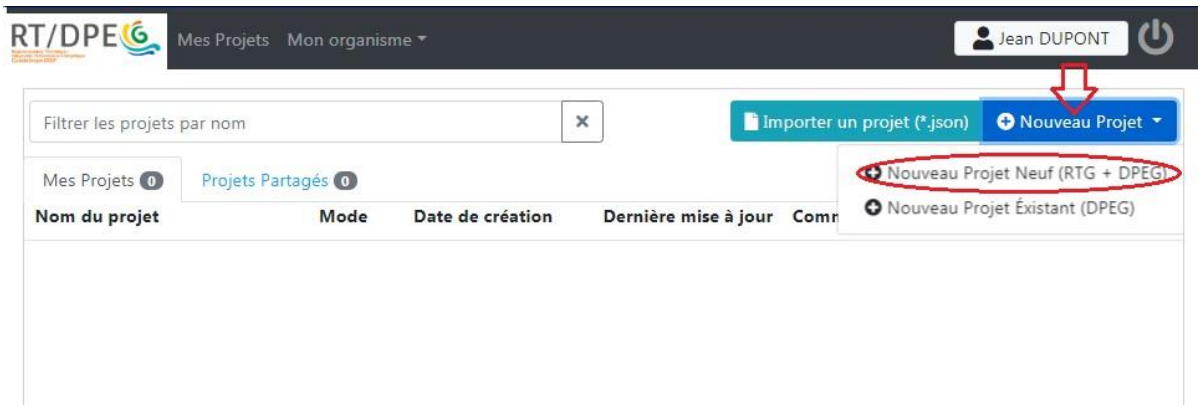
- When there is no icon, the project is yet to be completed.
- When a **yellow** icon appears, a study will be considered official, and a compliance certificate (BP) can be issued.
- When a **green** icon appears, the study has been approved and closed.



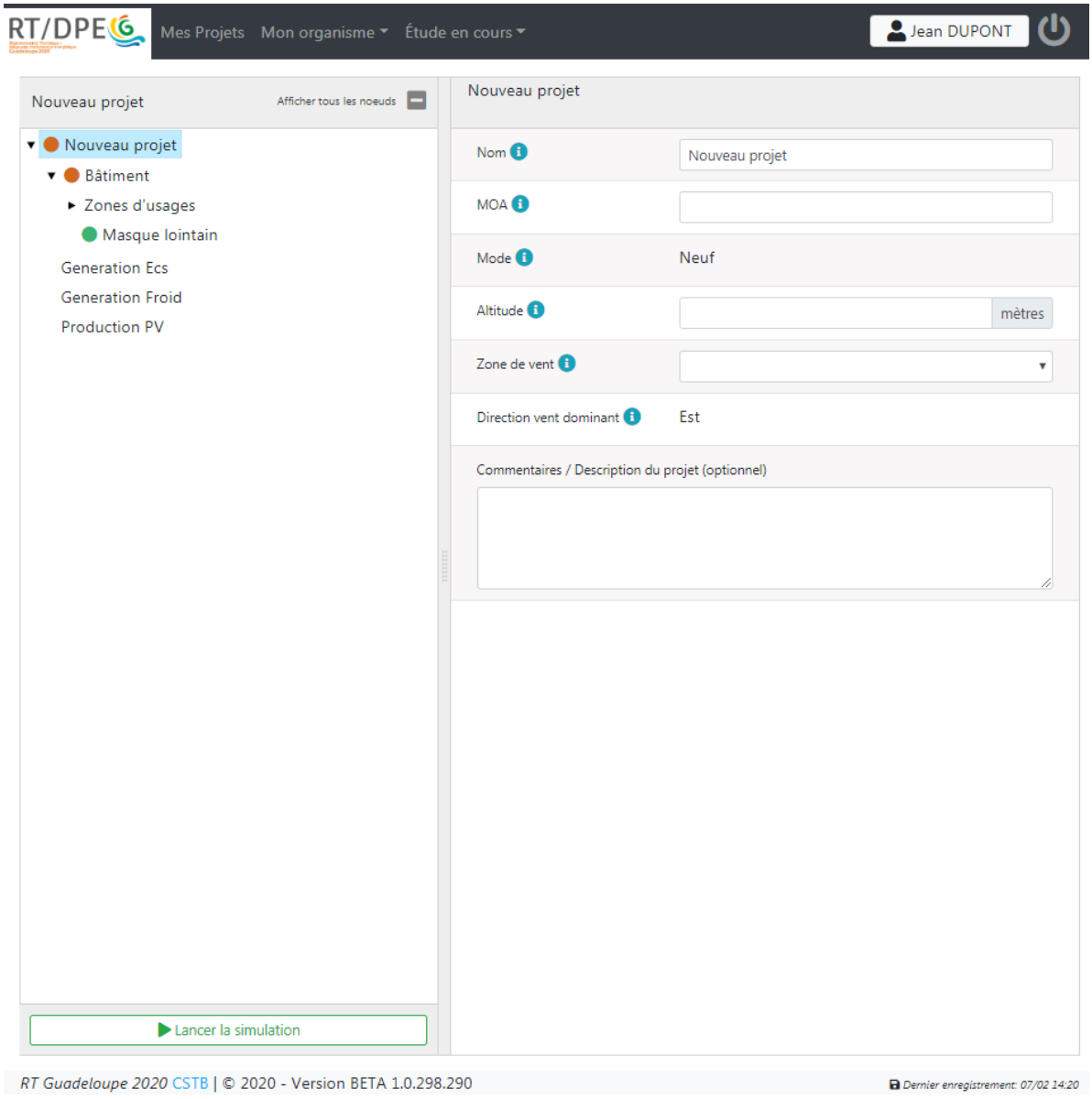
5.5 Create a project

Creating a new project for a new build can be done from the platform's homepage.

Select *Nouveau Projet* [New Project] then *Nouveau Projet Neuf* [New project for new builds] (RTG + DPEG).



This creates a new project which needs to be completed before any calculations can start.


RT/DPE
Mes Projets
Mon organisme
Étude en cours
Jean DUPONT
Nouveau projet
Afficher tous les noeuds
Nouveau projet
Bâtiment
Zones d'usages
Masque lointain
Generation Ecs
Generation Froid
Production PV
Lancer la simulation
Nouveau projet
Nom
Nouveau projet
MOA
Mode
Neuf
Altitude
mètres
Zone de vent
Direction vent dominant
Est
Commentaires / Description du projet (optionnel)
RT Guadeloupe 2020 CSTB | © 2020 - Version BETA 1.0.298.290
Dernier enregistrement: 07/02 14:20

5.6 Input data into a project

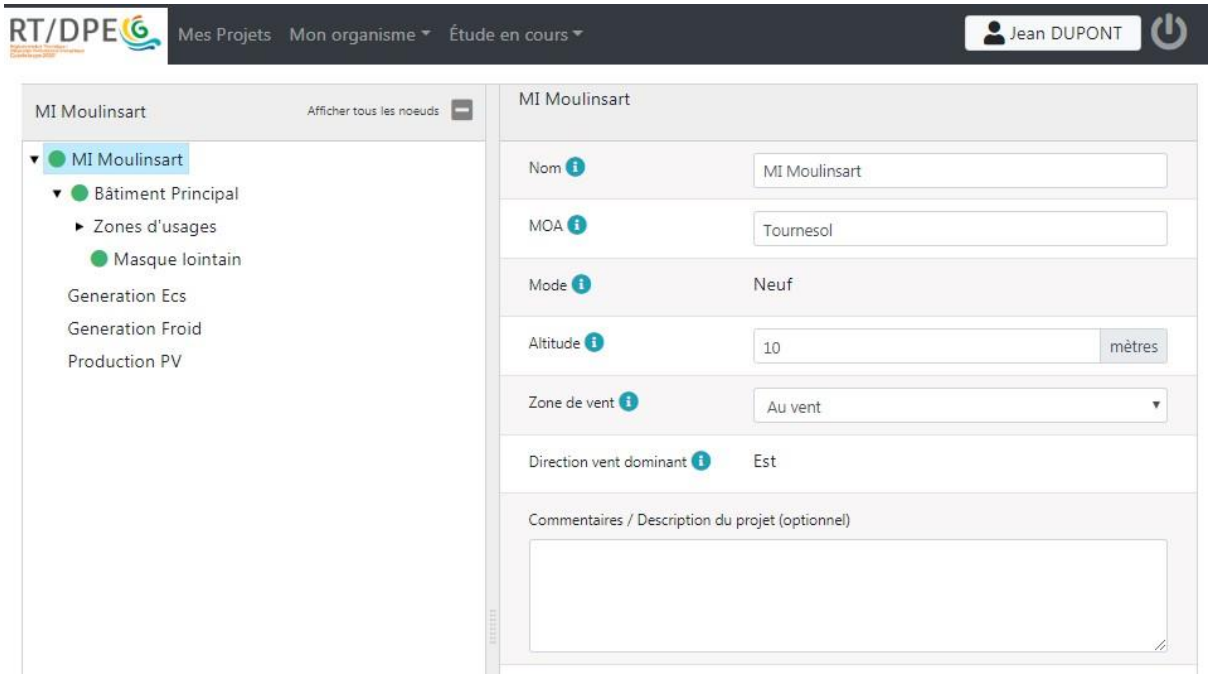
In this Chapter, we will describe, step by step, the input process for a normal project on the RTG platform.

5.6.1 Project node

The first step is to select the *nouveau projet* [new project] node in the left window, as shown above. The first form will appear in the right window. This is essentially general information about the project.

Please choose your project name carefully. It will be used both as a means of classification in your project library, and as a label for the various certificates and in the OREC database (used for DPEGs in particular).

Altitude and Wind load are two data useful for calculations.

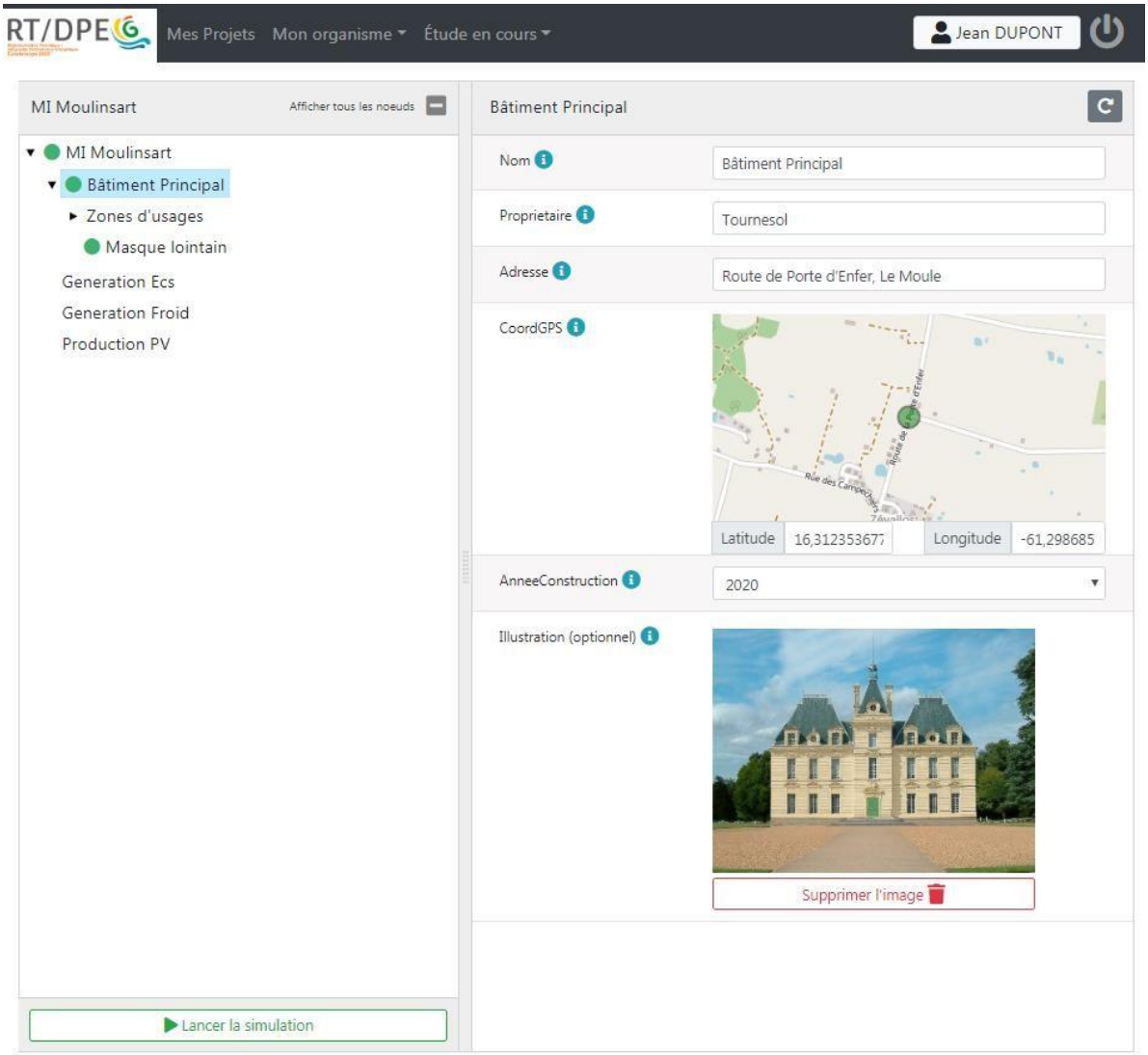


5.6.2 Building node

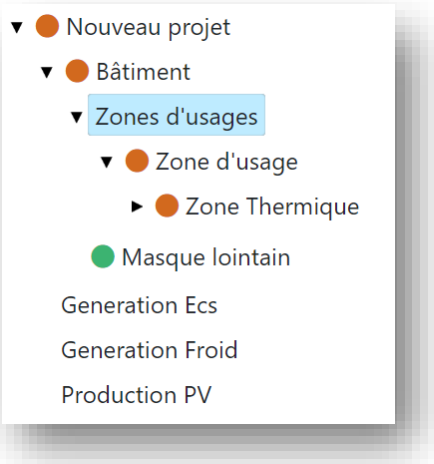
The platform will then ask for information about the building.

Its address and geolocalisation are the most important data because DPEG diagnosticians can then retrieve the original files to complete the data. You should therefore fill in these fields carefully.

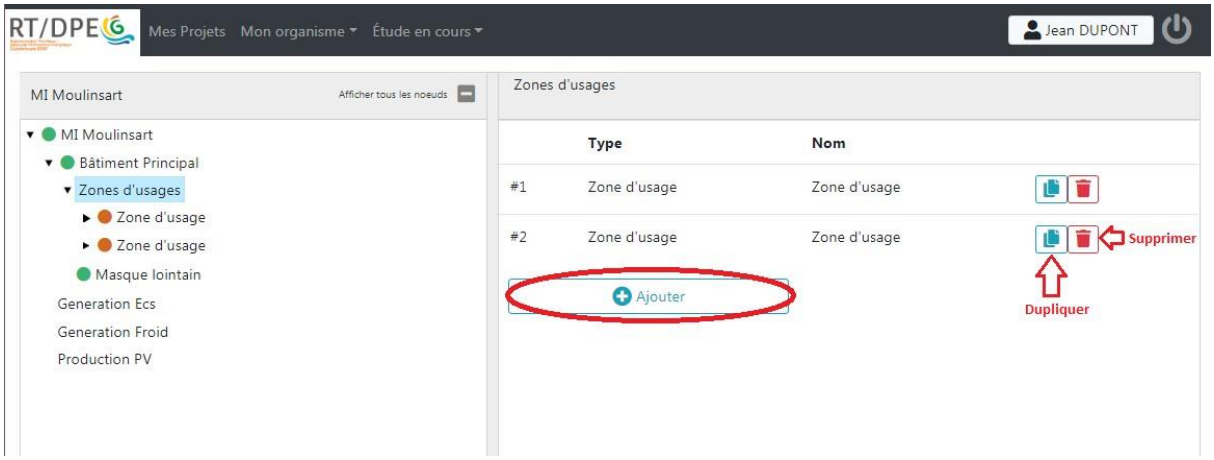
An image is compulsory and will appear on certificates. This will help make recognising the building easier. For a new build, you can upload an image of the facade of the building, a viewpoint or even a top view of the ground floor, etc.



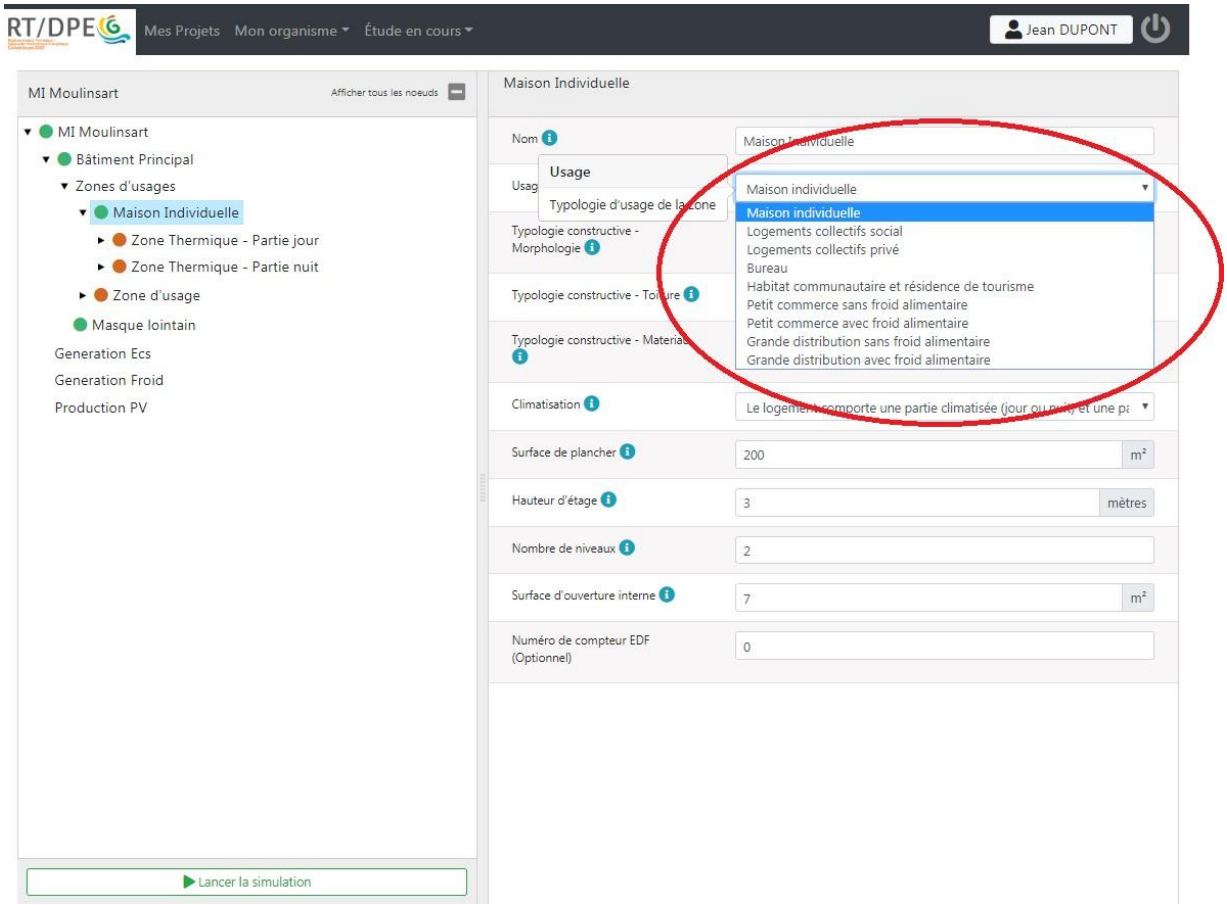
5.6.3 Use zone node



This is where information about use zones is input. In the *Zone d'usages* [use zone] item, specify the number of use zones necessary. A new use zone can be created by duplicating a pre-existing zone. /



Once these zones have been added, they will appear in the left window. It is then necessary to fill in the questionnaire for each of them: uses of the different areas, general information on the building type (which will open the fields necessary to correctly define the project). Take care to correctly name each zone, this will make your work easier later.



Each type of use will lead to different types of information being requested, for example: for an individual house, the type (townhouse, villa, individual terraced houses), the main type of roof and the type of material used will be needed.

Following this, the user will need to specify if there is air-conditioning, which will divide the space into a daytime zone and night-time zone. When *Le logement compote une partie climatisée (jour ou nuit) et une partie non climatisée (jour ou nuit)* [The living unit has an air-conditioned area (day or night) and a non-air-conditioned area (day or night)] is selected, two thermal zones will automatically be created.

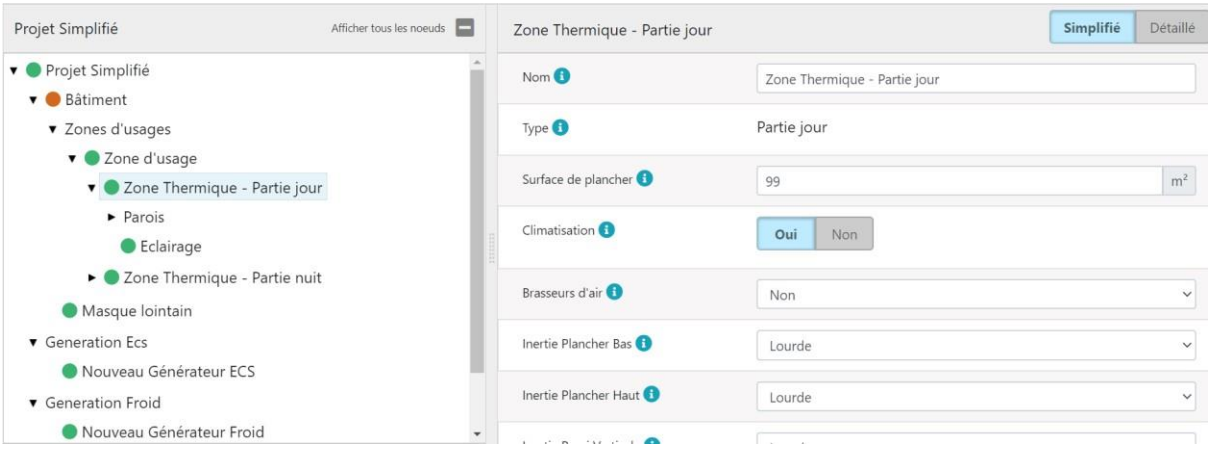
The following information concerning quantity surveys is to be carefully input.

5.6.4 Thermal zone node

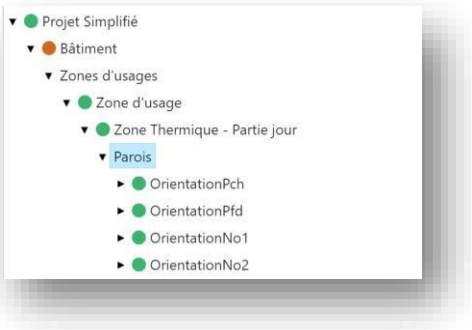
Once the thermal zone has been defined, the choice of input, between simplified mode and detailed mode, is available. Detailed mode requires often pre-calculated quantified data (to be generated according to part 4).

Floor surface is required for the thermal zone. It must be completed in accordance with the measurements of the use zone. Therefore, the sum of the surface areas of thermal zones in a use zone should be equal to the surface area of the latter.

The user will then be asked to input information about fans as well as the inertia of different walls. To estimate inertia characteristics, please refer to paragraph 4.6.4.



5.6.5 Wall nodes

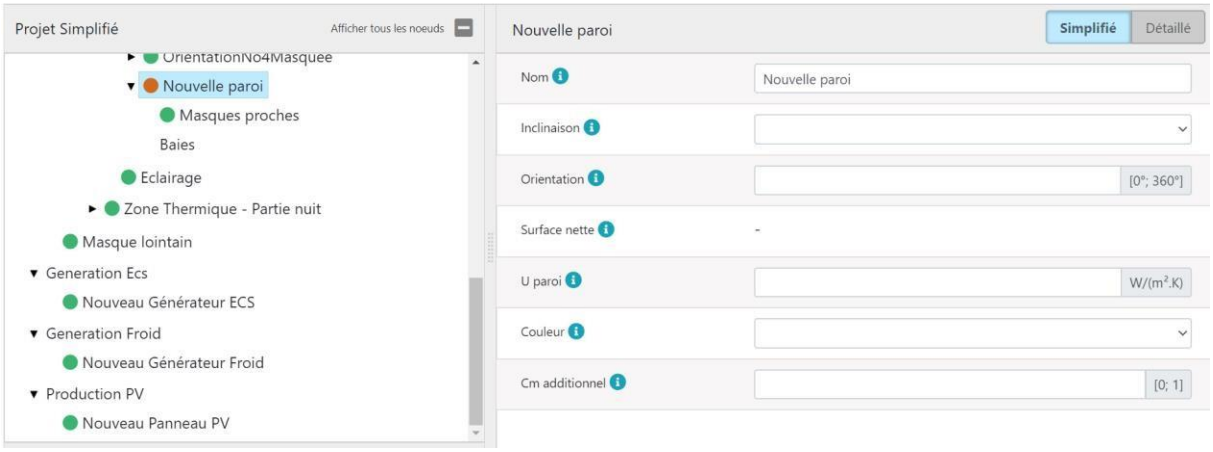


Adding walls in each thermal zone can be easily done by clicking on the *ajouter* [add] button in the respective tabs.

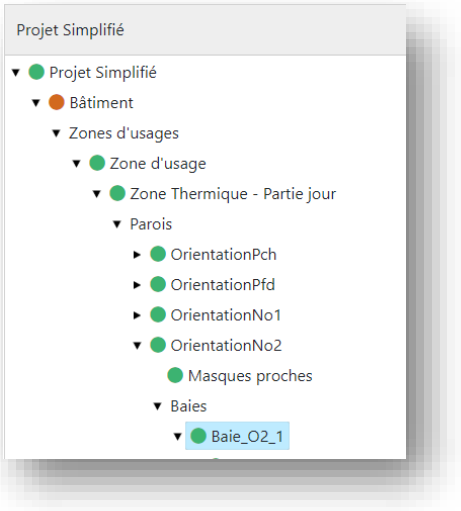
Nouvelle paroi [new wall] nodes that correspond to walls that have already been created will now appear in the left window.

Then by renaming these walls, input the direction (0°: North, 90°: East, 180°: South, 270°: West), the inclination, sizing as well as any information about the physical characteristics of the wall.

Simplifiers ('simplified' mode) can be used to pre-calculate solar gain.



5.6.6 Opening node



The user can create *openings* in a similar way to creating *walls*.

Adding openings to each thermal zone can easily be done by clicking on the *ajouter* [add] button in the respective tabs.

Nouvelle baie [new opening] nodes correspond to openings (that have already been created) that now appear in the left window.

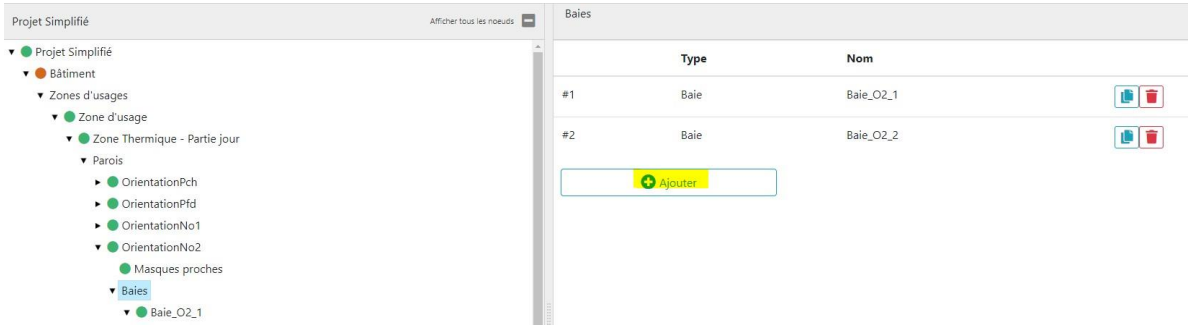
By renaming these openings, add the direction (0°: North, 90°: East, 180°: South, 270°: West), the inclination, sizing as well as any information about the type of installed opening.

Warning: do not forget to input any doors that open to the outside like an opening.

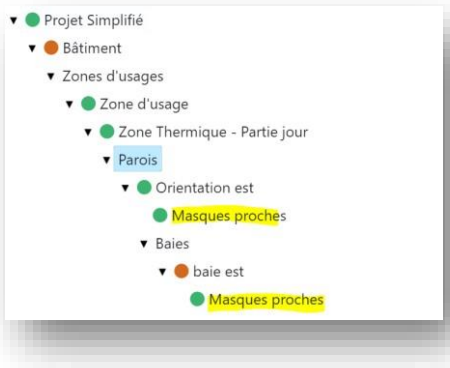
Note 1*: all openings should be declared as a 'porte' [door] or 'fenêtre' [window].*

Note 2: *a glass-pane door should be modelled like a window (using its actual measurements).*

Simplifiers ('simplified' mode) can be used to input openings by type of glass, movable protective device or brise soleil. If you would like to input more specific data, switch to 'detailed' mode.



5.6.7 Close solar protection nodal point

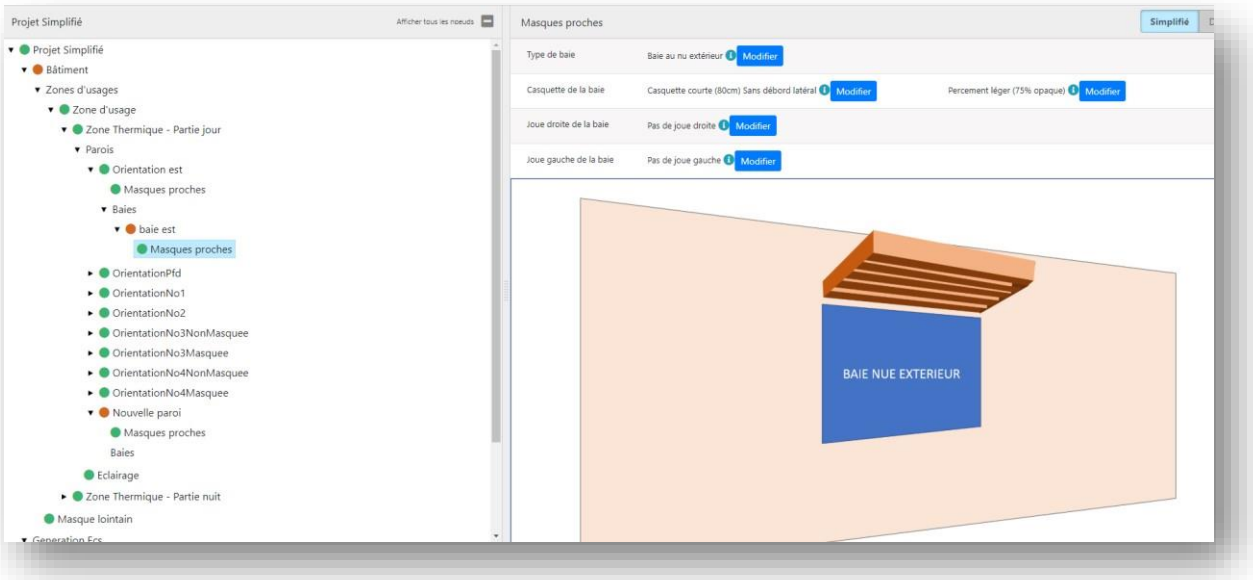


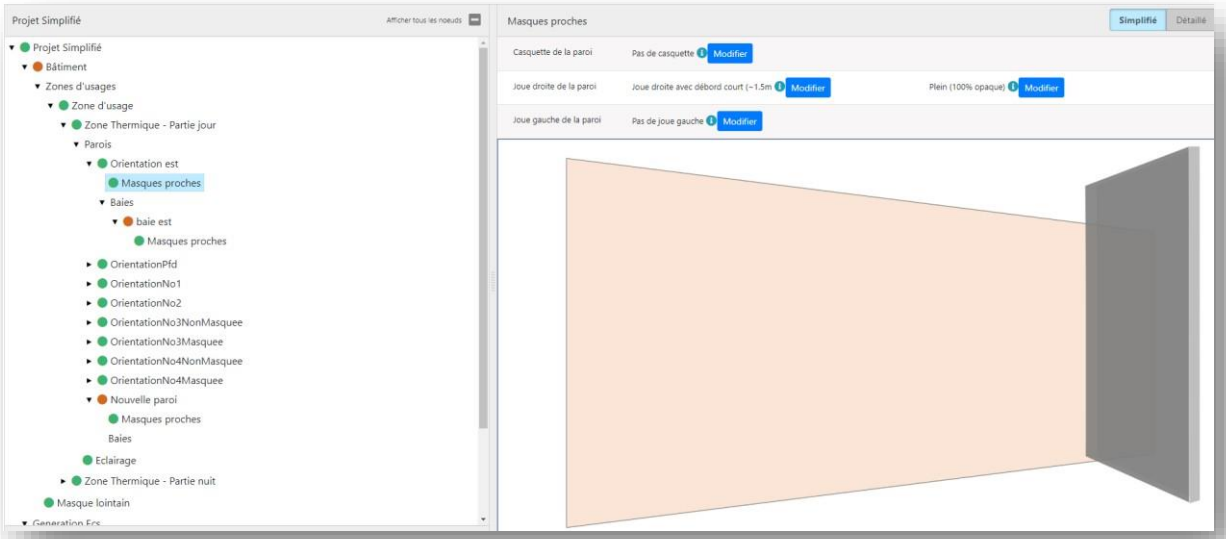
Close solar protection nodes appear for each *Nouvelle baie* [new opening] or *Nouvelle paroi verticale* [new vertical wall]
node.

Close solar protection that does not impact the opening should be input in the opening section.

Close solar protection that does impact a wall (or part of a wall that is wider than an opening) should be input in the wall section. If the protection only impacts part of the wall's width, the user should split the wall into two elementary walls: one completely impacted by the protection, and another not impacted.

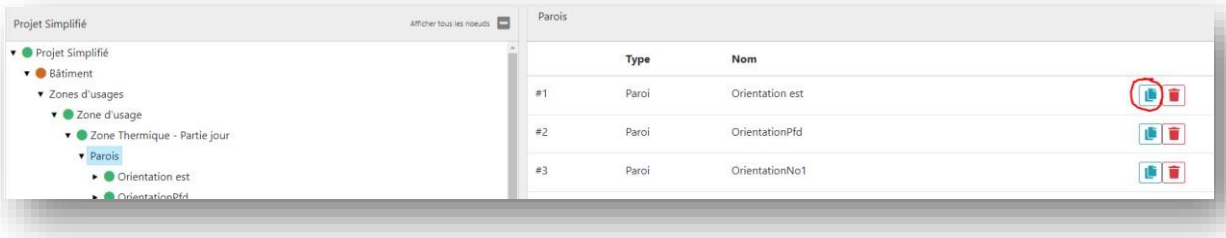
The simplifier can be used to input close solar protection for openings and walls in a
visual way.





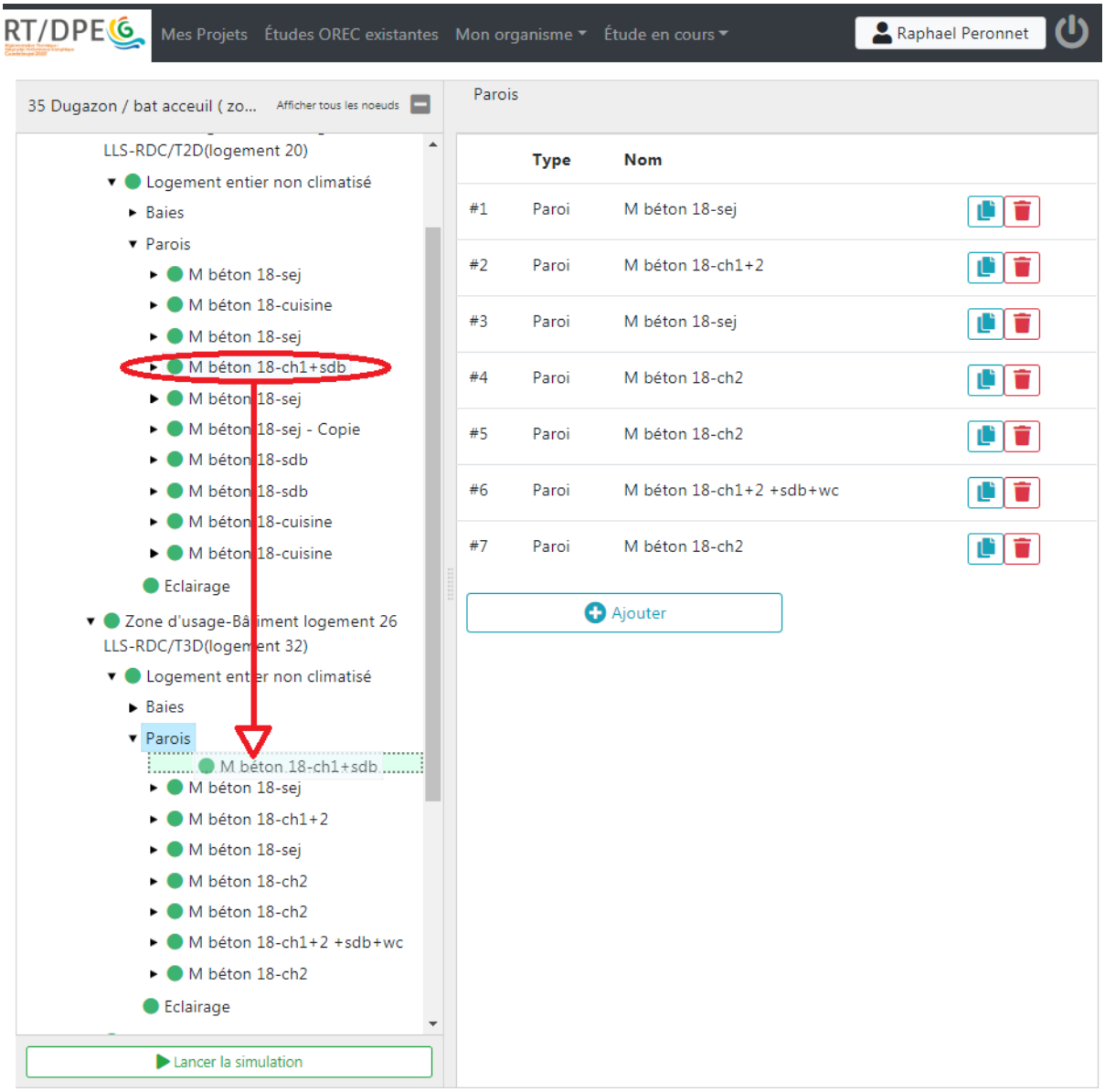
5.6.8 Opening and wall duplication feature

Using an opening or wall that has been created, the user can duplicate it in the thermal zone in question by clicking on the icon in the openings or walls root.



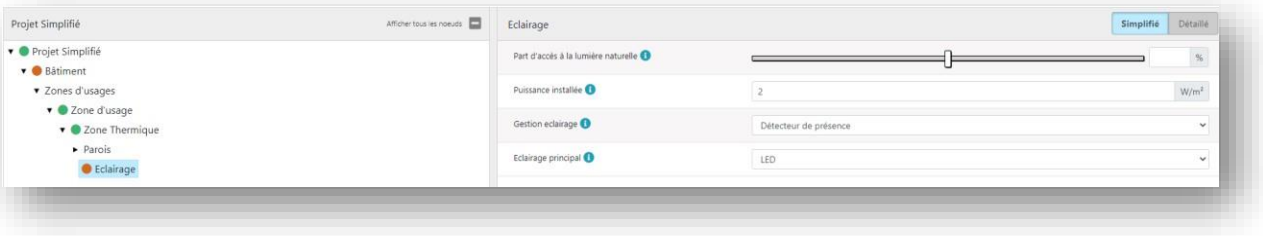
A duplicated wall will also include attached openings and protection.

To copy an opening or a wall to another thermal zone, select it and drag-and-drop it into a new zone.

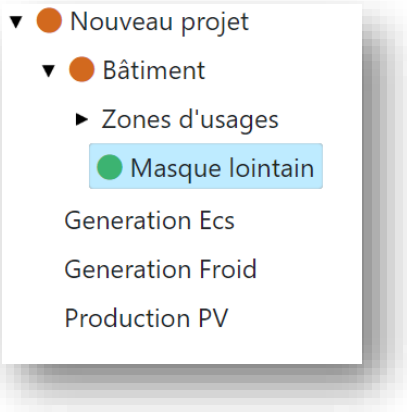


5.6.9 Lighting node

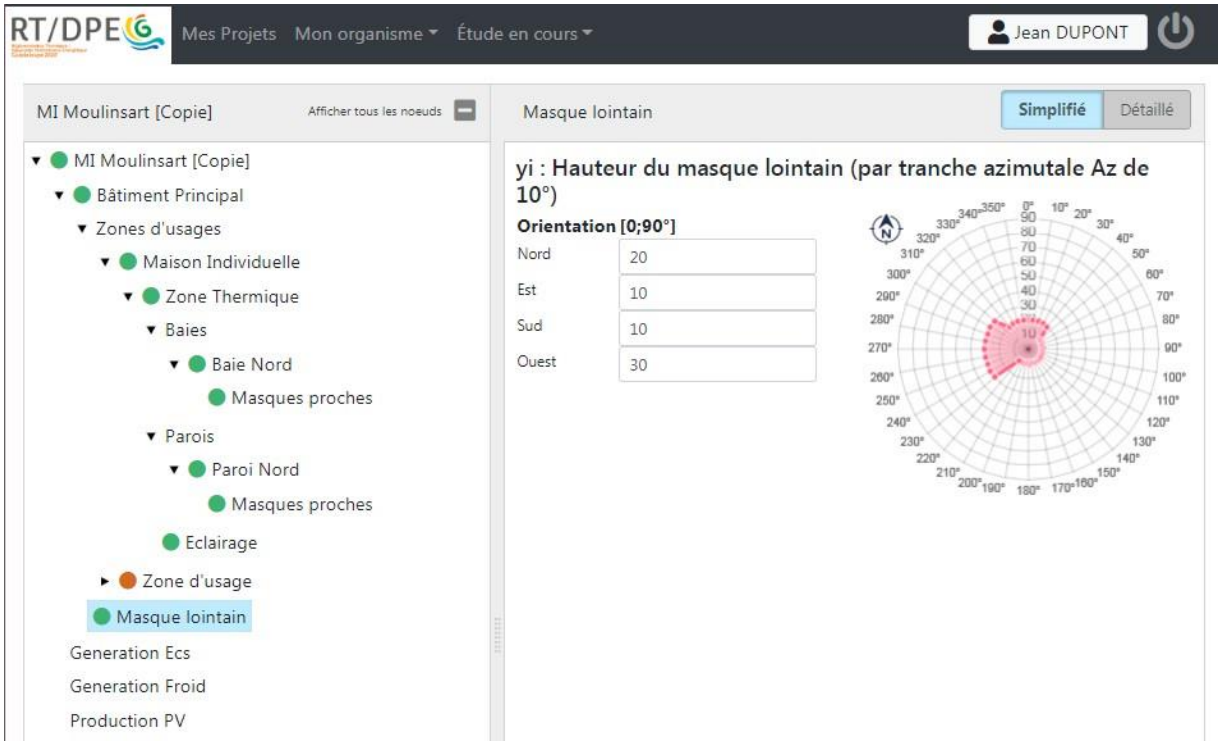
For non-residential buildings, lighting should be input. Managing lighting and the type of lighting are input data to be selected in the drop-down menu. For information: these data can be used in the calculation engine to create a lighting scenario and to calculate consumption of it.



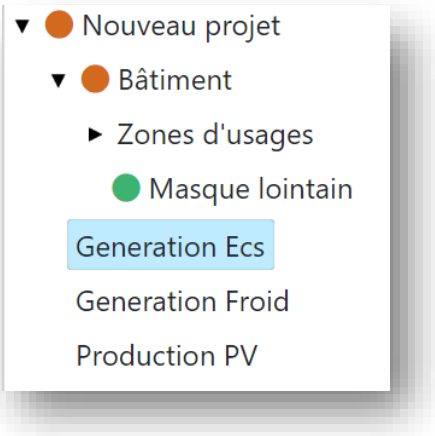
5.6.10 Distant solar protection nodal point



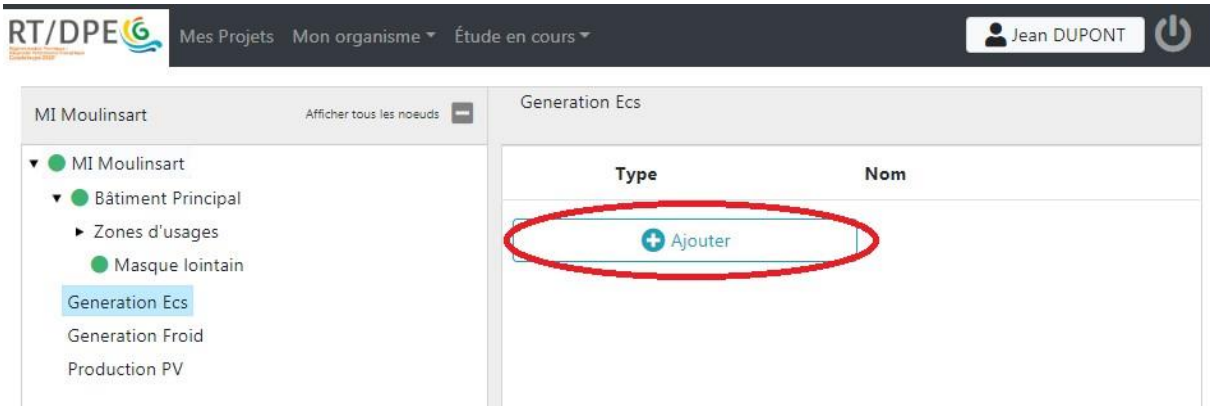
Distant solar protection is input by azimuthal range. In simplified mode, the (4) azimuthal ranges are 90°. In detailed mode, the (36) azimuthal ranges are 10°.



5.6.11 DHW (Domestic Hot Water) Generating Objects



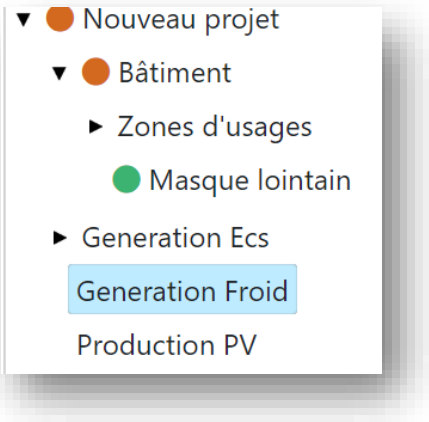
The project can be completed by adding different DHW, cooling and photovoltaic production generators. An *objet* [object] should be created for each system in the property. A *Nouveau générateur ECS* node will appear in the left window for each of them.



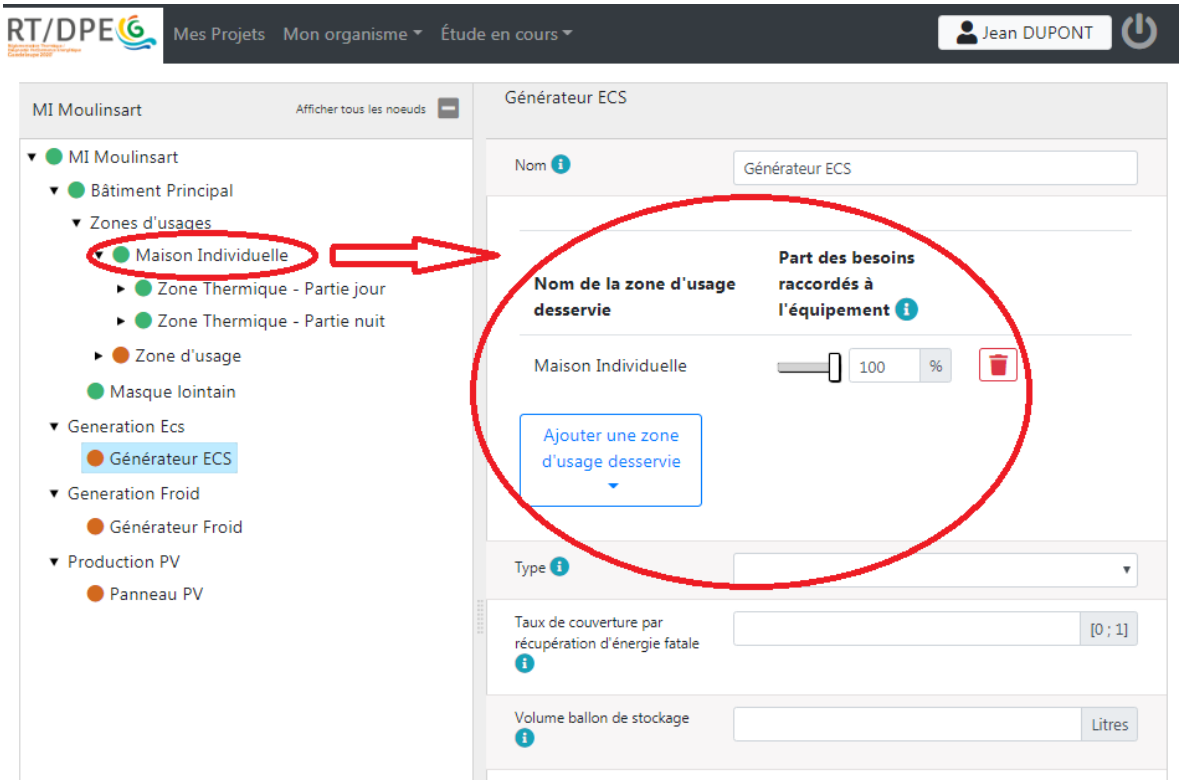
For each DHW boiler, link one or more supplied use zones and indicate the share of needs supplied by the system.

Warning: *the user should take care that the sum of all parts equals 100%.*

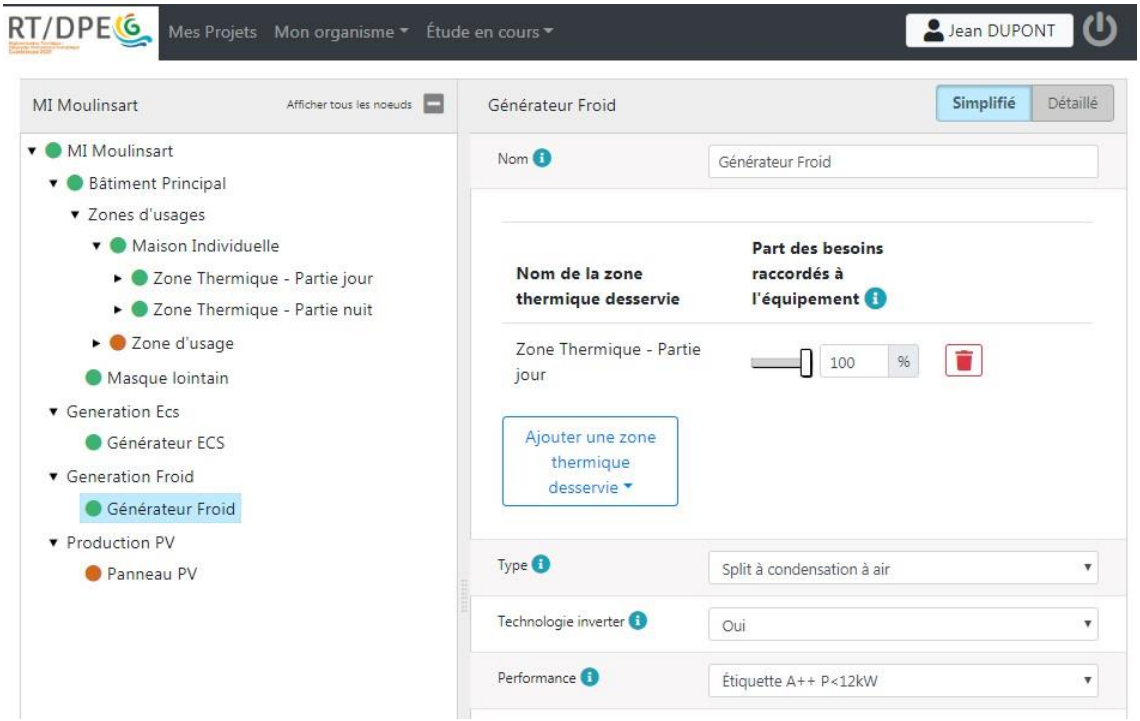
5.6.12 Cooling Generator Objects



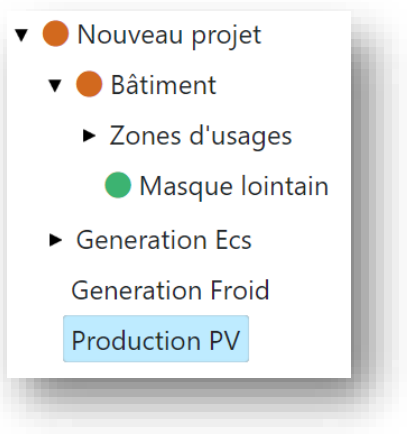
The same principle applies to cooling generators. They are linked to a *zone thermique* [thermal zone].



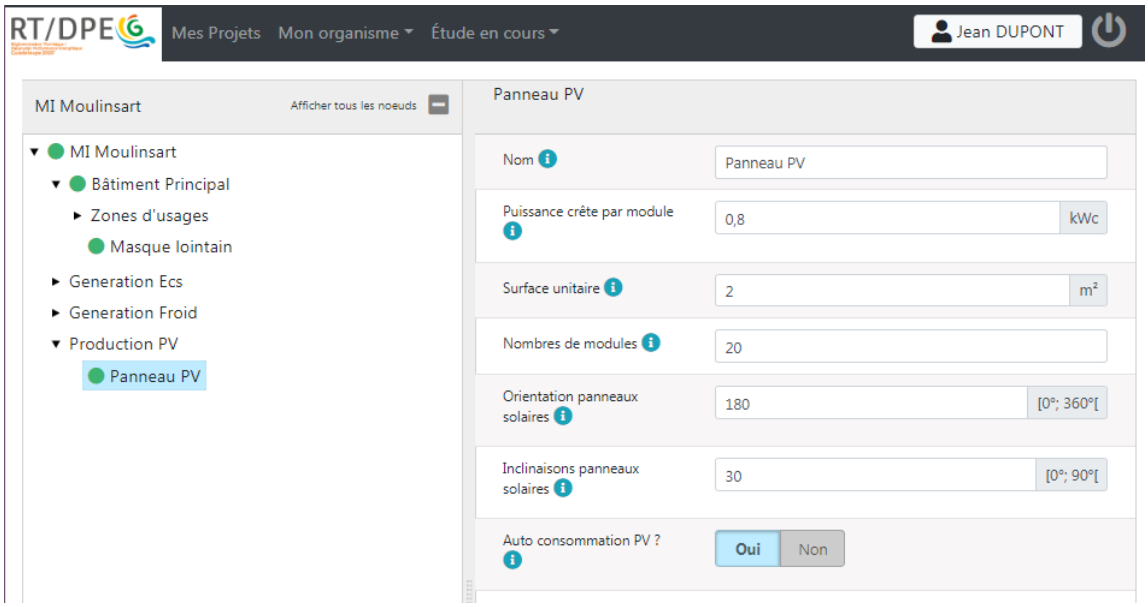
The type of system chosen will then allow the tool to calculate the necessary yield values required for calculation. Th cooling generator simplifier can therefore be used to specify system choice using the energy label.



5.6.13 PV Production Objects

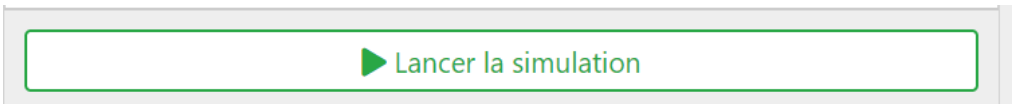


If the user wishes to add photovoltaic panels, they should also input its technical characteristics and position information



5.6.14 Launching Calculation

The user can then launch the calculation by clicking on the *lancer la simulation* [launch the simulation] button at the bottom of the left window.

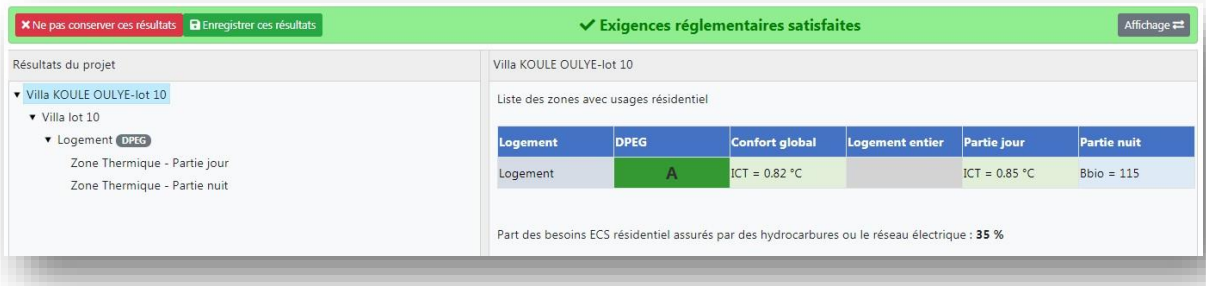


5.7 Interpreting Calculation Results

Once the calculation has finished, the project's results page will appear. There will be two types of information:

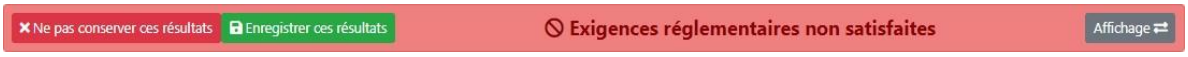
- Regulatory information
- Instructive information

5.7.1 Regulatory information



Regarding the project:

At the top of the page, it will be indicated if the project complies with RTG regulations (RTG calculation for new builds). This information will appear in a green or red banner.



Regarding the use zone:

The concept of compliance is then detailed per use zone. This can be used to identify problem areas – to be reviewed – .

***Key**:*

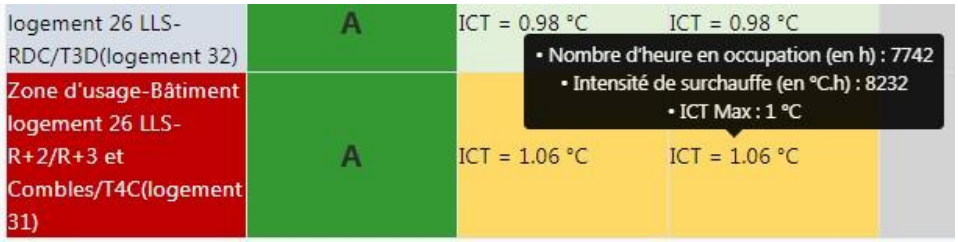
- *a use zone with a red background does not comply with regulatory requirements. A green background complies with these requirements.*
- *If the ICT is not compliant, it will appear on a yellow background. If it is, it will appear on a green background.*
- *If the Bbio is compliant, it will be on a blue background, otherwise, it will be a red background.*

Liste des zones avec usages résidentiel

Logement	DPEG	Confort global	Logement entier	Partie jour	Partie nuit
Zone d'usage-Bâtiment logement 26 LLS-RDC/T2D(logement 20)	A	ICT = 1.08 °C	ICT = 1.08 °C		
Zone d'usage-Bâtiment logement 26 LLS-RDC/T3D(logement 32)	A	ICT = 0.98 °C	ICT = 0.98 °C		
Zone d'usage-Bâtiment logement 26 LLS-R+2/R+3 et Combles/T4C(logement 31)	A	ICT = 1.06 °C	ICT = 1.06 °C		

Part des besoins ECS résidentiel assurés par des hydrocarbures ou le réseau électrique : **0 %**

To see ICT and Bbio thresholds that need to be reached, hover the cursor on the value in the table. Requirements will appear.



5.7.2 Instructive information

Regarding the project:

The DPEG label will appear in the DPEG column.

Logement	DPEG	Confort global	Logement entier	Partie jour	Partie nuit
Logement	A	ICT = 0.82 °C		ICT = 0.85 °C	Bbio = 115

The share of DHW supplied by hydrocarbons or the electrical grid is specified underneath the table. Reminder: this should be less than 50%

To get more detailed information about needs and consumption, switch to the building section.

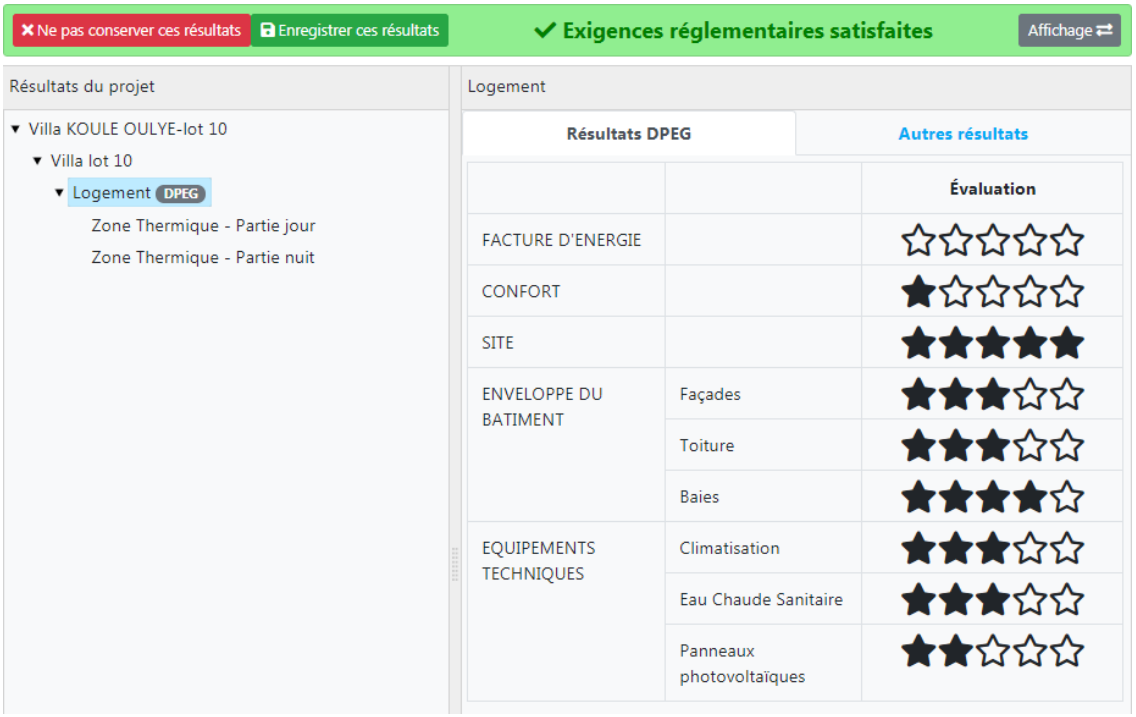
Regarding the building:

These data can be used to see the most significant needs and the most consumption-heavy clusters to improve the project.

About use zones:

Information about needs and consumption are also available in this section. They can be seen in the *Autres Résultats* [Other Results].

In the use zone results, there is also the DPEG score, which can be an indicator for project areas to change.

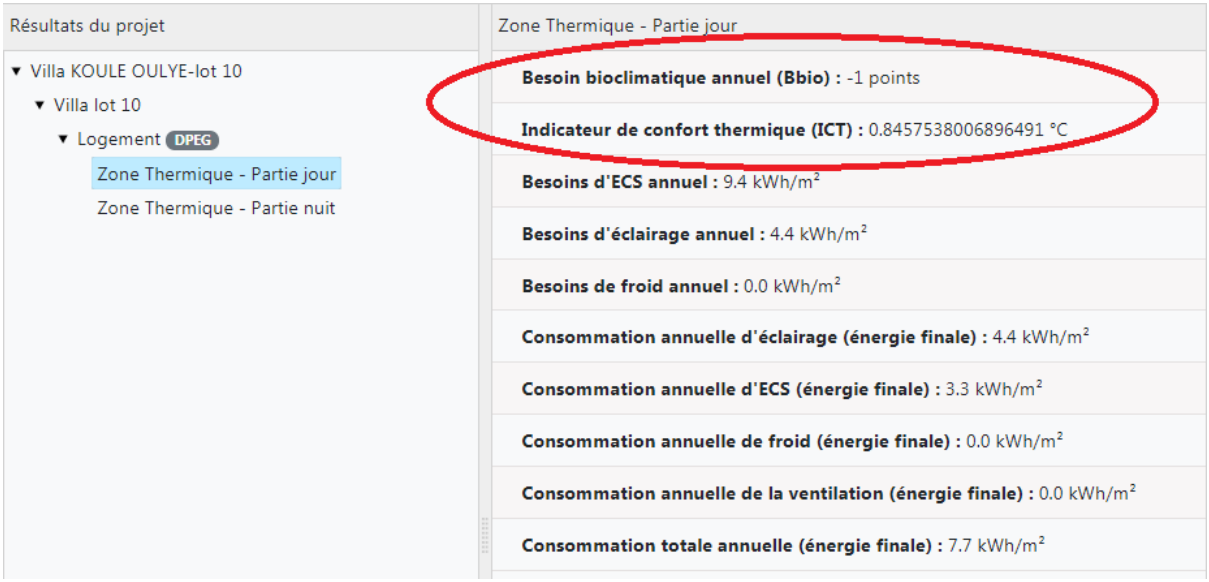


About thermal zones:

There is information about different needs and consumption, but also Bbio and ICT indicators.

Key: *ICT and BBIO indicators are* ***-1*** *when they have not been calculated.*

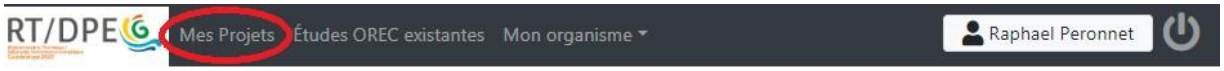
For example, a daytime thermal zone without air-conditioning will not have a calculated Bbio but will have a calculated ICT, therefore the user will see an
ICT value and a Bbio value of -1 points.



5.8 Managing the dashboard for projects and studies

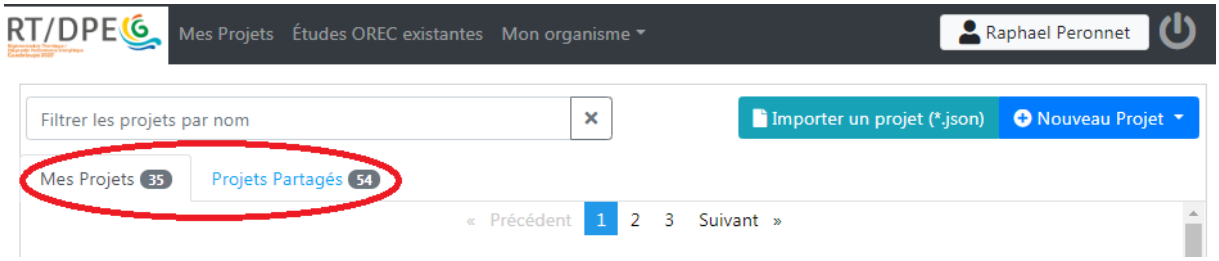
5.8.1 Projects

The dashboard can be used to access all projects, whether they have been input or are in the process of being input. It can be found at any time by clicking on the *Mes Projets* [My Projects] tab in the tools top bar.

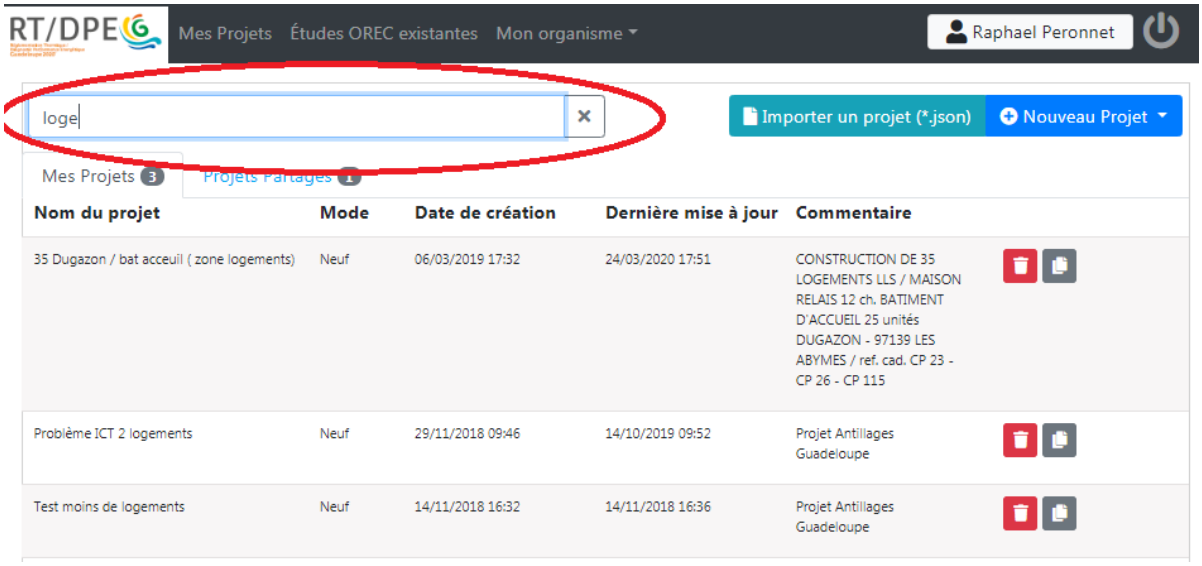


Projects are divided into 2 tabs:

- ***Mes projets* [My projects]:** 'personal' projects that you have created
- ***Projets partagés* [Shared projects]**: projects which have been shared with you by someone else in your company.



In personal projects (*Mes projets*), a complete list spread across different pages will appear and can be used to access each of them with one click. Projects are listed by their date of last modification. A search bar can be used to filter projects by name.

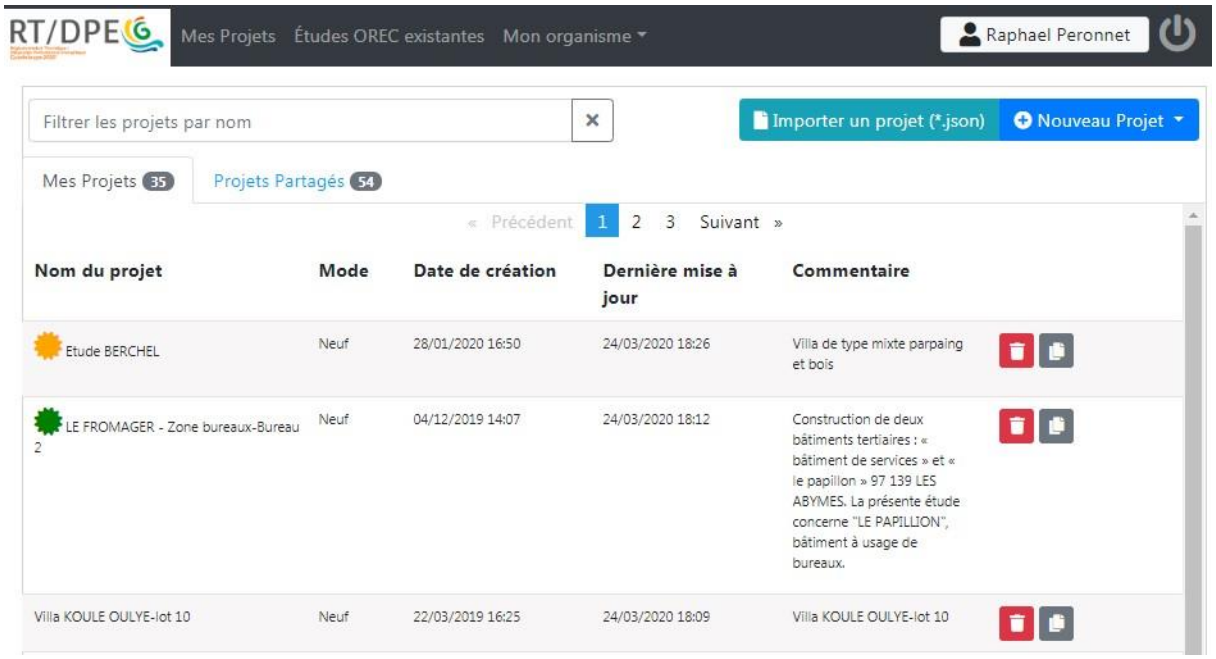


Different information is available for each project:

- its name,
- its 'mode' – which will always be *neuf* [new] for an RTG 2020 study,
- its date of creation and date of the last update,
- comments that may have been added (to track changes, for example).

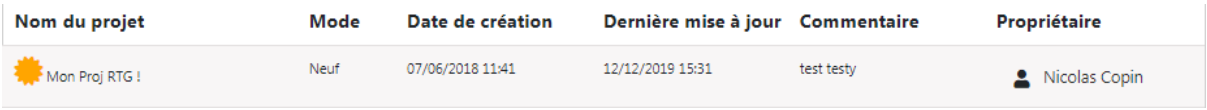
A yellow or green sun can also be seen to the left of the project name. It shows:

- if it is **yellow**, that the project has been simulated and results have been saved,
- if it is **green**, that the study has been validated and closed.



Red bin and grey leaf icons can also be seen to the right of the project. They, respectively, are used to delete and duplicate the project.

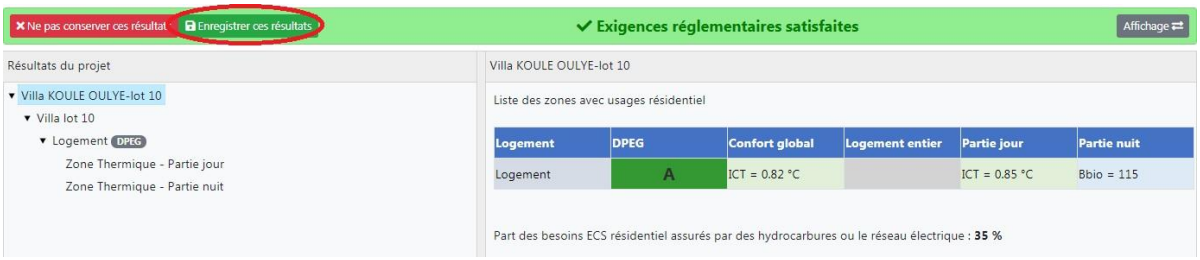
In the shared projects tab, another piece of information provided is the name of the owner.
This is useful if the user needs to contact them.



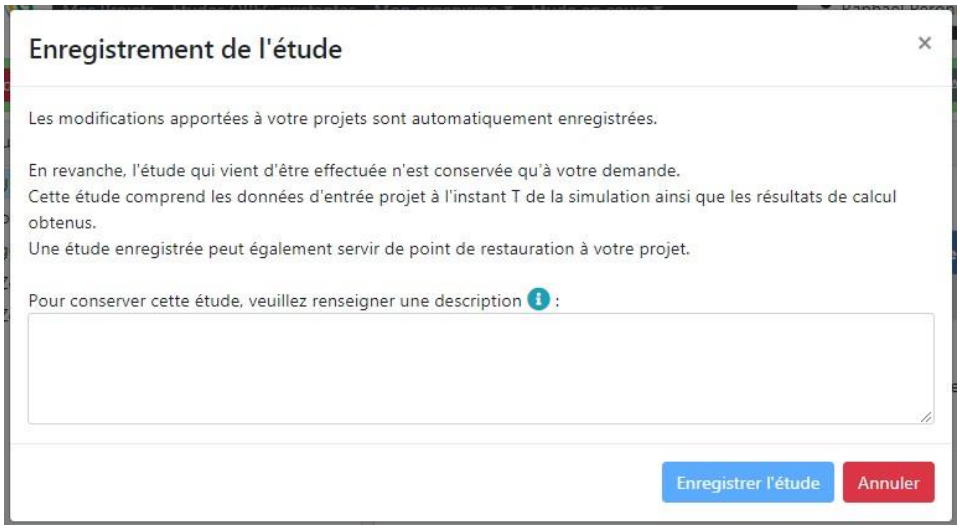
5.8.2 Studies

For each project, a studies dashboard will appear once **results have been saved** for the first time in this project.

To carry out this operation: after having launched the simulation, go to the project's results page, then click on 'Enregistrer ces résultats' [Save these results].

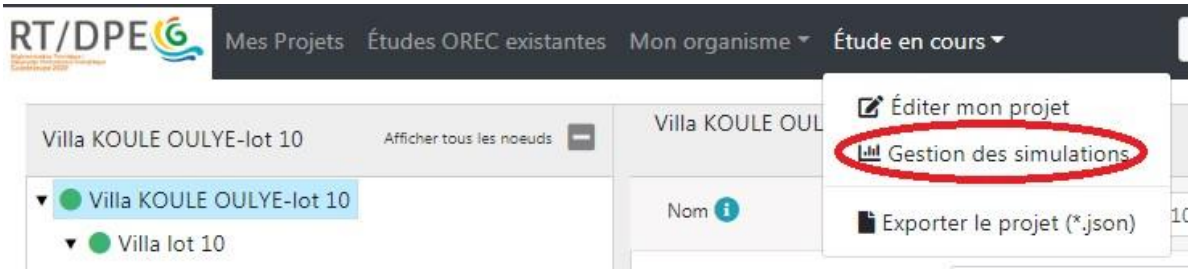


A study description is required. *We recommended drafting these results carefully because they can be used later to differentiate different versions of the project on the dashboard*.

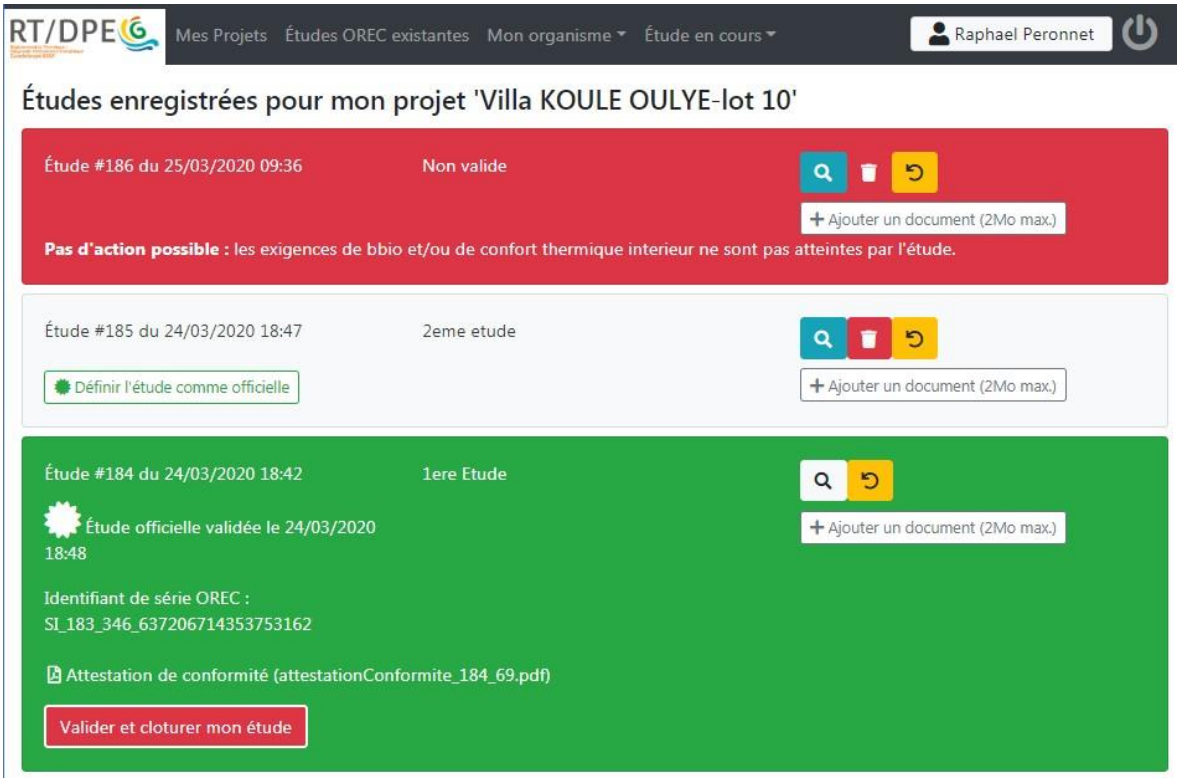


Once the description has been finished, click on *Enregistrer l'étude* [Save the study]. The study dashboard will then appear.

To access it later and retrieve different past results, once in the project,
click on *Etude en cours* [Study in progress] in the upper bar, then on *Gestion des simulations* [Simulation management].



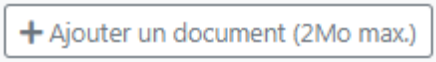
The interface will appear as follows.



All saved results will be shown with their study number, the date on which they were saved as well as its description. If the study does not comply with regulatory requirements, it will appear on a red background.

Several actions are allowed:

- Visualising results by clicking on the magnifying glass 
- Deleting saved results by clicking on the bin 
- Overwriting the current version from the project's dataset with that of the selected study by clicking on the arrow  , to modify this study, for example.
- Adding documents to the study for **<u>supporting documents</u>**



A study can also be considered official by clicking on *Définir l'étude comme officielle* [Mark the study as official]. The latter will now appear on a green background.

Note: *There can only be one official study per project. It is only this study that will appear in the OREC database. Other studies will remain as 'drafts' which are personal.*

Once it is official, the study cannot be deleted but only replaced by another
by clicking on the *définir comme étude officielle* [mark as official] button on the other study.

Access to the compliance certificate will now be available. To generate it, click on *Générer l'attestation de conformité* [Generate compliance certificate], then save the PDF that your browser will offer to download. Once this step has been carried out, an OREC ID will be allocated to your study.

Attestation de conformité du calcul Règlementation Thermique Guadeloupe (RTG)

(à joindre au dossier de demande de permis de construire)

Cette réglementation est définie par la délibération du conseil régional de la Guadeloupe CR/19-1155 du 31 octobre 2019 publiée au Journal officiel de la République française du xxx relevant du domaine du règlement relative à la réglementation thermique de Guadeloupe (calcul RTG) et aux caractéristiques thermiques de l'enveloppe des bâtiments nouveaux et des parties nouvelles de bâtiments, notamment l'article 7-I : « (…) le dossier joint à la demande de permis de construire comprend un document attestant la réalisation d'un calcul RTG provisoire conforme à la présente délibération, et délivré par la plateforme de calcul RTG/DPEG (…) ».

Références de l'attestation		
N° de l'attestation	183_68	*Pas d'illustration*
Date d'édition	24 mars 2020 18:30	
Identité du demandeur		
Maître d'Ouvrage	SAS rivages SUD	
Opérateur du calcul RTG	Raphael Peronnet - raphael.peronnet@cstb.fr (#6)	
Identité du bâtiment		
Nom du bâtiment	Villa lot 10	
Adresse	Lotissement KOULE OULYE, Grand-Bourg, Marie-Galante 97112	
Coordonnées GPS	latitude : 15,8771972566088 longitude : -61,2861633287597	
Surfaces de plancher par zone d'usage	Logement	MaisonIndividuelleResidentiel 112,35 m²
Zone de vent	Continental	
Surface de baies	45,5 m²	
Surface de parois verticales	145,9 m²	
Surface de toiture	130,3 m²	
BBIO/$BBIO_{max}$ de la zone la moins performante du projet	66 %	
ICT/ICT_{max} de la zone la moins performante du projet	85 %	
PRECS du bâtiment	0%	

Reminder: if the project has changed between the building permit stage and the end of works, the user must update it before closing the study and receiving the DPEG.

Once works have finished, you can **validate and close the study.** After this, a download link for the corresponding **new DPEG certificate** will be available (click on the red button below).

Étude #184 du 24/03/2020 18:42 1ere Etude

Étude officielle validée le 24/03/2020 18:48

Identifiant de série OREC :
SI_183_346_637206714353753162

Attestation de conformité (attestationConformite_184_69.pdf)

Valider et cloturer mon étude

+ Ajouter un document (2Mo max.)

DPE Diagnostic Performance Energétique Guadeloupe 2020

REGION GUADELOUPE

Attestation de diagnostic de performance énergétique

Bâtiment neuf	
N° de certificat DPE : DPE_184_70_1	Date d'émission du certificat : 25/03/2020 Valabe jusqu'au : ————
Activité hébergée: Maison individuelle Typologie de construction: Villa / Terrasse / Béton ☑ Le lot est le bâtiment entier ☐ Le lot est une partie de bâtiment (à préciser) :	Année de construction: 2019 Surface de pancher: 112,35 m² Surface de pancher climatisée: 34,7 m² Part réelle de surface climatisée: 31% Part conventionnelle de a surface climatisée: 31%
Propriétaire: SAS rivages SUD Nom: Villa lot 10 / Logement Adresse: Lotissement KOULE OULYE, Grand-Bourg, Marie-Galante 97112	Diagnostiqueur: Raphael Peronnet Adresse: raphael.peronnet@cstb.fr Tel.:

Bilan énergétique annuel - éstimé par le cacul RTG (conventionnel / 4 usages RTG)		
Usage: **Climatisation**		5,19 *kWhep/m².an*
Usage: **Eau chaude sanitaire**		3,32 *kWhep/m².an*
Usage: **Éclairage**		4,19 *kWhep/m².an*
Usage: **Ventilation**		0,00 *kWhep/m².an*
Production à demeure d'éléctricité à partir des sources renouvelables	Production	687,93 *kWhep/m².an*
	Part déductible (TRC)	5 *kWhep/m².an*
TOTAL (poduction déduite) : (ICE)		7,71 *kWhep/m².an*
Équivalent en énergie primaire :		26,97 *kWhef/m².an*
Émision de gaz à effet de serre :		6,16 *kg CO2/m².an*

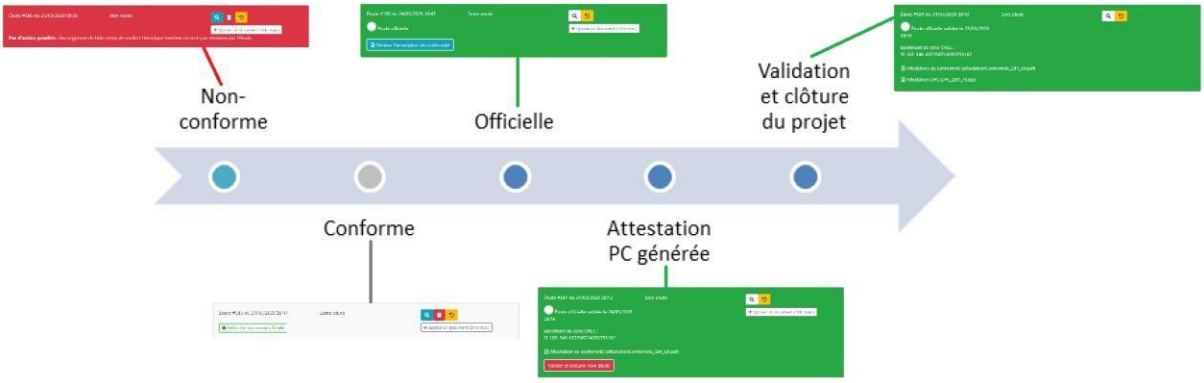
Indicateur de consommation énergétique (en énergie **finale** exprimée en kWhef/m²/an) Selon calcul RTG conventionnel / limité aux 4 usages RTG déduction faite d'une part de la production d'électricité à demeure	**Adresse du lot:** Lotissement KOULE OULYE, Grand-Bourg, Marie-Galante 97112
Bâtiment économe ≤ 15 A 15 à 25 B 25 à 30 C 30 à 45 D 45 à 60 E 60 à 90 F > 90 G ***Bâtiment énergivore*** 8 kW h_{ef}/m^2.an	*Pas d'illustration*

		Evaluation	Commentaires
FACTURE D'ENERGIE		*****	Qualifie le niveau de consommation global d'électricité constaté sur trois années. Résulte des conditions réelles d'occupation (température de consigne de climatisation, plages horaires de climatisation,...), la part de surface climatisée et les autres équipements électriques
CONFORT		* rang* 6/9	Qualifie la durée pendant laquelle le logement reste confortable sans climatisation. Dépend essentiellement des dimensions des ouvertures, de leur orientation relativement au vent, de la présence de brasseurs d'air, ainsi que de la performance de l'enveloppe.
SITE		***** rang* 9/9	Qualifie l'environnement du bâtiment du point de vue thermique. Dépend essentiellement des effets de masque lointains, de l'altitude et de la zone de vent.
ENVELOPPE DU BATIMENT	Façades	*** rang* 6/9	Qualifie le niveau de performance thermique de la partie pleine de la façade, c'est-à-dire sa capacité à protéger du rayonnement. Dépend alors essentiellement de la couleur, de l'isolation et des masques solaires (prend en compte également le rayonnement vers la voute celeste).
	Toiture	*** rang* 7/9	Qualifie le niveau de performance thermique de la partie pleine de la toiture, c'est-à-dire sa capacité à protéger du rayonnement. Dépend alors essentiellement de la couleur, de l'isolation et des masques solaires (prend en compte également le rayonnement vers la voute celeste).
	Baies	**** rang* 3/9	Qualifie le niveau de performance thermique de la partie pleine des baies, c'est-à-dire de leur capacité à protéger du rayonnement incident. Dépend alors essentiellement des masques solaires et des protections mobiles installées.
EQUIPEMENTS TECHNIQUES	Climatisation	*** rang* 7/9	Qualifie le rendement énergétique du système de climatisation.Dépend essentiellement de la nature du climatiseur.
	Eau Chaude Sanitaire	*** rang* 2/9	Qualifie le rendement énergétique de la production d'eau chaude sanitaire. Dépend du taux de couverture des besoins par une énergie d'origine renouvelable (notamment ECS solaire thermique)
	Panneaux photovoltaïques	** rang* 1/9	Qualifie le degré de valorisation de la surface de toiture disponible pour la prodution d'électricité photovoltaïque

(*) : clé de lecture : le rang 1 correspond au bâtiment le plus performant de sa catégorie

To summarise, here are the different study statuses:

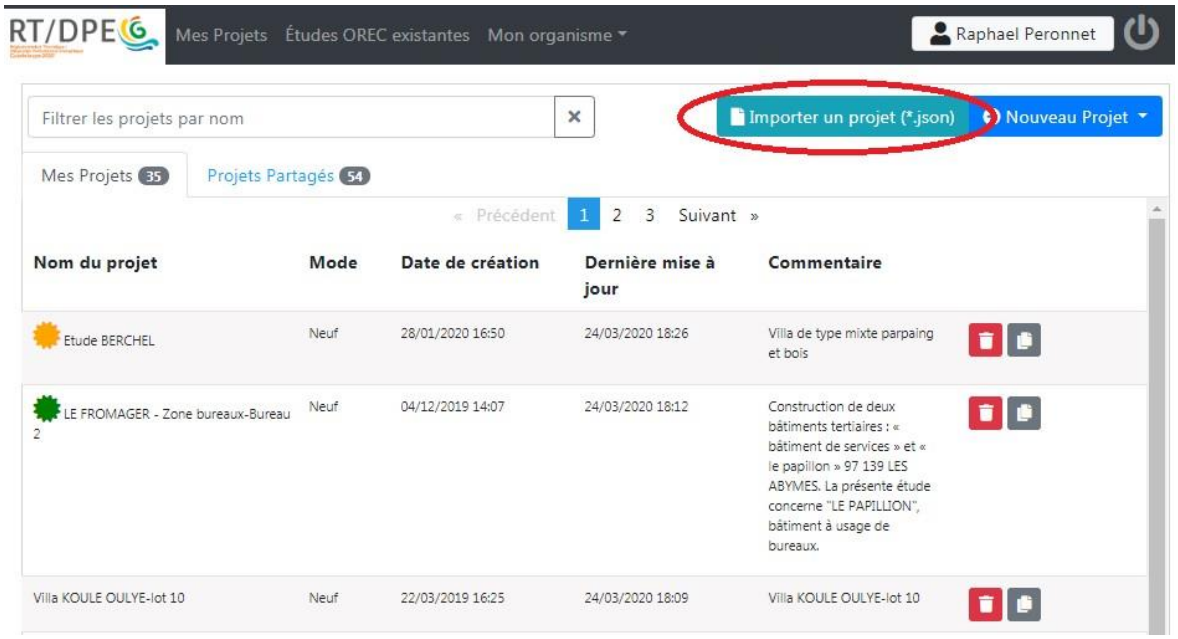
FR	EN
Non-conforme	*Non-conforme* [Non-compliant]
Conforme	*Conforme* [Compliant]
Officielle	*Officielle* [Official]
Attestation PC générée	*Attestation PC générée* [BP certificate issued]
Validation et clôture du projet	*Validation et clôture du projet* [Project validation and closure]


Non-
conforme
Officielle
Validation
et clôture
du projet
Conforme
Attestation
PC générée

5.9 Import/Export a Project

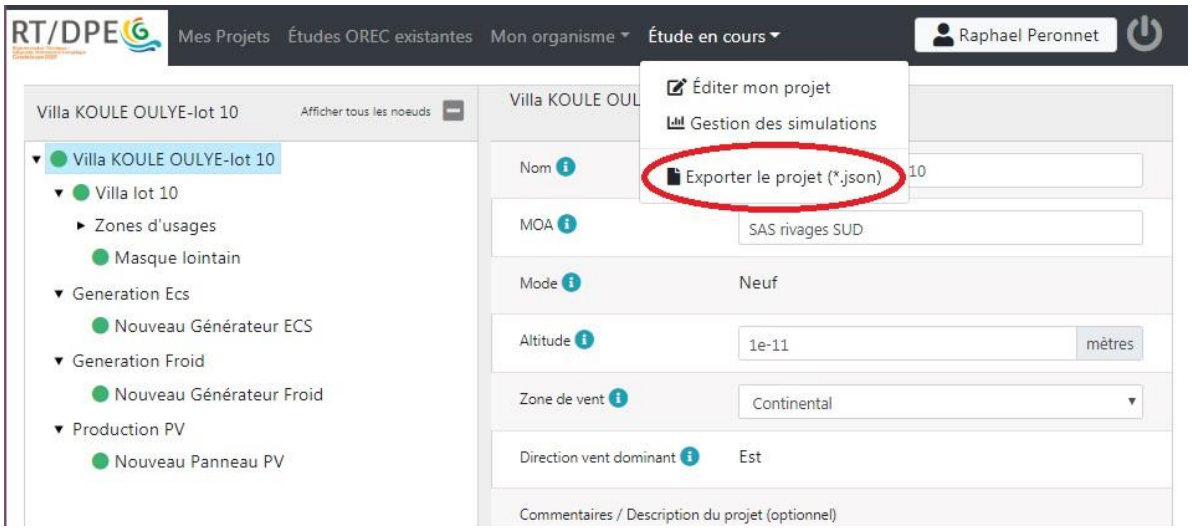
Important note: *The import/export a project feature is optional. It allows users to save their projects as they wish, to share them (for example, if it needs to be shared outside the company), to extract data from it, etc.*

To import a project in json format from a computer, go to the project dashboard and click on *Importer un projet (*.json)* [Import a *.json project].



Once the project has been selected on your disk, open it.

To export a project in json format, once in the project, click on *Etude en cours* [Project in progress] in the upper bar, then *Exporter le projet (*.json)* [Export the *.json project] and choose the destination folder.



6 GENERATE A DPEG FOR AN EXISTING BUILDING (FOR DIAGNOSTICIANS ONLY)

Warning: this Chapter is only for DPEG 2020 certified diagnosticians. Definitions:

- *An **existing building**: describes a building that has already been built, no matter its date of commission, as opposed to a new building or project. Please note that existing buildings that have been in service for less than 3 years should have a valid DPEG that was issued during construction (reminder: validity duration for new DPEGs = 3 years)*
- *A **new building** or **new project**: describes a building that is not yet in service. It can be in the design or construction phases.*
- *A **project** is **existing** when it has been modelled on the RTG/DPEG platform (closed or not closed). In the following text, and by misnomer, an **existing project** is when a previously constructed building is totally or partially modelled on the RTG/DPEG platform. This can mean modelling executed during the building's design as part of RTG application, or even a model developed while a DPEG was being created for all or part of the building. Existing projects will take the form of a JSON format file which can be archived in the OREC database (if it is an 'official' project) or an unofficial draft generated by the RTG/DPEG platform.*

Implementation of the DPEG diagnosis is based on the method and the RTG calculation tool.
There are, however, some specific details explained in this Chapter.

To generate a DPEG, there are two possibilities:

1. *Either the building has already been modelled (RTG or DPEG)→ you must absolutely retrieve the existing project and modify it (otherwise a double entry will be created in the database)*
2. *If not, you must create a new project by using the DPEG pre-configuration tool*

6.1 Calculation method: specificities for existing DPEGs

6.1.1 Clarifications about the definition of units

A unit is the subdivision of the building for which a DPEG is carried out.

Lot division is carried out by the diagnostician according to the following instructions:

- For residential buildings or a residential use zone in a building:
  each living unit is a specific unit

- For office or commercial buildings or use zones: outline a unit for each use zone and owner.

In other words:

- 1 unit per use zone (under paragraph 4.1) if the premises belong to a sole owner
- If there are several owners: the use zone is subdivided with 1 unit per owner

6.1.2 Clarifications about DPEG indicators

DPEG indicators are available in the results and DPEG certificate interface.

		Evaluation	Commentaires
FACTURE D'ENERGIE		*****	Qualifie le niveau de consommation global d'électricité constaté sur trois années. Résulte des conditions réelles d'occupation (température de consigne de climatisation, plages horaires de climatisation,...), la part de surface climatisée et les autres équipements électriques
CONFORT		* rang* 6/9	Qualifie la durée pendant laquelle le logement reste confortable sans climatisation. Dépend essentiellement des dimensions des ouvertures, de leur orientation relativement au vent, de la présence de brasseurs d'air, ainsi que de la performance de l'enveloppe.
SITE		***** rang* 9/9	Qualifie l'environnement du bâtiment du point de vue thermique. Dépend essentiellement des effets de masque lointains, de l'altitude et de la zone de vent.
ENVELOPPE DU BATIMENT	Façades	*** rang* 6/9	Qualifie le niveau de performance thermique de la partie pleine de la façade, c'est-à-dire sa capacité à protéger du rayonnement. Dépend alors essentiellement de la couleur, de l'isolation et des masques solaires (prend en compte également le rayonnement vers la voute céleste).
	Toiture	*** rang* 7/9	Qualifie le niveau de performance thermique de la partie pleine de la toiture, c'est-à-dire sa capacité à protéger du rayonnement. Dépend alors essentiellement de la couleur, de l'isolation et des masques solaires (prend en compte également le rayonnement vers la voute céleste).
	Baies	**** rang* 3/9	Qualifie le niveau de performance thermique de la partie pleine des baies, c'est-à-dire de leur capacité à protéger du rayonnement incident. Dépend alors essentiellement des masques solaires et des protections mobiles installées.
EQUIPEMENTS TECHNIQUES	Climatisation	*** rang* 7/9	Qualifie le rendement énergétique du système de climatisation.Dépend essentiellement de la nature du climatiseur.
	Eau Chaude Sanitaire	*** rang* 2/9	Qualifie le rendement énergétique de la production d'eau chaude sanitaire. Dépend du taux de couverture des besoins par une énergie d'origine renouvelable (notamment ECS solaire thermique)
	Panneaux photovoltaïques	** rang* 1/9	Qualifie le degré de valorisation de la surface de toiture disponible pour la prodution d'électricité photovoltaïque

(*) : clé de lecture : le rang 1 correspond au bâtiment le plus performant de sa catégorie

There are 9 of them, with a score from 0 to 5 and to which a rank, currently based on diagnosed projects in Guadeloupe, is allocated.

- *Facture d'Energie* [Energy Bill]: Describes the level of overall electricity consumption over the past three years. It is the result of real-time occupation conditions (air-conditioning setpoint temperature, air-conditioning windows of time, etc.), the air-conditioned share of the surface area and other electrical material.

- *Confort* [Comfort]: Describes how long the living unit remains comfortable without air-conditioning. It essentially depends on the size of openings, their direction in terms of wind, if there are fans as well as the envelope's performance.
- Site: Describes the building's surrounding from a thermal point of view. It essentially depends on the effects of distant solar protection, altitude and wind load.
- *Enveloppe du Bâtiment* [Building Envelope]:
    - Facades: Describes the thermal performance level of the solid part of the facade, meaning its ability to protect against rays. Therefore, it essentially depends on the colour, insulation and solar protection (also consider radiation towards the celestial sphere).
    - *Toiture* [Roof]: Describes the thermal performance level of the solid part of the roof, meaning its ability to protect against rays. Therefore, it essentially depends on the colour, insulation and solar protection (also consider radiation towards the celestial sphere).
    - *Baies* [Openings]: Describes the thermal performance level of the solid part of openings, meaning their ability to protect against incident radiation. It therefore essentially depends on solar protection and installed movable protective devices.
- *Equipement Techniques* [Technical Equipment]:
    - *Climatisation* [Air-conditioning): Describes the air-conditioning system's energy yield. It essentially depends on the type of air-conditioner.
    - *Eau Chaude Sanitaire* [Domestic Hot Water]: Describes the domestic hot water production system's energy yield. It depends on the coverage rate of needs per energy of renewable origin (in particular, solar thermal DHW systems).
    - *Panneaux Photovoltaïques* [Photovoltaic Panels]: Describes how much of the roof's surface area is available for photovoltaic electricity production.

6.2 RTG/DPEG calculation platform: particularities for an existing DPEG

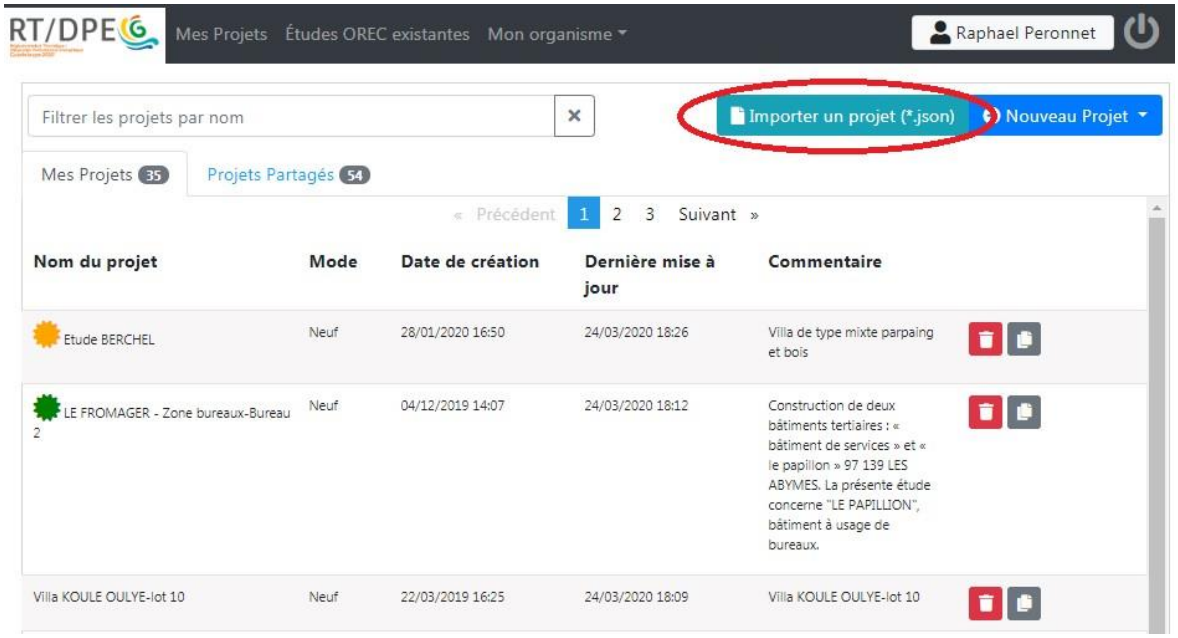
6.2.1 Get a diagnostician account

A *diagnostiqueur* [diagnostician] account is required to produce an existing DPEG. It is issued to the diagnostician by the accredited organisation (subject of paragraph 29-II of the DPEG resolution) after they have passed theoretical and practical certification exams. The account is only valid during the diagnostician's certificate's period of validity.

6.2.2 Retrieve an existing project

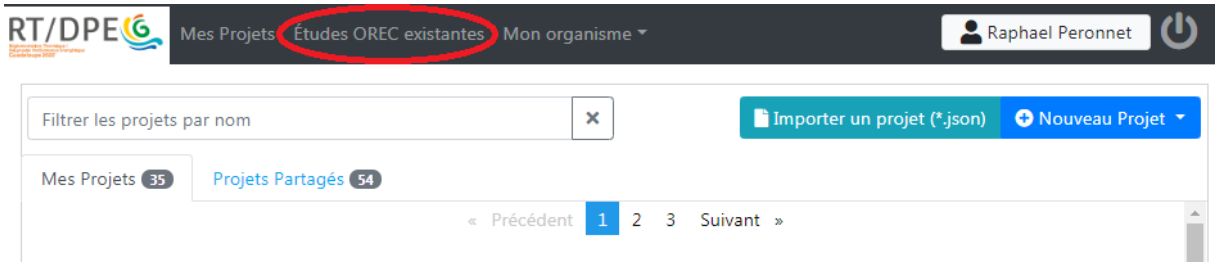
To retrieve an existing project for a building, either it was locally sent to you in JSON format and must be imported or you need to use the search tool in the OREC database.

To import a project in json format from a computer, go to the project dashboard and
click on *Importer un projet (*.json)* [Import a *.json project].



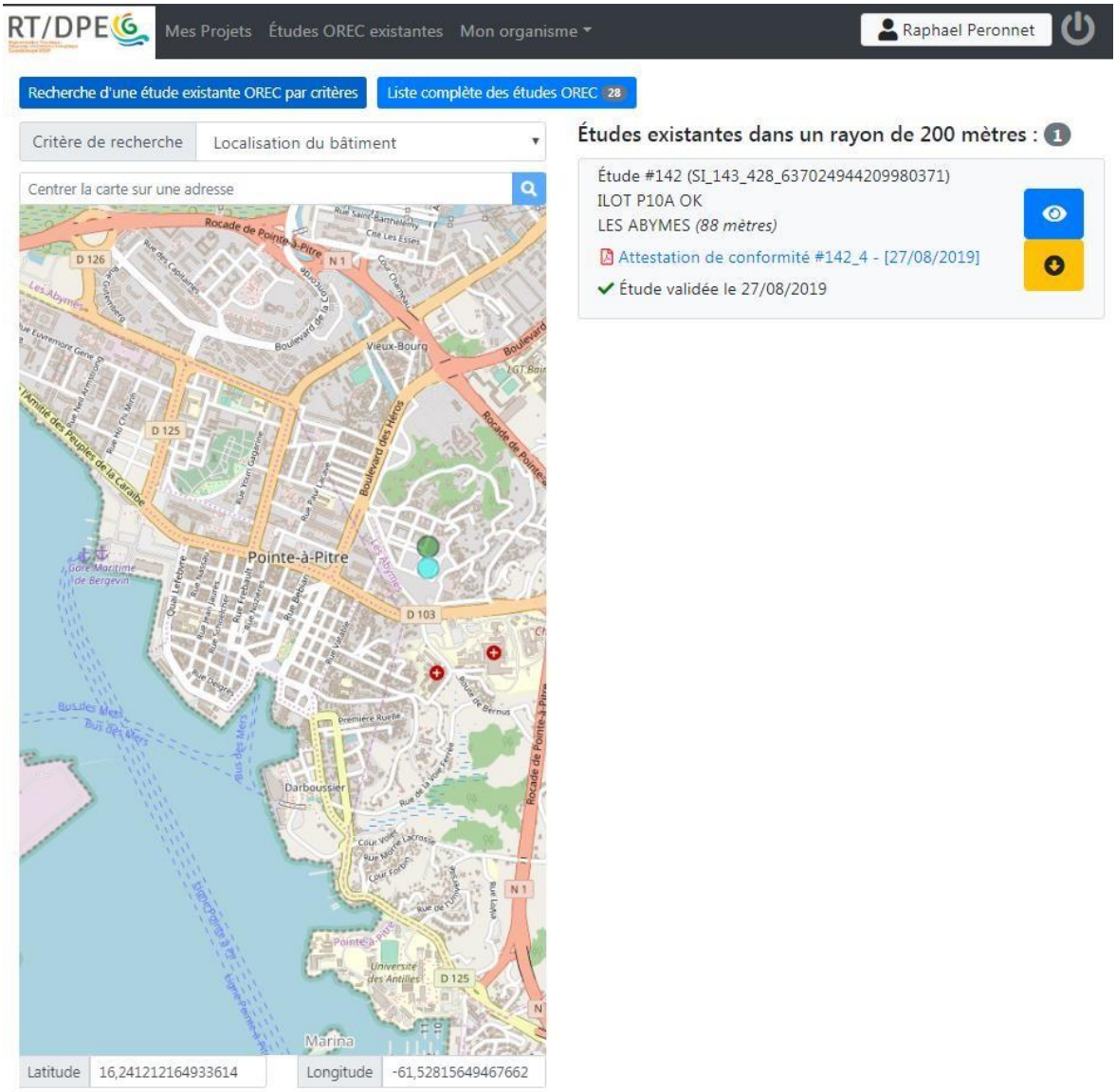
Once the project has been selected on your disk, open it.

To access OREC studies, click on the corresponding tab in the upper bar.

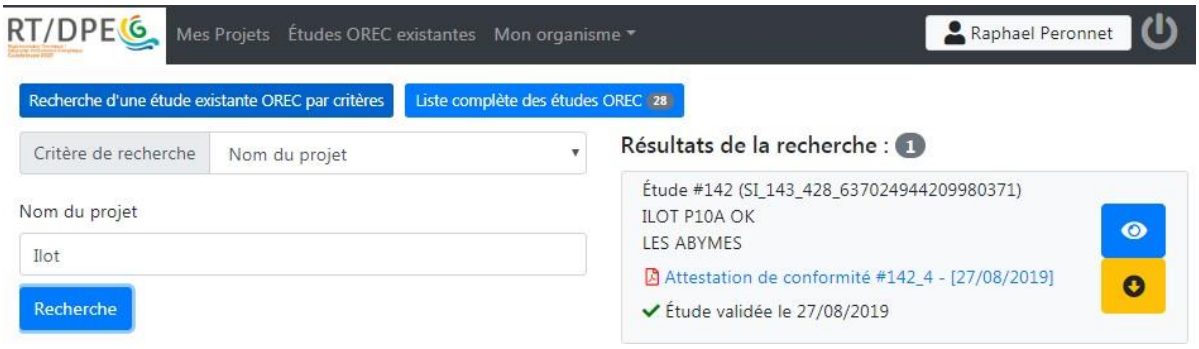


The OREC studies interface will firstly allow you to select a research criterion, such as map or GPS localisation, the name of the project, the study's ID, the study's serial number and the compliance certificate's serial number.

For the localisation criterion, you can click directly on the map, where all studies within 200 metres of the selected green dot will appear.



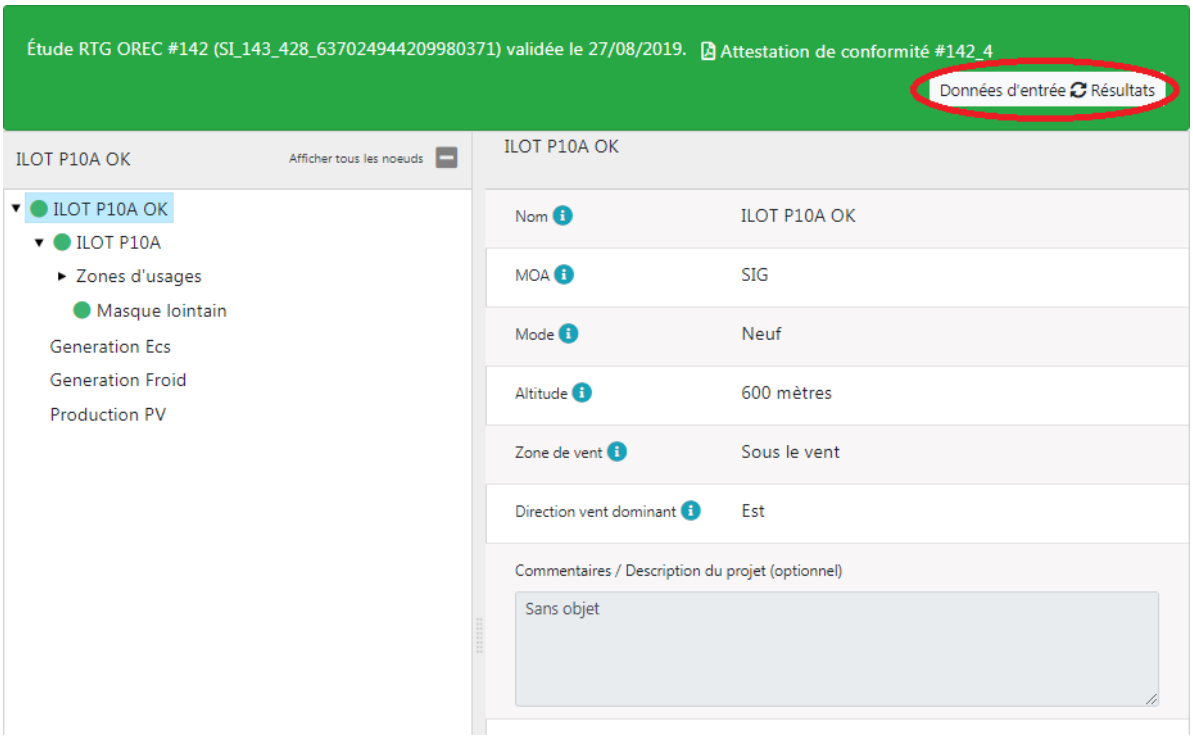
For the other criteria, all you need to do is type in your search request with the information you have in the search bar.



Once the required study has been found, appearing on the right, several actions are possible:

- Download the compliance certificate by clicking directly on the certificate.
- View input and output data without modifying by clicking on the eye 

Once you are in the viewing interface, you can switch to data input to data output by clicking on the *Données d'entrée – > Résultats* [Input data – > Results] icon.

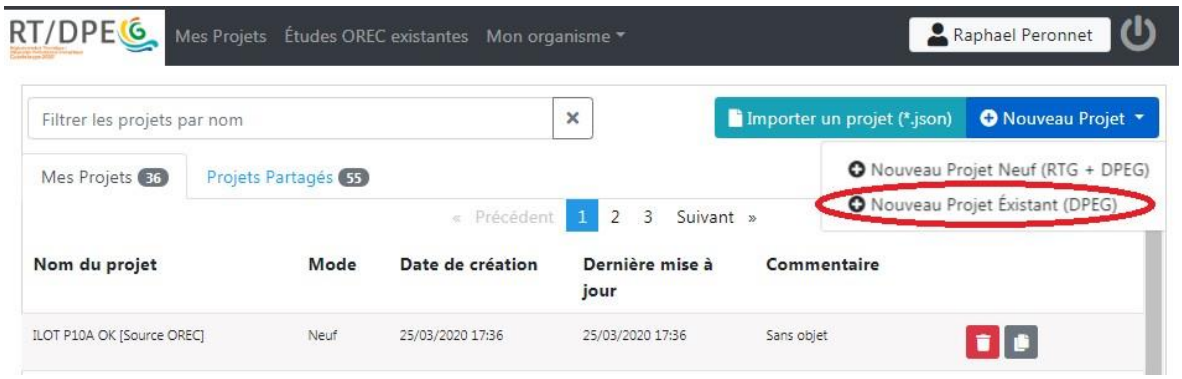


- Create a new project using the study by clicking on the arrow 

This creates a copy of the project in your dashboard that you can modify as you wish.

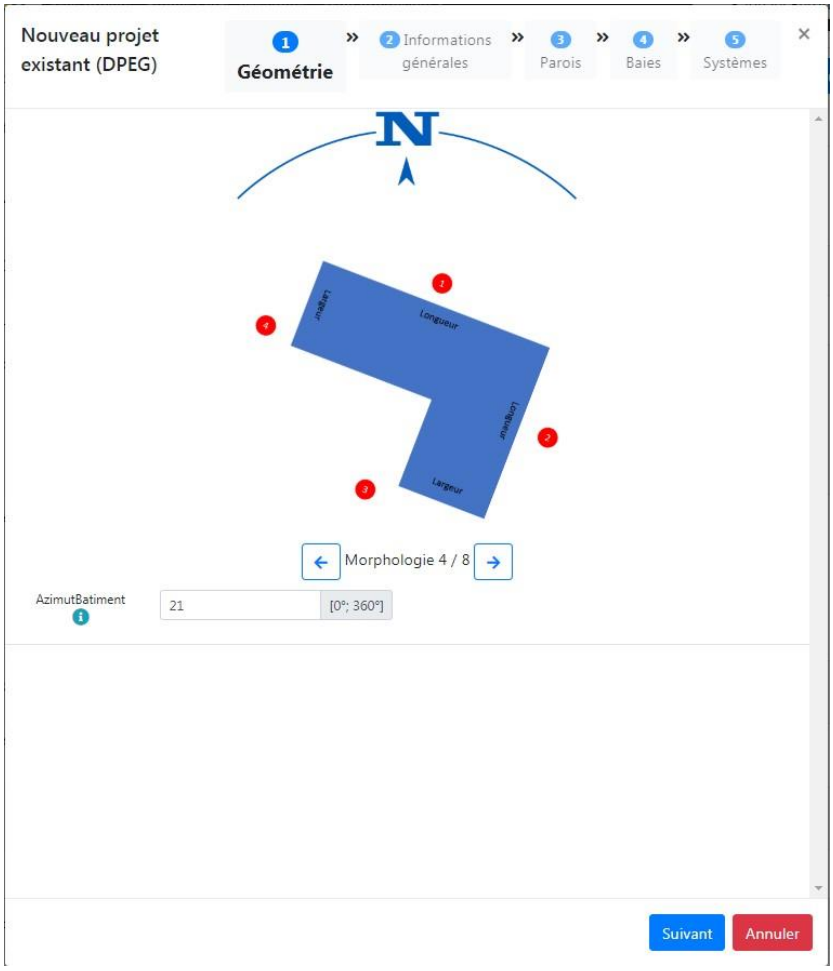
6.2.3 Use the DPEG pre-configuration tool

If the project is not in the OREC database, you will need to create a new DPEG project. It is necessary to model the building in the new RTG/DPEG 2020 tool. For this, a pre-configuration tool, which can be used to speed up and simplify input about existing buildings, is available. For this, click on *Nouveau Projet* [New Project], then on *Nouveau Projet Existant (DPEG)* [New Existing Project (DPEG)].

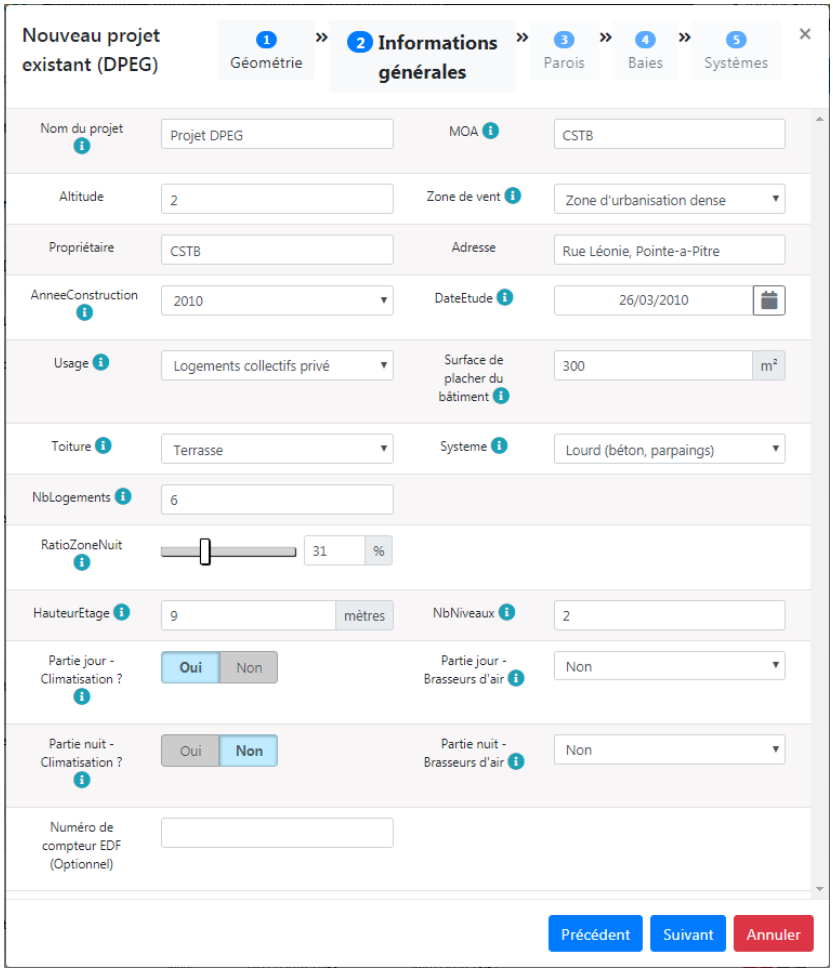


A new interface will appear, asking for basic information to create the project in a simplified way.

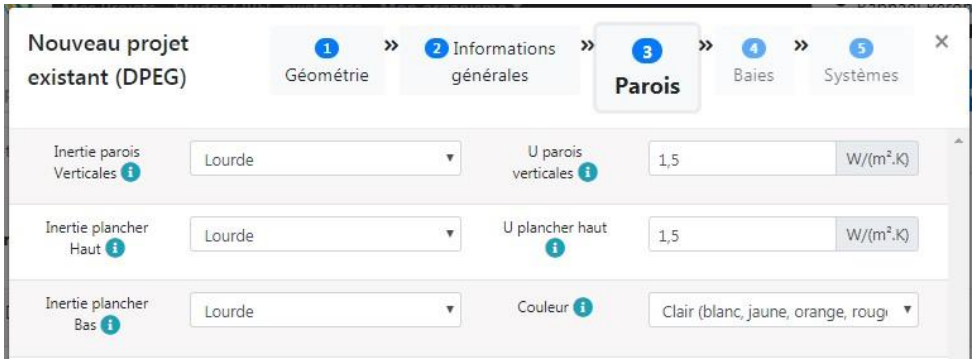
The first step requires an example shape with direction. The building can be selected with the mouse to rotate it.



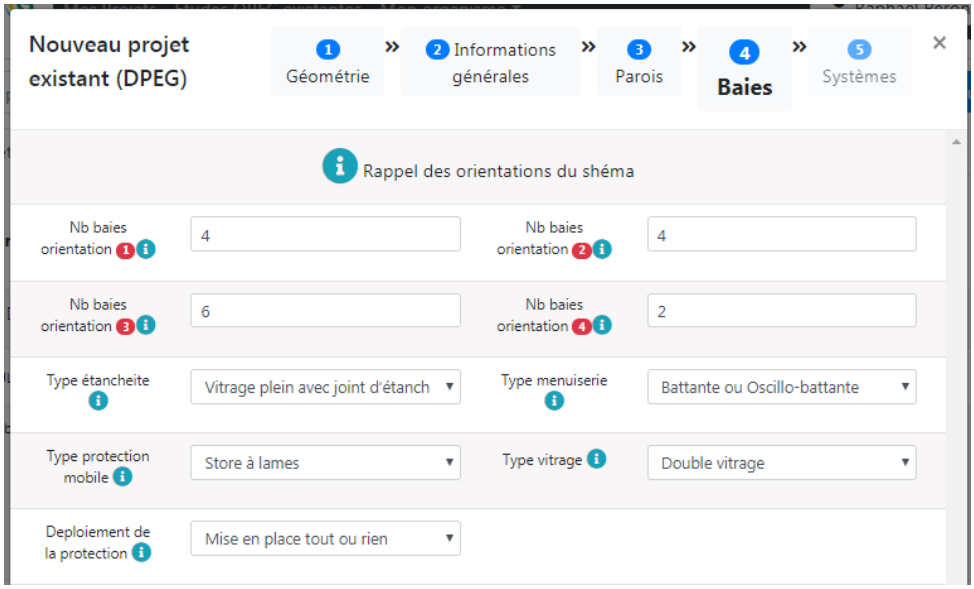
Following this, general information about the building, its location, its size, if there are air-conditioned zones and its construction should be specified.



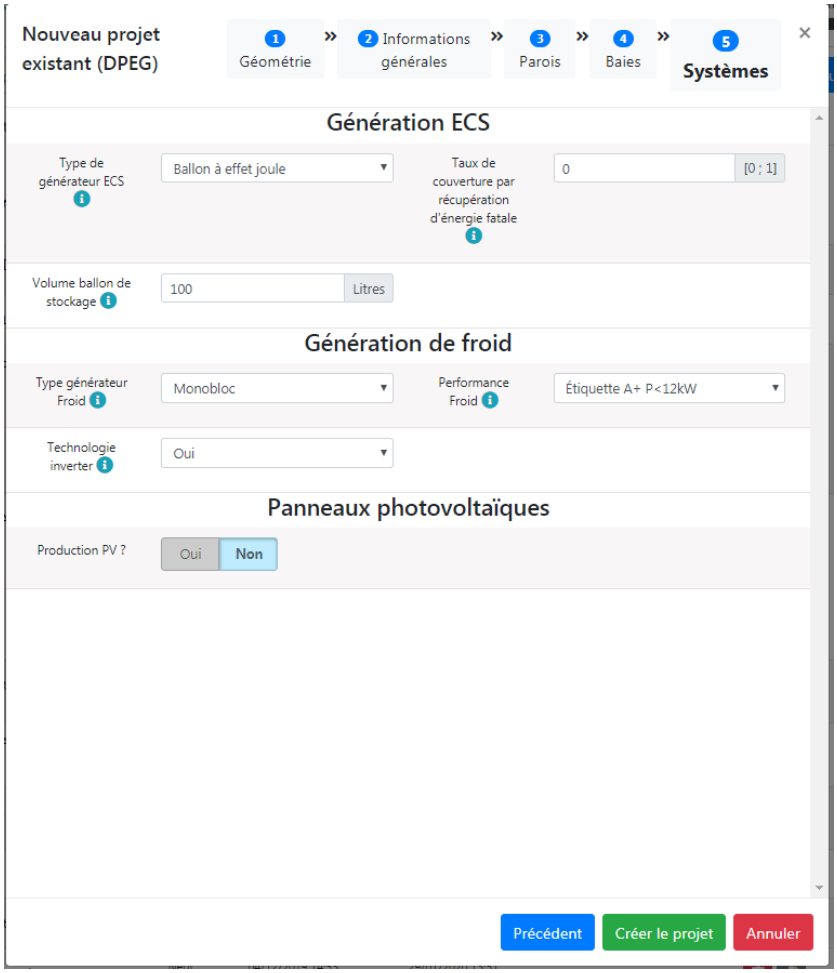
In step 3, basic information about the walls and floors is to be detailed. This will create default walls, which can be specified later.



Then in Step 4, the number of openings per direction and type of opening should be specified.



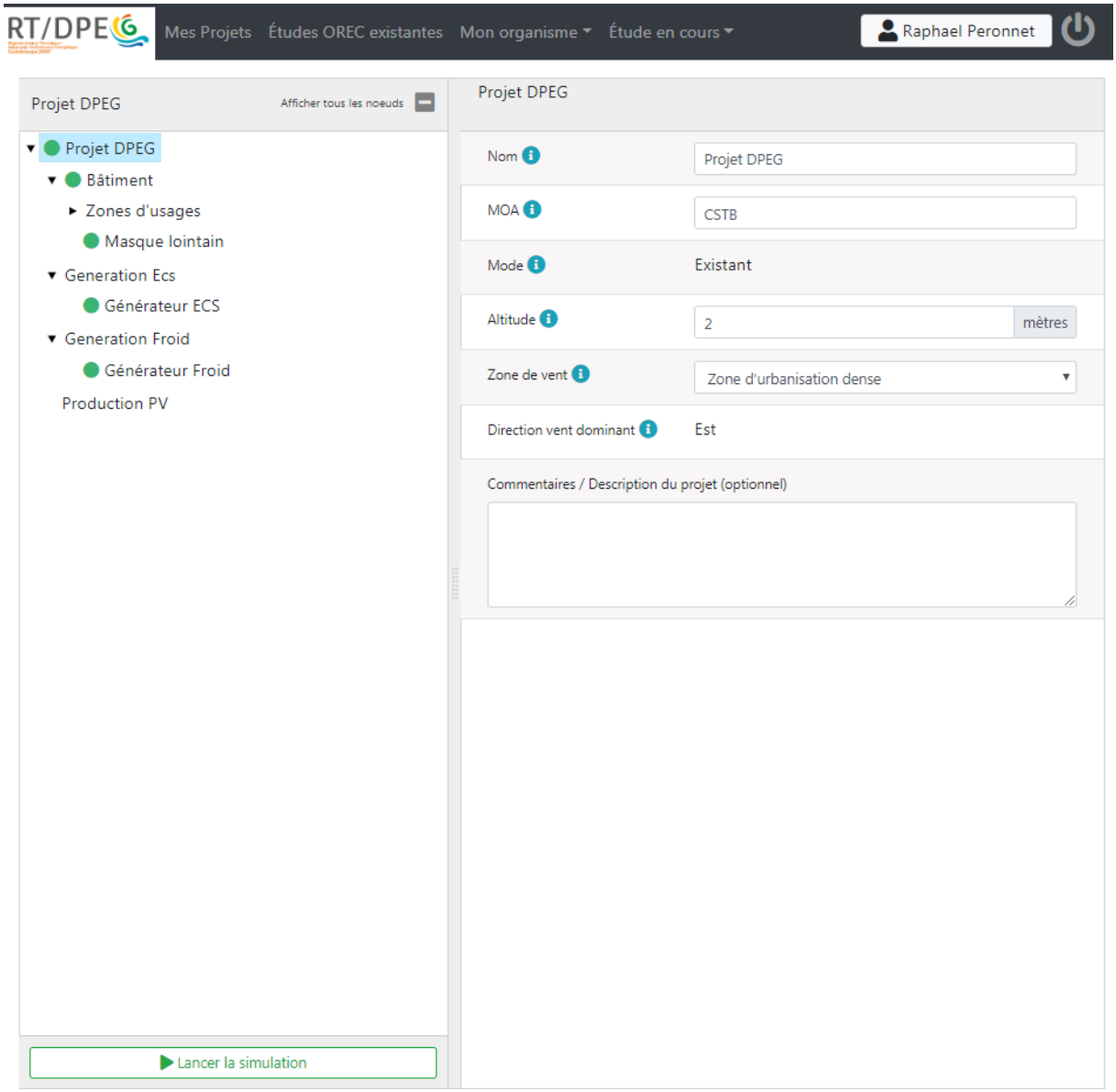
The last step is about different DHW, cooling and electricity production generating systems.



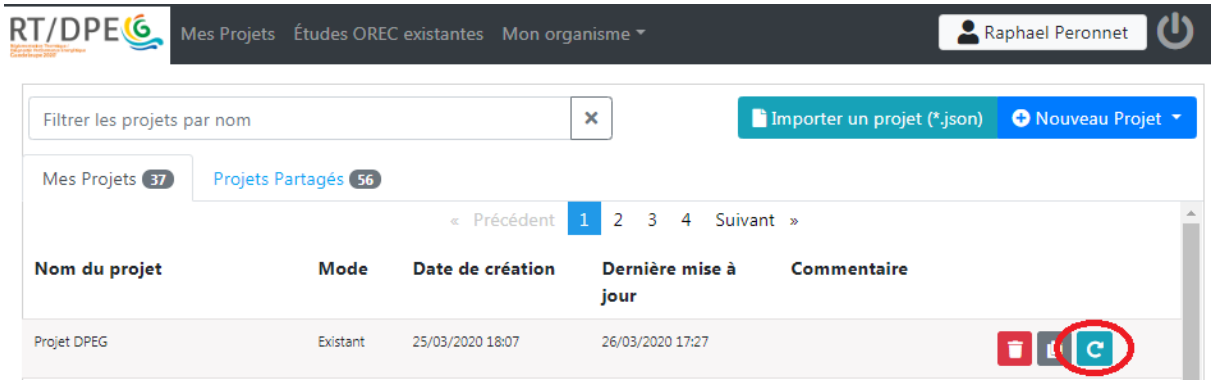
Once all this information has been input, click on *créer le projet* [create the project]. The RTG interface will then present the project which
can be simulated.

For more information, read the guide about RTG project input. You should:

- Verify that openings/walls are correctly adapted
- Add any close solar protection
- Correct the sizes of wall and opening objects (pre-filled by default by the pre-configuration tool)



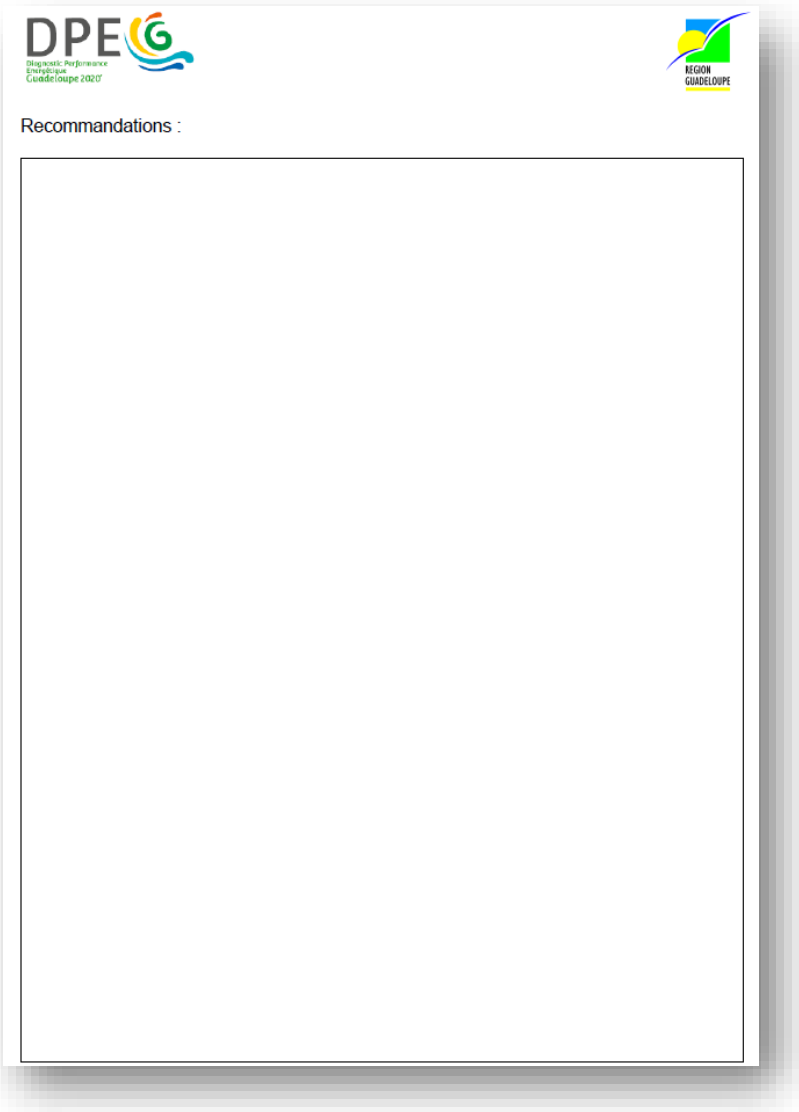
If there is missing information or an error in the simplifier's dataset, you can return to the project's pre-configuration tool from the project dashboard by clicking on the arrow.



6.2.4 Input Recommendations

The DPEG certificate is a 3-page document in which the last page is for the diagnostician to make recommendations about the building. An input feature will soon be available on the platform.

➔ *In the meantime, diagnosticians should manually write recommendations on the DPE document downloaded in PDF format.*



6.2.5 Open the model to other diagnosticians

During the final validation of the DPEG (corresponding to issuing the DPEG certificate), the digital model created on the RTG/DPEG platform can, by default, be read and modified by all certified diagnosticians.

However, if the author so wishes, they can delay publication of the model for a 3-month period, which can be renewed 4 times. At the end of each 3 months, they will be notified of the deadline with a personal e-mail with a link to renew the period, if necessary. Unless renewal is requested, the model will be definitively published.

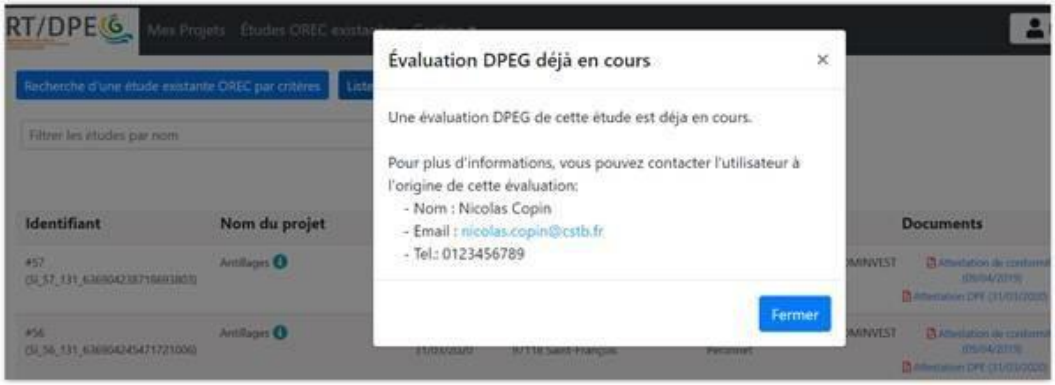
Delaying can be done as follows:

- When generating the DPEG: the diagnostician can choose from one of the following two options:
  - Publish the model now
  - Delay publication (3 months) in which case it is necessary to tick the corresponding box when the following window appears:

- <u>At the end of each 3 months</u>, they will receive an e-mail with an option to delay publishing by 3-months (clickable link in the e-mail). Unless this link is clicked in within 7 calendar days, the model will be definitively published
- Once the delay has been requested, the study is put on hold:

- The diagnostician can publish their study at any time via the *Publier maintenant* [Publish now] button.

When another diagnostician would like to retrieve a DPEG that is in the process of being developed, or has been delayed for publishing, they will see it in the following window, which will allow them to contact the author:



6.2.6 Clarifications about the electricity bill collection feature

The diagnostician will need an EDF contract number called ***NUMERO EDL*** **[EDL NUMBER]**, which is to be entered in step two of the simplifier – this will automatically retrieve the building's electricity bills.

This feature will be available soon.

6.2.7 Using the tablet app

The tablet application is being developed and will apply the same principles as the browser-based tool.

7 FOLLOW CHANGES TO THE RTG

RTG measures can change at any time. Here are some examples of possible changes:

- Adoption of new deliberations (amending or additional) as part of future regulatory authorisations, etc.
- Changes to the calculation or regulatory compliance rules;
- Changes to the RTG calculation platform: in the event of changes that are likely to change the value of ICT, BBIO and PRECS regulatory indicators, the authentic version is the one that was in force on the date of issue of the BP certificate. **If you have any issues, please use the hotline info@guadeloupe-energie.frfor custom support**

Except for one-off communication from the region, the www.guadeloupe-energie.gp website has all the latest information. On it, there are:

- The last version of open-source tools which can be downloaded (ratioclimG, rendementclimG, etc.);
- An FAQ provides answers to practical implementation questions;
- Regulatory texts;
- Conventional scenarios.

We recommend regularly visiting this website.

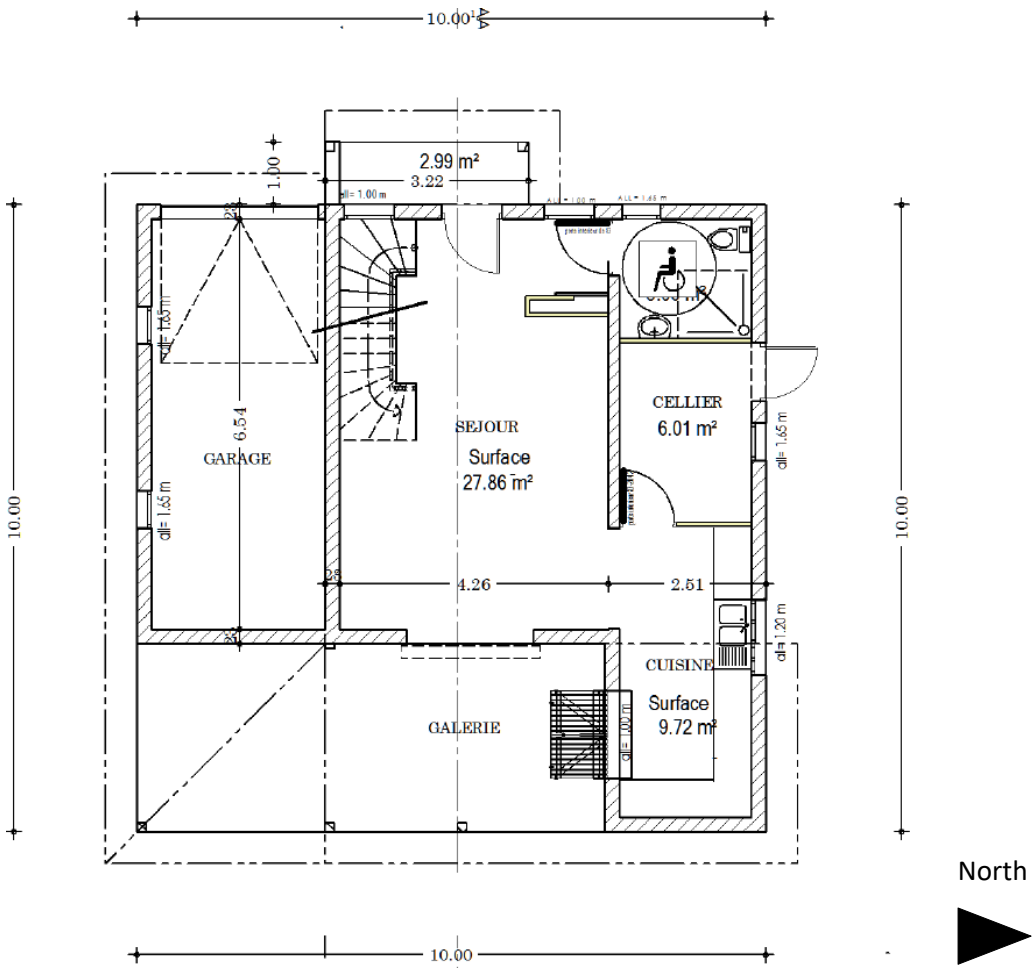
To find out more about the calculation method used on the RTG/DPEG platform, send the hotline an e-mail at info@guadeloupe-energie.fr

8 APPENDIX: PRACTICAL EXAMPLE

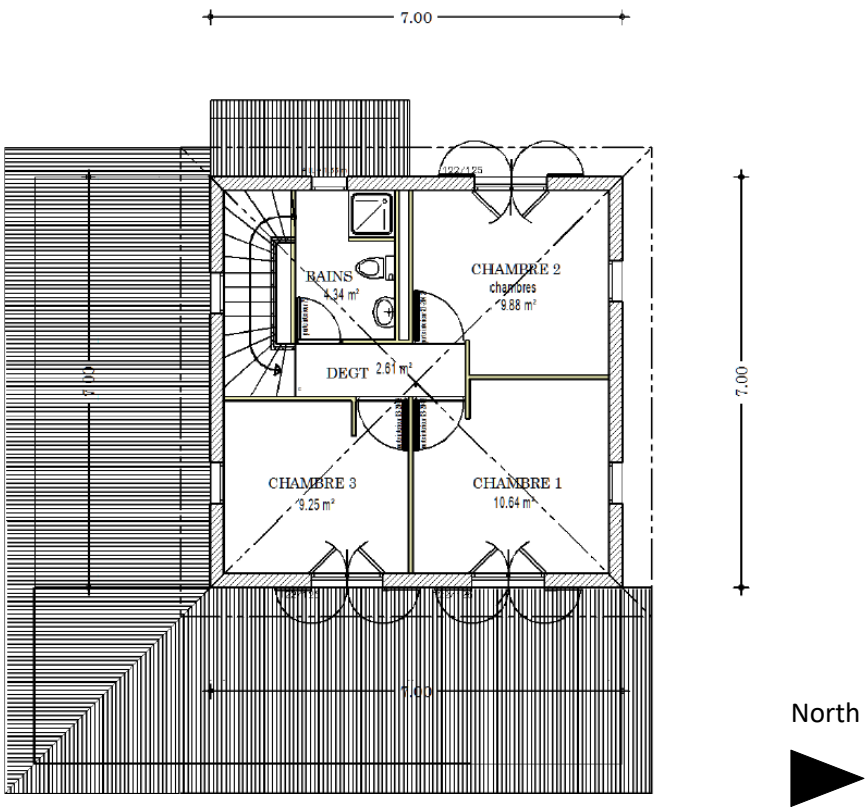
Description

The house used is shown below. It is a two-storey house with:

- a ground floor for daytime rooms (a living room and a kitchen)
- and night-time rooms (three bedrooms) and a bathroom upstairs

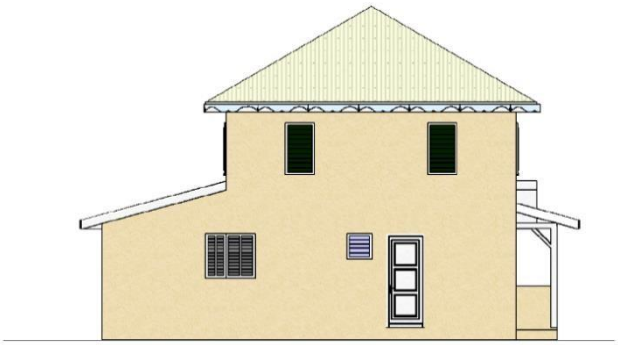


Plan of the ground floor



Plan of the first floor

East Facade



North Facade

West Facade

South Facade

Location

The house is in a continental area at sea level (1 m altitude) with the main facade facing East. The prevailing wind comes from the East.

8.1 Description in the RTG tool:

This is the information outlined in Chapter 4

8.1.1 Different zones in the building:

Per the information in Chapter 4.1, , our project includes:

- only 1 building.
- Since it is a residential building, there is only 1 use zone
- The house is partially air-conditioned (only the night-time zone), therefore there are two thermal zones (a daytime zone and a night-time zone).

This information is reused in the image below:

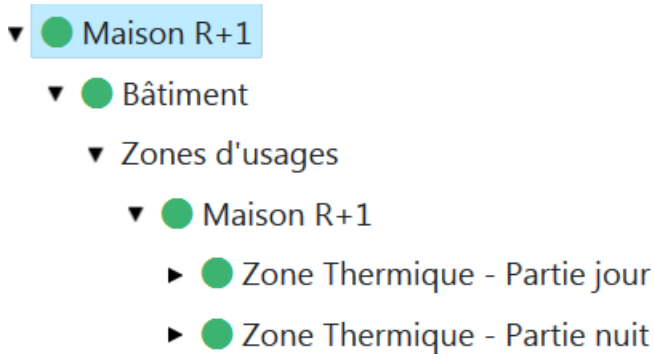


Figure 3 – Use zone and thermal zones for describing the house

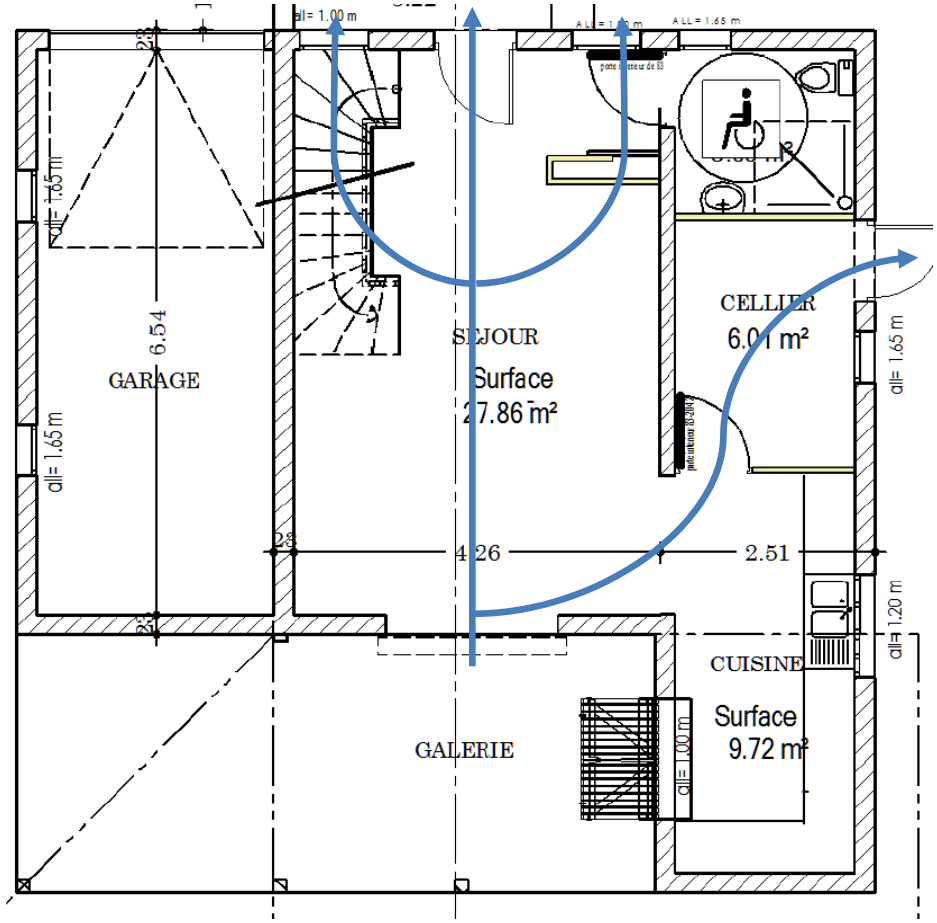
Description about the 'use zone' – The house:

The descriptive details are specified here at a use zone level.

It is a Villa that has a roof with an attic and uses breeze blocks as its main material.

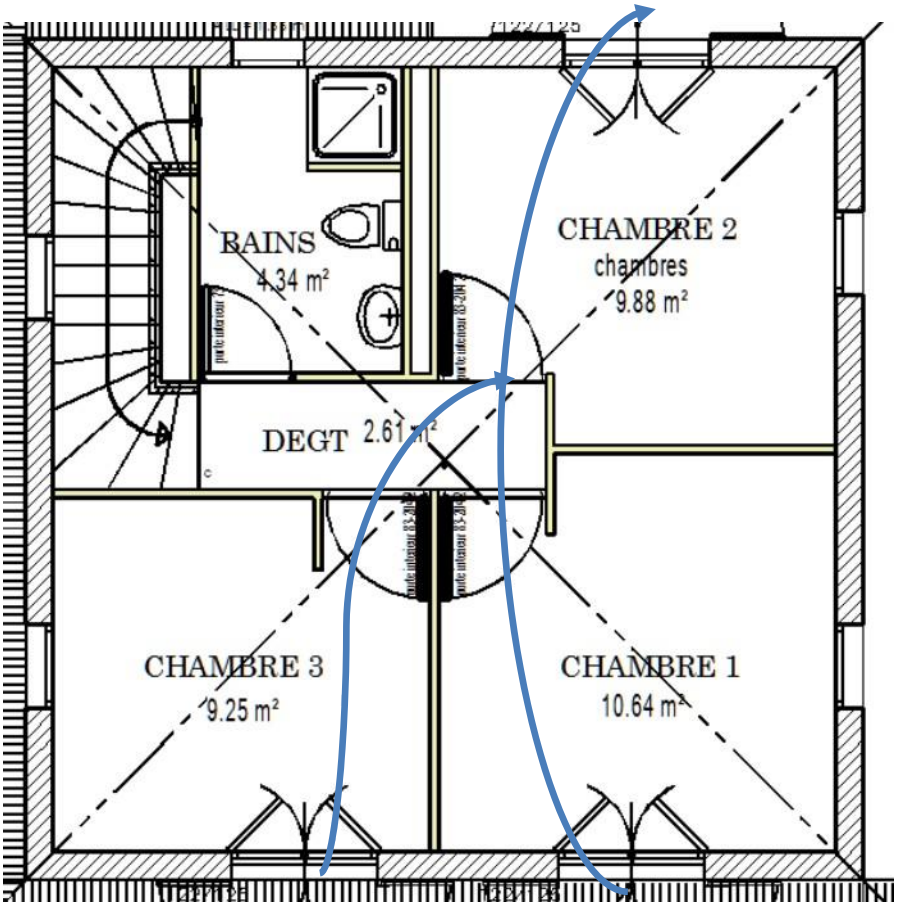
The internal open surface area (see. 4.5.2) is calculated as follows (see the process for **Error! Source of reference not found**).

The main facades with the most openings are the East and West facades.



On the ground floor, there are two possible paths (in blue below):

- one only concerns the living room, with a limiting internal open surface area related to the width of the living room.
- The other concern the living rooms and the cellar. This path, which does not go from the windward facade to the
  leeward facade, should be ignored.



On the first floor, there are two paths, but they meet at the entrance of bedroom 2. It is therefore the door of bedroom 2 that is the limiting open surface area.
Lastly, there is a path that passes through the stairs between the ground floor and the first floor. Its limiting surface area is the passage surface area via the stairs. This surface area, however, is larger than that of the doorway to bedroom 2.

The limiting internal open surface area is therefore that of bedroom 2. Its surface area is 0.83*2.04 = 1.7 m².

The floor surface is equal to the Liveable surface area (see **Error! Source of reference not found**.) equal here to:

- 36.72 m² for the first floor
- 47.58 m² for the ground floor
- 84.3 m² for the whole house

Description about 'thermal zones' – The daytime zone and the night-time zone:
Considering how the living unit is laid out, the night-time zone takes up one floor. With this, we include the three bedrooms, and secondary premises joined to these bedrooms (recess and bathroom).

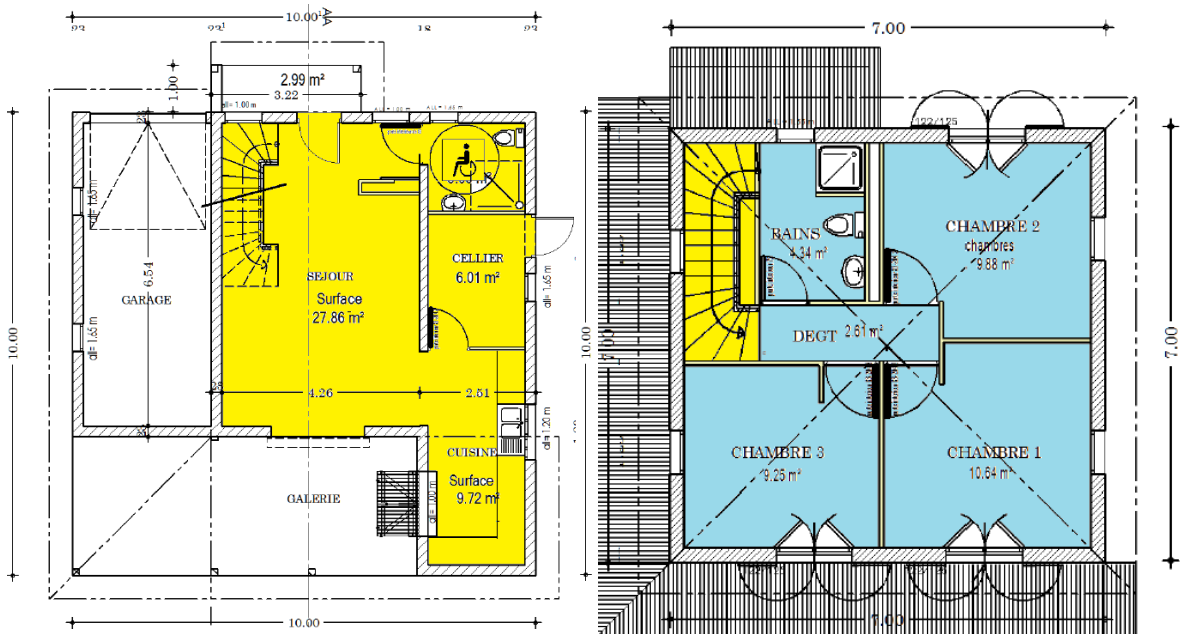


Figure 4 – Distribution of different rooms in the house between the daytime zone (yellow) and the night-time zone (blue)

8.1.2 Description of the building

8.1.2.1 The building

8.1.2.1.1 Intrinsic thermal and solar characteristics

8.1.2.1.1.1 Outdoor opaque walls

Wall modelling:

Stairwell:

The stairs that lead to the first floor can be considered to be an internal space that is not counted in the floor surface (*or possibly as an adjoining space without a permanent opening onto the outside (see 4.2.2) – In this respect, walls (opaque and openings) that separate the zone in question from the adjoining volume are not considered by the RTG calculation tool. Walls (opaque and openings) separating the adjoining space and the outside are walls that face towards the outside for the zone in question. They are measured and input in the RTG calculation tool*).

Garage:

This house's garage has two permanent openings out to the outside. In doing so, it is therefore considered to be an external space (cf. $Special case: a shared garage). The walls facing the garage are therefore considered to be facing outside and should be described in the RTG tool. Nevertheless, it is necessary to apply an additional protection coefficient (Cm) that corresponds to the fact that this wall does not truly face outwards. The value that should be used is a Cm of 0.3.

N.B.: we want to remind you that the floor surface of the garage should not be included in the floor surface of the building.

8.1.2.1.1.2 Glass windows

We are using simplified input for the openings described in Chapter 4.6.6.

Function	*Descriptive characteristics*	*Results ICT MP closed*	*Results ICT MP open*	*Results Bbio MP closed*	*Results Bbio MP open*
Bedroom windows	Full single glazing with gasket Hinged or tilt-and-turn carpentry Light coloured shutter type movable protective device (all or nothing)	U = 3.8 S = 0.06 Tl = 0	U = 10 S = 0.77 Tl = 0.75	U = 3.05 S = 0.06 Tl = 0	U = 5.43 S = 0.67 Tl = 0.68
Jalousies of bedrooms	Jalousies with gasket No movable protective device		U = 10 S = 1 Tl = 1		
Jalousies of of stairs, the hallway and the cellar	Jalousies with gasket No movable protective device		U = 10 S = 1 Tl = 1		
Jalousies of washrooms	Jalousies with gasket No movable protective device and facing sanitary facilities		U = 10 S = 1 Tl = 1		
Living room window with a roller shutter	Full single glazing with gasket Hinged or tilt-and-turn carpentry Light coloured adjustable vertical blind movable protective device	U = 5.43 S = 0.2 Tl = 0.14	U = 10 S = 0.67 Tl = 1	U = 4.02 S = 0.17 Tl = 0.13	U = 5.43 S = 0.67 Tl = 0.68
Front door	Light coloured with very poor thermal resistance		U = 9.4 S = 0.15 Tl = 0		
Door of cellar backstairs	Light-coloured PVC door		U = 5.6 S = 0.09 Tl = 0		
Serving hatch the kitchen	Jalousies with gasket Fixed blade brise soleil		U = 10 S = 1		

Tl = 1

Outdoor opaque walls

There are two levels of modelling (simplified and detailed). The difference between the two is only visible for the solar gain parameter (automatically calculated in simplified mode using the colour of the wall, and input in detailed mode).

External walls are made from 20 cm breeze blocks with a 2 cm external coating and internal 12.5 cm plaster coating.
The thermal resistance of the different levels is determined by this relation:

$$= \quad -$$

Therefore, we have:

- coating: $\frac{=0.02}{1.15} = 0.018\ ^2/$
- breeze block: $\frac{=0.2}{1} = 0.2\ ^2/$
- plaster: $\frac{=0.0125}{0.25} = 0.05\ ^2/$

Hence $= \sum = 0.27\ ^2/$

Based on Appendix 12, we, therefore, have, for exterior walls:

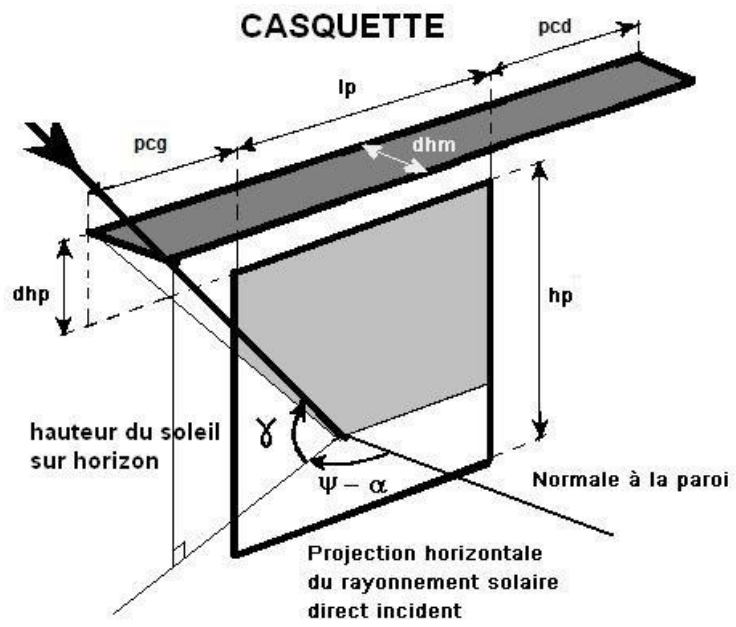
$$= \frac{1}{+0.20} = 2.14\ /^2$$

Walls are a light colour $(= 0.4)$. Which gives an (automatically calculated) solar gain of:

$$: = \frac{\frac{0.4 \times}{2.14}}{25} = 0.03424$$

Close solar protection of vertical walls:

There is an overhanging roof on the first floor. It, therefore, impacts opaque walls and glass windows on the first floor. This 63 cm roof overhang should be individually listed for each wall and opening on the first floor (night-time zone) as a sunshade.
Because the overhang is located at a certain distance from openings, the description for this should indicate the distance between the opening and the horizontal sunshade (dhp parameter). In the same way, since the length of the sunshade is more than that of the openings, it is necessary to indicate for each of the extended lengths on the right (pcd parameter) and on the left (pcg parameter) of the sunshade's opening.
These elements are illustrated below with the description of the sunshade for opaque walls (above) and an opening (below). Additionally, in our example, the opening rate of the sunshade is null.



FR	EN
Casquette	Sunshade
Hauteur du soleil sur horizon	Height of the sun on the horizon
Normale à la paroi	Normal on the wall
Projection horizontale du rayonnement solaire direct incident	Horizontal projection of direct incident solar radiation

This sunshade is also on part of the opaque walls on the ground floor.

Roof

The roof is made up of a ceiling under an un-ventilated attic with 6 cm of

fibreglass insulation. The thermal resistances of these elements are:

- plaster: $= \frac{0.0125}{0.25} = 0.05\ ^2/$
- insulation: $= \frac{0.06}{0.04} = 1.5\ ^2/$

Either:

$$= \frac{1}{1.50 + 0.20} = 0.59\ ^2/$$

Section 4 about Th-U rules describes a calculation method to calculate resistance due to air in the attic. In accordance with this method, since the height of the attic is over 30 cm, this resistance is null.

For solar gain calculation in simplified mode, the roof is light-coloured.

Inertia

Reminder: inertia, in simplified mode, should be input in the thermal zone section (thus for this example, individually for the daytime zone and the night-time zone).

Daytime zone:

We are looking at a 12 cm thick concrete lower floor with a tile coating, with no thermal effect. It is therefore in the 'Heavy' category (see 4.6.4). Reminder, this lower floor is not input in the RTG tool.
We are looking at a 15 cm (intermediary) concrete upstairs floor without insulation. It is therefore in the 'Heavy' category (see 4.6.4). Reminder, this lower floor is not input in the RTG tool.
The surface area of the walls is around 81.2 m² (see description below). It is therefore at least equal to 0.9 times the floor surface (84.3 m² see above). Since the walls are made of 20 cm thick breeze blocks, the vertical wall belongs to the 'Heavy' category.

Night-time zone:

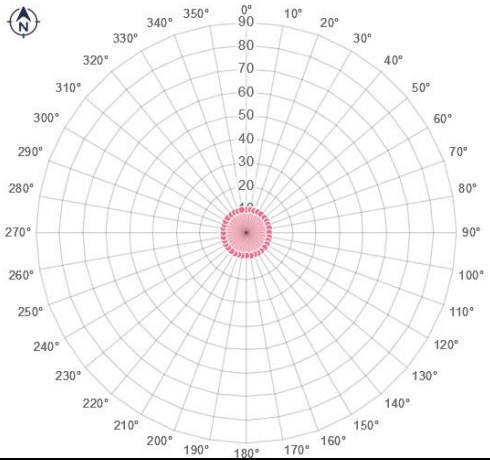
The floor is made up of an intermediary level with heavy inertia as defined above.
The upstairs is 'light or medium' inertia – the upstairs faces the attic.

Distant solar protection:

We assume that information about distant solar protection is not well known. Simplified input is therefore done using a 10° value, no matter the direction (see image below).

yi : Hauteur du masque lointain (par tranche azimutale Az de 10°)

Orientation [0;90°]	
Nord	10
Est	10
Sud	10
Ouest	10



FR	*EN*
Hauteur du masque lointain (par tranche azimutale Az de 10°)	*Height of distant solar protection (per 10° azimuthal (Az) range)*
Orientation	*Direction*
Nord	*North*
Est	*East*
Sud	*South*
Ouest	*West*

Fans

The house has dedicated spaces. This information is input in the thermal zone section, therefore individually for each zone.

8.1.2.1.2 Calculation input data

Opaque walls:

For opaque walls, we input the lengths and height of the facade seen from inside, as well as the surface area of the opaque area (without openings) – see ***Error! Source of reference not found.*** Take care to remove the surface area of the facade protected by inside partition walls.

An example is given below for walls in the night-time zone:

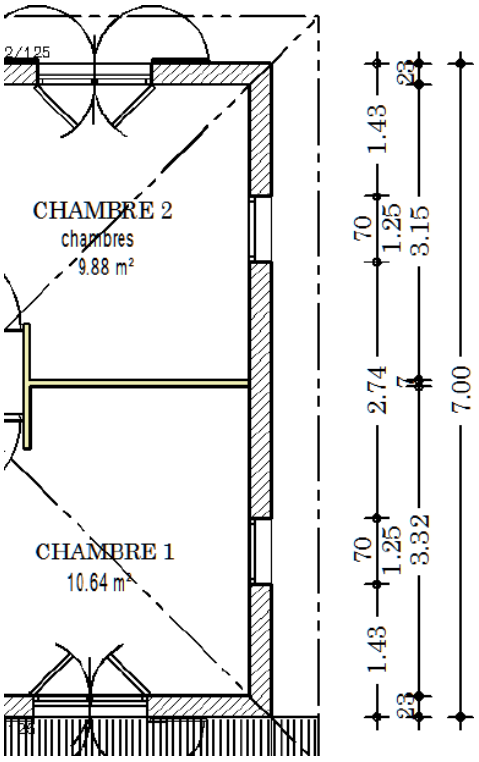


Figure 5 – Detail of the North external wall on the first floor

For the right facade, we need to input:

- *its length as seen from inside (7 m minus the thickness of external walls - 2*0.23 m – hence a length of 6.54 m)*
- *its height (here, 2.5 m) – height under the ceiling of the premises*
- *the surface area seen from inside: 6.54 * 2.5 = 16.35 m²*
    - *without glass windows - 2*0.7*1.25 = 1.75 m²*
    - *without the surface area covered by the internal partition wall -*

*0.07*2.5 m = 0.175 m². Therefore, the surface area of the facade is thus 16.35 - 1.75 - 0.175 = 14.425 m²)*

The following tables show the surface areas of opaque walls, then the openings by direction and by room, depending on the example. The surface area of the roof was calculated using the floor surface by subtracting the surface area taken up by partition walls. We looked at 7 cm thick partition walls.

Walls facing South and East for the daytime zone are divided into two, due to there being different close architectural protection nearby.

Opaque Walls	Net surface area (m^2)	Width (m)	Height (m)	U wall ($W/m^2.k$)	Colour
Night-time zone					
East	13.13	6.54	2.5	2.14	Light
South	6.5	2.95	2.5	2.14	Light
North	14.43	6.54	2.5	2.14	Light
West	11.07	5.32	2.5	2.14	Light
Roof	36.72	-	-	0.6	Light
Daytime zone					
South kitchen	5.73	2.77	2.5	2.14	Light
South Garage	16.33	6.53	2.5	2.14	Light
South storey	8.8	3.52	2.5	2.14	Light
East	11.38	6.35	2.5	2.14	Light
North	19.79	9.54	2.5	2.14	Light
Ground floor West	11.45	6.54	2.5	2.14	Light
First floor West	2.88	1.15	2.5	2.14	Light

Glass windows	Width (m)	Height (m)
Night-time zone		
Bedroom 1 East	1.22	1.25
Bedroom 3 East	1.22	1.25
Bedroom 2 West	1.22	1.25
Jalousie Bedroom 1 North	0.7	1.25
Jalousie Bedroom 2 North	0.7	1.25
Jalousie Bedroom 3 South	0.7	1.25
Jalousie Washroom West	0.6	0.6
Daytime zone		
East Living Room	2	2.25
Kitchen serving hatch South	1.2	1
Jalousie Stairs South	0.7	1.25
Jalousie Kitchen North	1.2	1.05

Jalousie Cellar North	0.6	0.6

Service door Cellar North	0.93	2.25
Jalousie Washroom West	0.6	0.6
Jalousie Entrance West	0.8	1.25
Door Entrance West	0.96	2.18
Jalousie Stairs West	0.8	1.25

8.1.2.2 Energy Systems

Lighting:

No lighting data should be input, because this is conventional for residential buildings (see $**Error! Source of reference not found**).

Generating domestic hot water:

The domestic hot water production system is a solar-heated water tank. This covers all needs of the house. This is made up:

- Of 2 m² solar thermal panels facing South and tilted 30° (roof inclination)
- Of a 200-litre tank

Calculation input data in detailed mode are provided in the figure below:

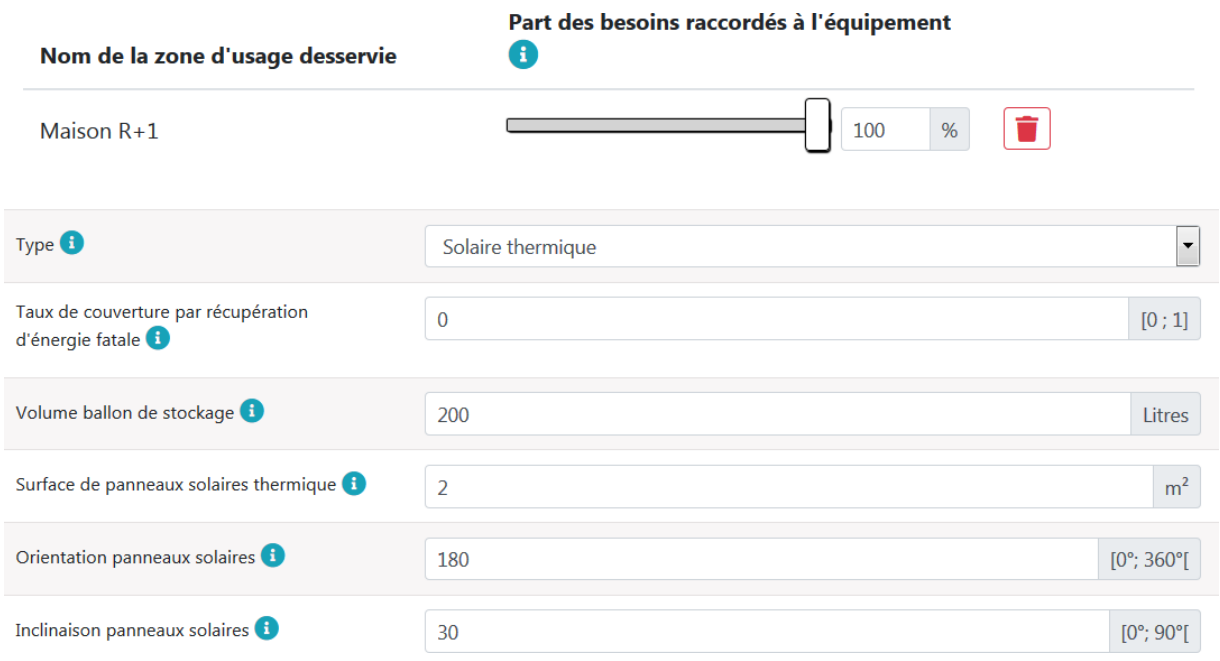


Figure 6-Parameter input for the domestic hot water production system

Cooling:

In our example, only the night-time zone is supplied by an air-conditioning system. It is a split air-conditioner with air condensation, with Inverter technology with an energy performance label of A++ for a device with less than 12 kW of power.

This appears in simplified mood as:

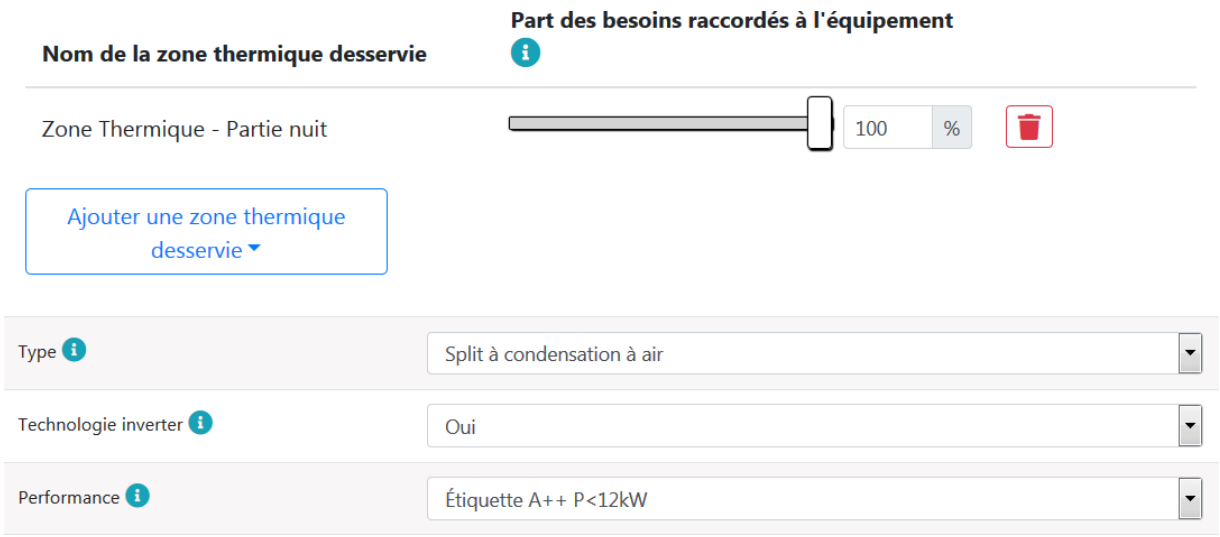


Figure 7-Parameter input for the air-conditioning system

8.1.3 Results

The figure below shows the calculation tool's interface with the results of the calculation on the living unit.

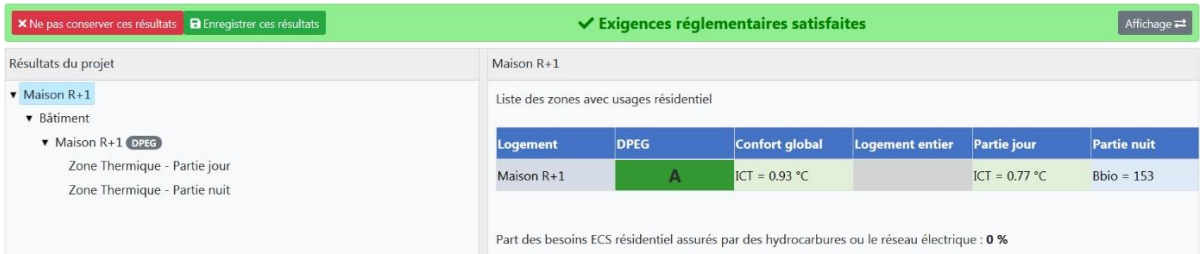


Figure 8-Print screen of results for the individual house example

We will come back to these results later.

8.1.3.1 ICT – Hygro-Thermal Comfort Indicator

Since this is a living unit that is partially air-conditioned – see $3.2.1, there is a double requirement for the ICT indicator:

- For the whole living unit
- For the non-air-conditioned area (daytime zone)

We verified that the project complies with performance requirements:

- ICT of 0.93 °C for the whole living unit
- ICT of 0.77 °C for the daytime

zone. For $_{max}$ ICT of 1 °C maximum values.

8.1.3.2 BBIO – Energy Requirement Indicator

The Energy Requirement Indicator is verified for the air-conditioned area (night-time zone) – see $3.2.1

In our case, with the following needs:

- Heat load of 67.06 kWhef/m²ZT.
- Lighting needs of 3.77 kWhef/m²ZT

We therefore have a Bbio of 5*3.77+ 2*67.06 = 152.97 <175 kWhef/m²ZT ($_{max}$Bbio)

8.1.3.3 PRECS = Share of energy drawn from the electricity grid (or hydrocarbons) for DHW

The requirement regarding the share of energy taken from the electricity grid is verified at a building level. In our case, this share is 0% (solar production), and therefore meets the requirement (PRECSproject <50%).

8.1.3.4 DPEG – Energy Consumption Indicator

This calculation is also used to calculate the DPEG. Using the

consumption of the energy-powered units below:

- Lighting: 3.8 kWhef/m²
- DHW: 0
- Cooling: 10.7 kWhef/m²
- Ventilation: 0

N.B.: we can see here that null consumption for the domestic hot water system although, if we look at the detailed results, the coverage rate by the sun is not 100%. This is due to the following assumption done as part of the RTG: if the solar system can cover 85% of DHW needs, we can assume that there is no extra installed system and thus no electrical consumption (pump consumption is negligible).

We have a total consumption of 14.5 kWhef/m²

It is therefore a Class A building (consumption less than 15 kWh/m².year).

9 APPENDIX: PRACTICAL EXAMPLE OF AN OFFICE

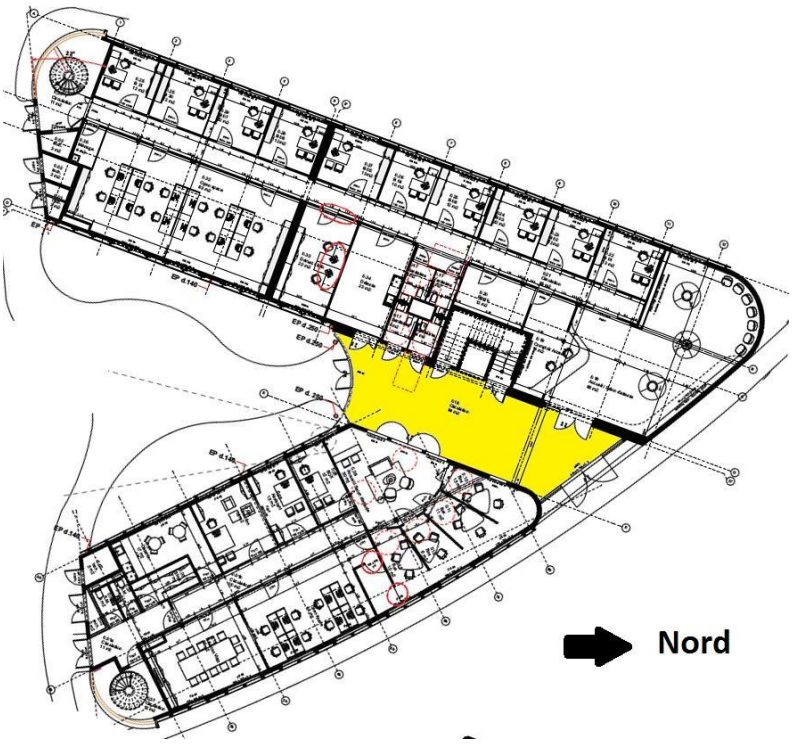
Description

The office used is shown below. It is a two-storey office with:

- Offices (individual or open space)
- Meeting rooms
- A cafeteria on the ground floor
- An open office area to rent on the second floor.

Building views (from above and facade)

The building is made up of two wings (one face North-South and the other North-West/South-East) linked by hallways (example below for the ground floor).



Sectional view of the building (ground floor)

FR	EN
Nord	North

Location

The building is in a continental zone at sea level (0m altitude). The prevailing wind comes from the East.

9.1 Description in the RTG tool:

This is the information outlined in Chapter 4

9.1.1 Different zones in the building:

In accordance with the information in Chapter 4.1, , our project includes:

- only 1 building.
- It is a tertiary building with a cafeteria whose size (75 m²) is much smaller compared to the size of the building (more than 2,000 m²), we have only 1 use zone for offices
- Since it is a tertiary building with 1 tertiary use zone, we have only 1 thermal zone which is also of tertiary use.

This information is reused in the image below:

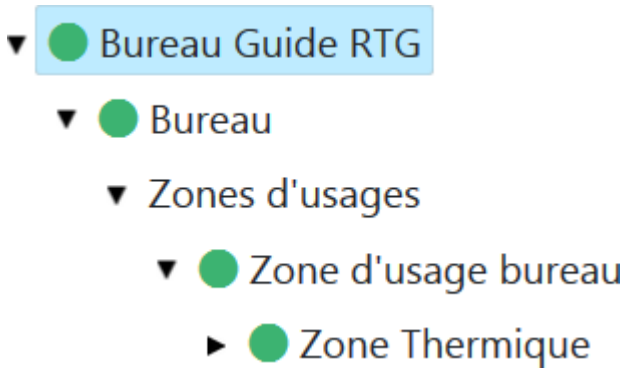


Figure 9 – Use zone and thermal zone for describing the office

Description about the 'use zone' – The office:

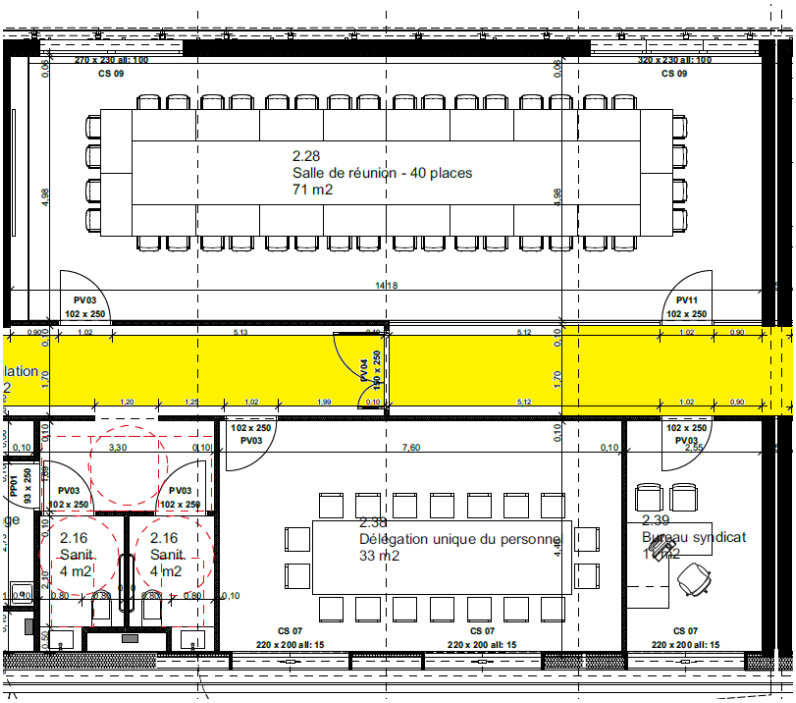
The descriptive details are specified here at a use zone level.

The floor surface is equal to the Useable surface area (see **Error! Source of reference not found**.) equal here to:

- 2,190 m² for the building

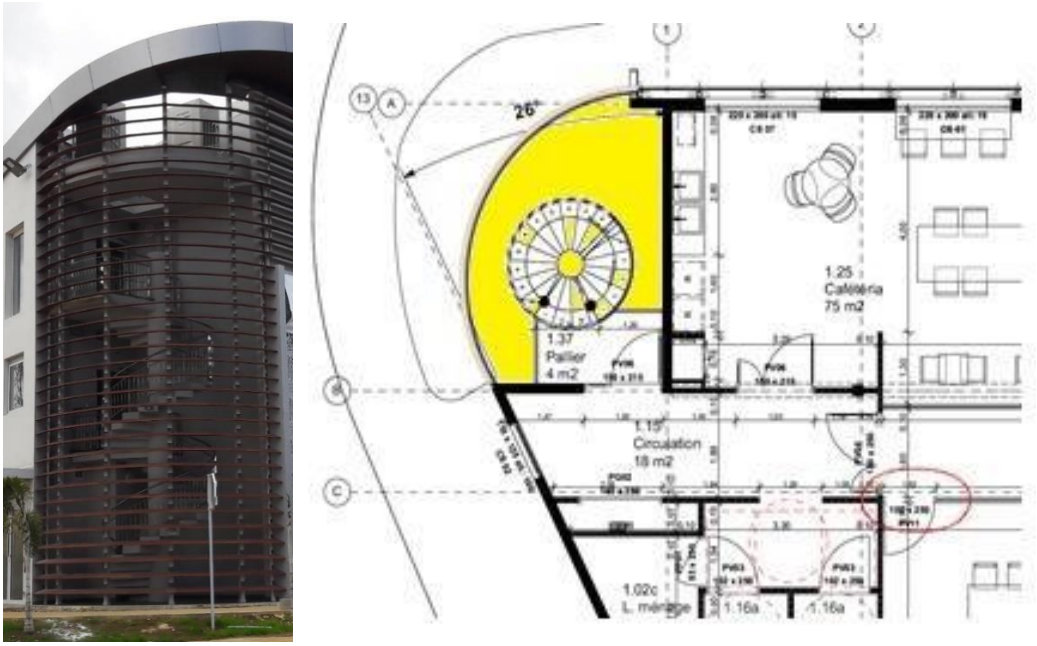
N.B..: Hallways:

There are fully integrated hallways in the building, and therefore the office zone.



Hallways (in yellow) integrated into the office zone

There are different types of hallways in this building. At the end of the building (see the figures below), it is adjoining spaces **with permanent openings** onto the outside and there are considered to be exterior spaces but whose presence creates a sun protection effect.



Exterior view and overview (yellow area) of passageways on different floors.

Lastly, there are passageways between the two wings of the building. They are processed differently depending on the floor:

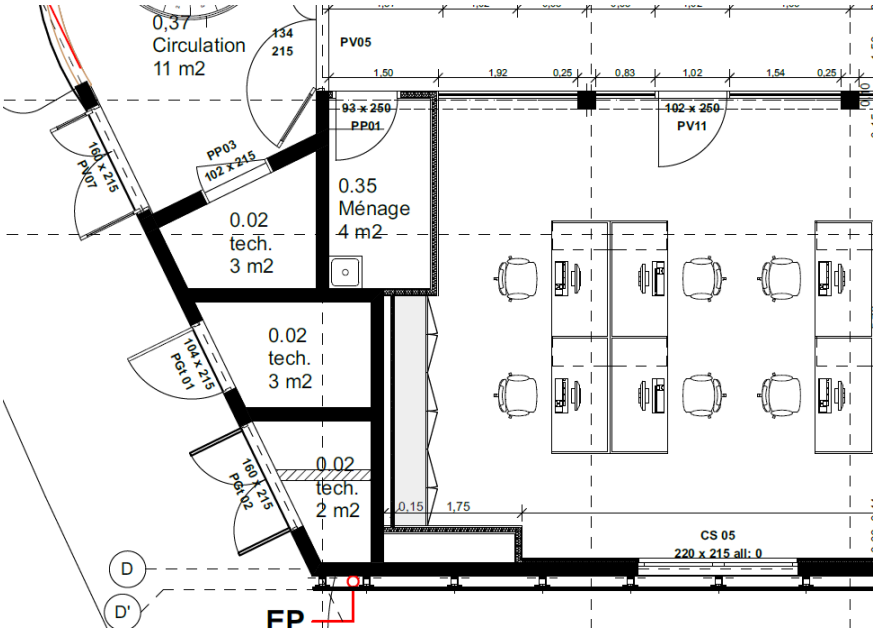
- On the ground floor and the first floor, they are permanently open (and thus are processed in the same way as above)
- On the second floor, they are closed and are therefore included in the floor surface, and when inputting opaque and glass walls.

External view of inter-building passageways (open on the ground and first floors – closed on the second floor)

FR	EN
Ouverture	Opening

N.B..: Technical facilities:

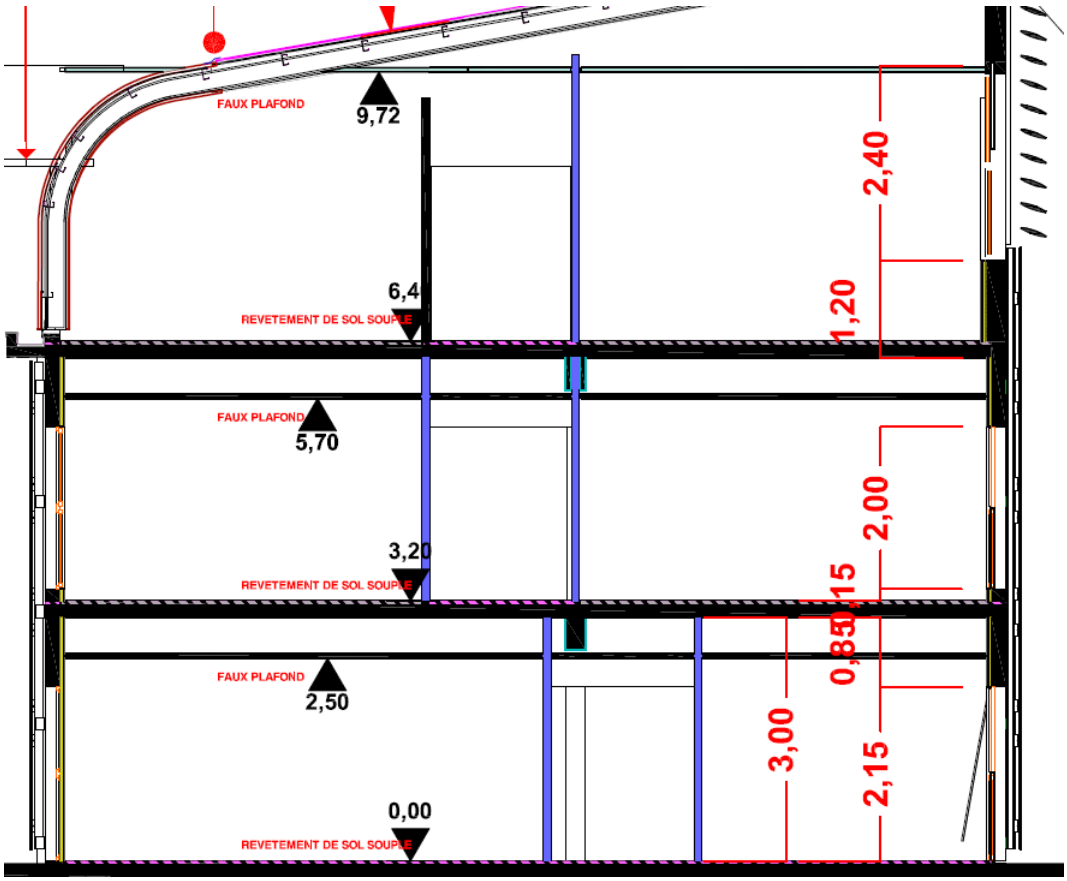
It should be remembered that the surface area of technical facilities should not be included in the floor surface of the building (see specific definition). However, they are included in the description of the envelope because they are attached to the offices (small technical facilities spread across each of the floors).



Detail showing the location of technical facilities in the building

The height of the floor, in accordance with the definition provided in the Appendix is as follows:
"The distance between the upper level of the finished floor and the lower level of the ceiling or dropped ceiling, in metres."

On the sectional diagram below, we can see the height for each of the floors.



Sectional view of the building

FR	EN
Faux plafond	Dropped ceiling
Revêtement de sol souple	Flexible floor coating

The heights of the different floors are:

- 2.5 m for the ground floor and the first floor
- 3.32 m for the second floor

Hence a value for the building of (2.5*2 +3.32)/3 = 2.77 m

We thereby calculate a weighted average to determine the average height of the floors. What is of interest to us is to get the right volume using the floor surface and the height of the floor.

Ventilation rates are as follows per occupied floor:

- **Ground floor:** 1900 m3/h
- **First floor:** 2,635 m3/h
- **Second floor:** 2,095 m3/h

When they are unoccupied, we use 15% of this value.

Description about the 'thermal zone' – The office:

Because this is a tertiary building, there is only one thermal zone for the whole building. Below are the input data in simplified mode:

- here we have the floor surface which is identical to the one input for the

use zone.

- The thermal zone is air-conditioned, we, therefore, tick *Oui* [Yes].
    - In detailed mode, we can input the air-conditioned share, which for this example, is 100%.

- We also need to indicate if there are fans (none here)
- Lastly, we need to indicate the inertia (see clarifications below) of different walls: (lower floor, upstairs floor and walls)

Inertia

The building has several levels. Therefore, the lower floor needs to be understood as the ground floor of the building's floor and the upstairs floor as the roof of the building

Lower floor:

We are looking at a 12 cm thick concrete floor with a coating, with no thermal effect. It is therefore in the 'Heavy' category (see 4.6.4). Reminder, this lower floor is not input in the RTG tool. Upstairs floor: The upstairs floor is in steel sheeting. It is therefore not in the 'Heavy' category (see 4.6.4).

Vertical walls:

Vertical walls are insulated from the outside and have 18 cm or 25 cm thick concrete coatings depending on the floor. They can be listed in the *Lourde* [Heavy] category but their surface area is not equal to 0.9 of the floor surface. Therefore, the inertia category is *Légère ou moyenne* [Light or medium].

9.1.2 Description of the building

9.1.2.1 The building

9.1.2.1.1 Intrinsic thermal and solar characteristics

9.1.2.1.1.1 Outdoor opaque walls

There are two levels of modelling (simplified and detailed). The difference between the two is only visible for the solar gain parameter (automatically calculated in simplified mode using the colour of the wall, and input in detailed mode).

	Thickness (cm)	Thermal conductivity (W/m.K)	Resistance (m².K/W)
Concrete Ground floor and First floor	18	2.5	0.072
Concrete Second floor	25	2.5	0.1
Insulating	4.5	0.4	1.125
Ground floor and First floor total	R = 1.197 hence a U of 0.71		
Second floor total	R = 1.225 hence a U of 0.7		

Calculation example for ground floor and first-floor walls. The thermal resistance of the different levels is determined by this relation:

$$= \quad -$$

Therefore, we have:

- concrete: $= \frac{0.18}{2.5} = 0.072\ ^2/$
- insulating: $= \frac{0.045}{0.04} = 1.125\ ^2/$

Hence $= \sum = 1.197\ ^{2}/$

Based on Appendix 12, we therefore have, for exterior walls:

$$= \frac{1}{+ 0.20} = 0.71\ /^2$$

Walls are a light colour $(= 0.4)$. Which gives an (automatically calculated) solar gain of:

$$: = \frac{0.4 \times 0.71}{25} = 0.01145$$

Roof

The roof is a sheet steel roof insulated with two beds of rigid 40 mm mineral panels each. The thermal resistances of these elements are:

- sheet metal: $= \frac{0.001}{50} = 0.05\ ^2/$
- insulation: $= \frac{0.08}{0.038} = 2.1\ ^2/$

Either:

$$= \frac{1}{2.15 + 0.20} = 0.43\ ^2/$$

For solar gain calculation in simplified mode, the roof is medium-coloured (light grey $= 0.6$.).

$$: = \frac{0.6 \times 0.43}{25} = 0.01032$$

9.1.2.1.1.2 Glass walls

Openings are for the most part clear double glazing with aluminium frames. There is no movable solar protective device but there is architectural solar protection (see below)

- with perforated mesh for the ground and first floors. To simplify the process, the Cm to be taken into account is linked to the perforation rate of this mesh. Here, it is 44% (data provided by the manufacturer), hence a Cm of (1-0.44) = 0.56
- per fixed blade for the second floor. This example is pre-simulated in the openings section of the simplified interface and uses a Cm Brise soleil coefficient of 0.47.

The doors are made from aluminium. These are the main characteristics:

Opening and position	*Descriptive characteristics*	*U (W/m².K)*	*Movable solar protective device*	*Brise soleil*
Ground floor and First floor windows	Clear double-glazing Aluminium joinery	1.1	Without	Other with Cm of 0.56

	Fixed and casement windows Perforated metal protection			
All openings level	Clear double-glazing Aluminium joinery Fixed and casement windows Facing passageways	1.1	Without	None
Openings Second floor	Clear double-glazing Aluminium joinery Fixed and casement windows Fixed brise soleil protection	1.1	Without	Fixed blades Pre-simulated Cm of 0.47
Doors	Aluminium doors	5	Without	

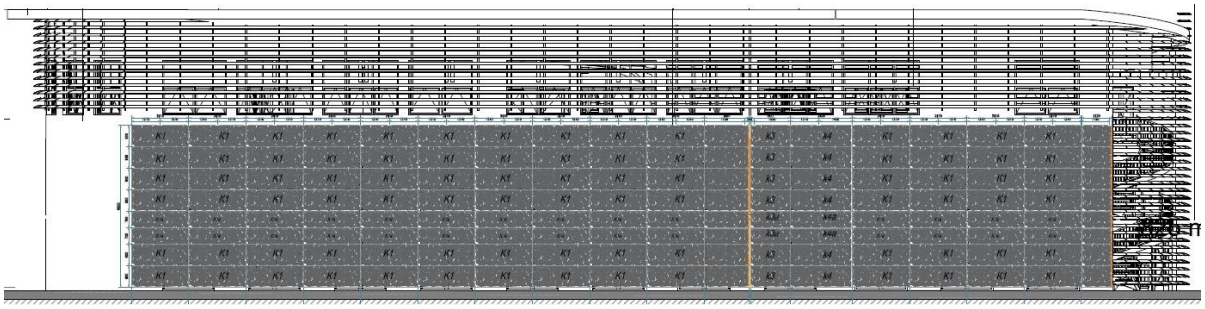
9.1.2.1.2 Solar protection

There is a set of architectural solar protective devices in place in this building (mesh and fixed blade brise soleil), and others linked to its shape (protection from one wing of the building to another). They are summarised in the table below (the inner side corresponds to the facades facing each other, the outer side corresponds to the other facades):

Storey	**Shading device**
Glass Windows	
Ground floor/First floor	Mesh
Second floor external side	Brise soleil with fixed blades and roof overhang
Second floor internal side	Sunshade except for glass windows in hallways Protection via the opposite building wing
Opaque Walls	
Ground floor/First floor	Mesh
Second floor external side	Brise soleil with fixed blades and roof overhang
Second floor internal side	Protection via the opposite building wing

Mesh and fixed blade brise soleils:

In the figure below, we can see the position of the different brise soleils; fixed blades on the second floor and mesh on other storeys (view of the West facade)



The mesh has a perforation rate of 44%. A protection coefficient for the additional opaque walls and windows in question is considered to be equal to Cm = 1-0.44 = 0.56.
Brise soleils should be input as is in simplified mode. A Cm coefficient of 0.47 will automatically be attributed to it. *Note: the design office can input a more specific value but should, in this case, explain it in the calculation note*

Architectural Protective Devices:
There are architectural protective devices on the last floor:

- there is a 1 m (approx.) of roof overhang on the building's external facades. It therefore has an impact on opaque walls and glass windows for the last floor. This 1 m (approx.) roof overhang should be described individually for each wall and opening on this floor as a sunshade.
- an additional sunshade on glass windows of internal facades (facing one another).

Protection linked to another wing of the building:
Each of the two opposing wings is protection for the other wing ('internal' side of facades).
We can only describe one distant solar protection per building. In its description, it will impact all glass windows and opaque walls in the building. Therefore, we cannot use this description mode.
We can overlook this protection. If we would like to describe it in the tool, this can be done by using sides (left or right) whose length corresponds to the length of the building's wing.

Distant solar protection:
There are buildings around the office. However, their height and distance do not make them distant solar protection for our building.

9.1.2.1.3 Calculation input data

9.1.2.1.3.1 Opaque wall measurements

For opaque walls, we input the lengths and height of the facade seen from inside, as well as the surface area of the opaque area (without openings) – see **Error! Source of reference not found.** Take care to remove the surface area of the facade protected by inside partition walls.

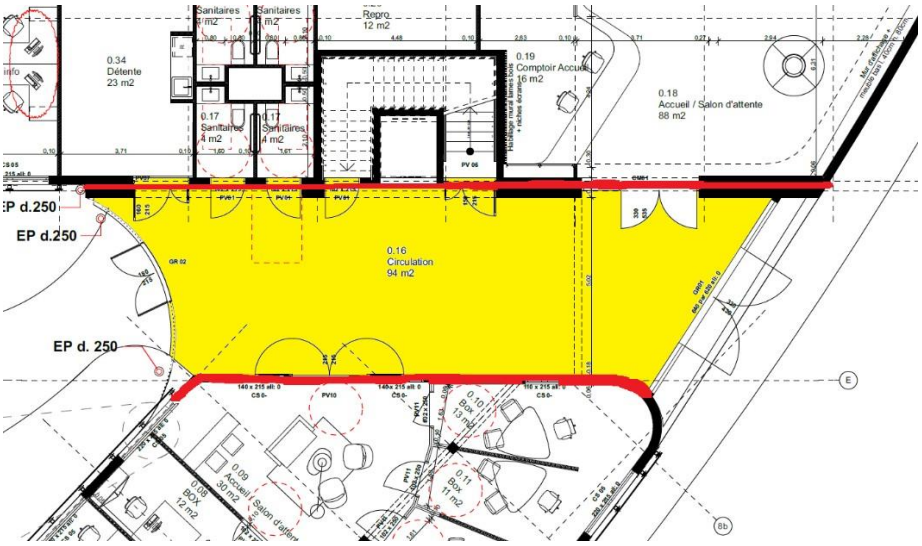
An example is provided for the first test case – the individual house.
The following tables show the surface areas of opaque walls, then the openings by direction and by storey in question for calculation. Walls are differentiated:

- According to storeys to keep protection or specific solar protection (see previously presented descriptive information)
- Depending on their direction. Please note that we grouped the walls for the four main directions together according to the table's sequence below.

South Direction	West Direction	North Direction	East Direction
South Direction is any direction between south-east and south-west through the south, including south-east and south-west direction.	West Direction is any direction between north-west and south-west through the west, excluding north-west and south-west directions.	North Direction is any direction between north-east and north-west through the north, including north-east and north-west direction.	East Direction is any direction between north-east and south-east through the east, excluding north-east and south-east directions.

Note: *the calculation tool can now be used for more detailed input about wall directions. In this case, we can specify the exact direction of each of the walls*

- Finally, the last distinction is made between external walls facing completely open hallways between the two wings of the building. For this, they are considered to be external walls but since they face hallways, they have a protection coefficient of Cm = 0 (below, walls in red facing completely open hallways in yellow).



Detail about inputting walls between offices and open hallways on the ground and first floors between building wings.

Below is descriptive information about measurements for opaque walls

Direction and floor	Net surface area (m²) except openings	Width (m)	Height (m)	Additional Cm
East facades internal side Ground floor/First floor	54.6	18.22	5	0.56 Mesh
East facades external side Ground floor/First floor	54.56	22.78	5	0.56 Mesh
West facades internal side Ground floor/First floor	55.6	18.42	5	0.56 Mesh
West facades external sides Ground floor/First floor	116.22	43.3	5	0.56 Mesh
West facing landings – hallways Ground floor/First floor	53.84	14.77	5	0
East on landings – open hallways Ground floor/First floor	91.8	23.66	5	0
South Ground floor/First floor	46.6	12.98	5	
North Ground floor/First floor	63.8	12.75	5	
South on open hallways Ground floor/First floor	42.9	9.15	5	0
West external side second floor	82.2	43.3	3.32	0.47 brise soleil
West internal side second floor	48.6	18.6	3.32	
East external side second floor	49.9	31.4	3.32	0.47 brise soleil
East internal side second floor	47.3	18.2	3.32	
West on open hallways Second floor	7.73	3.4	3.32	0
East on open hallways Second floor	10.9	3.3	3.32	0
South Second floor	56.8	21.1	3.32	
North Second floor	17.3	12.7	3.32	
South on open hallways Second floor	31.2	9.4	3.32	0

Roof	730			

9.1.2.1.3.2 Measuring glass windows

Below is descriptive information about glass windows

Please note that each opening should be described separately. This can be waived for openings with the same direction, and without protection, or identical brise soleil protection.

Direction and floor	Width (m)	Height (m)	Additional Cm
West exterior side Ground floor	*2.2*	*2.15*	*0.56 Mesh* *11 identical openings*
West interior side Ground floor	*2.2*	*2.15*	*0.56 Mesh* *4 identical openings*
East exterior side Ground floor	*2.2*	*2.15*	*0.56 Mesh* *6 identical openings*
	1.1	*2.15*	*0.56 Mesh*
East interior side Ground floor	*2.2*	*2.15*	*0.56 Mesh* *4 identical openings*
Ground floor South	*1.8*	*2.15*	
Ground floor South on landing	*1.34*	*2.15*	*0*
Ground floor Doors	*1.04*	*2.15*	*2 identical doors*
	1.6	*2.15*	
	1.77	*2.15*	
First floor West external side	*2.2*	*2*	*0.56 Mesh* *11 identical openings*
First floor West internal side	*2.2*	*2*	*0.56 Mesh* *4 identical openings*
First floor East external side	*2.2*	*2*	*0.56 Mesh* *6 identical openings*
	1.1	*2*	*0.56 Mesh*
First floor East internal side	*2.2*	*2*	*0.56 mesh* *4 identical openings*
West Ground floor/First floor on hallways	*9.32*	*2.15*	*0*
East Ground floor/First floor on hallways	*12.32*	*2.15*	*0*

Direction and floor	*Width (m)*	*Height (m)*	*Additional Cm*
First floor South	*2.2*	*2.15*	
Second floor West external side	*2.7*	*2.3*	*Fixed blade brise soleil 4 identical openings*
	3.2	*2.3*	*Fixed blade brise soleil 5 identical openings*
Second floor West internal side	*2.2*	*2*	*3 identical openings*
Second floor East external side	*2*	*2.3*	*Fixed blade brise soleil*
	2.2	*2.3*	*Fixed blade brise soleil 3 identical openings*
	2.7	*2.3*	*Fixed blade brise soleil 2 identical openings*
	3.2	*2.3*	*Fixed blade brise soleil 3 identical openings*
Second floor East internal side	*2.2*	*2*	*3 identical openings*
Second floor West on landing	*1.5*	*2.15*	*0*
Second floor East on landings	*1.5*	*2.15*	*0*
Second floor North	*1.1*	*2.3*	*Fixed blade brise soleil 4 identical openings*
	3.2	*2.3*	*Fixed blade brise soleil 2 identical openings*
Second floor South	*2*	*2.2*	*3 identical openings*

9.1.2.3 Energy Systems

Lighting:

LED lighting with 5 W/m² of installed power. It is managed
using a switch

Premises with access to natural light are those located less than 5 m from an opening, which here include all premises except hallways and shaded premises (sanitary facilities, storage rooms, cleaning rooms, etc.), which represent a surface area of 450 m². The rate of access to natural lighting is therefore 80%.

Generating domestic hot water:

The domestic hot water production system is a solar-heated water tank. This covers all
needs of the building. This is made up:

- Of 2 m² solar thermal panels facing South and tilted 30°
- Of a 200-litre tank

Cooling:

The building has a VRF central air-conditioning system with
cassette internal unit distribution. Whose performance is known (EER of 3.5).

Ventilation:

Fresh air supply via the indoor units of the VRF system with air intakes in the facade. Mechanical ventilation system extraction
in the sanitary facilities and cafeteria.

9.1.3 Results

The figure below shows the calculation tool's interface with the results of the calculation on the office.

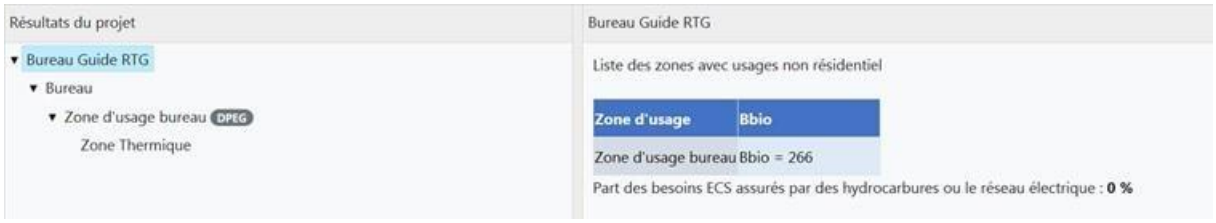


Figure 10 – Print screen of results for the Office example

We will come back to these results later.

9.1.3.1 ICT – Hygro-Thermal Comfort Indicator

Since this is an office building, this indicator is not evaluated.

9.1.3.2 BBIO – Energy Requirement Indicator

The Energy Requirement Indicator is verified for the use zone – see $3.2.1

In our case, with the following needs:

- Heat load of 124 kWhef/m²ZT
- Domestic hot water needs of 1.9 kWhef/m²ZT
- Lighting needs of 3.5 kWhef/m²ZT

We therefore have a Bbio of 5*3.5+ 2*124 = 265.5 <370 kWhef/m²ZT ($_{max}$Bbio). This value is rounded to 266 by the tool.

(note: this is automatically calculated)

9.1.3.3 PRECS = Share of energy drawn from the electricity grid (or hydrocarbons) for domestic hot water

The requirement regarding the share of energy taken from the electricity grid is verified at a building level. In our case, this share is 0% (solar production), and therefore meets the requirement (PRECSproject <50%).

9.1.3.4 DPEG – Energy Consumption Indicator

This calculation is also used to calculate the DPEG. Using the

consumption of the energy-powered units below:

- Lighting: 3.5 kWhef/m²
- DHW: 0 kWhef/m²
- Cooling: 39.3 kWhef/m²
- Ventilation: 3 kWhef/m²

We have a total consumption of 45.9 kWhef/m²SPL.year

It is therefore a Class A building (consumption less than 60 kWhef/m²SPL.year).

10 APPENDIX: EXTRACT FROM RESOLUTION191155 OF 31/10/2019 PERTAINING TO RTG CALCULATIONS FOR NEW BUILDS

Article 1:

I. The resolution of the Regional Council of Guadeloupe CR/13679 of 14 June 2013 published in the Official Journal of the French Republic of 30 July 2013 pertaining to the field of regulation relating to Guadeloupe's Thermal Regulations (RTG) and to the thermal characteristics of the envelope of new buildings and new parts of buildings, repealing and replacing the resolution CR/11372, is repealed.

II. In application of Article 205 of law no.°2015-992 of 17 August 2015 pertaining to energy transition for green growth, specific rules are set for Guadeloupe in terms of the thermal characteristics of the envelope for new buildings and new parts of buildings (thermal regulation system known as 'RTG calculation').

III. These rules complement and derogate, for Guadeloupe, as necessary, the following texts:

- *Code de la construction et de l'habitation* [Construction and Housing Code], in particular Articles R. 162-1 to R. 162-4;
- decree n°2009-424 of 17 April 2009 regarding special provisions relating to the thermal, energy, acoustic and ventilation characteristics of residential buildings in the departments of Guadeloupe, French Guiana, Martinique and Réunion;
- order of 17 April 2009 stipulating the minimum thermal characteristics of new residential buildings in the departments of Guadeloupe, Martinique, French Guiana and Réunion;
- order of 17 April 2009 pertaining to acoustic characteristics of new residential buildings in the departments of Guadeloupe, Martinique, French Guiana and Réunion;
- order of 17 April 2009 pertaining to ventilation in new residential buildings in the departments of Guadeloupe, Martinique, French Guiana and Réunion.

Chapter I – Scope of Application

Article 2:

I. The provisions of this resolution apply to new buildings and new parts of buildings, whether they are air-conditioned and non-air-conditioned, for residential, office or commercial use as defined in Appendix 2 of this resolution.

II. The provisions of this resolution shall also apply to extensions or additions to existing buildings or parts of existing buildings, except in cases where the extension or addition concerns a floor surface of less than 150 m² and 30% of the surface area of existing buildings.

Article 3:

The provisions in this resolution do not apply:

- to provisional constructions that are due to be used for two years or less;

- to buildings classed or listed as historical monuments under the *Code du Patrimoine* [Heritage code];
- to buildings for religious use;
- to independent buildings whose floor surface area is less than 40 m².

Chapter II – Definitions

Article 4:

The definitions of terms that are necessary to understanding this resolution that are in Appendices 1, 2, 3 and 4 of this resolution.

Chapter III – Regulatory Compliance Conditions

Article 5:

Any residential use zone building falling within the scope defined in Article 2 for which the project owner can demonstrate that the following conditions are met at the same time is considered to comply with the thermal regulations defined in this resolution:

- for every living unit, whether air-conditioned or not, the ICT indicator is less than or equal to the threshold calculated for the same living zone, noted 'ICT_max', determined in accordance with Chapter V of this resolution;

- in the case of air-conditioned living units: regarding the non-air-conditioned thermal zone in the living unit, the ICT indicator is less than or equal to the threshold calculated for this same zone, labelled
'ICT_max', determined in accordance with Chapter V of this resolution;

  regarding a residential building, the PRECS indicator calculator for all zones of the living unit is less than or equal to the threshold calculated for this same zone, labelled 'BBIO_max', determined in accordance with Chapter V of this resolution;

- for residential buildings, the PRECS indicator, calculated for all the
living zones is less than or equal to the threshold calculated for this same zone, labelled 'PRECS_max' determined in accordance with Chapter V of this resolution.

Article 6:

Any office or commercial use zone building for which the project owner can demonstrate that the following conditions are met at the same time is considered to comply with the thermal regulations defined in this resolution:

- The BBIO indicator calculated for the zone is less than or equal to the calculated threshold for this same zone, labelled 'BBIO_max', determined in accordance with Chapter V of this resolution;

- The PRECS indicator calculated for the zone is less than or equal to the calculated threshold for this same zone, labelled 'PRECS_max', determined in accordance with Chapter V of this resolution.

Article 7:

I. By way of derogation from j) Article R. 431-16 of the Town Planning Code, when a project falls within the scope of the present resolution, the file attached to the building permit application includes a

document confirming the execution of a provisional RTG calculation that complies with this resolution and has been issued by the RTG/DPEG calculation platform that is the object of Appendix 2 of this resolution.

II. The provisions of paragraph I of this Article do not apply to residential use zones made up of social housing.

Article 8:

I. At the very latest of the date the works start, the project owner of a building that is subject to the application of this resolution should have validated, using the RTG/DPEG calculation platform, the RTG calculation of their building in the 'definitive' status, based on the characteristics that correspond to those of the building as it was designed at the end of project studies, under the *Code de la commande publique* [Public Order Code].

II. No later than the date of the start of the works, the project owner of a building falling within the scope of this resolution must provide the competent administrative authority with an 'RTG Calculation Note' in the project file on the RTG/DPEG calculation platform, which outlines the building's zoning and justifies the input data used for the calculation method described in Appendix 4 of this resolution.

III. During building construction, if there is a change to the project that affects the thermal performance of the building, the project owner is required to update the RTG calculation using the RTG/DPEG calculation platform.

IV. In the special case of a building delivered by the project owner to the buyer before commissioning of the building:

- the provisions of paragraphs I and II should be applied on the basis of assumptions made about the sizing and thermal characteristics of not implemented components;

- these assumptions are to be included in the 'RTG Calculation Note' which is the subject of Paragraph II of this Article, which should, additionally, be given by the project owner to the buyer during delivery of the building.

Chapter IV – The method to calculate the RTG

Article 9:

The RTG calculation method is used to calculate BBIO, ICT and PRECS indicators in order to verify the building's regulatory compliance with the provisions in Chapter III of this resolution.

It should not be used to predict the building's actual energy consumption.

Article 10:

I. The RTG calculation method is implemented using the RTG/DPEG calculation platform described in Appendix 2 of this resolution, the authoritative version being that in force on the date of the building permit application.

II. In the special case of ICT calculations, the project owner may, if they wish, prove that their project is compliant by carrying out additional studies such as ventilation calculations or wind tunnel measurements, provided that they comply with the calculation conventions of the RTG calculation method.

Article 11:

Input data for the RTG calculation method have been specified in Appendix 4 of this resolution.

Chapter V – Threshold values for performance indicators

Article 12:

The $_{max}$ BBIO threshold value changes for each project, according to the following formula:

$$= * (-.4.25.\ 10^{-4} *)$$

The $_{base}$ BBIO conventional coefficient depends on the use zone of the building under Appendix 3 of this resolution, and is outlined in the following table:

	Living unit	Office	Commercial
base$_{BBIO}$	175	370	1030

The M_{wind} coefficient depends on the project's wind load, under Appendix 1 of this resolution, and is outlined in the following table:

	Zone A – windward	Zone B – continental	Zone C – leeward, or dense urban zone
M_{wind}	0.98	1	1.02

ALTITUDE is the altitude of the project as is outlined in Appendix 4 of this resolution.

Article 13:

The $_{max}$ threshold ICT value changes for each project, according to the following formula:

$$= -\ 17.\ 10^{-4} *\ +\ 7.\ 10^{-7} *^{2}$$

The base$_{ICT}$ depends on the project's wind load, under Appendix 1 of this resolution, and is outlined in the following table:

	Zone A – windward	Zone B – continental	Zone C – leeward, or dense urban zone
base$_{ICT}$	0.95 °C	1 °C	1.05 °C

ALTITUDE is the altitude of the project as is outlined in Appendix 4 of this resolution.

Article 14:

The PRECS_max threshold value is set at 50% no matter how the building is used.

Chapter V - Execution

Article 15:

In accordance with the provisions of Article LO 44357 of the Local and Regional Collectivity Code, this resolution will come into force the following day after it is published in the Official Journal of the French Republic.

Nevertheless, all provisions take effect from 1 June 2020.

The President of the Regional Council, the Director-General of Services for the Region and, as needed, relevant Government services are responsible, each as far as they are concerned, for the execution of this resolution.

APPENDIX 1 – DEFINITION OF WIND LOADS

There are three wind loads:

- zone A – windward;
- zone B – continental;
- zone C – leeward, or dense urban zone.

The perimeter of each zone is outlined by the following table:

Island	Town	Post Code	Zone A – windward	Zone B – continental	Zone C – leeward, or dense urban zone
Grande-Terre	Les Abymes	97139		the whole of the territory	
Grande-Terre	Anse-Bertrand	97121	3 km coastal strip facing East	rest of the territory	
Basse-Terre	Baie-Mahault	97122		the whole of the territory	
Basse-Terre	Baillif	97123			the whole of the territory
Basse-Terre	Basse-Terre	97100			the whole of the territory
Basse-Terre	Bouillante	97125			the whole of the territory
Basse-Terre	Capesterre-Belle-Eau	97130	3 km coastal strip	rest of the territory	
Marie-Galante	Capesterre-de- Marie-Galante	97140	3 km coastal strip	rest of the territory	
Basse-Terre	Deshaies	97126			the whole of the territory
La Désirade	La Désirade	97127	the whole of the territory		
Grande-Terre	Le Gosier	97190	3 km coastal strip	rest of the territory	

Basse-Terre	Gourbeyre	97113			the whole of the territory

Basse-Terre	Goyave	97128	3 km coastal strip	rest of the territory	
Marie-Galante	Grand-Bourg	97112		the whole of the territory	
Basse-Terre	Lamentin	97129	3 km coastal strip	rest of the territory	
Grande-Terre	Morne-à-l'Eau	97111		the whole of the territory	
Grande-Terre	Le Moule	97160	3 km coastal strip	rest of the territory	
Basse-Terre	Petit-Bourg	97170	3 km coastal strip	rest of the territory	
Grande-Terre	Petit-Canal	97131	3 km coastal strip facing East	rest of the territory	
Grande-Terre	Pointe-à-Pitre	97110		rest of the territory	Plots with COS≥1.2 (dense urban zone)
Basse-Terre	Pointe-Noire	97116			the whole of the territory
Grande-Terre	Port-Louis	97117		the whole of the territory	
Basse-Terre	Saint-Claude	97120			the whole of the territory
Grande-Terre	Saint-François	97118	3 km coastal strip	rest of the territory	
Marie-Galante	Saint-Louis	97134	3 km coastal strip facing East	rest of the territory	
Grande-Terre	Sainte-Anne	97180	3 km coastal strip	rest of the territory	
Basse-Terre	Sainte-Rose	97115	3 km coastal strip	rest of the territory	
Les Saintes	Terre-de-Bas	97136	the whole of the territory		
Les Saintes	Terre-de-Haut	97137	the whole of the territory		
Basse-Terre	Trois-Rivières	97114	3 km coastal strip	rest of the territory	
Basse-Terre	Vieux-Fort	97141	the whole of the territory		
Basse-Terre	Vieux-Habitants	97119			the whole of the territory

APPENDIX 2 – DEFINITIONS

DEDICATED SPACE FOR AN AIR-CONDITIONING SYSTEM: describes an electrical system located on the premises to be cooled and is dedicated to cooling.

SPACE FOR A CEILING FAN: describes a mechanical hanging system on the ceiling for a ceiling fan with horizontal blades with a diameter of at least 0.80 metres, with its own power supply and a wall-mounted control unit, which can be identified and used by any users to turn on fan rotation.

OPENING: means an opening in an exterior or interior wall used for lighting passage or ventilation. A transparent or translucent wall is considered to be an opening.

BBIO: describes the Energy Requirement Indicator of a building or a zone in a building for the premises' air-conditioning and lighting. It is calculated according to the following formula:

$$= 5 * + 2 *$$

This size-neutral indicator is calculated over one year by adopting conventional climate data for each climate zone, according to the calculation method referred to in Article 10 of this resolution.

BUILDING: describes a construction with a roof and walls.

VERIFIED THERMAL CHARACTERISTIC: a thermal characteristic is considered to be verified for a product, system or construction process if the numerical value of this characteristic is specified in a supporting document from the following list:

- a certificate issued by an organisation accredited by a European Accreditation member;
- a *Pass Innovation* – green light – issued by the CSTB;
- an ETA (European technical assessment);
- an ATEx – *Appréciation Technique Expérimentale* [technical experimentation evaluation];
- a DTA - *Document Technique d'Application* [Technical Application Document];
- a technical opinion (AT or Atec), either directly or resulting from 'confirmation of authorisation by a UEAtc's member (European equivalent).

FACADE: describes, for a building or a living unit, all vertical walls in contact with outside consisting of opaque parts and openings which face the same direction.

ICT: describes the hydrothermal comfort indicator of a building or zone of a building (as is stipulated in Appendix 3).

This indicator, which is written in °C, is calculated over one year by adopting conventional climate data for each climate zone, according to the calculation method described in Article 10 of this resolution.

Its value represents the average value of exceeding the comfort temperature when occupied.

The comfort temperature is set at 28 °C (perceived) by this resolution.

RTG CALCULATION NOTE: describes the document that the project owner must create in addition to online calculation. This Microsoft Word or PDF document is submitted to relevant administrative authorities after being uploaded to the RTG/DPEG calculation platform. It should contain, *at a minimum*, comments and explanations about the following choices and calculations:

- A definition of building zones (according to Appendix 3 of this resolution);
- Detail about the calculation of U values for the envelope's opaque walls, as is defined in this Appendix;
- Detail about the calculation, in the event that Cm coefficients are calculated using a method other than those suggested on the RTG/DPEG calculation platform;
- Supporting documents (or references) if Thermal Characteristics are used, verified under Paragraph I of Article 2 of this resolution;
- Detail about the calculation of the internal open surface area, with an outline of airflow between facades;
- Detail of the calculation, in case of deviation from the tabulated values proposed on the RTG/DPEG calculation platform when calculating the COP and EER of thermodynamic systems, or thermal characteristics of openings;
- Development of assumptions about the dimensional and thermal characteristics of the non-implemented components, in the special case of a building delivered by the client to the purchaser before the implementation of all works.

THE ENVELOPE'S OPAQUE WALL: describes a wall that is neither transparent nor translucent. A wall is transparent or translucent if its light transmittance factor (except for possible movable protective devices) is equal to or more than 0.05.

PERIMETER BY TYPE OF BUILDING: describes, under Paragraph I of Article 2 of this resolution:

- A building or part of a building for residential use means an individual or collective living unit, community housing and tourist residences, excluding nursing homes and hotels. Community housing or tourist residences differ from hotels due to longer stays (durations over a month-long). There are two types of residential use zones:
    - Individual houses: detached or semi-detached house, or individual house in a row;
    - Collective housing: other residential buildings
- A building or part of a building used for offices includes corridors, service rooms and archives if they are adjacent to the offices on the same floor, public reception areas classified as ERP type W under Article GN1 of the order of 25 June 1980 approving the general provisions of the safety regulations against the risks of fire and panic in establishments open to the public (ERP), if they are adjacent to offices;
- Commercial use zones in a building denote ERP M zones under Article GN1 of the order of 25 June 1980 approving the general provisions

of safety regulations against the risks of fire and panic in establishments open to the public (ERP).

A building or part of a building for commercial use excludes:
- bars, hotels and restaurants;
- storerooms except for those that adjoin commercial spaces that do not have a ventilation system that can dissipate overheating.

RTG/DPEG CALCULATION PLATFORM: describes the online calculation tool implementing the calculation method described in Chapter IV of this resolution, which is freely accessible to all natural or legal person on the http://www.guadeloupe-energie.gp/en/ website in the *Portail RTG* [RTG portal] section. The project owner can use this to carry out the following operations:

- Input and modify information about the project;
- Calculate the ICT, BBIO and PRECS regulatory performance indicators for the project;
- Calculate the threshold values for ICTmax and BBIOmax performance indicators that are specific to the project, in accordance with Chapter V of this resolution;
- Verify the regulatory compliance conditions in accordance with Chapter III of this resolution;
- Download the *attestation de conformite du calcul RTG* [certificate of RTG calculation compliance] (to be attached to the Building Permit in accordance with Article 7 of this resolution;
- Download Guadeloupe Energy Performance Diagnostics document (DPEG) for new projects only.

PRECS: describes the indicator quantifying the share of energy made from hydrocarbons or taken from the electricity grid
to produce domestic hot water calculated by adopting conventional DHW need profiles.

This indicator is calculated for the building or for the building zone, and is written in percentages of energy needs for DHW over a conventional year.

Energy needs for DHW over a conventional year are calculated by the RTG/DPEG calculation platform by using conventional DHW needs profiles, according to the calculation method that is the subject of Article 10 of this resolution.

AIR-CONDITIONING SYSTEM: denotes the combination of all the components necessary to provide a form of air treatment in which the temperature is lowered and can be controlled, possibly in combination with ventilation, humidity and air purity control.

APPENDIX 3 – DEFINITIONS OF BUILDING ZONES

USE ZONE: denotes, together, areas of the same use located in the same building, according to the list of uses stipulated in Article 2 of this resolution.

For residential use: each living unit in the building is a specific use zone, named 'living zone'.

For non-residential use: all surface areas sharing the same use (office or commercial) are a use zone.

NIGHT-time ZONE IN A LIVING UNIT: denotes all the bedrooms in this living unit together with rooms in this living unit which have a permanent opening into at least one of the rooms.

DAYTIME ZONE IN A LIVING UNIT: denotes the living zone minus the night-time zone in this living unit.

THERMAL ZONE: denotes the elementary scale on which BBIO and ICT indicators are calculated.

For residential use: each daytime or night-time zone in a living unit is a thermal zone.

For non-residential use: the thermal zone corresponds to the use zone.

AIR-CONDITIONED ZONE IN A LIVING UNIT: is defined as follows:

- The daytime zone in a living zone is an air-conditioned zone from the moment it has at least one air-conditioning system or a dedicated space for an air-conditioning system.

- The night-time zone in a living zone is an air-conditioned zone from the moment it has at least one air-conditioning system or a dedicated space for an air-conditioning system.

A living unit is said to be air-conditioned from the moment it has at least one air-conditioned zone.

ZONE WITH CEILING FANS: is defined as follows:

- For residential use zone: any thermal zone, day or night, in which all the main rooms are equipped with ceiling fans, with one fan per 20 m² in a living room and 30 m² in other main rooms, is a zone equipped with ceiling fans;

- For an office or commercial use zone: a zone equipped with ceiling fans is any thermal zone for office or commercial use in which the premises accommodating workstations and the public are equipped with ceiling fans with a minimum average density of one fan per 20 m².

ZONE WITH DEDICATED SPACE FOR CEILING FANS: is defined as follows:

- For residential use zone: any thermal zone, day or night, in which all the main rooms are equipped with dedicated spaces for ceiling fans (in accordance with the definition in Appendix 2), with one fan per 20 m² in a living room and 30 m² in other main rooms, is a zone equipped with dedicated space for ceiling fans.

- For an office or commercial use zone: a zone equipped with dedicated space for ceiling fans is any thermal zone for office or commercial use in which the premises accommodating workstations and the public are equipped with dedicated space for ceiling fans (in accordance with the definition in Appendix 2) with a minimum average density of one fan per 20 m².

APPENDIX 4 – INPUT DATA FOR THE ALPHA CALCULATION METHOD:

ABSORPTION COEFFICIENT OF AN OPAQUE WALL IN THE ENVELOPE

The absorption coefficient written as 'α' is a datum for each opaque wall facing the outside and whose S size is not directly known. It is defined by the colour of the external surface and the inclination of the surface area according to the simplified calculation method suggested by the RTG/DPEG calculation platform.

It is represented by a size-neutral coefficient between 0 and 1.

ALTITUDE

The altitude of a building is that of the threshold of its main front door. It is written in metres (m) and corresponds to the NGG (*niveau général de la Guadeloupe*, [general level of Guadeloupe]).

The altitude of a living unit or a building zone (as is stipulated in Appendix 3) is equal to the altitude of the building in which this living unit or this zone is found.

AZIMUTH OF AN OPENING OR AN OPAQUE WALL IN THE ENVELOPE

The direction of the wall, called 'Azimuth', is written in degrees from north, clockwise.

SOLAR THERMAL HOT WATER TANK

Solar thermal hot water tanks are characterised by:

- The surface area of solar panels, represented in m^2;
- The azimuth of solar panels, represented in degrees from north, clockwise;
- The inclination of the solar panels relative to the horizontal plane, expressed in degrees;
- The accumulated storage volume of DHW, represented in litres.

COP OF A THERMODYNAMIC DHW PRODUCTION SYSTEM

This coefficient covers the year-averaged thermodynamic yield of a thermodynamic DHW production system. The value can be generated by selecting a tabulated value or by direct input. In this case, this coefficient should be explained in the Calculation Note.

CM, CM_BRISE SOLEIL: SOLAR GAIN REDUCTION COEFFICIENT

The solar gain reduction coefficient, which is related to shade and is labelled 'Cm' in the RTG arising from resolution CR/13679 of 14 June 2013, is now calculated by the RTG/DPEG Calculation Platform depending on side and sunshade protection and movable protective devices for openings.

It is also possible to model an additional protective device, whether it is fixed or not taken into account by the RTG/DPEG Calculation Platform by completing the 'Cm_brise soleil' field in an opening or opaque wall section.

Cm_brise soleil should be calculated using either of the following methods:

- manual calculation of additional protective measures: ventilated wall, brise soleil, *etc*.

- *Th-Bât* rules in force in mainland France, in the '*parois opaques* and *parois vitrées* sections;

- reusing the numerical values in the supporting document for the construction process of the product, if the Cm coefficient is a verified thermal characteristic under Appendix 2.

It is represented by a size-neutral coefficient between 0 and 1. (0 protection

VENTILATION RATE

Ventilation rate denotes the renewal of clean air and is an input datum for each non-residential use zone. It is determined by the extracted airflow rate when occupied and when unoccupied.

It is written in cubic metre per hour (m^3/h).

LIGHTING MANAGEMENT

How lighting is managed is an input datum for non-residential use zones. Possible management modes:

- using a switch;
- using a presence detector to turn the light on and off;
- using automatic dimming based on the level of natural light;
- using a presence detector with a dimmer.

STOREY HEIGHT

The distance between the upper level of the finished floor and the lower level of the ceiling or dropped ceiling, in metres.

INCLINATION OF AN OPENING OR AN OPAQUE WALL IN THE ENVELOPE

The inclination of the wall, written as Beta, is written in degrees from the horizontal plane (0° for a horizontal wall, 90° for a vertical wall).

I INERTIA OF THE ZONE

The I thermal inertia of the building in question can be one of the following values:

1 – very light;
2 –light;

3 –medium;
4 – heavy;
5 – very heavy.

Thermal inertia should be calculated using either of the following methods:

- the 'fixed' method in the Th-Bât rules that are in mainland France, in TH-I Chapter 2;

- the 'by inertia point' method in the Th-Bât rules that are in mainland France, in TH-I Chapter 3.

- The calculation method recommended by the RTG/DPEG calculation platform, in accordance with the Th-Bât rules in force in mainland France, in the *Inertie* section, is based on the daily thermal capacity of the zone and the equivalent exchange surface area of heavy walls with the environment.

NUMBER OF LEVELS

Corresponds to the number of levels in the use zone space, meaning:

- For residential use: in each of the living units

- For non-residential use: throughout the use zone.

DIRECTION OF PREVAILING WIND

The direction of the prevailing wind is an input datum for residential use zones when the building is located in a 'C – leeward' area. For other cases, this value is conventional.

The direction of prevailing wind for a site in question corresponds to the direction in which comes the strongest wind. It is represented according to azimuth rules outlined in this Appendix.

LIGHTING CAPACITY

Lighting power is the cumulative installed electrical capacity of indoor lighting in a given calculation area. It is an input datum for non-residential use zones. This capacity is conventional for residential use zones.

Excluded from calculation:

- Outdoor lighting;
- Lighting in car parks;
- Security lighting. It is

written in Watts (W).

INTERNAL OPEN SURFACE AREA

The internal open surface area of a living unit is the surface area of airflow between the prevailing wind facade and the prevailing leeward facade, calculated according to the most limiting cross-section, with doors and openings in an open position. It is written in m^2.

FLOOR SURFACE

The floor surface of a building zone (as stipulated in Appendix 3) has the meaning given to it in Article R 111-22 of the *Code de l'urbanisme* [town planning code]. It is written in metres squared (m^2).

SURFACE AREA WITH ACCESS TO NATURAL LIGHT

The surface area with access to natural light is an input datum for non-residential use zones. It corresponds to the floor surface located at least 5 metres from an opening.

It is written in metres squared (m^2).

It is considered that the surface area of zones located in buildings that are less than 10 metres thick and in which the only rooms without windows are storage rooms, hallways, technical facilities and sanitary facilities, have full access to natural light.

SURFACE AREA OF AN OPENING OR AN OPAQUE WALL IN THE ENVELOPE

The surface area of an opening to be taken into account is its surface area seen from inside the building.

The surface area of an opaque wall in the envelope to be taken into account is the internal surface area minus the surface areas of openings (including doors and movable opaque parts). This rule applies no matter the inclination of the wall.

Surface areas are represented in metres squared (m^2).

S: SOLAR GAIN OF AN OPENING OR AN OPAQUE WALL IN THE ENVELOPE

The solar gain of a component (opaque wall in the envelope or an opening), written as 'S', is the relationship between energy due to solar rays transmitted to the premises and incidental energy on the component. It is an input datum:

- for each opening,
- for opaque walls facing outside

It is represented by a size-neutral coefficient between 0 and 1.

The solar gain of an opaque wall in the envelope or of an opening should be calculated using either of the following methods:

- simplified calculation method proposed by the RTG/DPEG Calculation Platform;

- Th-Bât rules in force in mainland France, in the 'opaque walls' and 'glass walls' sections, the surface exchange coefficients (h_e) being taken for null wind (he summer = 25 $W/m^2.K$);

- reusing the numerical values in the supporting document for the construction process of the product, if the S coefficient is a verified thermal characteristic under Appendix 2, and that the S value was generated with a null wind hypothesis (he summer = 25 $W/m^2.K$).

The solar gain of an opening should be calculated in the following four set-ups:

	Name of the parameter	Opening position	Solar protection position
Natural ventilation condition 1	Sict_PMferme	open	100% used
Natural ventilation condition 2	Sict_PMouvert	open	Not used
Air-conditioning condition 1	Sbbio_PMouvert	closed	100% used
Air-conditioning condition 2	Sbbio_PMferme	closed	Not used

T: LIGHT TRANSMISSION RATE OF AN OPENING

The light transmission rate of an opening, written as 'T', is represented by a coefficient without dimensions between 0 and 1

It should be calculated using either of the following methods:

- simplified calculation method, using tabulated values, proposed by the RTG/DPEG Calculation Platform;
- *Th-Bât* rules in force in mainland France, in the *parois vitrées* section;
- reusing the numerical values in the supporting document for the construction process of the product, if the T coefficient is a verified thermal characteristic under Appendix 2.

The light transmission coefficient of an opening should be calculated in the following four set-ups:

	Name of the parameter	Opening position	Solar protection position
Natural ventilation condition 1	Tict_PMferme	open	100% used
Natural ventilation condition 2	Tict_PMouvert	open	Not used
Air-conditioning condition 1	Tbbio_PMouvert	closed	100% used
Air-conditioning condition 2	Tbbio_PMferme	closed	Not used

U: THERMAL TRANSMISSION COEFFICIENT OF AN OPENING OR AN OPAQUE WALL IN THE ENVELOPE

The average heat transfer coefficient, 'U', is an input datum for each opening and each opaque wall in the envelope. It is written in W/m².K.

The U coefficient of an opaque wall in the envelope should be calculated using either of the following methods:

- Manual calculation, layer by layer according to the simplified formula: U=1/(R+0,20)

  where R is the wall's resistance in m².K/W. R thermal resistance is either known or calculated using the thermal conductivity and thickness of the material. The term 0.2 represents the superficial thermal resistance of the inner and outer sides of the wall.

- Th-Bât rules in force in mainland France, in their *parois opaques* guide, with the following conventions: surface thermal resistances Rse=0.07 m².K/W and Rsi= 0.13 m².K/W, surface exchange h_e) being taken for null wind (he summer = 25 W/m².K);

- reusing the numerical values in the supporting document about the construction process, if the U coefficient is a verified thermal characteristic under Appendix 2, and that the U-value was generated with a null wind hypothesis (he summer = 25 W/m².K).

The U coefficient of an opening corresponds to the overall Uw of this opening and should be calculated using either of the following methods:

- simplified calculation method, using tabulated values, proposed by the RTG/DPEG Calculation Platform;

- *Th-Bât* rules in force in mainland France, in the *parois vitrées* section;

- reusing the numerical values in the supporting document about the product of the product, if the Uw coefficient is a verified thermal characteristic under Appendix 2 of this resolution.

The Uw coefficient should be calculated in the four following set-ups:

	Name of the parameter	Opening position	Solar protection position
Natural ventilation condition 1	Uict_PMferme	open	100% used
Natural ventilation condition 2	Uict_PMouvert	open	Not used
Air-conditioning condition 1	Ubbio_PMouvert	closed	100% used
Air-conditioning condition 2	Ubbio_PMferme	closed	Not used

DHW COVERAGE RATE USING TRAPPED ENERGY RECOVERY

This size quantifies the share of DHW needs that are covered for free using a trapped energy recovery system. It is represented by a coefficient whose value is between 0 (0%) and 1 (100%). The input value should be explained by the project owner, on the basis of calculations carried out by the manufacturing supplier of the system by using conventions in the RTG calculation method.

WIND LOAD

The wind load assigned to a site determines the conventional meteorological data used in the calculation method. The wind load is stipulated according to Appendix 1.

11 APPENDIX: EXTRACT FROM RESOLUTION19-1156 OF 31/10/2019 PERTAINING TO THE DPEG

Article 1:

I. The resolution of the Regional Council of Guadeloupe CR/13-680 of 14 June 2013 published in the Official Journal of the French Republic of 30 July 2013 pertaining to the field of regulation about Guadeloupe Energy Performance Diagnostics (DPEG), repealing and replacing the deliberation CR/11-373, is repealed.

II. In application of Article 205 of law no.°2015-992 of 17 August 2015 pertaining to energy transition for green growth, specific rules are set for Guadeloupe in terms of certifying the energy performance of new buildings in establishing Guadeloupe Energy Performance Diagnostics ('DPEG').

III. These rules complement and derogate, for Guadeloupe, as necessary, the following texts:

- *Code de la construction et de l'habitation* [Construction and Housing Code], in particular Articles R. 134-1 to R. 134-5 et seq. and R. 271-1 to R. 271-5 et seq.;
- decree no. 2006-1147 of 14 September 2006 pertaining to Guadeloupe Energy Performance Diagnostics and the state of the internal gas installation for certain buildings;
- decree no. 2006-1653 of 21 December 2006 pertaining to the periods of validity of the documents in the technical diagnosis file and amending the *Code de la construction et de l'habitation* [construction and housing code];
- decree no. 2007-363 of 19 March 2007 pertaining to feasibility studies for energy provision, thermal characteristics and energy performance of existing buildings and displaying Guadeloupe Energy Performance Diagnostics;
- decree no. 2008-461 of 15 May 2008 pertaining to Guadeloupe Energy Performance Diagnostics when letting out buildings for main residential use and amending the *Code de la construction et de l'habitation* [construction and housing code];
- order of 3 May 2007 regarding the thermal characteristics and energy performance of existing buildings;
- order of 2 July 2018 defining the criteria for the certifying technical diagnostic operators and training bodies and accrediting certification bodies;

Chapter I – Scope of Application

Article 2:

The provisions of this resolution apply to new buildings and parts of buildings as long as they fall within the scope of the resolution relating to the Guadeloupe thermal regulations (RTG calculation) and to the thermal characteristics of the envelope of new buildings and new parts of buildings as outlined by Article 2 of the said resolution.

Article 3:

The provisions of this resolution also apply to existing buildings and parts buildings that meet either of the following criteria:

- living units in which at least one of the bedrooms has an air-conditioning system;
- buildings and parts of buildings for office, commercial, educational, hotel and health uses whose air-conditioned floor surface area is more than 50 m²;
- public buildings whose air-conditioned floor surface area is more than 500 m², no matter the type of use.

Extensions or additions to existing buildings or parts of existing buildings whose floor surface area is greater than or equal to 150 m^2 or 30% of the floor surface area of the existing buildings are considered to be new constructions covered by the provisions of Article 2 of this resolution.

Article 4:

The provisions in this resolution are not applicable:

- to provisional constructions that are due to be used for two years or less;
- to buildings classed or listed as historical monuments under the *Code du Patrimoine* [Heritage code];
- to buildings for religious use;
- to independent buildings whose floor surface area is less than 50 m².

Chapter II – Definitions

Article 5:

The definitions of terms that are necessary to understanding this resolution are in Appendix 1 of this resolution.

Chapter III – DPEG Certification Conditions

Article 6:

I. All project owners should have a DPEG executed for a new building or a new part of a building by the start of works at the latest.

II. During building construction of a new building or a new part of a building, if there is a change in the project that affects the thermal performance of the building, the project owner is required to update the DPEG calculation at the very latest at the end of works.

Article 7:

Any owner of an existing public building or shopping centre or an existing building for education, hotel or healthcare purposes that has not received DPEG certification of the said building upon this resolution coming into force will have a year from this date of entry into force. They should renew the DPEG no later than its expiry date.

Article 8:

Any owners of an existing building or an existing part of a building should have a DPEG executed in the event of a property transaction such as a sale or letting of the building or part of the building. The owner should include a DPEG certificate that is valid when the property transaction takes place.

Chapter IV – DPEG-Allocated Unit

Article 9:

In the event it is a new or existing building or part of a building for residential use, a DPEG will be carried out for each living unit in the same building.

Article 10:

I. In the event of an existing building for non-residential use, a DPEG will be carried out for each use zone and each owner.

II. In the event of a building or part of a building in a new construction that is for non-residential use, a DPEG will be carried out for each use zone.

Chapter V – Format and Content of the DPEG Certificate

Article 11:

The DPEG certificate is simultaneously issued in the following formats:

1) digitally: the digital description file of the zone covered by the certificate (or its update if there is a pre-existing version) is archived in *officiel* [official] status on the RTG/DPEG calculation platform;

2) in PDF format: the PDF DPEG certificate is generated by the RTG/DPEG calculation platform and is 3 pages long.

Article 12:

The DPEG certificate should include, *at a minimum*, the following information:

1) The geolocation of the unit;

2) A photograph or drawing of the building;

3) The annual conventional energy balance simulated by the RTG/DPEG calculation platform;

4) The ICE indicator for convention consumption, calculated in accordance with provisions in Article 13 of this resolution;

5) The corresponding energy label for the ICE indicator;

6) The multi-criterion evaluation for instructive purposes on page 2 of the DPEG certificate;

7) For existing buildings:

    a. The average annual electricity bill calculated in accordance with provisions in Article 17 of this resolution;

b. A comparative analysis of simulated performance and actual bills, highlighting explanatory factors;

8) Recommendations for cost-effective energy performance and thermal comfort improvements of the building or part of the building (as per Appendix 4 of this resolution).

Chapter VI – Definition of Indicators

Article 13:

The *indicator de consommation d'énergie* [energy consumption indicator, ICE] determines the values of the energy label on the
DPEG certificate. It is calculated according to the following formula:

$$= - \min(;)$$

with:
- C: conventional energy consumption ('C') of the unit simulated for the 4 uses in the RTG, in kWh_{fe}/m^2.year
- Ppv: real electricity production per unit in question, in kWh_{fe}/m^2.year
- TRC: range of the C-band of the energy label according to Appendix 3 of this resolution, in kWh_{fe}/m^2.year
- S: floor surface of the unit in question in m^2
  min(X;Y): operator minimum value of the values X and Y

This indicator is written in kWh_{fe} of final energy per m^2 of floor surface area by unit and by year.

Article 14:

Conventional annual energy consumption, written as 'C', of the unit, limited to the four of the building's main energy uses, is simulated using the RTG/DPEG Calculation Platform, according to the following formula:

$$C = Cclim + Cecs + Cecl + Cvmc$$

With:

- C: conventional consumption of energy;
- Cclim: energy consumption of air-conditioning equipment simulated under conventional conditions on the basis of a conventional occupancy scenario and air-conditioned surface area assumptions;
- Cecs: energy consumption of domestic hot water equipment simulated in conventional conditions;
- Cecl: energy consumption of interior lighting systems simulated in conventional conditions;
- Cvmc: energy consumption of the mechanical ventilation system simulated in conventional conditions; by convention, this value is 0 for living units

This indicator is written in kWh_{fe} of final energy per m^2 of floor surface area by unit and by year.

Article 15:

Home energy production using photovoltaic panels that can be attributed to a unit, named 'Ppv', is simulated in conventional conditions on the RTG/DPEG Calculation Platform. This

indicator is written in kWh_{fe} of final energy per m² of floor surface area by unit and by year.

Article 16:

For new or existing buildings, the deduction value of home electricity production using renewable sources, represented in kWh_{fe} of final energy by metre squared and by year, does not exceed the range value of class C on the energy label scale corresponding to the type of unit in question and stipulated in Appendix 3 of this resolution.

Chapter VII – Balance of Real Electricity Bills for Existing Buildings

Article 17:

For existing buildings, the annual average energy bill, written as 'F', of the unit (all uses), is determined by calculating the average of the share that can be allocated to this unit, entered onto electricity bills for the past three years.

This indicator is written in kWh_{fe} of final energy by year.

Article 18:

The share of the electricity bill that can be attributed to a unit is estimated in proportion to the floor surface of the unit
in relation to the total floor surface of the part of the building which uses the electricity metre.

Article 19:

Energy produced or consumed by shared equipment is charged to the unit in proportion to its floor surface in relation to the total floor surface of the part of the building which it serves.

Chapter VIII – Converting Energy Values

Article 20:

Greenhouse gas emission (m_CO2) is calculated based on energy consumption (E)
by applying the following formula:

$$m\_CO2 = 0.8 \times E$$

With:

- m_CO2: greenhouse has emission;
- E: energy consumption in final energy.

Greenhouse gas emission (m_CO2) is written in $kg.CO_2$ per year.

Article 21:

Primary energy consumption is calculated based on final energy consumption (E) by applying the following formula:

$$Ep = 3.5 \times E$$

With:

- Pe: energy consumption in primary energy.
- E: energy consumption in final energy.

Article 22:

The average annual energy bill cost of F energy is calculated on the basis of a conventional pricing assumption included in the RTG/DPEG Calculation Platform.

Chapter IX – Displaying and Sending the DPEG Certificate

Article 23:

Without prejudice to the provisions in Article 7 of this resolution, the operator of a public building that houses a facility that is open to the public, from the first to the fourth category under Article R. 12319 of the *Code de la construction et de l'habitation* [Construction and Housing Code], is required to display the energy label referred to in Article 26 of this resolution, in a manner that it is visible to the public, near the main entrance or reception point of the building.

Article 24:

Without prejudice to the provisions of Article 7 of this resolution, the operator of a hotel or shopping centre is required to display the energy label referred to in Article 26 of this resolution, in a manner that is visible to the public, in the vicinity of the reception area of the building.

Article 25:

When the following are offered for sale or rent:

- a building for which a DPEG has been issued,
- a part of a building including in a building for which a DPEG has been issued,
- a part of a building for which a DPEG has been issued,

the following measures have been met by the seller, the lessor or any interested third party:

- the energy label referred to in Article 26 of this resolution of the building or part of the building, as the case may be, must appear in advertisements in commercial media relating to the sale or rental;
- the DPEG certificate or a copy of this should be sent to the new tenant or owner before the tenancy agreement or sales contract is signed.

Article 26:

Information and display obligations under this resolution include, *as a minimum*, the energy label as defined in Appendix 3 of this resolution, including the Indicateur de Consommation Energétique (ICE) measured on the DPEG scale. This is shown in the last box on page 1 of DPEG certificates.

Chapter X – Validity

Article 27:

A DPEG certificate issued for a new building, or a new part of a building, is valid for three years from the date of issue.

DPEG certificates issued for an existing building, or an existing part of a building are valid for ten years from the date of issue.

Subject to the provisions of Article 28 of this resolution, DPEG certificates issued for an existing building without an on-site visit by a person referred to in Article 29 I of this resolution are not considered to be compliant with this resolution.

Chapter XI – Qualification of Persons Authorised to Conduct DPEGs and Issue DPEG Certificates

Article 28:

In the event of new construction, DPEGs provided for in this resolution are conducted by the project owner.

Article 29:

I. In the case of an existing building, DPEGs provided for by this resolution are prepared and DPEG certificates are issued by persons whose skills have been certified by an organisation referred to in paragraph II of this Article, after having demonstrated their knowledge, understanding and mastery of the thermal regulations that specifically apply to Guadeloupe, which are adapted to the specificities of construction and thermal regulations in Guadeloupe, and whose content has been approved beforehand by the Regional Council of Guadeloupe.

The validity period of certificates of competence is two years.

II. Bodies accredited, in accordance with the provisions of the order of 2 July 2018 stipulating the criteria for certifying technical diagnostic operators, training bodies and accreditation of certification bodies, to issue skills certificates in mainland France, are authorised to issue the certification, referred to in paragraph I of this Article, of skills in Guadeloupe.

Chapter XII – Execution

Article 30:

In accordance with the provisions of Article LO 44357 of the Local and Regional Collectivity Code, this resolution will come into force the following day after it is published in the Official Journal of the French Republic.

Nevertheless, all provisions take effect from 1 January 2020.

The President of the Regional Council, the Director-General of Services for the Region and, as needed, relevant Government services are responsible, each as far as they are concerned, for the execution of this resolution.

APPENDIX 1 – DEFINITIONS

BUILDING: describes a construction with a roof and walls;

A BUILDING OR PART OF A BUILDING FOR OFFICE USE: includes hallways, service rooms and archives if they are adjacent to the offices on the same floor, public reception areas classified as ERP type W under Article GN1 of the order of 25 June 1980 approving the general provisions of the safety regulations against the risks of fire and panic in establishments open to the public (ERP), if they are adjacent to offices;

A BUILDING OR PART OF A BUILDING FOR COMMERCIAL USE: denotes ERP type M zones under Article GN1 of the order of 25 June 1980 approving the general provisions of the safety regulations against the risks of fire and panic in establishments open to the public (ERP).

A building or part of a building for commercial use excludes:

- bars, hotels and restaurants;
- storerooms except for those that adjoin commercial spaces that do not have a ventilation system that can dissipate overheating;

A BUILDING OR PART OF A BUILDING FOR RESIDENTIAL USE: denotes individual or collective living unit, community housing and tourist residences, excluding nursing homes and hotels. Community housing or tourist residences differ from hotels due to longer stays (durations over a month-long).

A BUILDING OR PART OF A BUILDING FOR HEALTHCARE USE: denotes hospital establishments, nursing and care homes;

PUBLIC BUILDINGS: denotes buildings whose owner is a public person;

SHOPPING CENTRE: denotes a building or part of a building for commercial use, which is home to several shops or services by a general passageway inside the building. Shopping centres include bars and restaurants as well as adjoining storerooms.

GUADELOUPE ENERGY PERFORMANCE DIAGNOSTICS OR DPEG: denotes the certification process developed by the Guadeloupe region, culminating in delivering an energy performance certificate, called a 'DPEG certificate' in this resolution, which provides information on the energy performance of a building or part of a building;

SHARED FACILITIES: denotes a technical building system that cannot be allocated in full to only one unit;

PRIMARY ENERGY: denotes energy from renewable or non-renewable sources that has not been converted or processed;

ENERGY PRODUCED USING RENEWABLE SOURCES: denotes energy produced using renewable, non-fossil fuel sources, meaning wind, solar, aerothermal, geothermal, hygrothermal and marine energy, and hydroelectricity, biomass, landfill gas, sewage and biogas treatment gas and trapped energy recovery;

BUILDING ENVELOPE: denotes integrated parts of a building that separate its internal space from its external environment;

UNIT ATTRIBUTED TO A DPEGCERTIFICATE: denotes the part of the building for which the certificate was issued;

ENERGY PERFORMANCE OF A BUILDING: denotes the quantity of calculated or measured energy that is needed to meet all energy needs for normal use of the building;

RTG/DPEG CALCULATION PLATFORM: describes the online calculation tool implementing the calculation method described in Chapter IV of this resolution, which is freely accessible to all natural or legal person on the http://www.guadeloupe-energie.gp/en/ website in the *Portail RTG* [RTG portal] section. The project owner can use this to carry out the following operations:

- Input and modify information about the project
- Calculate the ICT, BBIO and PRECS regulatory performance indicators for the project
- Calculate the threshold values for ICTmax and BBIOmax performance indicators that are specific to the project, in accordance with Chapter V of this resolution
- Verify the regulatory compliance conditions in accordance with Chapter III of this resolution
- Download the *attestation de conformite du calcul RTG* [certificate of RTG calculation compliance] (to be attached to the Building Permit in accordance with Article 6 of this resolution)
- Download Guadeloupe Energy Performance Diagnostics document (DPEG) for new constructions only

FLOOR SURFACE: has the meaning given to it in Article R 111-22 of the *Code de l'urbanisme* [French town planning code]. It is written in metres squared (m^2).

AIR-CONDITIONED FLOOR SURFACE: denotes the sum of floor surface of rooms in which energy is used to regulate the internal temperature to a temperature that is less than the external temperature;

AIR-CONDITIONING SYSTEM: denotes a combination of components that are necessary to condition internal air, through which air temperature can be controlled or lowered;

TECHNICAL BUILDING SYSTEM: denotes technical material used to cool, ventilate, produce hot water and lighting in a building or part of a building, or a combination of several of these functions.

APPENDIX 2 – INPUT DATA FOR THE CALCULATION METHOD

Input data shared with the RTG calculation method:

Input data used in the DPEG calculation method, which is the same as the RTG calculation method, are described in Appendix 4 of the resolution pertaining to the Guadeloupe's Thermal Regulations (RTG calculation) and the thermal characteristics of the envelope in new buildings and new parts of buildings.

Input data specific to the DPEG calculation method:

FAN POWER

Electrical power of the mechanical ventilation system in the unit (extractors, AHU, etc.). This value is a ratio of the installed power to the ventilation rate, expressed in W/(m3/h).

LIGHTING EFFICIENCY

This value is written in W/m².100 lux which describes the efficiency of the different lights on-site.

'EER' OF AN AIR-CONDITIONING SYSTEM

This coefficient covers the year-averaged thermodynamic yield of an air-conditioning system. The value can be generated by selecting a tabulated value or directly input. In this case, this coefficient should be explained in the RTG Calculation Note for a new build.

'CA' OF AN AIR-CONDITIONING SYSTEM

This coefficient describes the space-time variation of radiators and the regulation system. The value can be generated by selecting a tabulated value or directly input. In this case, this coefficient should be explained in the RTG Calculation Note for a new build.

PHOTOVOLTAIC SOLAR PANELS

Photovoltaic solar panels are characterised by:

- The surface area of an elementary module, represented in m²
- The number of modules (with identical characteristics and direction)
- The azimuth of solar panels, represented in degrees from north, clockwise.
- The inclination of the solar panels relative to the horizontal plane, expressed in degrees
- Cumulative electrical storage capacity, represented in kWh
- Whether all or part of the electricity produced is consumed on-site

APPENDIX 3 – ENERGY LABEL RATINGS

Energy labels show a ranking of ICEs according to a reference scale of A to G (i.e. a ranking on a seven-class scale).

The energy label indicates class ranges as outlined in the following table, and it should be noted that:

- classes are based on a distinction between buildings according to their occupation and their field of activity:
    - residential buildings;
    - non-residential buildings.

- Classes apply without distinction to new buildings and existing buildings.

	residential buildings	**non-residential buildings**
Class	ICE value in kWh_{fe}/m^2_{SPL}.year	
A	≤ 15	≤ 60
B	16 to 25	61 to 100
C	26 to 30	101 to 150
D	31 to 45	151 to 200
E	46 to 60	201 to 250
F	61 to 90	251 to 350
G	> 90	> 350

Guidelines for printing the label:

The following colours should be used when printing the energy label:

- for the arrow representing Class A: 100% cyan, 0% magenta, 100% yellow, 0% black;
- for the arrow representing Class B: 70% cyan, 0% magenta, 100% yellow, 0% black;
- for the arrow representing Class C: 30% cyan, 0% magenta, 100% yellow, 0% black;
- for the arrow representing Class D: 0% cyan, 0% magenta, 100% yellow, 0% black;
- for the arrow representing Class E: 0% cyan, 30% magenta, 100% yellow, 0% black;
- for the arrow representing Class F: 0% cyan, 70% magenta, 100% yellow, 0% black;
- for the arrow representing Class G: 0% cyan, 100% magenta, 100% yellow, 0% black;
- for the content: 100% cyan, 0% magenta, 70% yellow, 0% black.

All text must be in black type, except for the marker indicating the level of consumption on the scale and the text in the red bar representing class G. This marker has white text on a black background. The text in Class G must be white. The background of the label must be white.

A clearly readable black and white reproduction of the label can also be made, as well as the whole DPEG certificate.

APPENDIX 4 – CONTENT OF RECOMMENDATIONS

The recommendations made by the person issuing the DPEG certificate are technically feasible for the building concerned. The person who is drafting and issuing the DPEG certificate should be able to provide an estimate of the range of payback periods or cost benefits over its economic life.

For a new building, the person issuing the DPEG should make recommendations as to how the building should be used in order to maximise thermal comfort and minimise energy consumption.

For an existing building, the person who is drafting and issuing the DPEG certificate should make recommendations as to how the building should be used to maximise thermal comfort and minimise energy consumption, and what measures should be taken during any major refurbishment of the building envelope or the building's technical systems. To do this, it considers the following information:

a) actual thermal characteristics of the building, including its internal subdivisions;

b) hot water material and supplies, including them
insulating characteristics;

c) air-conditioning systems, including how they are controlled;

d) natural and mechanic ventilation;

e) integrated lighting systems (mainly in the non-residential sector);

f) passive solar designs and solar protective devices;

g) indoor temperature conditions, including the expected indoor temperature;

h) internal loads;

i) active solar designs using energy from renewable sources;

j) natural lighting.

12 APPENDIX: SIMPLIFIED METHOD FOR CALCULATING U

1. The surface transmission coefficient ('U') of a wall is calculated using formula [1],

$$U = \frac{1}{R + 0{,}20} \qquad \textit{formule [1]}$$

where R is the wall's thermal resistance in m^2.K/W.

2. For a wall made up of a set of wall elements that have the same direction and inclination, the U-value for the set is calculated by weighting the surface area of the different wall elements:

$$U = \frac{\Sigma U_i * A_i}{\Sigma A_i} \qquad \textit{formule [2]}$$

where:

- Ui is the surface transmission coefficient of the wall element (i) in W/m^2.K calculated by applying formula [1];
- Ai is the surface area of the wall element in m^2.K/W.

13 APPENDIX: SIMPLIFIED METHOD TO CALCULATE S AND CM

Calculation of S (opaque walls, openings, etc.) and Cm are now largely automated in the RTG/DPEG calculation platform. In certain special cases, it may be useful to calculate them separately and to input the value in detailed mode. In this test case, the calculation methods used are those that are recommended by the RTG 2020:

1. Solar gain of opaque walls

1.1. Solar gain, which is written as 'S', of an opaque wall is calculated using formula [1]:

$$S = \frac{0{,}074 * Cm * \alpha}{R + 0{,}20} \qquad \textit{formule [1]}$$

where:

- Cm is a reduction coefficient corresponding to brise soleils;
- α is the absorption coefficient of the wall;

- R is the wall's thermal resistance in m^2.K/W.

When the wall is protected by a ventilated solar protective device, it is the α absorption coefficient that corresponds to the colours of the solar protective device which can be used to calculate the wall's solar gain.

For a set of walls that face the same way, are of the same inclination and have different solar gains, the solar factor (S) of the set is calculated by surface weighting the different wall elements:

$$S = \frac{\Sigma S_i * A_i}{\Sigma A_i} \qquad \textit{formule [2]}$$

where:

- S_i is the solar gain of the i element of the wall determined according to formula [1];
- A_i is the surface area of the i component.

2. Solar gain of openings

2.1. The solar gain of an opening is equal to the solar gain without horizontal solar protection (So), corrected by the Cm coefficient that corresponds to the effect of the solar protection:

$$S = So * Cm \qquad \text{formule [3]}$$

The solar gain factor of an opening without a horizontal sunshade (So) is determined by the way it is closed, the solar shading characteristics in the opening's plane, and the function of the opening with regard to natural ventilation for thermal comfort.

The So solar gain of an opening in an air-conditioned room can be determined by applying Th-S rules.

2.2. For an opening consisting of different elements with different solar gains, the S solar factor of the whole opening including the possible effects of the horizontal sunshade is calculated by weighting the surface area of the different elements:

$$S = \frac{\Sigma S_i * A_i}{\Sigma A_i} \qquad \textit{formule [4]}$$

where:

- S_i is the solar gain of the i part of the opening determined according to formula [3] by taking into account the Cm coefficient for this part of the opening;
- A_i is the surface area of the i part of the opening.

3. Joint procedures to calculate the solar gains of walls and openings

Table: Cm coefficient of horizontal walls

Localisation	Coefficient de réduction Cm correspondant aux pare-soleil	
	Paroi sans pare-soleil	Paroi avec pare-soleil horizontal ventilé
Tout département	1,0	0,3

Ventilated solar shading is defined as follows:

For horizontal walls:

A horizontal wall is considered to have a ventilated solar shading device when the opening ratio (opening area to wall surface area) is at least 5%. Openings should be positioned in opposite directions and preferably windward and leeward.

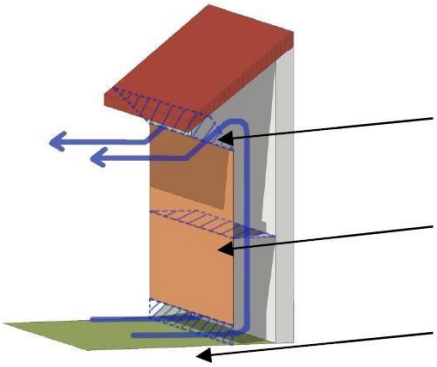
For vertical walls:

A vertical wall is considered to have a ventilated sunshade when the following three conditions are simultaneously met:

- the perforation ratio (open area in relation to the wall surface area) at the lower end of the wall is at least 3%;
- the perforation ratio (open area in relation to the wall surface area) at the top end of the wall is at least 3%;
- the horizontal distance between the inner face of the sunshade and the outer face of the wall is such that, over the entire height of the wall, a free horizontal surface area equal to at least 3% of the surface of the wall is provided to ensure the passage of air.

The colour to be considered when determining α to calculate the solar gain of vertical opaque walls S is that of the external side of the protective solar device and not that of the protected wall.

FR	EN
>3 % d'ouverture en partie haute (section haute / surface paroi *100)	>3% of perforation for the upper part (upper section/wall surface area *100)
>3 % d'ouverture en écoulement (section courant / surface paroi * 100)	>3% flow opening (cross-sectional area/wall surface area * 100)
>3 % d'ouverture en partie basse (section basse / surface paroi *100)	>3% of perforation for the lower part (lower section/wall surface area *100)



≥ 3 % d'ouverture en partie haute
(section haute / surface paroi *100)

≥ 3 % d'ouverture en écoulement
(section courante / surface paroi *100)

≥ 3 % d'ouverture en partie basse
(section basse / surface paroi *100)

14 EXAMPLE OF THE RTG CERTIFICATE AT THE BUILDING PERMIT STAGE

Attestation de conformité du calcul Règlementation Thermique Guadeloupe (RTG)

(à joindre au dossier de demande de permis de construire)

Cette réglementation est définie par la délibération du conseil régional de la Guadeloupe CR/19-1155 du 31 octobre 2019 publiée au Journal officiel de la République française du xxx relevant du domaine du règlement relative à la réglementation thermique de Guadeloupe (calcul RTG) et aux caractéristiques thermiques de l'enveloppe des bâtiments nouveaux et des parties nouvelles de bâtiments, notamment l'article 7-I : « (…) le dossier joint à la demande de permis de construire comprend un document attestant la réalisation d'un calcul RTG provisoire conforme à la présente délibération, et délivré par la plateforme de calcul RTG/DPEG (…) ».

Références de l'attestation		
N° de l'attestation	104_140	
Date d'édition	23 janvier 2020 13:54	

Identité du demandeur	
Maître d'Ouvrage	Dupont
Opérateur du calcul RTG	Émilien Paron - emilien.paron@cstb.fr (#3)

Identité du bâtiment			
Nom du bâtiment	Maison		
Adresse	Pigeon Bouillante		
Coordonnées GPS	latitude : 16.1469614144398 longitude : -61.7700204498385		
Surfaces de plancher par zone d'usage	Zone d'usage	MaisonIndividuelleResidentiel	69.01 m²
Zone de vent	Continental		
Surface de baies	10 m²		
Surface de parois verticales	46.1 m²		
Surface de toiture	54.4 m²		
BBIO/BBIO$_{max}$ de la zone la moins performante du projet	Non applicable		
ICT/ICT$_{max}$ de la zone la moins performante du projet	73 %		
PRECS du bâtiment	0%		

15 EXAMPLE OF THE DPEG CERTIFICATE AT THE END OF THE DESIGN STAGE

DPEG Diagnostic Performance Energétique Guadeloupe 2020

REGION GUADELOUPE

Attestation de diagnostic de performance énergétique

Bâtiment neuf	
N° de certificat DPE : DPE_103_139_1	Date d'émission du certificat : 22/01/2020 Valabe jusqu'au : ----------
Activité hébergée: Maison individuelle Typologie de construction: Maison de ville / Couverture (tôle, tuiles...) avec combles / Bois Dupont ☑ Le lot est le bâtiment entier ☐ Le lot est une partie de bâtiment (à préciser) :	Année de construction: 2019 Surface de pancher: 69.01 m² Surface de pancher climatisée: 0 m² Part réelle de surface climatisée: 0% Part conventionnele de a surface climatisée: 0%
Propriétaire: Dupont Nom: Maison Adresse: Pigeon Bouillante	Diagnostiqueur: Émilien Paron Adresse: emilien.paron@cstb.fr Tel.:

Bilan énergétique annuel - éstimé par le cacul RTG (conventionnel / 4 usages RTG)		
Usage: **Climatisation**		0.00 *kWhₑₚ/m².an*
Usage: **Eau chaude sanitaire**		0.00 *kWhₑₚ/m².an*
Usage: **Éclairage**		5.91 *kWhₑₚ/m².an*
Usage: **Ventilation**		4.77 *kWhₑₚ/m².an*
Production à demeure d'éléctricité à partir des sources renouvelables	Production	475.40 *kWhₑₚ/m².an*
	Part déductible (TRC)	5 *kWhₑₚ/m².an*
TOTAL (poduction déduite) : (ICE)		5.68 *kWhₑₚ/m².an*
Équivalent en énergie primaire :		19.87 *kWhₑₚ/m².an*
Émision de gaz à effet de serre :		4.54 *kg CO2/m².an*

Indicateur de consommation energétique
(en énergie **finale** exprimée en kWhₑₚ/m²/an)
Selon calcul RTG conventionnel / limité aux 4 usages RTG
déduction faite d'une part de la production d'électricité à demeure

Bâtiment économe

≤ 15 A
15 à 25 B
25 à 30 C
30 à 45 D
45 à 60 E
60 à 80 F
> 80 G

Bâtiment énergivore

6 kW h_{ef}/m².an

Adresse du lot:
Pigeon Bouillante

DPE Diagnostic Performance Energétique Guadeloupe 2020

REGION GUADELOUPE

		Evaluation	Commentaires
FACTURE D'ENERGIE		*****	Qualifie le niveau de consommation global d'électricité constaté sur trois années. Résulte des conditions réelles d'occupation (température de consigne de climatisation, plages horaires de climatisation,...), la part de surface climatisée et les autres équipements électriques
CONFORT		***** rang* 1/17	Qualifie la durée pendant laquelle le logement reste confortable sans climatisation. Dépend essentiellement des dimensions des ouvertures, de leur orientation relativement au vent, de la présence de brasseurs d'air, ainsi que de la performance de l'enveloppe.
SITE		***** rang* 17/17	Qualifie l'environnement du bâtiment du point de vue thermique. Dépend essentiellement des effets de masque lointains, de l'altitude et de la zone de vent.
ENVELOPPE DU BATIMENT	Façades	***** rang* 12/17	Qualifie le niveau de performance thermique de la partie pleine de la façade, c'est-à-dire sa capacité à protéger du rayonnement. Dépend alors essentiellement de la couleur, de l'isolation et des masques solaires (prend en compte également le rayonnement vers la voute céleste).
	Toiture	***** rang* 12/17	Qualifie le niveau de performance thermique de la partie pleine de la toiture, c'est-à-dire sa capacité à protéger du rayonnement. Dépend alors essentiellement de la couleur, de l'isolation et des masques solaires (prend en compte également le rayonnement vers la voute céleste).
	Baies	***** rang* 17/17	Qualifie le niveau de performance thermique de la partie pleine des baies, c'est-à-dire de leur capacité à protéger du rayonnement incident. Dépend alors essentiellement des masques solaires et des protections mobiles installées.
EQUIPEMENTS TECHNIQUES	Climatisation	***** rang* 12/17	Qualifie le rendement énergétique du système de climatisation.Dépend essentiellement de la nature du climatiseur.
	Eau Chaude Sanitaire	***** rang* 1/17	Qualifie le rendement énergétique de la production d'eau chaude sanitaire. Dépend du taux de couverture des besoins par une énergie d'origine renouvelable (notamment ECS solaire thermique)
	Panneaux photovoltaïques	***** rang* 1/17	Qualifie le degré de valorisation de la surface de toiture disponible pour la prodution d'électricité photovoltaïque

(*) : clé de lecture : le rang 1 correspond au bâtiment le plus performant de sa catégorie

Recommandations :