



## TRNSYS Export from Pleiades Modeler



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SCOP ARL with variable capital • 433 271 905 RCS Sète



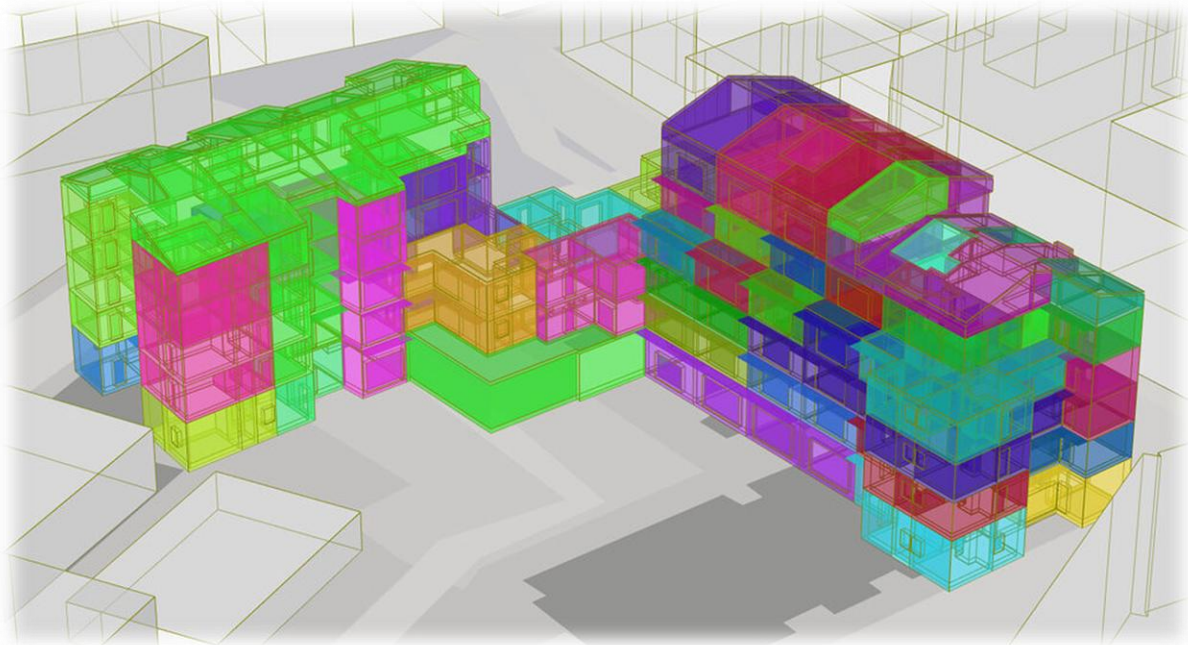
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## I. IZUBA Energy – TRNSYS distributor

**Pleiades** is the eco-design software for buildings developed and distributed by **IZUBA energies**.

IZUBA Energy is also [the official distributor of TRNSYS](#) in France and has developed a gateway between [Pleiades Modeler](#) and TRNBuild to facilitate interoperability between the two tools.



Versatile, Pleiades integrates all the tools required for evaluating building energy and environmental performance: dynamic thermal simulation, regulatory compliance, system sizing, life cycle assessment, and indoor air quality analysis.

User-friendly, Pleiades provides an intuitive interface for fast and efficient data input, including a graphical modeler and BIM import capabilities.

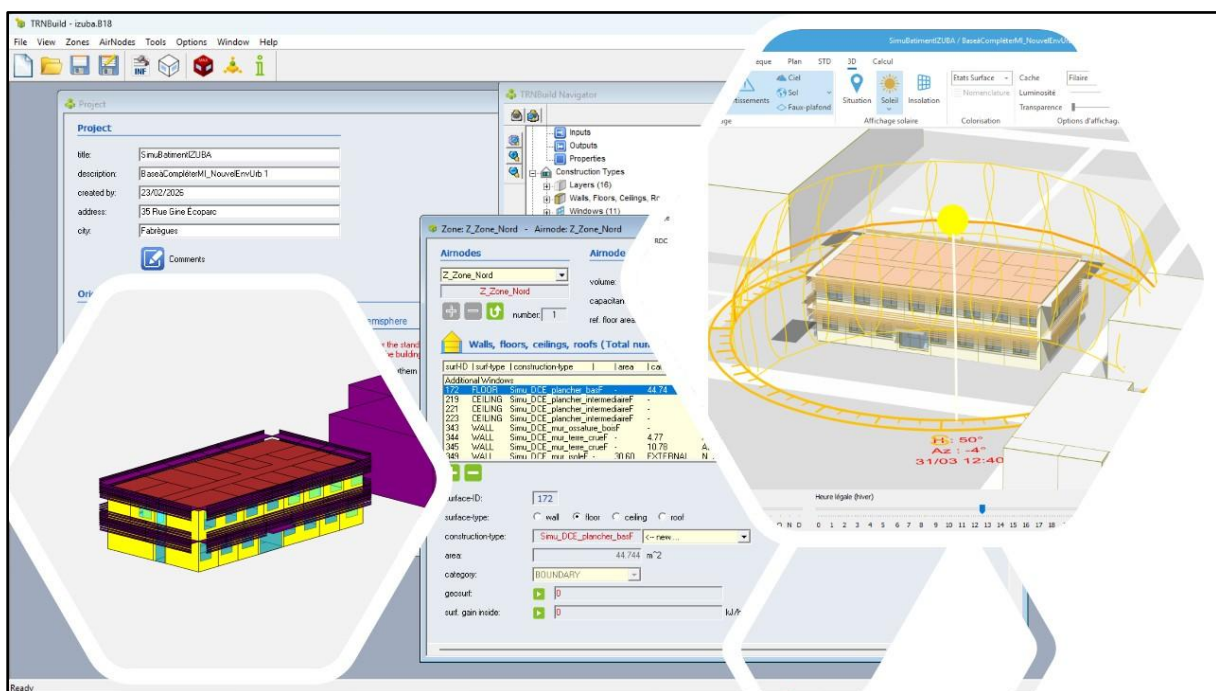
Innovative, Pleiades is continuously enhanced with new features incorporating the latest scientific research developments.

## II. General principle of the gateway between Pleiades Modeler to TRNBuild

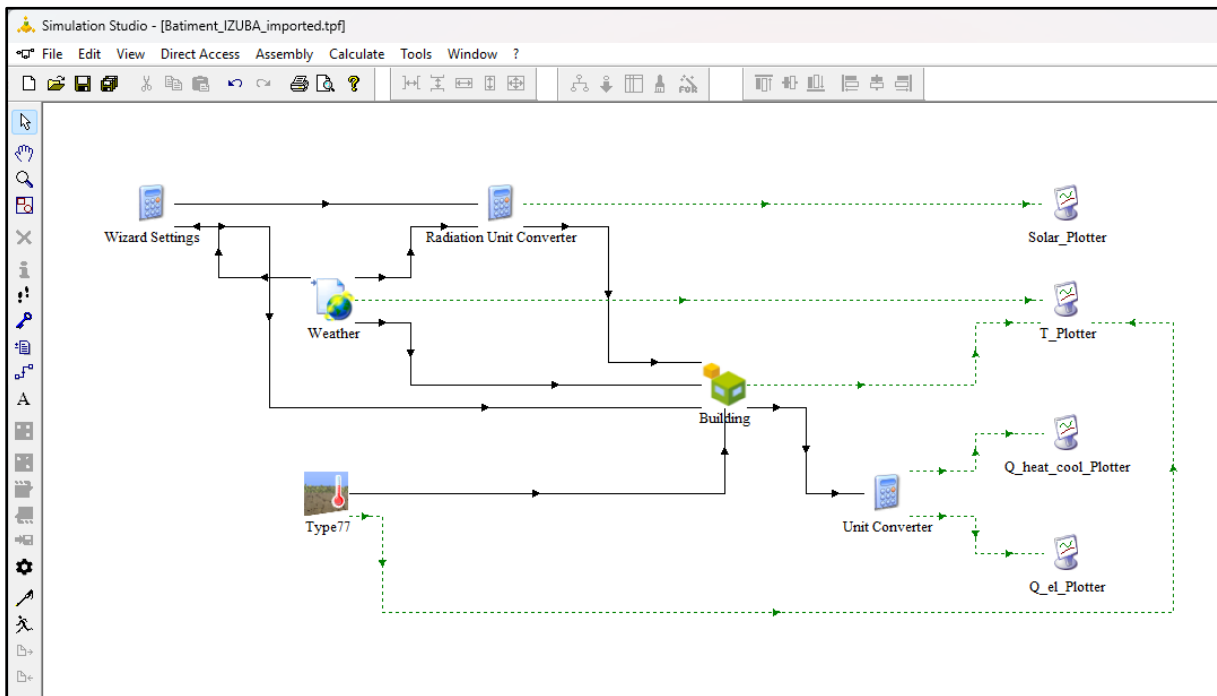
The TRNSYS export from Pleiades Modeler consists of converting the building thermal model including geometry, materials, constructions, surface properties, thermal bridges, windows, scenarios (as schedules or inputs), and environmental/architectural shading into a structured .b18 text file readable by TRNBuild.

The objective is to take advantage of the simplicity of modeling offered by **Pleiades Modeler** to build a complete thermal model: creation of zones, integration of masks, consideration of thermal bridges and definition of wall compositions.

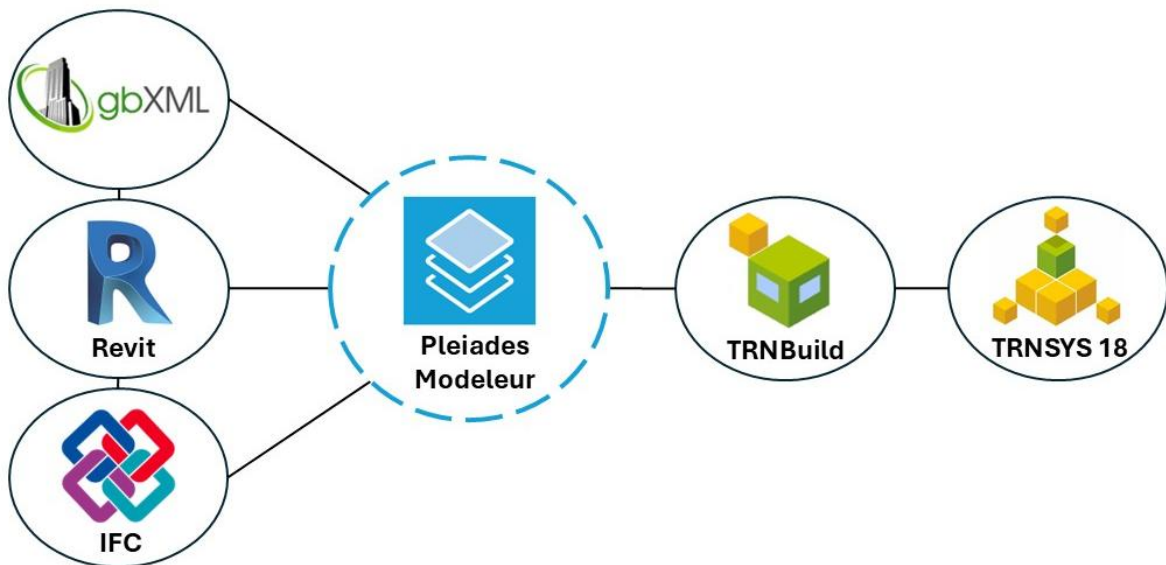
Conversely, modeling via **SketchUp** is more complex and time-consuming for this purpose, as this tool is not specifically designed for thermal modeling of buildings and requires more manipulation to properly structure zones and constructions.



The generated file is a **B18 file**, containing all the information required to reconstruct a multizone thermal model in TRNBuild. This model is then used by TRNSYS for dynamic simulations using **Type 56**.



Pleiades Modeler also supports BIM import via [the Pleiades plugin for Revit](#), as well as gbXML, IFC 2x3, and IFC4 formats. Imported models can still be edited and corrected.



### III. General export principle

#### 1. Naming and orientation management

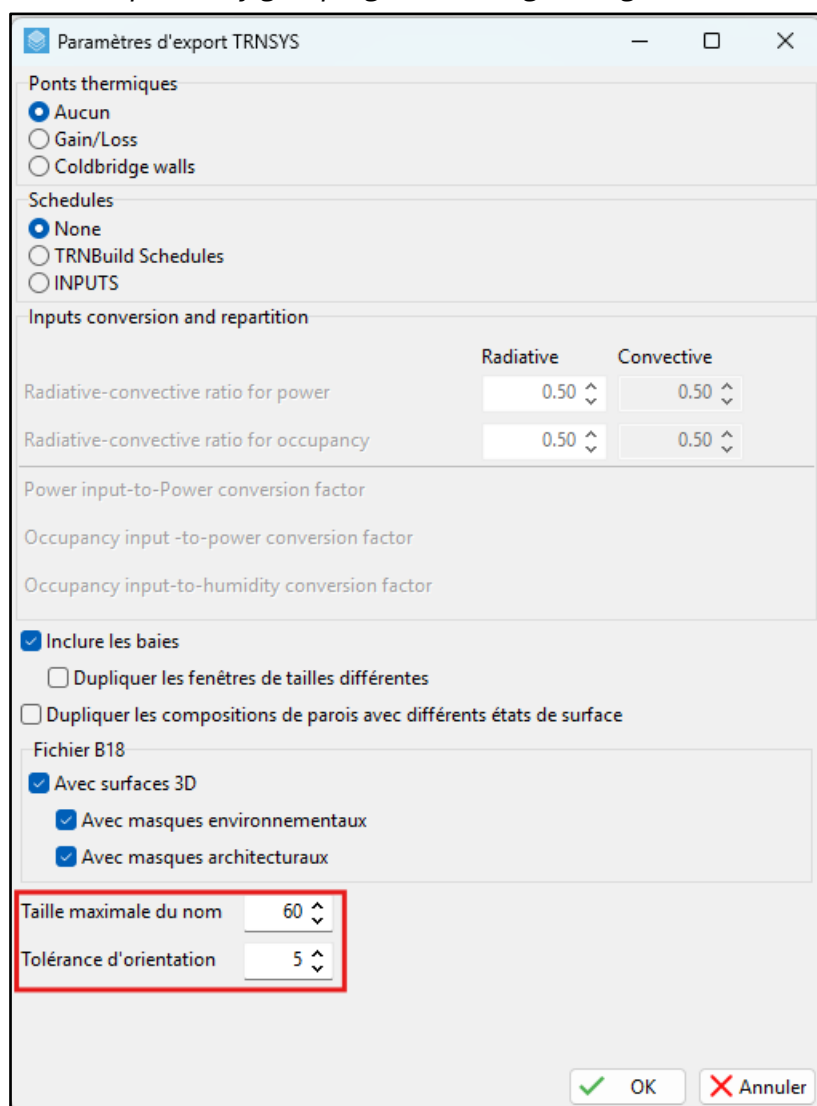
- *TRNBuild has limitations regarding object name length (zones, walls, layers, etc.).*

**The gateway therefore introduces:**

- *Applies a maximum name length,*
- *Truncates names exceeding the limit and adds 4 characters to ensure uniqueness.*

**Regarding orientation:**

- *Orientations are automatically generated,*
- *They can be simplified by grouping them using an angular tolerance.*



**Note:** Internal walls within the same zone are removed during export due to a TRNBuild limitation.

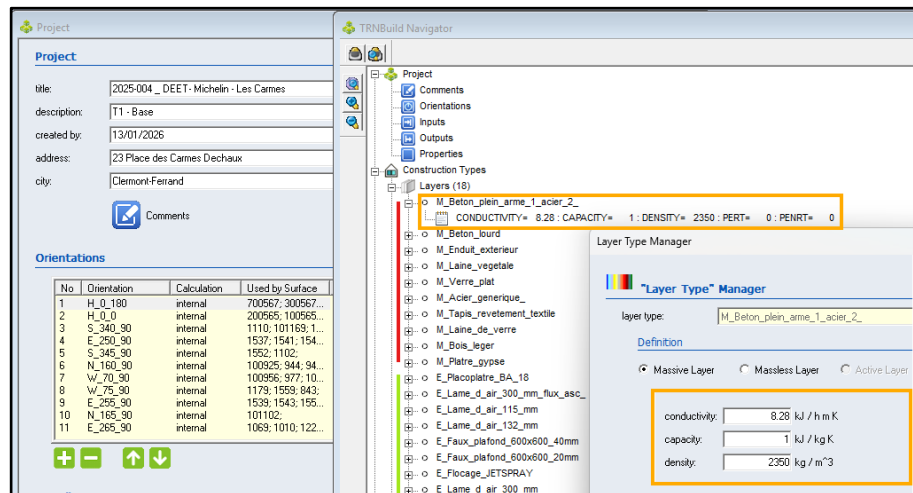
## 2. Pleiades Materials/TRNBuild → TRNBuild (Layers):

Each wall layer in TRNBuild corresponds directly to the materials/Elements defined in Pleiades.

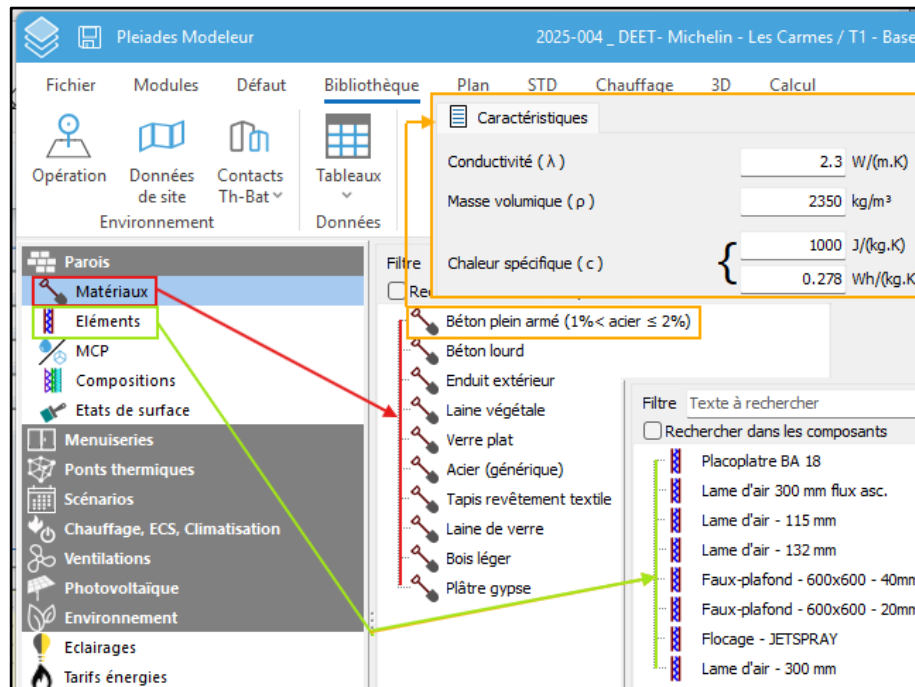
Transferred Parameters:

- Conductivity → Thermal Conductivity
- Capacity → Mass Heat Capacity
- Density → Density

**TRNBuild**

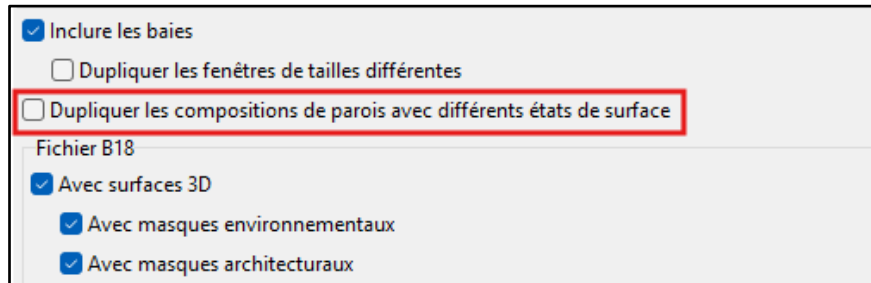


**Pleiades Modeler**



### 3. Pleiades Compositions → TRNBuild (Wall, Floor, Roof, Ceilings):

For the composition of the walls between pleiades and TRNBuild, there are two export modes that exist:



1st case: Without duplication	2nd case: With duplication
<p>If the option disabled, Pleiades creates the construct as:</p> <ul style="list-style-type: none"> <li>• <b>Layers:</b> from the Pleiades compositions.</li> <li>• <b>Thickness:</b> Actual thickness.</li> </ul> <p>- Default values:</p> <ul style="list-style-type: none"> <li>• <b>Absorptivity (Front &amp; Back):</b> 0.6</li> <li>• <b>Emissivity (Front &amp; Back):</b> 0.9</li> <li>• <b>Surface exchange coefficients (Front &amp; Back):</b> 11 W/m<sup>2</sup>K</li> </ul>	<p>If the option is enabled, Pleiades creates multiple constructs based on:</p> <ul style="list-style-type: none"> <li>• Composition type</li> <li>• Surface state</li> </ul> <p>- TRNBuild receives in this case:</p> <ul style="list-style-type: none"> <li>• <b>Layers:</b> from the Pleiades compositions.</li> <li>• <b>Thickness:</b> Actual thicknesses</li> <li>• <b>Absorptivity (Front &amp; Back):</b> From the absorptivity of the surface state.</li> <li>• <b>Emissivity (Front &amp; Back):</b> From the absorption of the surface state.</li> <li>• <b>Exchange coefficient:</b> From the exchange coefficients defined in STD tab calculations (<a href="#">the expert parameters</a>).</li> </ul>

### TRNBuild

The screenshot shows the TRNBuild Construction Type Manager interface. On the left, a tree view shows the project structure with 'Layers (18)' expanded to 'Walls, Floors, Ceilings, Roofs (13)', where 'Dalle sur terre-plein' is selected. The main window displays the configuration for 'Dalle sur terre-plein'. The 'Layer' table shows a single layer: 'M\_Beton\_plein\_arm' with a thickness of 0.250 m and a type of 'massive'. The 'u-value' is 3.588 W/m²K. Below, the 'Solar Absorptance' and 'Longwave Emission Coefficient' are both set to 0.6 for the front and back surfaces. The 'Convective Heat Transfer Coefficient' is set to 'internal calculation' for both sides.

### Pleiades Modeller / (Expert Settings tab STD)

The screenshot shows the 'Editez le composant' window in Pleiades Modeller. The component is 'Dalle sur terre-plein' from the 'STD Michelin CHANTEMERLE' library. The 'Type de paroi' is set to 'Mur lourd'. The 'Composants' table is as follows:

Composants	T	cm	kg/m³	λ	R
Béton plein armé (1% < acier ≤ 2%)		25.000	588	2.3	0.11

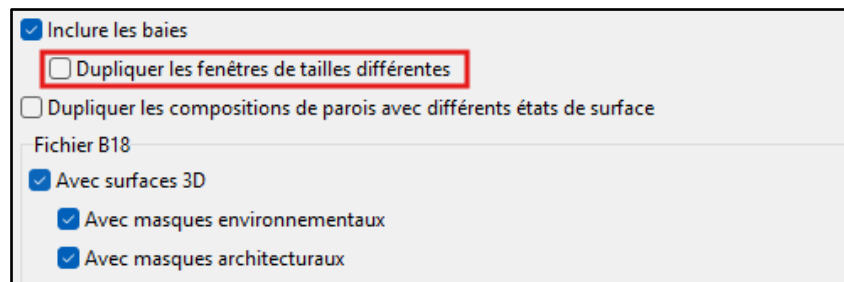
The total values are: Total 25 cm, 588 kg/m³, 0.11 R.

The screenshot shows the 'Paramètres experts' and 'Coefficients d'échange' tabs. The 'Coefficients d'échange' table is as follows:

Paroi	Emissivité	Coefficients d'échange (convectif + radiatif)		
		h int	h ext	Exp. sévère
Verticale	0.9	8.13	18.2	33.3
Plafond externe	0.9	9.43	22.2	50.0
Plancher externe	0.9	6.67	20.0	20.0
Plancher interne	0.9	1.78	20.0	20.0
Vide sanitaire	0.9	8.00		
Comble	0.9	3.00		
	0.9	6.25		
	0.9	3.33		
	0.9	7.14		
	0	4.00		

## 4. Pleiades Windows → TRNBuild (Windows):

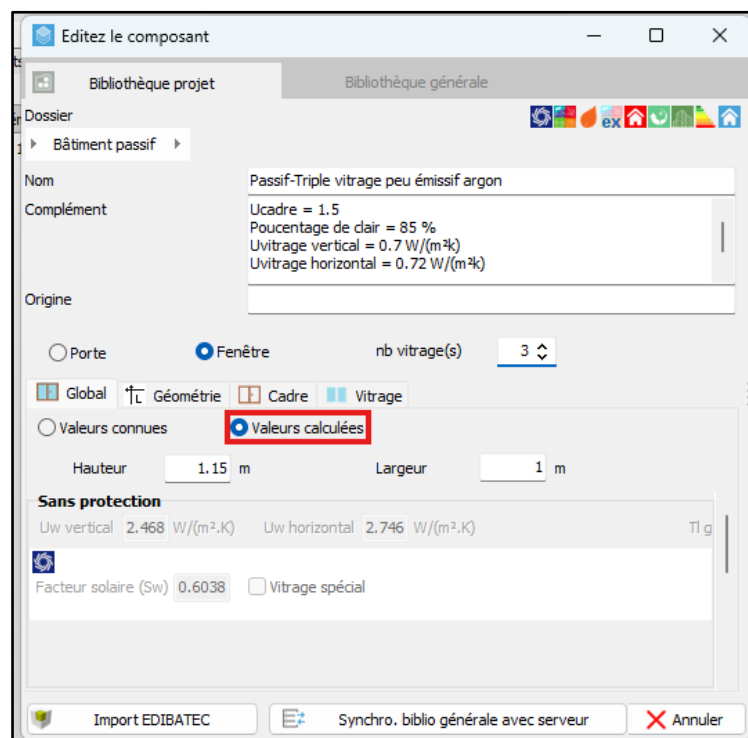
For windows between Pleiades and TRNBuild, there are two export modes:



### Without duplication

- One window is created per window type.

**Important:** Windows must be defined using “calculated values” in Pleiades. If defined using “known values”, export is not possible.



- Default **WINID (14207)** is used in TRNBuild,
- The user must define or select window properties in TRNBuild,
- **UFRAME** and **FFRAME** are imported from Pleiades.

TRNBuild

Editez le composant

Bibliothèque projet Bibliothèque générale

Dossier: Bâtiment passif

Nom: Passif-Triple vitrage peu émissif argon

Complément: Ucadr Origine

Ucadr:  Pouce  Uvitra  Uvitra

Origine:  Porte  Fenêtre nb vitrage(s): 2

Global  Géométrie  Cadre  Vitrage

Coeff U Opaque (Uf): 5 W/(m².K)

Global  Géométrie  Cadre  Vitrage

Hauteur: 1.15 m Largeur: 1 m Dessiné

Coffre: hc 0 m Dans le tableau  Au-dessus ou dans le linteau

	Surface (m²)	% hors coffre	Intercalaires (m)
Cadre	0.173	15	0
Vitrage	0.977	85	3.96
Panneau opaque	0	0	0
Coffre	0	0	0

Import EDIBATEC Synchro. biblio générale avec serveur OK Annuler

Pleiades  
Modeleur

Window Type Manager

Window Type: W\_Passif\_Triple\_vitrage\_peu\_émissif\_argon\_1\_5\_1\_1

Glazing

ID number: 100

slope of window:  userdefined  surface orientation

For 1 glazing module width: 1.5 m height: 1.5 m

u-value: 5.00 W/m²K

g-value: 1.0/100

ID spacer: 4 Insulated

Frame

window frame fraction: 0.15

c-value (1/R): 5 kJ/h m² K

solar absorptance: 0.6

emissivity: 0.9

Optional Properties of Shading Devices

Additional Thermal Resistance

internal device: 0 h m² K/AJ

external device: 0 h m² K/AJ

Radiation depending shading control (internal mode)

Close if total radiation on window >: T-SHADE\_CLOSE kJ/h m²

Open if total radiation on window <: T-SHADE\_OPEN kJ/h m²

Daylight Properties (required if window is used in thermal zone with daylight sensor points)

Reflection Coefficient of Internal Device

towards window: 0.5

towards zone: 0.5

Emissivity of Internal Device towards zone: 0.9

Fraction of abs. Solar Radiation of Internal Device transformed to a conv. Heat Flow Rate (CCISHADE): 0.5

Add as conv. gain to airnode: 1

Front (inside) - Convective Heat Transfer Coefficient

useddefined  internal calculation

11 kJ/h m² K

Back (outside) - Convective Heat Transfer Coefficient

useddefined  internal calculation

64 kJ/h m² K

Embodied Energy (optional data, not required for thermal simulation)

total renewable primary energy: 0 MJ / m²

total non-renewable primary energy: 0 MJ / m²

### With duplication

- The number of windows increases based on window type/size combinations,
- **FFRAME** is adjusted according to dimensions.

## 5. Pleiades Thermal Bridge → TRNBuild

Two options for transferring thermal bridges from Pleiades Modeler to TRNBuild.

**Ponts thermiques**

Aucun

Gain/Loss

Coldbridge walls

### i. Gain/loss Types:

Thermal bridges are converted into gains/losses under the **THERMAL BRIDGE** category.

**Ponts thermiques**

Aucun

Gain/Loss

Coldbridge walls

- One gain per zone,
- 50% radiative / 50% convective.

Gain/loss Types (1)

• GAIN001

CONVECTIVE=50 : RADIATIVE=0 : HUMIDITY=0 : ELPOWERFRAC=0 : ABSOLUTE : CATEGORY=THBRIDGE

Daylight Control Types (0)

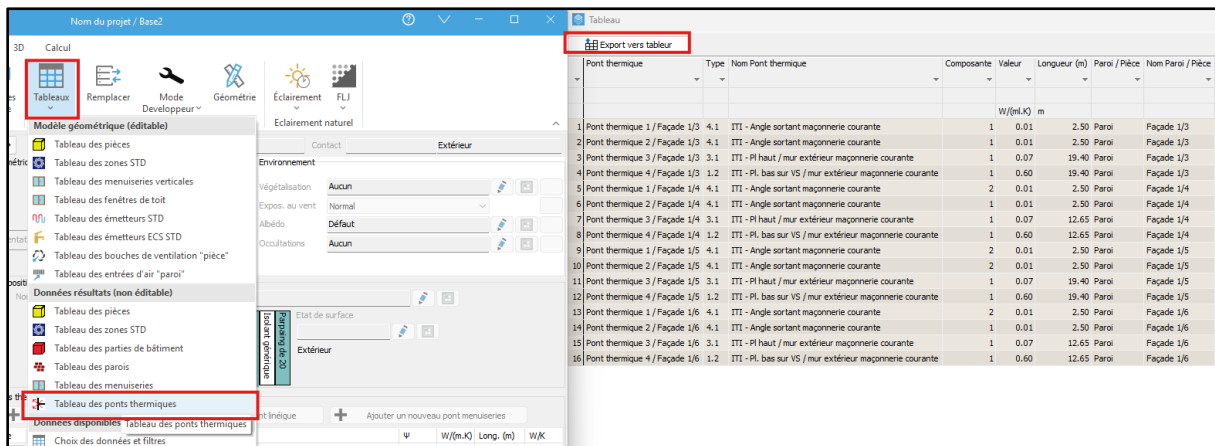
Calculation principle, for each thermal bridge type:

The screenshot shows the software interface with a table of thermal bridge results. A red box highlights the table, and another red box highlights the 'Façade 1/6' element in the project tree. A red arrow points from the table to the element in the tree.

Type	Nom	$\psi$	W/(m.K)	Long. (m)	W/K
ITI	ITI - Angle sortant maçonnerie courante	$\psi_2$	0.010	2.50	0.03
ITI	ITI - Angle sortant maçonnerie courante	$\psi_1$	0.010	2.50	0.03
ITI	ITI - Pl haut / mur extérieur maçonnerie courante	$\psi_1$	0.070	12.65	0.89
ITI	ITI - Pl. bas sur VS / mur extérieur maçonnerie courante	$\psi_1$	0.600	12.65	7.59

- $\psi$ -value and length are used,
- Total heat loss (W/K) is calculated per zone.

To check, you can export your project's thermal bridges from the data table and then sum up all the thermal bridges for each zone.



As shown in the Excel table below, the sum of the thermal bridges in the area is 43.147 W/K. After conversion of the units, this corresponds to 155.32 kJ/(h· K), with **50% of the radiative part and 50% of the convective part.**

	A	B	C	D	E	F	
Pleiaide			compo	Valeur	Longeur (m)	W/K	
IT1 - Angle sortant maçonnerie courante	Façade 1/3		1	0,01	2,5	0,025	
IT1 - Angle sortant maçonnerie courante	Façade 1/3		1	0,01	2,5	0,025	
IT1 - Pl haut / mur extérieur maçonnerie courante	Façade 1/3		1	0,07	19,4	1,358	
IT1 - Pl. bas sur VS / mur extérieur maçonnerie courante	Façade 1/3		1	0,6	19,4	11,64	
IT1 - Angle sortant maçonnerie courante	Façade 1/4		2	0,01	2,5	0,025	
IT1 - Angle sortant maçonnerie courante	Façade 1/4		1	0,01	2,5	0,025	
IT1 - Pl haut / mur extérieur maçonnerie courante	Façade 1/4		1	0,07	12,65	0,8855	
IT1 - Pl. bas sur VS / mur extérieur maçonnerie courante	Façade 1/4		1	0,6	12,65	7,59	
IT1 - Angle sortant maçonnerie courante	Façade 1/5		2	0,01	2,5	0,025	
IT1 - Angle sortant maçonnerie courante	Façade 1/5		2	0,01	2,5	0,025	
IT1 - Pl haut / mur extérieur maçonnerie courante	Façade 1/5		1	0,07	19,4	1,358	
IT1 - Pl. bas sur VS / mur extérieur maçonnerie courante	Façade 1/5		1	0,6	19,4	11,64	
IT1 - Angle sortant maçonnerie courante	Façade 1/6		2	0,01	2,5	0,025	
IT1 - Angle sortant maçonnerie courante	Façade 1/6		1	0,01	2,5	0,025	
IT1 - Pl haut / mur extérieur maçonnerie courante	Façade 1/6		1	0,07	12,65	0,8855	
IT1 - Pl. bas sur VS / mur extérieur maçonnerie courante	Façade 1/6		1	0,6	12,65	7,59	
<b>Totale</b>						<b>43,147 W/K</b>	
							TRNBuild Totale
							155,3292 kJ/(h·K).
							50% Radiative 77,66 kJ/(h·K).
							50% Convective 77,66 kJ/(h·K).

## ii. Coldbridge Effect:

**Ponts thermiques**

Aucun  
 Gain/Loss  
 Coldbridge walls

This method consists of creating thermal bridges directly at the zone level in TRNBuild.

This also generates corresponding entries at the **Layer level**.

Let's take the following example:

Nom du Pont Thermique	Psi 1 ou Psi 2	Valeur W/(m.K)	Longuer	Valeut Totale (W/K)	Paroi	Nom paroi
ITI - Angle sortant maçonnerie courante	1	0,01	2,5		Paroi	Façade 1/6
ITI - Angle sortant maçonnerie courante	1	0,01	2,5		Paroi	Façade 1/3
ITI - Angle sortant maçonnerie courante	1	0,01	2,5		Paroi	Façade 1/3
ITI - Angle sortant maçonnerie courante	1	0,01	2,5		Paroi	Façade 1/4
ITI - Angle sortant maçonnerie courante	2	0,01	2,5		Paroi	Façade 1/5
ITI - Angle sortant maçonnerie courante	2	0,01	2,5		Paroi	Façade 1/5
ITI - Angle sortant maçonnerie courante	2	0,01	2,5		Paroi	Façade 1/6
ITI - Angle sortant maçonnerie courante	2	0,01	2,5		Paroi	Façade 1/4
		0,08	20	1,6	W/k	

**Note that**, for thermal bridges with two components ( $\psi_1$  and  $\psi_2$ ), such as the outgoing corner thermal bridge, the export to TRNBuild is translated into CBRP1 and CBRP2 as shown in the figure below:

**CBRP1**, corresponding to  $\psi_1$

**CBRP2**, corresponding to  $\psi_2$

Id	Type	Material	Area (m²)	Orientation	Angle
8	FLOOR	BBC_Plancher_bas_hourdis_isole_en_sous_face	49.95	EXTERNAL	H_0_180
9	ROOF	BBC_Toit_comble_perdus	49.95	EXTERNAL	H_0_0
10	WALL	ITI_BBC_Mur_maçonnerie_courante	22.5	EXTERNAL	S_0_90
1	WALL	CBRP1_ITI_Angle_sortant_maçonnerie_courante	2.5	EXTERNAL	S_0_90
2	WALL	CBRP1_ITI_Angle_sortant_maçonnerie_courante	2.5	EXTERNAL	S_0_90
3	WALL	CBRP1_ITI_Pl_haut_mur_exterieur_maçonnerie_courante	9	EXTERNAL	S_0_90
4	WALL	CBRP1_ITI_Pl_bas_sur_VS_mur_exterieur_maçonnerie_courante	9	EXTERNAL	S_0_90
11	WALL	ITI_BBC_Mur_maçonnerie_courante	13.875	EXTERNAL	E_270_90
5	WALL	CBRP2_ITI_Angle_sortant_maçonnerie_courante	2.5	EXTERNAL	E_270_90
6	WALL	CBRP1_ITI_Angle_sortant_maçonnerie_courante	2.5	EXTERNAL	E_270_90
7	WALL	CBRP1_ITI_Pl_haut_mur_exterieur_maçonnerie_courante	5.55	EXTERNAL	E_270_90
14	WALL	CBRP1_ITI_Pl_bas_sur_VS_mur_exterieur_maçonnerie_courante	5.55	EXTERNAL	E_270_90
12	WALL	ITI_BBC_Mur_maçonnerie_courante	22.5	EXTERNAL	N_180_90
15	WALL	CBRP2_ITI_Angle_sortant_maçonnerie_courante	2.5	EXTERNAL	N_180_90
16	WALL	CBRP2_ITI_Angle_sortant_maçonnerie_courante	2.5	EXTERNAL	N_180_90
17	WALL	CBRP1_ITI_Pl_haut_mur_exterieur_maçonnerie_courante	9	EXTERNAL	N_180_90
18	WALL	CBRP1_ITI_Pl_bas_sur_VS_mur_exterieur_maçonnerie_courante	9	EXTERNAL	N_180_90
13	WALL	ITI_BBC_Mur_maçonnerie_courante	13.875	EXTERNAL	W_90_90
19	WALL	CBRP2_ITI_Angle_sortant_maçonnerie_courante	2.5	EXTERNAL	W_90_90
20	WALL	CBRP1_ITI_Angle_sortant_maçonnerie_courante	2.5	EXTERNAL	W_90_90
21	WALL	CBRP1_ITI_Pl_haut_mur_exterieur_maçonnerie_courante	5.55	EXTERNAL	W_90_90
22	WALL	CBRP1_ITI_Pl_bas_sur_VS_mur_exterieur_maçonnerie_courante	5.55	EXTERNAL	W_90_90

## 6. Pleiades Schedules → TRNBuild Schedules:

We propose two methods to export schedules from **Pleiades** to **TRNBuild**: an export in the form of *schedules* or in the form of *inputs*. For all scenarios (temperature, power dissipation, occupancy, ventilation).

Schedules

- None
- TRNBuild Schedules
- INPUTS

### i. TRNBuild Schedules

The export in the form of *schedules* directly creates *schedules* in **TRNBuild**, with the possibility to choose the ratio between the convective and radiative part of the internal inputs related to **occupancy** and **dissipated power**.

Schedules

- None
- TRNBuild Schedules
- INPUTS

Inputs conversion and repartition

	Radiative	Convective
Radiative-convective ratio for power	0.20	0.80
Radiative-convective ratio for occupancy	0.5	0.50

For units in the occupancy and power dissipated scenarios:

- **Occupancy scenarios:** two options are possible in **Pleiades**

-In *absolute occupancy* → exported as **an absolute gain** in **TRNBuild**.

-In *area occupation (occupancy/m<sup>2</sup>)* → exported as **gain related to reference floor area** in **TRNBuild**.

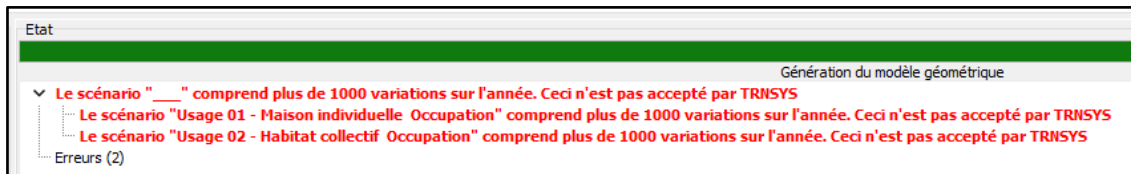
- **Power dissipation scenarios:** two options as well

-*Absolute power (W)* → exported as **absolute gain** in **TRNBuild**.

-In *pf<sub>d</sub> (W/m<sup>2</sup>)* → exported as **gain related to reference floor area** in **TRNBuild**.

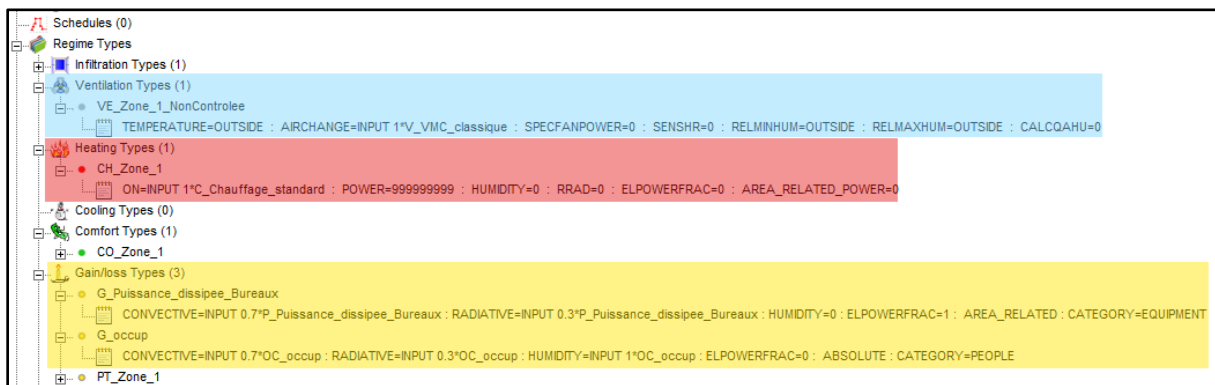
gain/loss type name	gain/loss type category	gain/loss type mode	scale 1	scale 2	ref. area fraction	geo pos	daylight contr
G_Puissance_Chambre	electrical equipment	gain related to reference floor area	1	1	1	0	-
G_Occupation_Chambre	people	gain related to reference floor area	1	1	1	0	-
G_Puissance_Sejour	electrical equipment	absolute gain	1	1	no	0	-
G_Occupation_Sejour	people	absolute gain	1	1	no	0	-

A limitation of this export method is that **TRNBuild** does not accept more than 1000 variations per year. If you fill in a *schedule* with more than 1000 variations per year, you will get this error message. In this case, *schedules* in the form of *inputs must be used*.



## ii. INPUTS

The export in the form of *INPUTS* directly creates *INPUTS* in **TRNBuild**, for all the following scenarios (**Ventilation**, **Temperature**, **Occupancy** and **dissipated power**) with the possibility to choose the ratio between the convective and the radiative part of the internal inputs related to the occupancy and the dissipated power.

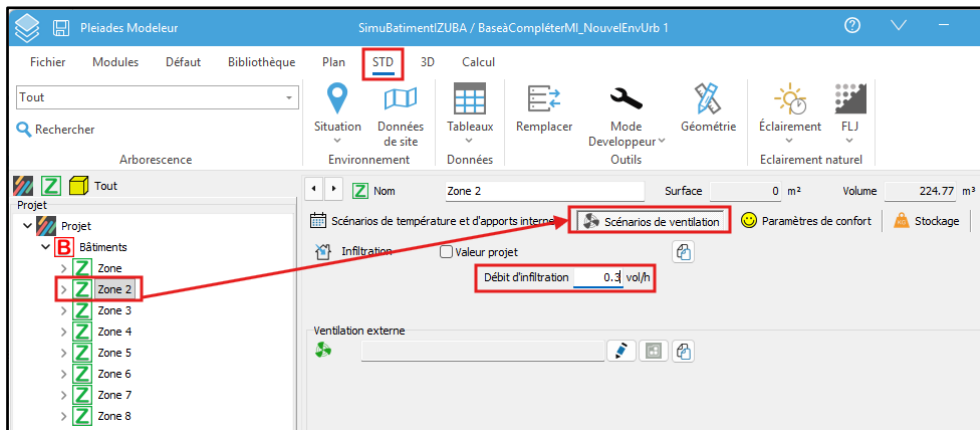
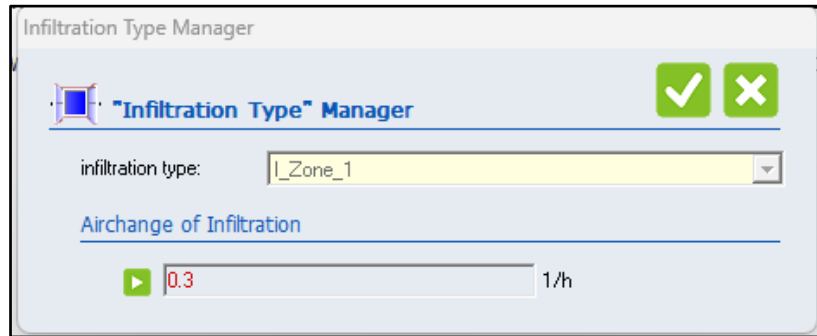


Conversion factors for inputs are also proposed, as **TRNBuild** uses units that are not internationally standardized.

Schedules		
<input type="radio"/> None		
<input type="radio"/> TRNBuild Schedules		
<input checked="" type="radio"/> <b>INPUTS</b>		
Inputs conversion and repartition		
	Radiative	Convective
Radiative-convective ratio for power	0.30	0.70
Radiative-convective ratio for occupancy	0.50	0.50
Power input-to-Power conversion factor	1.00	
Occupancy input -to-power conversion factor	1.00	
Occupancy input-to-humidity conversion factor	1.00000	

## 7. Pleiades Infiltration → TRNBuild Infiltration Type:

Infiltrations will be created from airflow rates defined in zones using simplified ventilation mode of Pleiades.



## 8. Additional remarks

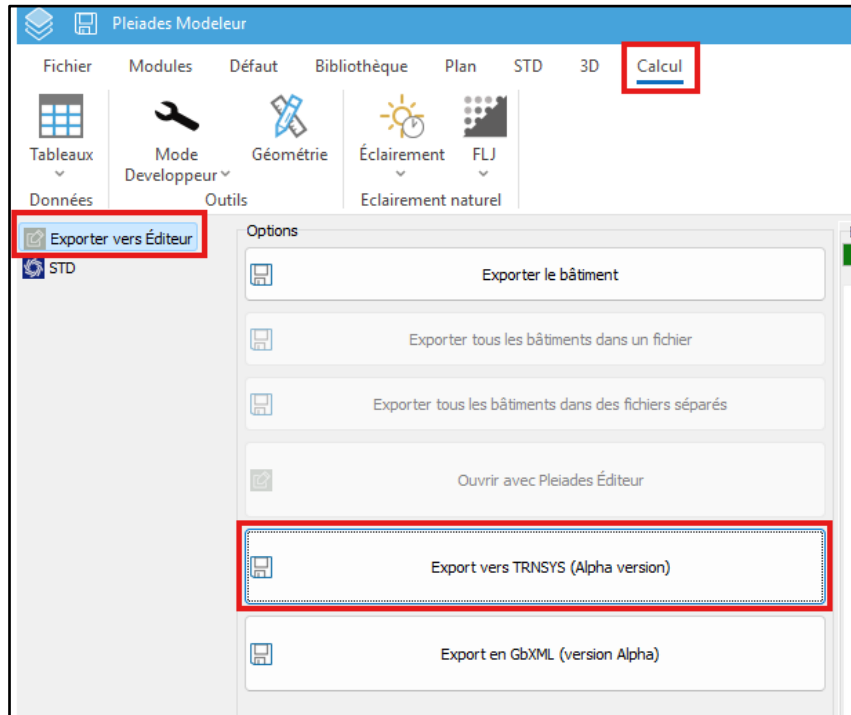
- From the .B18 generated by Pleiades Modeler, it is then possible to produce a .IDF, compatible with SSketchUp.



**The gateway between Pleiades and TRNBuild is currently in Alpha version, your feedback is welcome to improve its stability and functionality.**

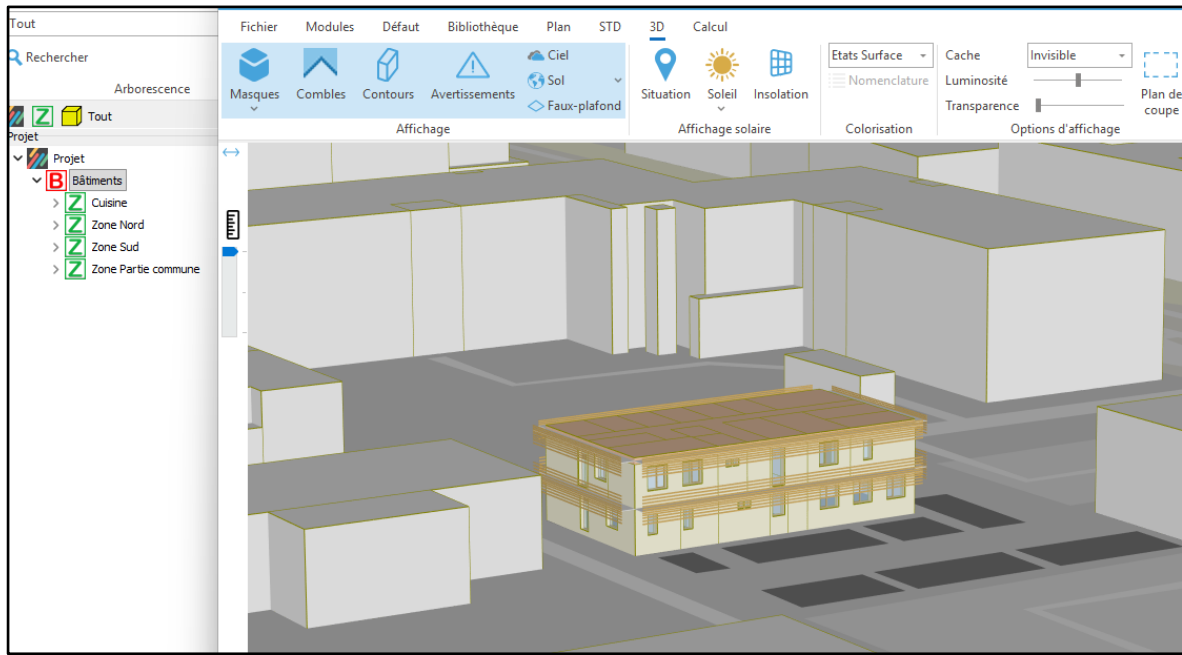
## 9. Examples of exporting from Pleiades to TRNbuild

To perform the export, go to the **Calculation tab** → **Export to Editor**, then click on **Export to TRNSYS** to generate the **.B18**.

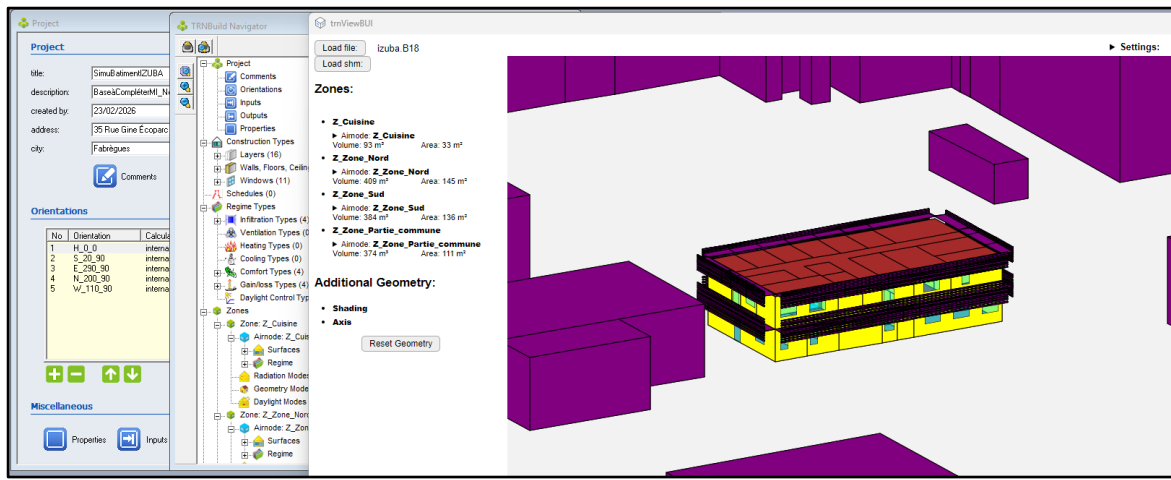


## Example 1: IZUBA Energie building

### Pleiades Modeler

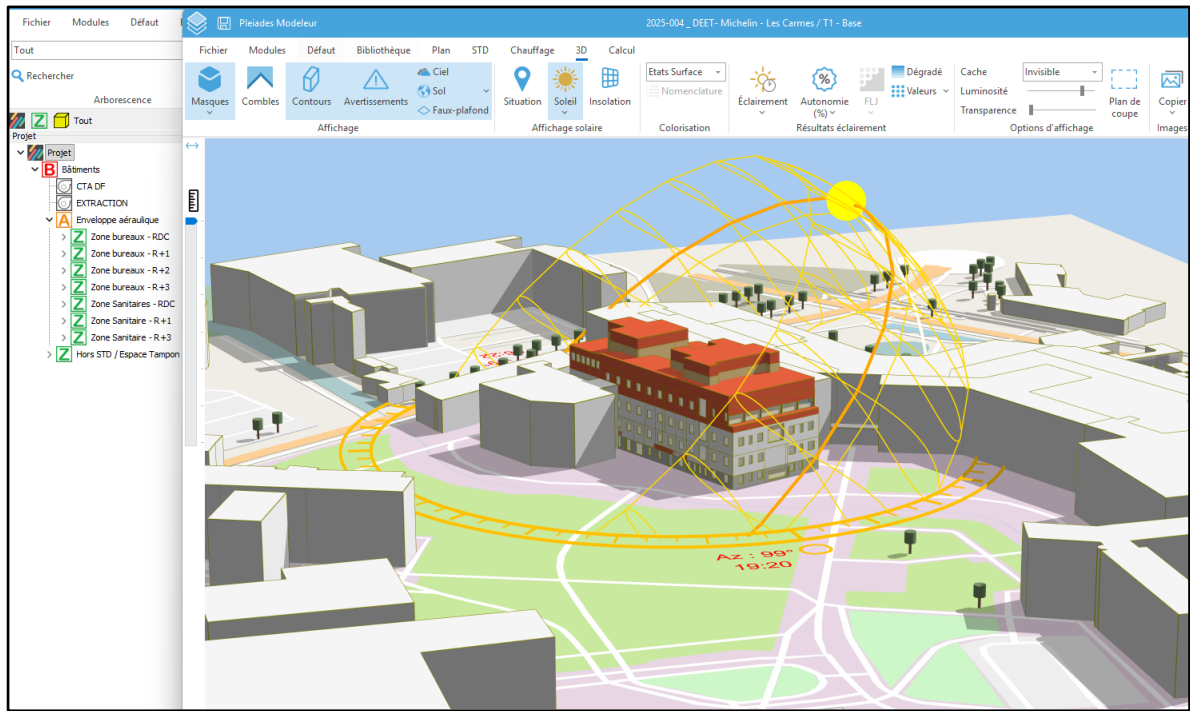


### TRNBUILD

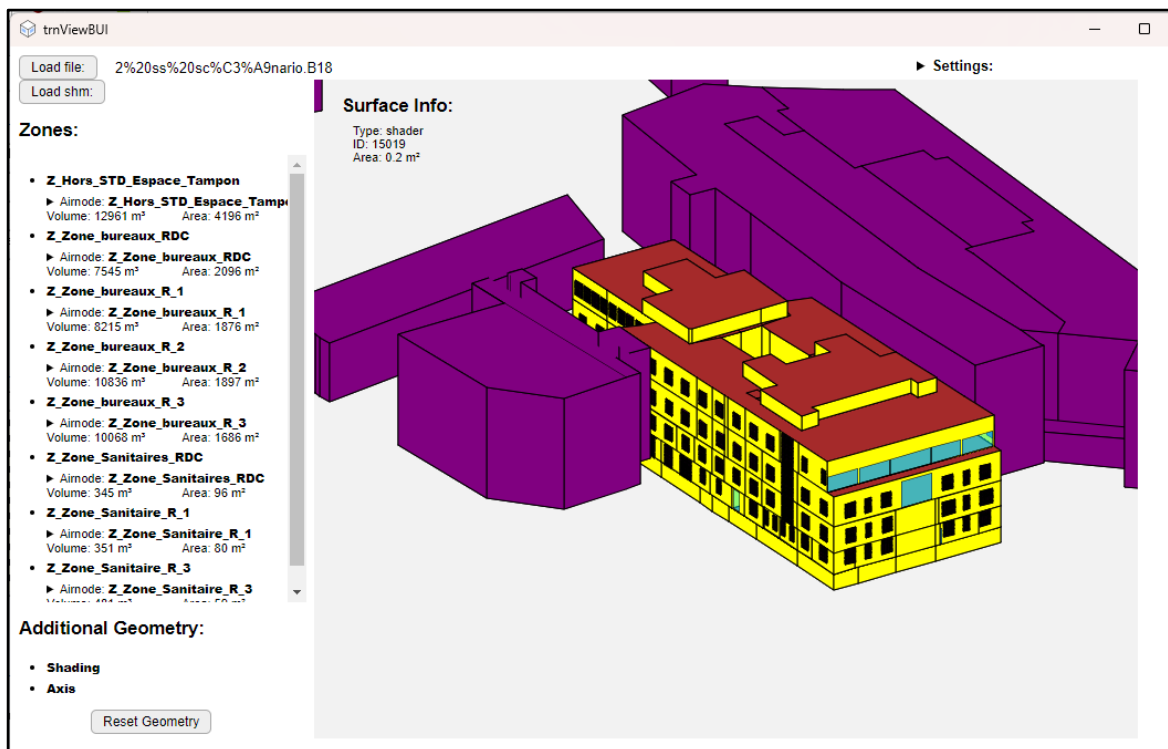


## Example 2:

### Pleiades Modeler

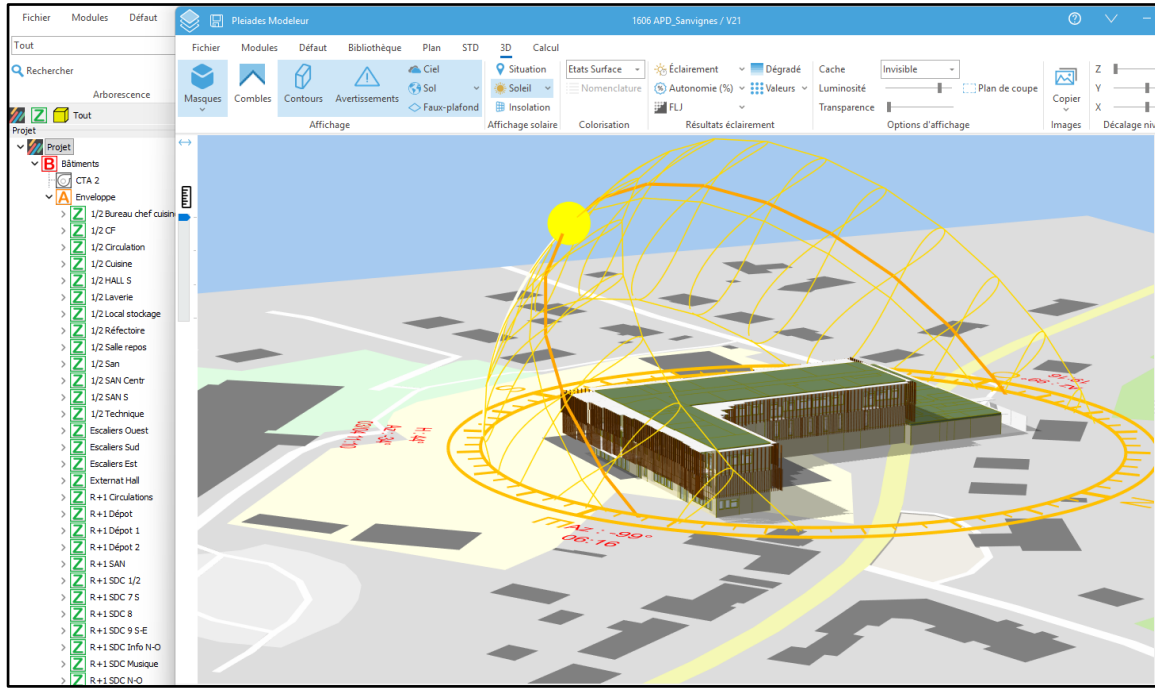


### TRNBUILD

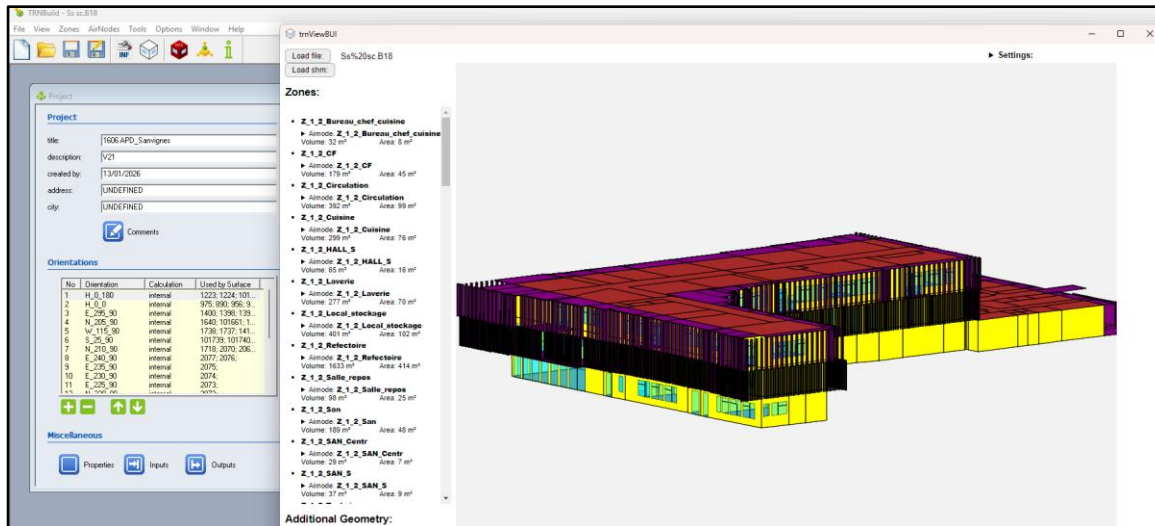


## Example 2:

### Pleiades Modeler

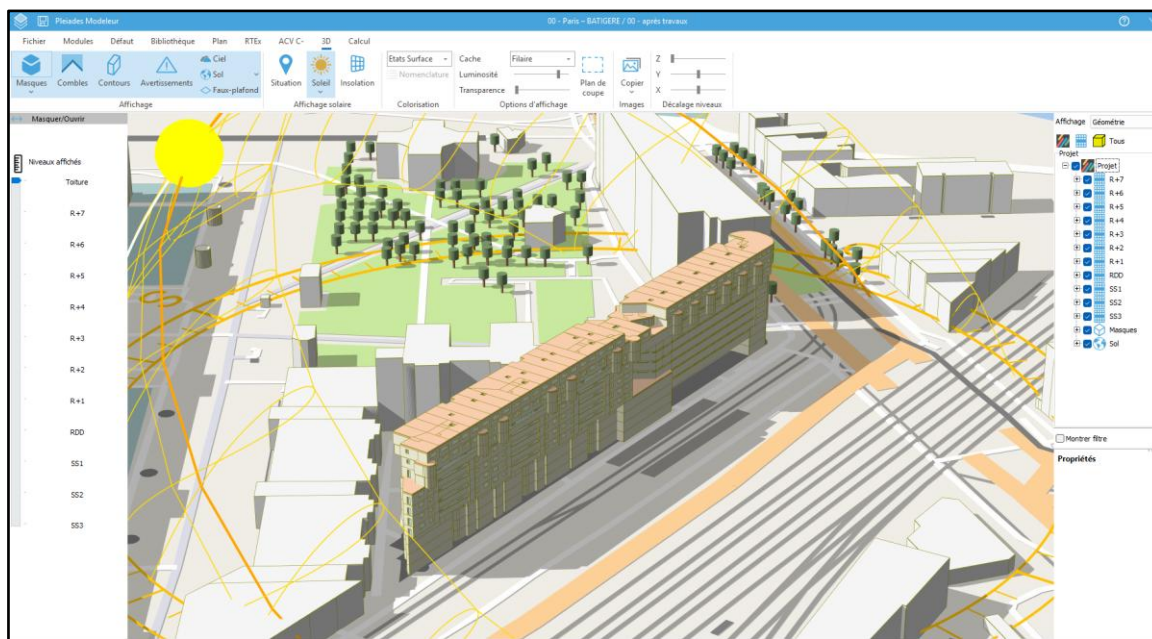


### TRNBUILD

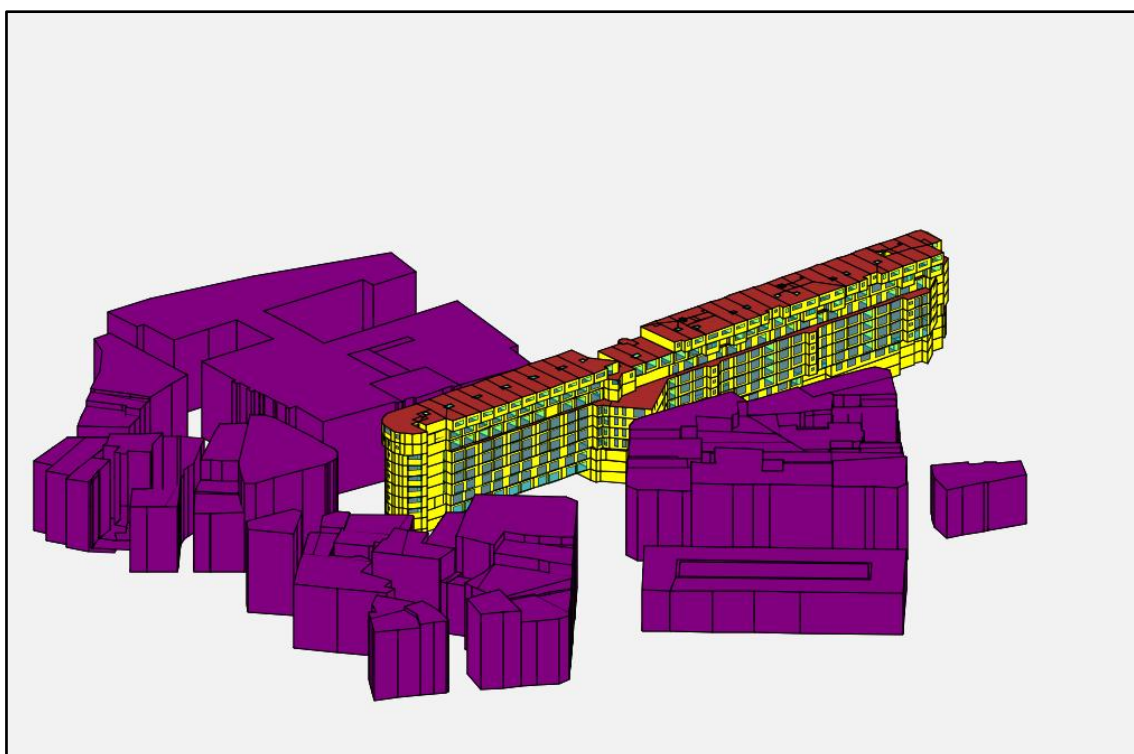


### Example 3:

#### Pleiades Modeler

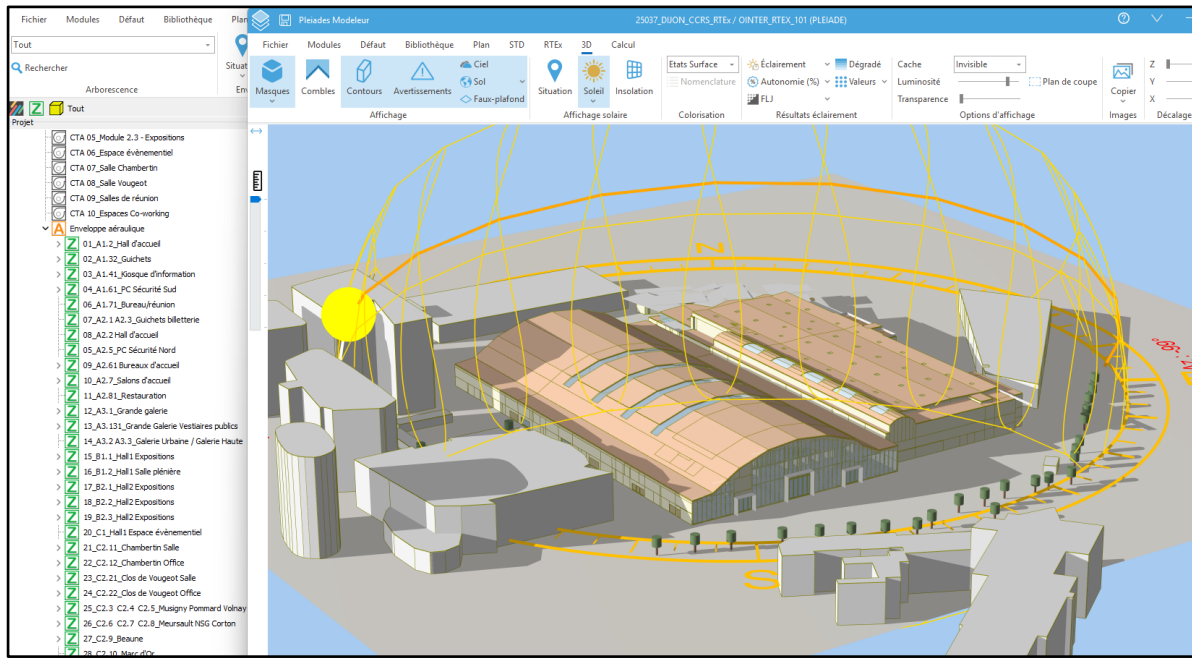


#### TRNBUILD



## Example 4:

### Pleiades Modeler



### TRNBUILD

