

BIO4EEB Platform

How to run simulations

AUTHOR(s): CHRISTOS PAMPIDIS

DATE: 19 FEB 2025



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Run simulations in BIO4EEB platform

In this report you will find instructions of how a user can run simulations in the BIO4EEB platform for 3 virtual buildings.

1. From the **Homepage** the user can **navigate** to the '**Simulations**' dedicated page from the top menu as shown in Figure 1 below.

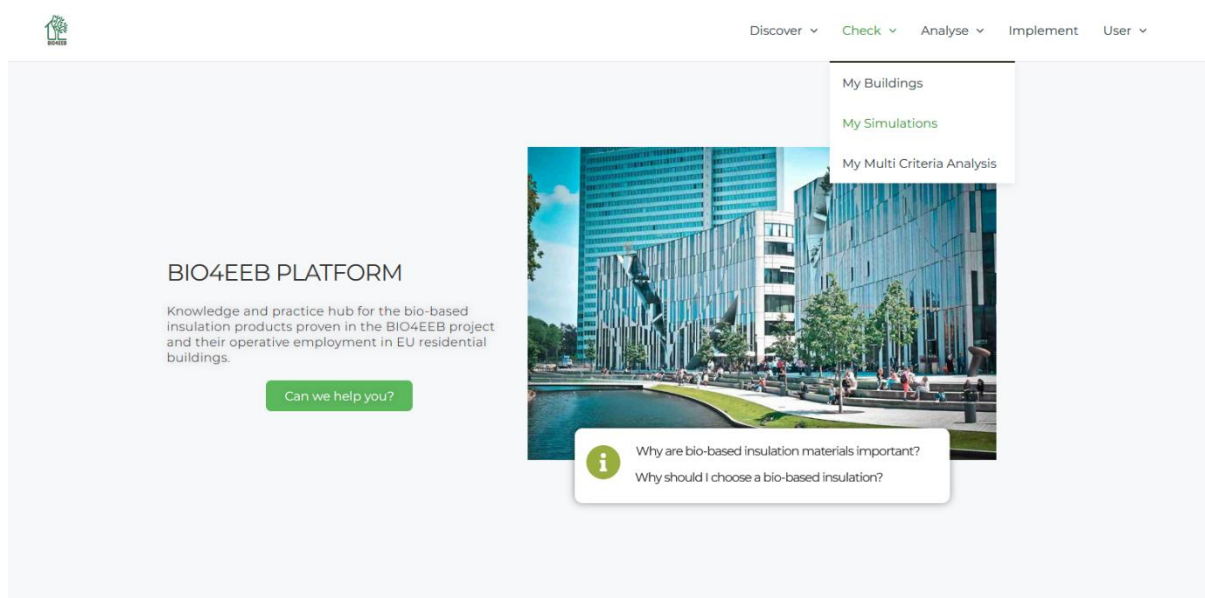
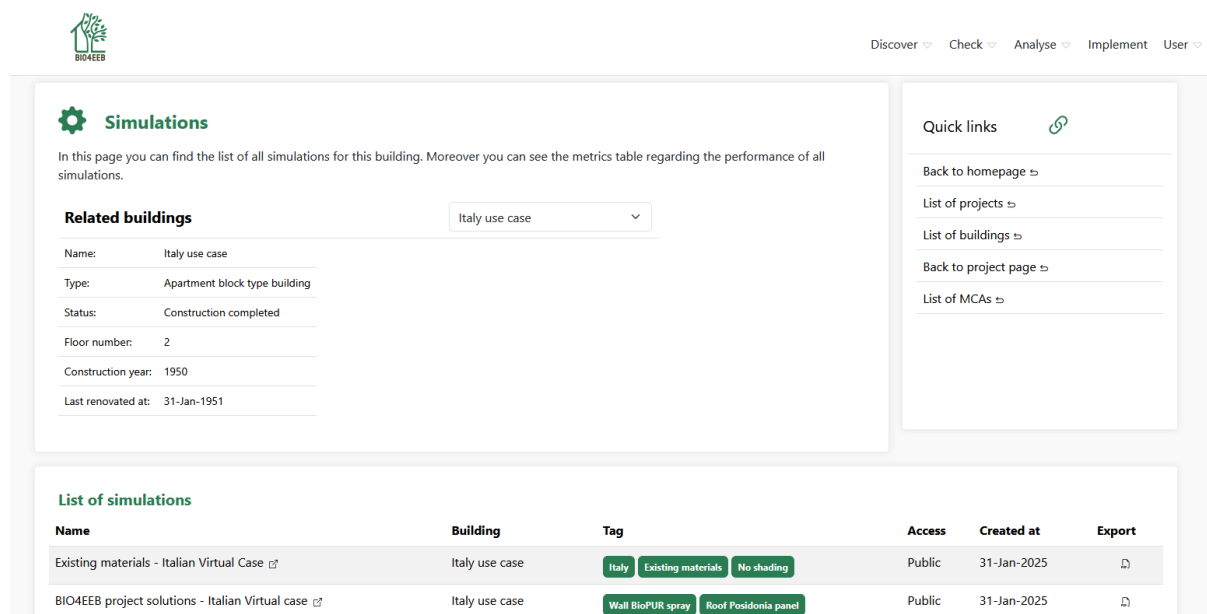


Figure 1: Navigation to the Simulations page from the homepage.

2. **List of simulations page.** In figure 2, the user can see 3 sections. The top left sections show a table with the buildings related to the listed simulations in the bottom. On the top right a table with quick links helps the user navigate through the platform faster.

On the bottom the user sees a List of simulations that have been created by the user or by other users if the access were to be public.



Simulations

In this page you can find the list of all simulations for this building. Moreover you can see the metrics table regarding the performance of all simulations.

Related buildings

Italy use case

Name: Italy use case

Type: Apartment block type building

Status: Construction completed

Floor number: 2

Construction year: 1950

Last renovated at: 31-Jan-1951

Quick links

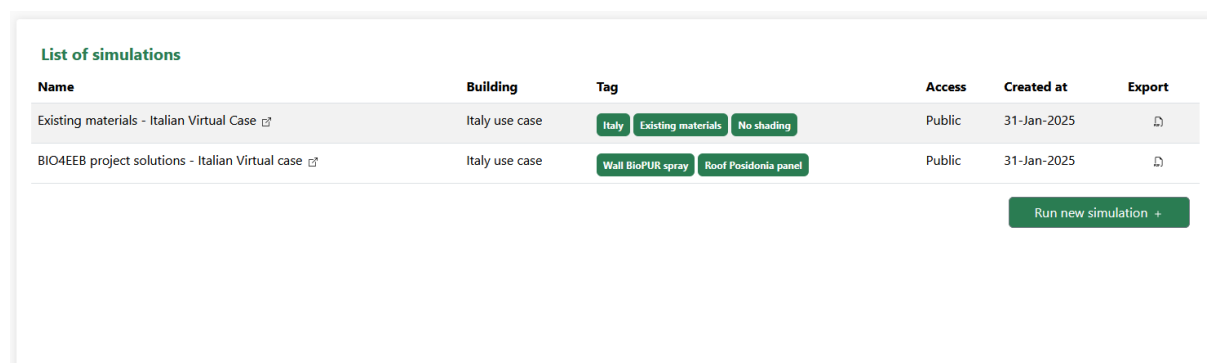
- Back to homepage
- List of projects
- List of buildings
- Back to project page
- List of MCAs

List of simulations

Name	Building	Tag	Access	Created at	Export
Existing materials - Italian Virtual Case	Italy use case	Italy Existing materials No shading	Public	31-Jan-2025	Export
BIO4EEB project solutions - Italian Virtual case	Italy use case	Wall BioPUR spray Roof Posidonia panel	Public	31-Jan-2025	Export

Figure 2: List of simulations and export functionality.

3. **List of simulations** and the 'Run new simulation' button.



List of simulations

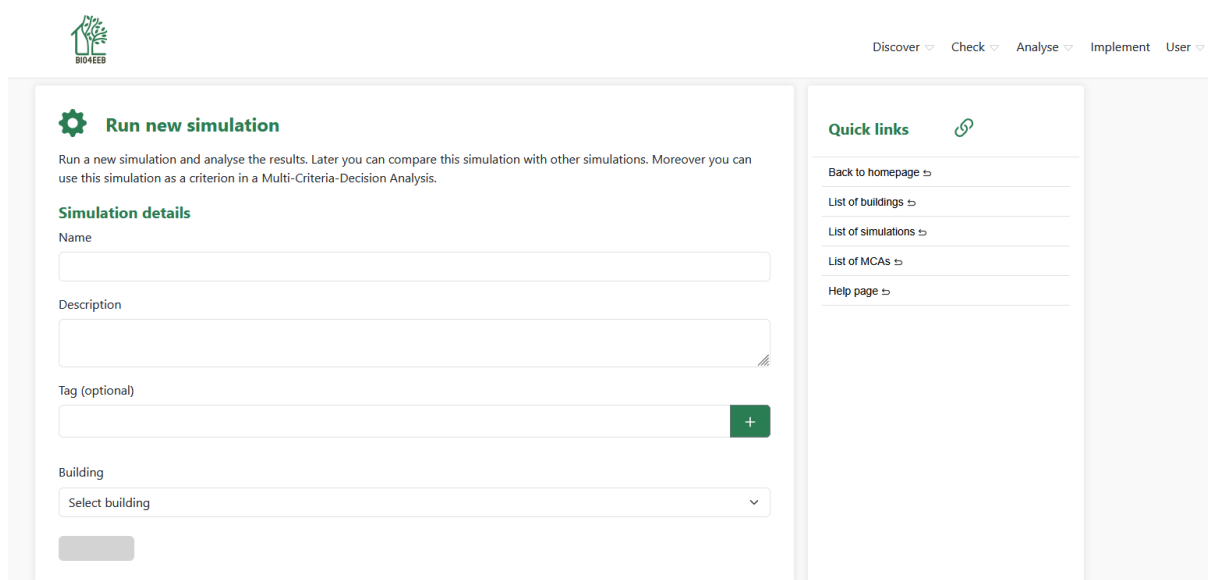
Name	Building	Tag	Access	Created at	Export
Existing materials - Italian Virtual Case	Italy use case	Italy Existing materials No shading	Public	31-Jan-2025	Export
BIO4EEB project solutions - Italian Virtual case	Italy use case	Wall BioPUR spray Roof Posidonia panel	Public	31-Jan-2025	Export

Run new simulation +

Figure 3: List of simulations and simulation creation button.

4. **Create a new simulation – first block of information needed.** In this block some general information is needed. The user can give a name, a description as desired to be able to find it back when needed.

The tag field provides the user the ability to associate a tag (in text) to the created simulation. This can help the user later to distinguish a simulation from another. The last field lets the user choose one of the 3 Virtual buildings for which simulations are available (Hungarian, Belgian and Italian virtual case).



The screenshot shows the 'Run new simulation' form in the BIO4EEB interface. The form is titled 'Run new simulation' and includes a sub-section 'Simulation details'. The fields are:

- Name:** A text input field.
- Description:** A text input field with a small icon on the right.
- Tag (optional):** A text input field with a green '+' button on the right.
- Building:** A dropdown menu with the text 'Select building' and a downward arrow.

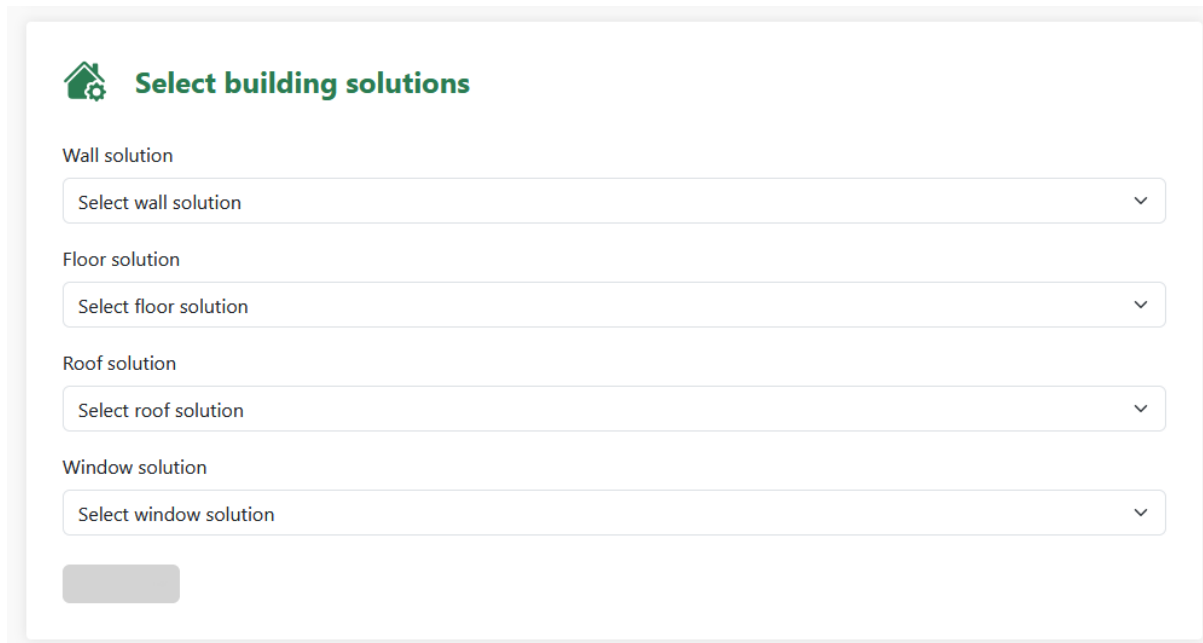
Below the 'Building' dropdown is a grey button. To the right of the form is a 'Quick links' sidebar with the following links:

- Back to homepage ↗
- List of buildings ↗
- List of simulations ↗
- List of MCAs ↗
- Help page ↗

At the top right of the interface, there is a navigation bar with the following links: Discover ▾, Check ▾, Analyse ▾, Implement, and User ▾.

Figure 4: Create simulation block 1.

5. **Create new simulation – second block of information needed.** In this block the user can choose different solutions to simulate the building. The choices are restricted to insulation solutions of the Walls, Floors, Roof and Windows. These are the solutions the user can choose from and create a simulation from.



Select building solutions

Wall solution
Select wall solution

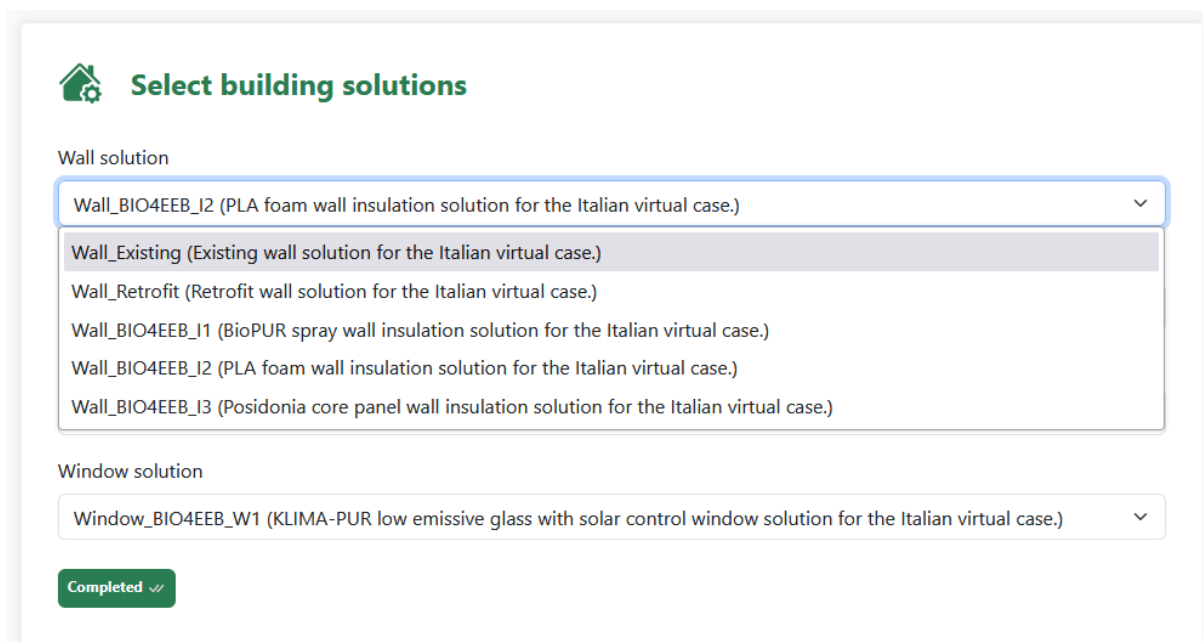
Floor solution
Select floor solution

Roof solution
Select roof solution

Window solution
Select window solution

Figure 5: Create simulations - second block. Building solutions.

6. Choices of **insulation solutions** to simulate. Figure 6 shows an example of the choices for the Wall.



Select building solutions

Wall solution

- Wall_BIO4EEB_I2 (PLA foam wall insulation solution for the Italian virtual case.)
- Wall_Existing (Existing wall solution for the Italian virtual case.)
- Wall_Retrofit (Retrofit wall solution for the Italian virtual case.)
- Wall_BIO4EEB_I1 (BioPUR spray wall insulation solution for the Italian virtual case.)
- Wall_BIO4EEB_I2 (PLA foam wall insulation solution for the Italian virtual case.)
- Wall_BIO4EEB_I3 (Posidonia core panel wall insulation solution for the Italian virtual case.)

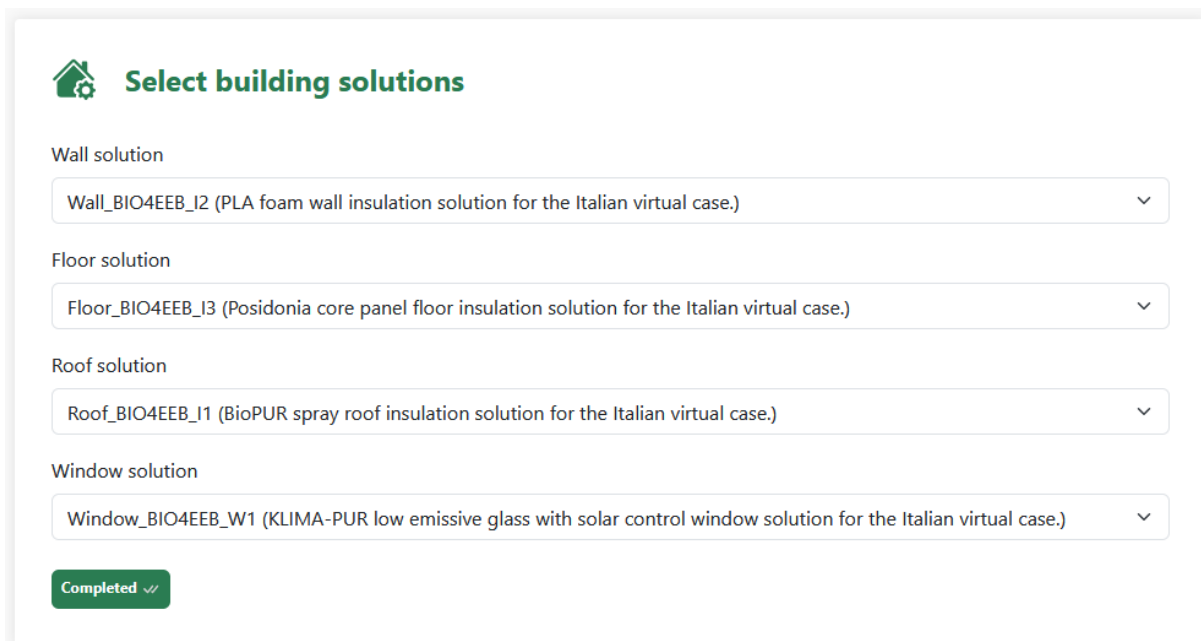
Window solution

Window_BIO4EEB_W1 (KLIMA-PUR low emissive glass with solar control window solution for the Italian virtual case.)

Completed ✓

Figure 6: Insulation solutions the user can choose to simulate.

7. Figure 8 shows an **example selection** to be simulated. The results of this simulation will be shown in the remainder of this document.



Select building solutions

Wall solution
Wall_BIO4EEB_I2 (PLA foam wall insulation solution for the Italian virtual case.)

Floor solution
Floor_BIO4EEB_I3 (Posidonia core panel floor insulation solution for the Italian virtual case.)

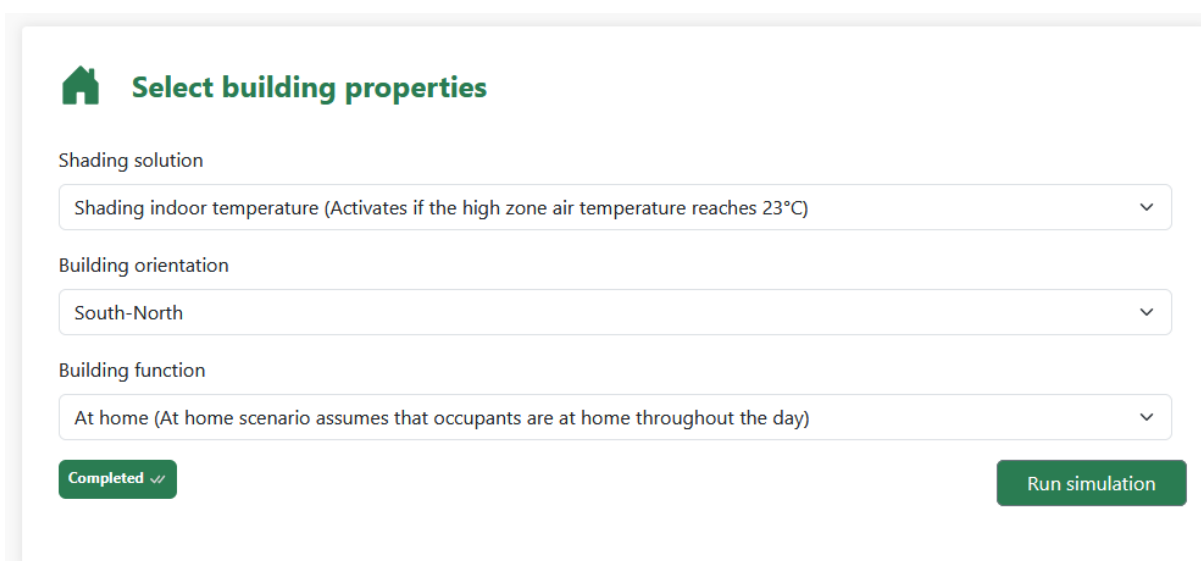
Roof solution
Roof_BIO4EEB_I1 (BioPUR spray roof insulation solution for the Italian virtual case.)

Window solution
Window_BIO4EEB_W1 (KLIMA-PUR low emissive glass with solar control window solution for the Italian virtual case.)

Completed ✓

Figure 7: Insulation solutions example to be simulated.

8. **Create simulation – third block.** The third block of information needed to run a new simulation is related to the building configuration (**shading, orientation and behavior of occupants**). The



Select building properties

Shading solution
Shading indoor temperature (Activates if the high zone air temperature reaches 23°C)

Building orientation
South-North

Building function
At home (At home scenario assumes that occupants are at home throughout the day)

Completed ✓

Run simulation

Figure 8: Create simulation - third block. Run simulation button below.

9. **List of simulations** after running the simulations shown above. When the simulation has successfully been run, a message prompt is shown on the page where all simulations are listed.

Simulation created successfully.

Simulations

In this page you can find the list of all simulations for this building. Moreover you can see the metrics table regarding the performance of all simulations.

Related buildings

Italy use case

Name: Italy use case

Type: Apartment block type building

Status: Construction completed

Floor number: 2

Construction year: 1950

Last renovated at: 31-Jan-1951

Quick links

- [Back to homepage](#)
- [List of projects](#)
- [List of buildings](#)
- [Back to project page](#)
- [List of MCAs](#)

List of simulations

Name	Building	Tag	Access	Created at	Export
Existing materials - Italian Virtual Case	Italy use case	Italy Existing materials No shading	Public	31-Jan-2025	
BIO4EEB project solutions - Italian Virtual case	Italy use case	Wall BioPUR spray Roof Posidonia panel	Public	31-Jan-2025	
Bio-based materials simulations - Italian Virtual Case	Italy use case	Posidonia panels PLA foam BioPUR spray At home	Private	19-Feb-2025	

Run new simulation +

Figure 9: Simulation ran successfully and listed in the simulations list page.

10. **Results of simulation** created in the examples above. The first result of the simulation is the **energy demand (heating and cooling)** for **each floor** of the building. On the left side, a table of general information regarding the simulation is shown and below that, quick links for navigation purposes.

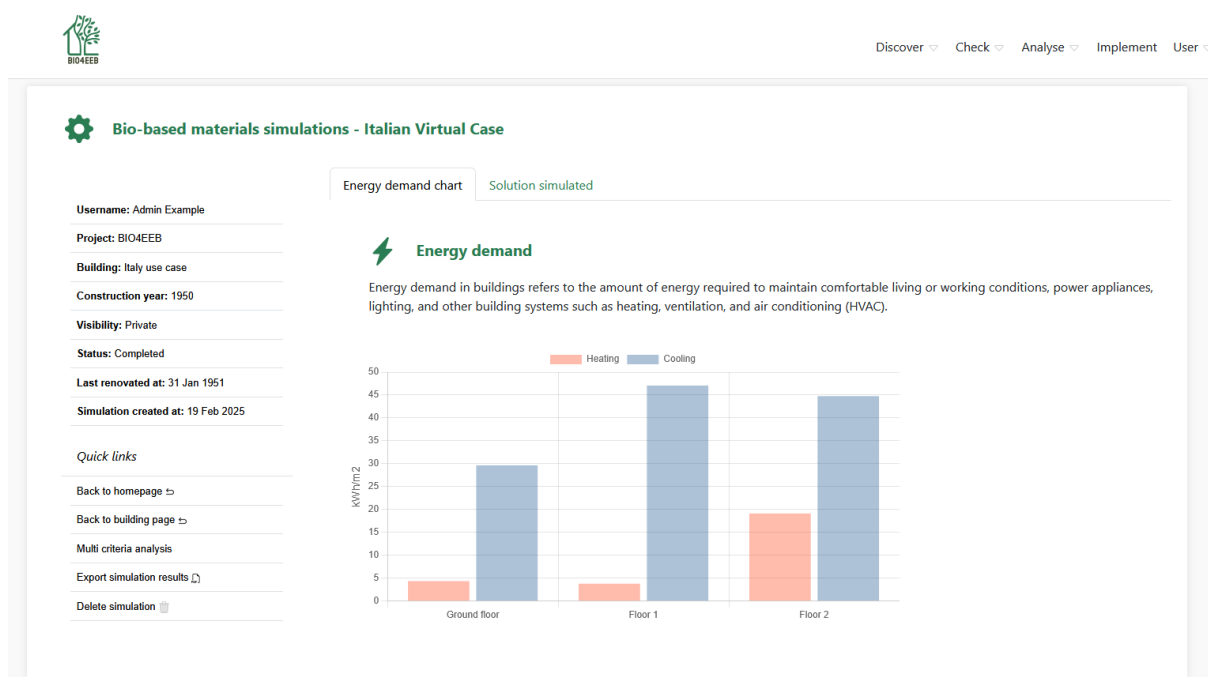
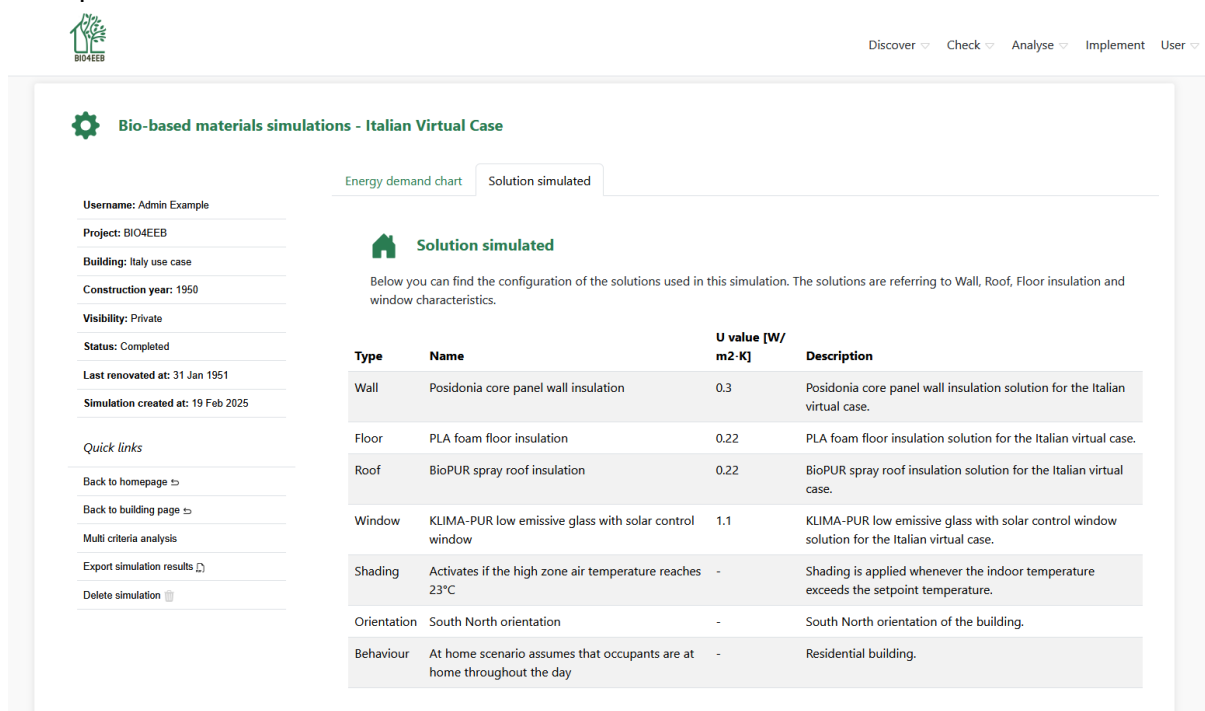


Figure 10: Energy demand (heating, cooling) for each floor of the building.

11. Next to the energy demand tab the user can open the **'Solution simulated' tab**. There the user can see which building configuration was used for the simulation and the respective descriptions.



Bio-based materials simulations - Italian Virtual Case

Energy demand chart | **Solution simulated**

Solution simulated

Below you can find the configuration of the solutions used in this simulation. The solutions are referring to Wall, Roof, Floor insulation and window characteristics.

Type	Name	U value [W/m ² ·K]	Description
Wall	Posidonia core panel wall insulation	0.3	Posidonia core panel wall insulation solution for the Italian virtual case.
Floor	PLA foam floor insulation	0.22	PLA foam floor insulation solution for the Italian virtual case.
Roof	BioPUR spray roof insulation	0.22	BioPUR spray roof insulation solution for the Italian virtual case.
Window	KLIMA-PUR low emissive glass with solar control window	1.1	KLIMA-PUR low emissive glass with solar control window solution for the Italian virtual case.
Shading	Activates if the high zone air temperature reaches 23°C	-	Shading is applied whenever the indoor temperature exceeds the setpoint temperature.
Orientation	South North orientation	-	South North orientation of the building.
Behaviour	At home scenario assumes that occupants are at home throughout the day	-	Residential building.

Figure 11: Solution simulated tab.

12. Two more results per floor of the building are generated from the simulations. The predicted mean vote (PMV) and the Predicted percentage of dissatisfied (PPD) which give an indication of the comfort of occupants in the building.

Specifically, the charts on the platform show a percentage which indicates the percentage of hours in which the PMV and the PPD are in Category B of the ISO 7030. This category is indicates that the occupants are comfortable for the percentage of hours shown in the chart.

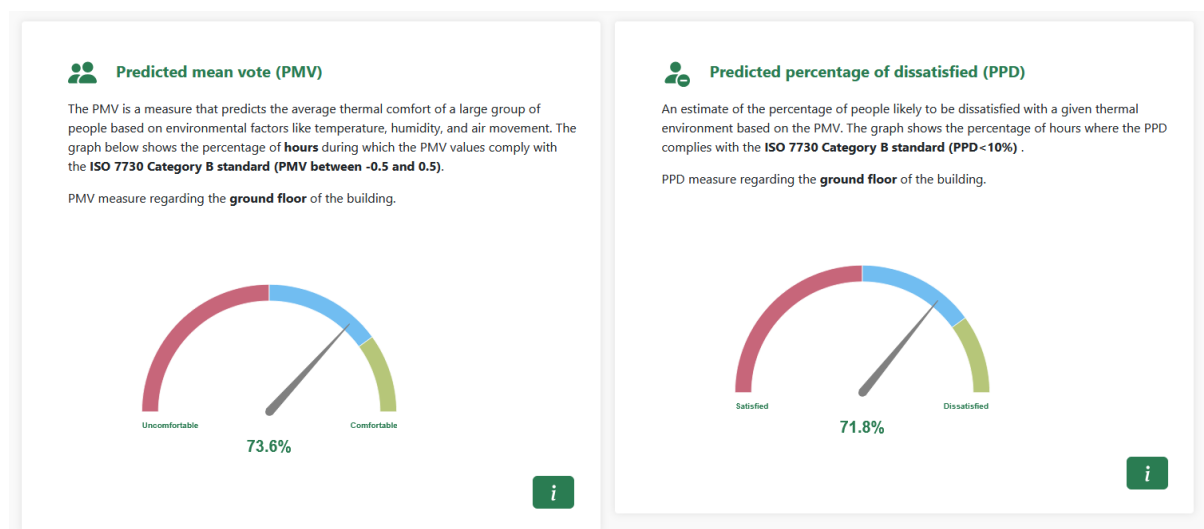


Figure 12: Predicted mean vote (PMV) and Predicted percentage of dissatisfied (PPD) results.

13. For more information the user can click on the information button on the bottom right of each chart. An explanation is given about the specific comfort indicators.

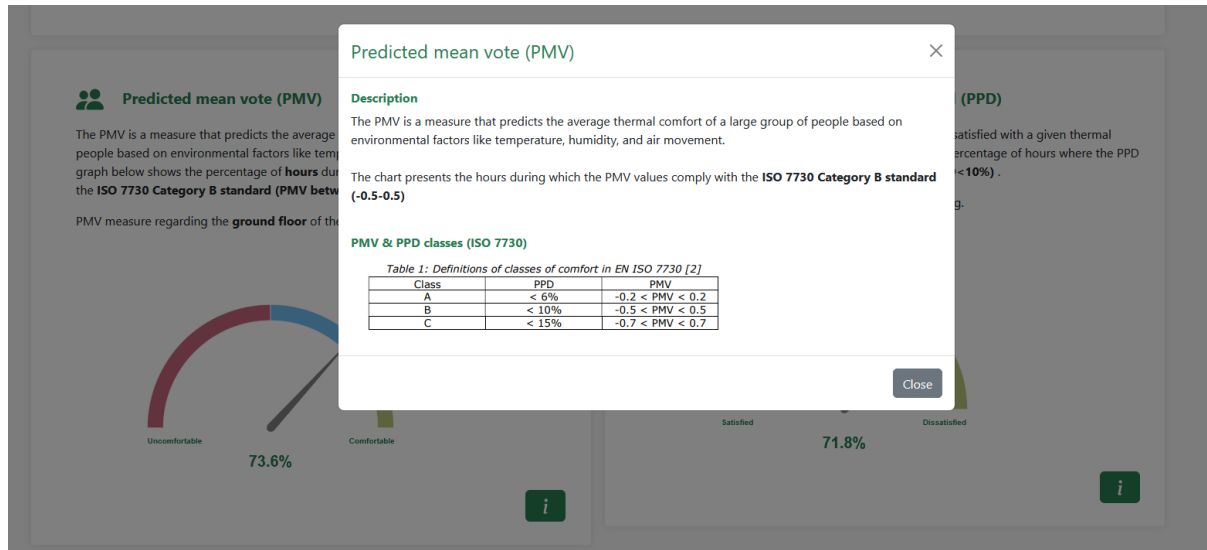


Figure 13: Information about the comfort indicator.

14. Continuing in the results page the user can see again the comfort indicators for more floors. Here the user can see the indicators for the first floor. Before it was for the ground floor. Depending on the amount of floors more charts will be shown in the simulation results page.

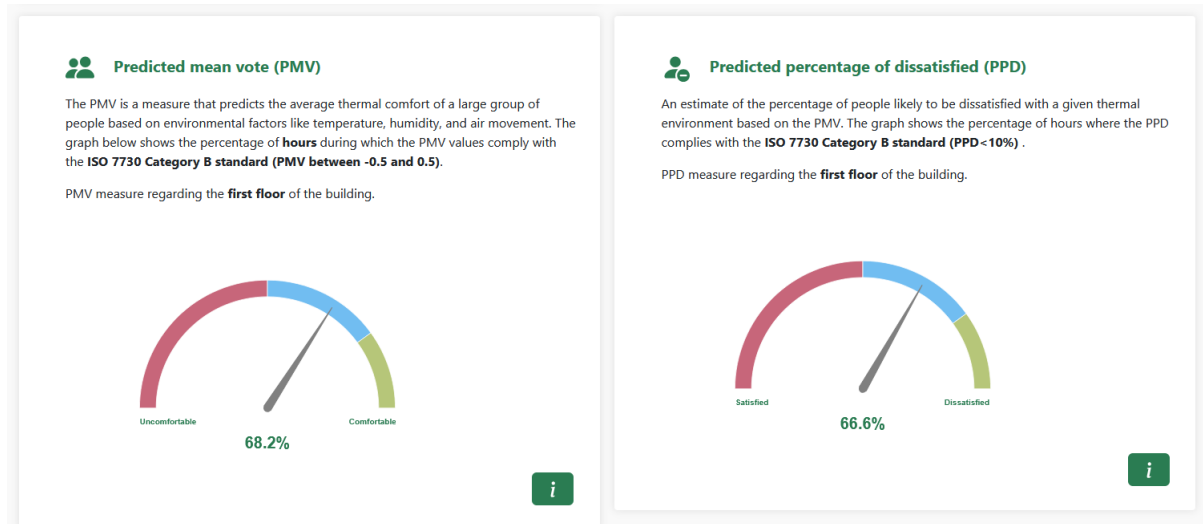


Figure 14: Comfort indicator charts for the first floor.

15. Below the simulation results, the user can compare other simulation results. There are 2 fields the user can select. One is the simulation to compare with (this depends on how many simulations the user has already ran. If no simulations have been ran the field will be empty).

Two is the parameter to be compared (the parameters to be compared are the energy demand and the comfort indicators per floor).

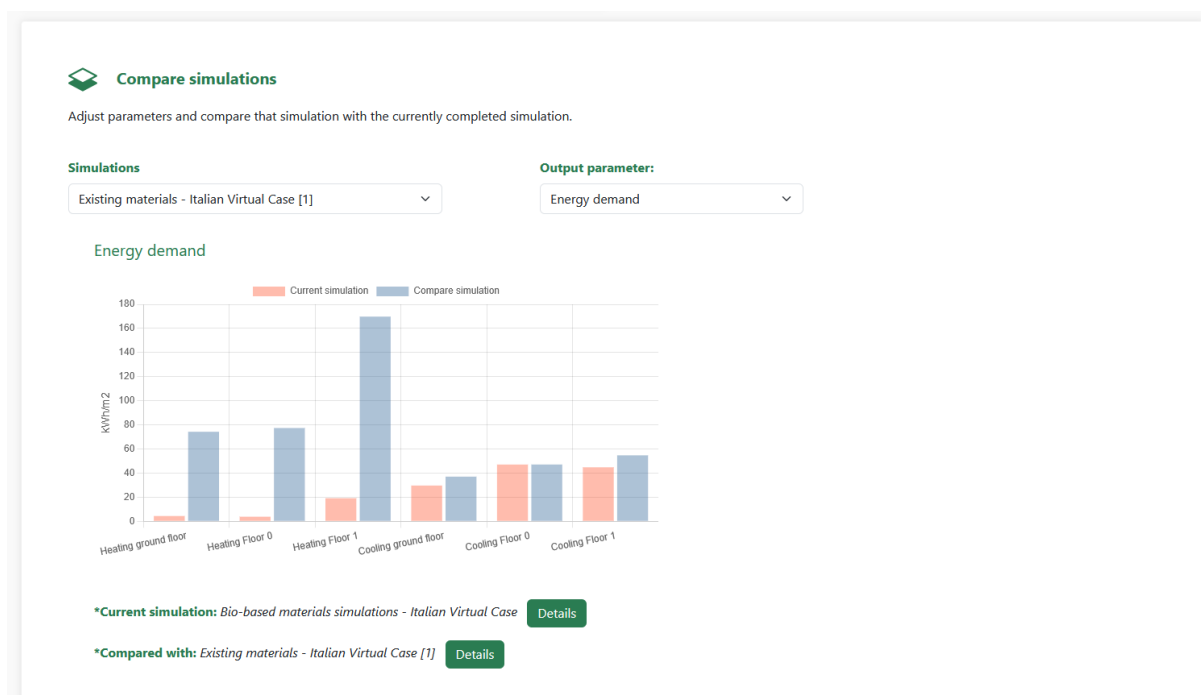


Figure 15: Simulation comparison of energy demand.

16. As seen in figure 15, below the chart the user can press on 2 'Details' buttons. Each one pops up a window with information about the simulation. So, in case the user does not remember which simulations are being compared, this window can help realize which configuration of solutions has been selected for each simulation.

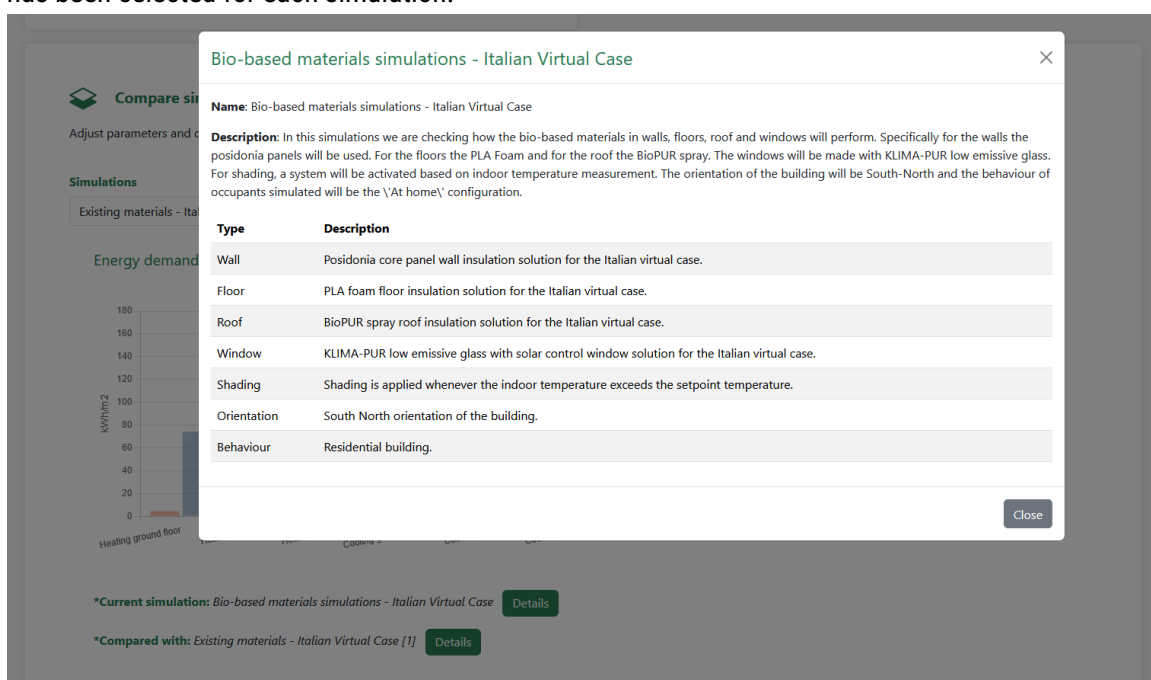


Figure 16: Details button showing simulation configuration.

17. In figure 17, you can see the comparison of the comfort indicator PMV for the ground floor. In this example you can see that the percentage of hours where the comfort indicator is satisfactory, is larger (73,6%) for the BIO4EEB renovation compared to the indicator in the existing situation (61,6%).

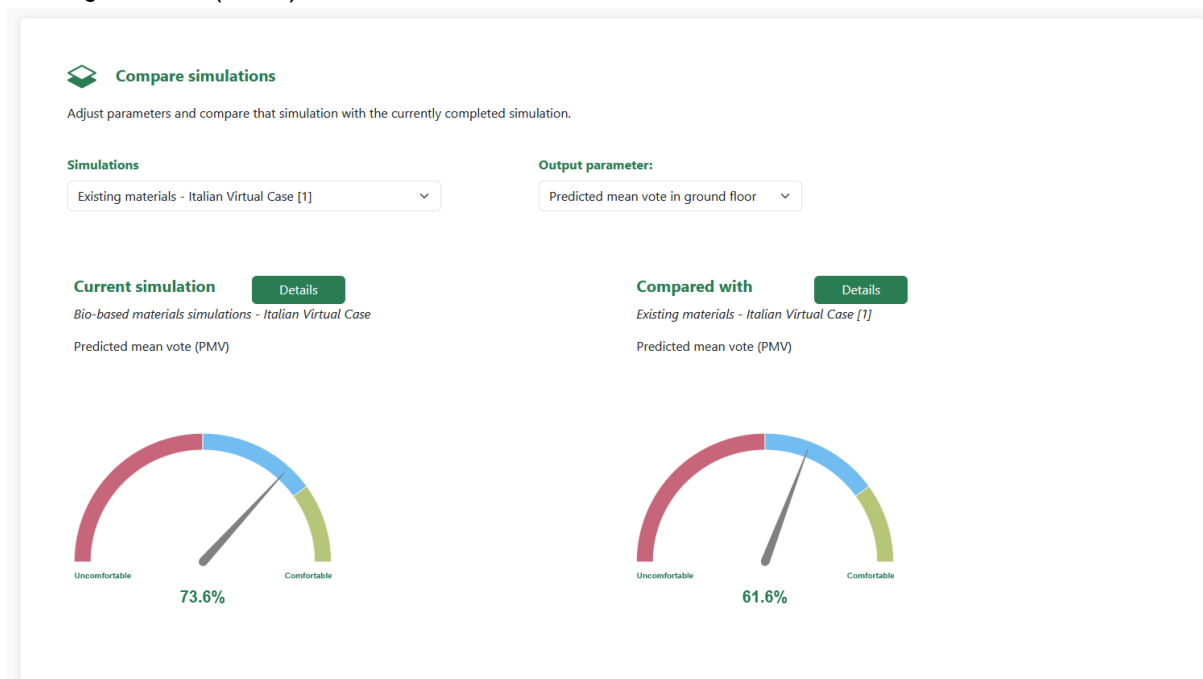


Figure 17: PMV comfort indicators comparison.

18. Figure 18 shows again the comfort indicator PPD comparison for the ground floor.

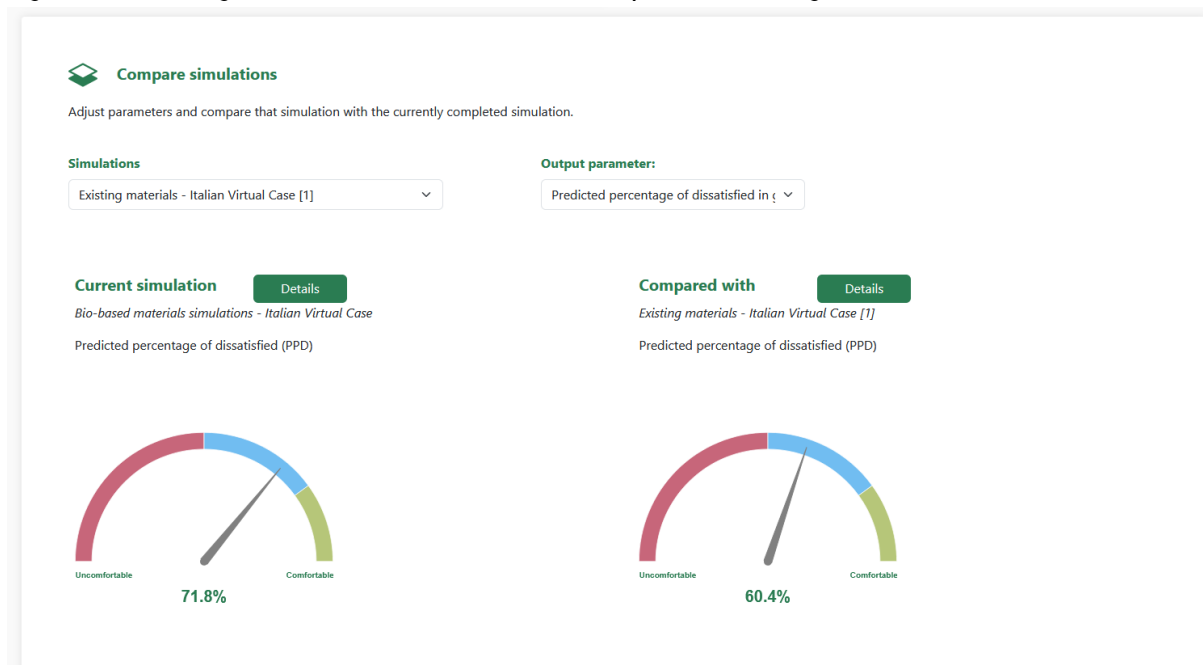


Figure 18: PPD comfort indicators comparison.

19. Finally, on the top left of the simulation results page the user can click on the 'Delete simulation' button. A prompt will show up asking if the user really wants to delete it, for cases in which this was not the intention.

In addition, right above the delete simulation button the user can also press on the 'Export simulation results' button. The user will receive a link, which will contain a PDF of the simulation results.

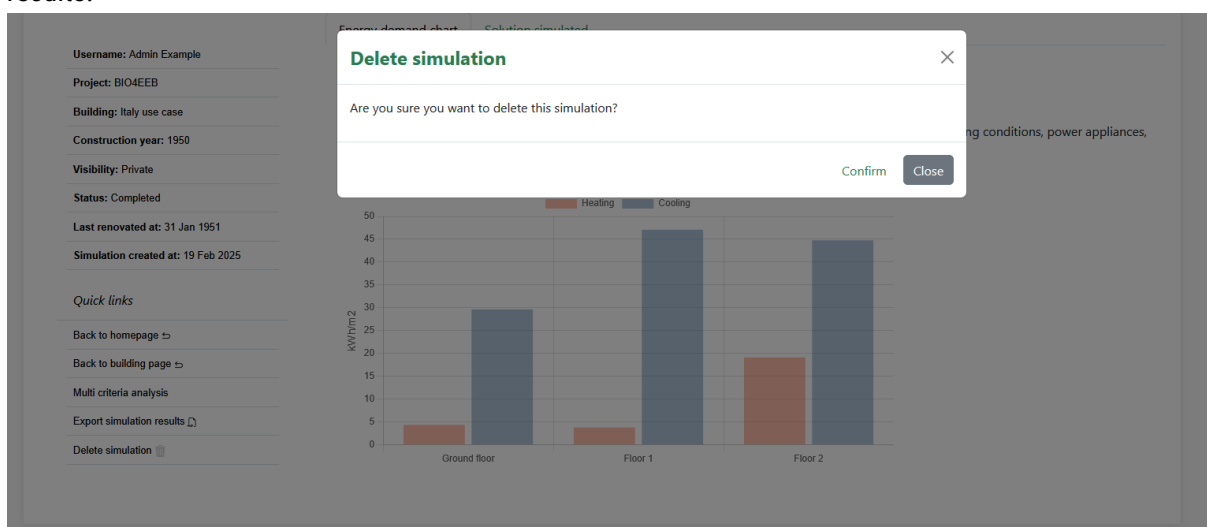


Figure 19: Delete & Export simulation functionalities.