BIO4EEB Platform
How to run simulations

AUTHOR(S): CHRISTOS PAMPIDIS

DATE: 19 FEB 2025

Co-funded by the European Union

Co-funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or European Health and Digital Executive Agency (HADEA). Neither the European Union nor the granting authority can be held responsible for them.

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.

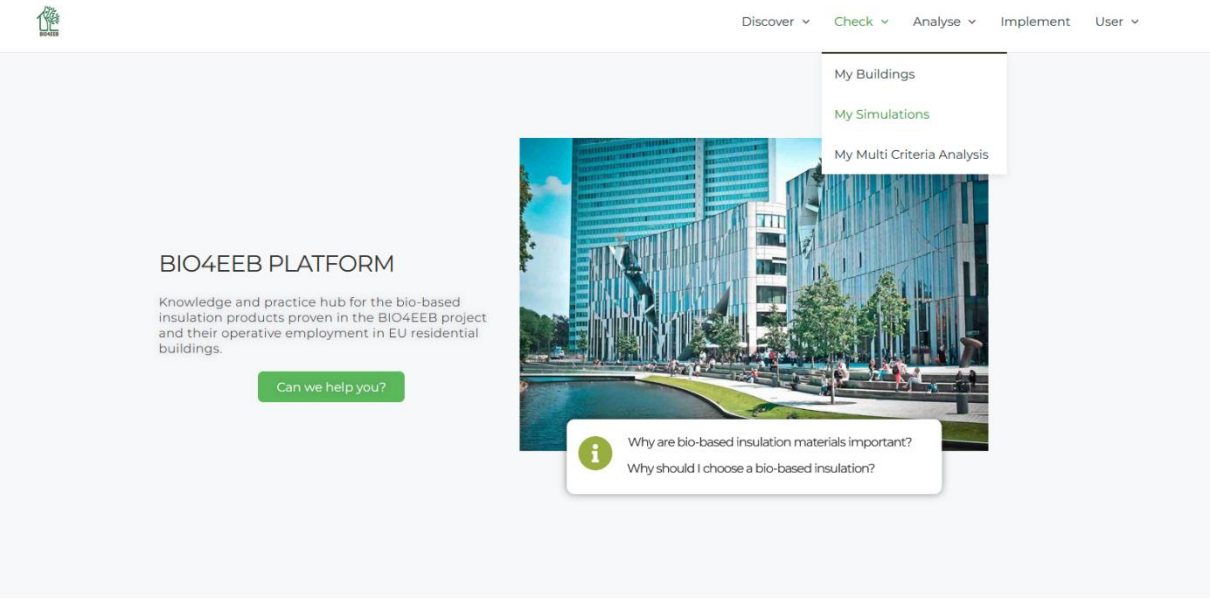

Figure 1: Navigation to the Simulations page from the homepage.

Co-funded by the European Union

Co-funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or European Health and Digital Executive Agency (HADEA). Neither the European Union nor the granting authority can be held responsible for them.

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.

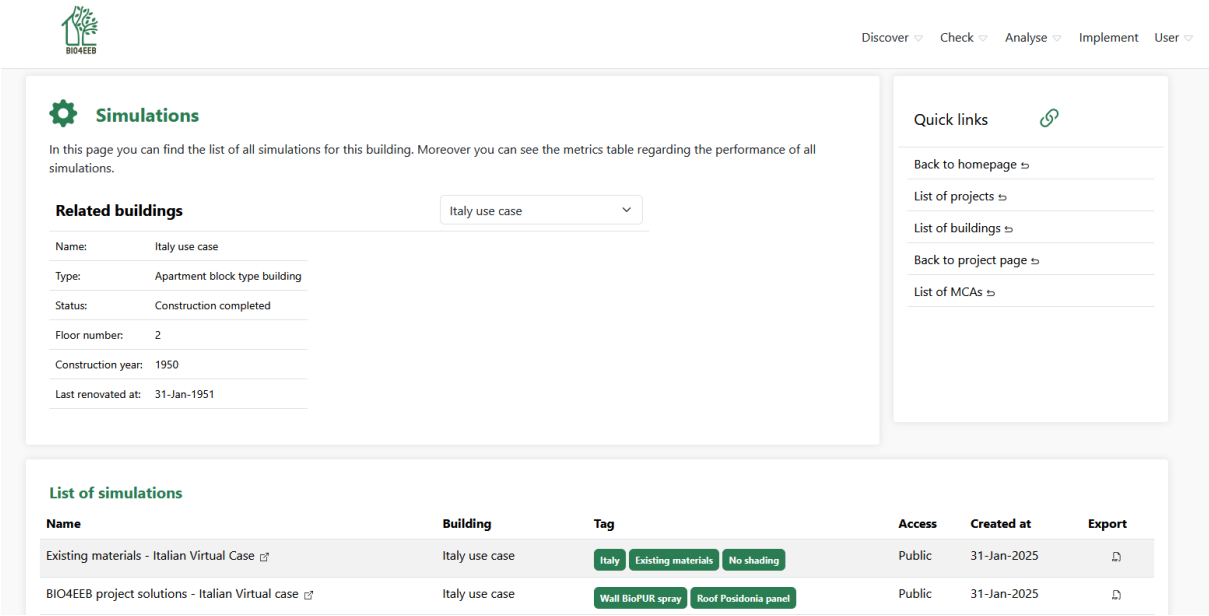

Figure 2: List of simulations and export functionality.

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

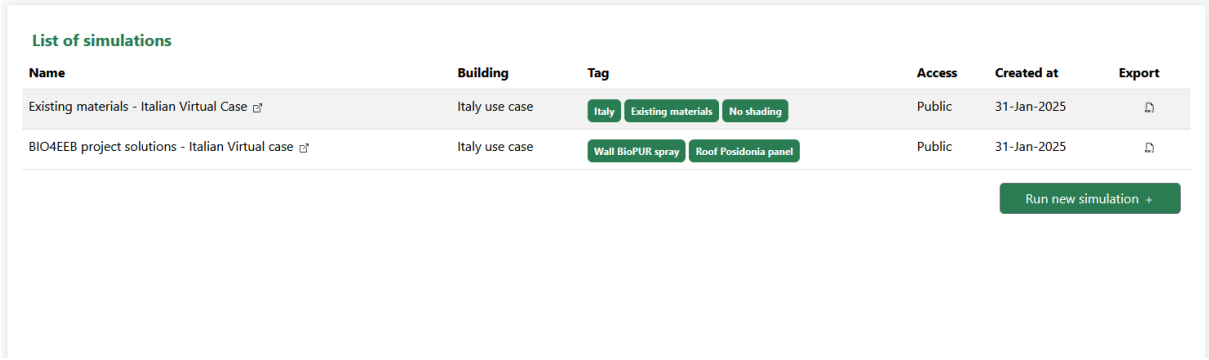

Figure 3: List of simulations and simulation creation button.

Co-funded by the European Union

Co-funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or European Health and Digital Executive Agency (HADEA). Neither the European Union nor the granting authority can be held responsible for them.

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).

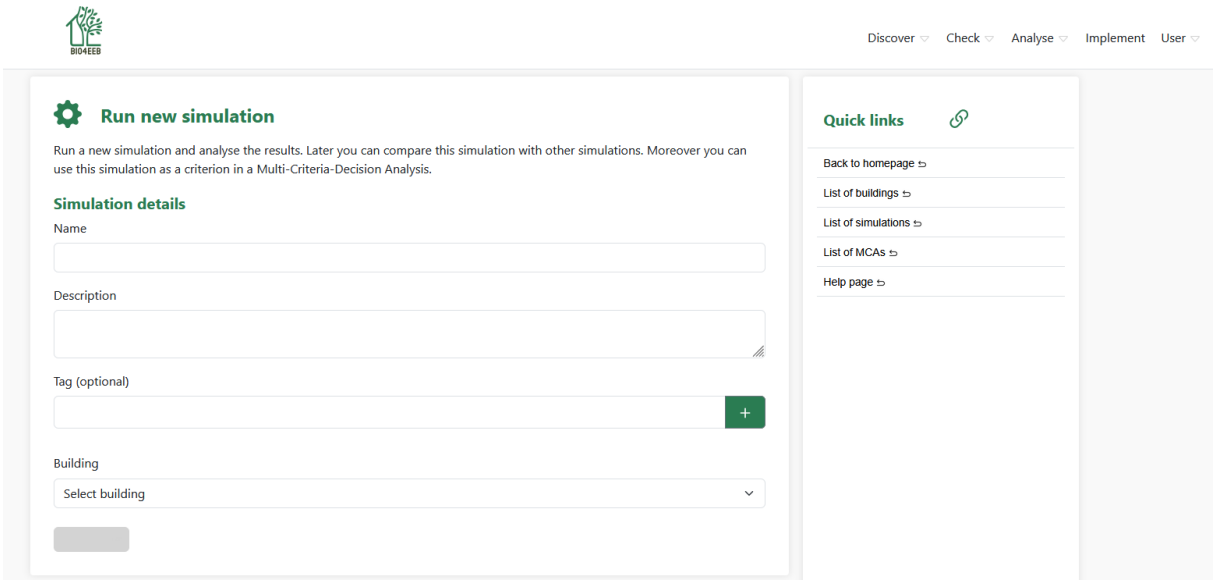

Figure 4: Create simulation block 1.

Co-funded by the European Union

Co-funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or European Health and Digital Executive Agency (HADEA). Neither the European Union nor the granting authority can be held responsible for them.

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.

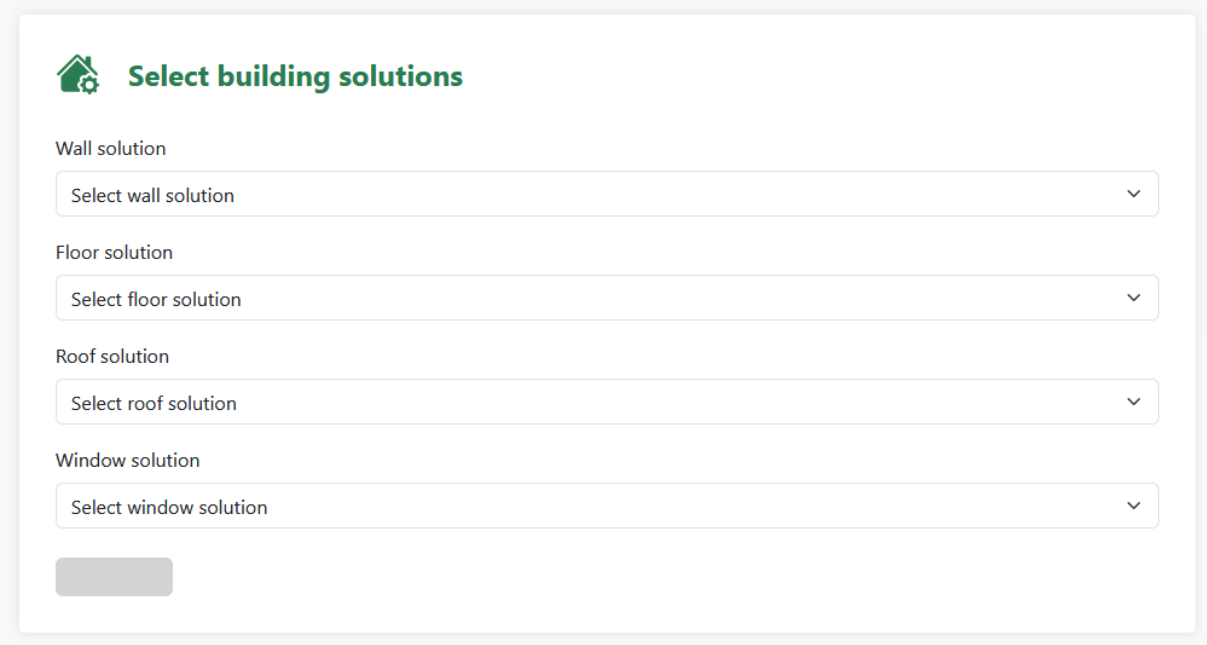

Figure 5: Create simulations - second block. Building solutions.

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

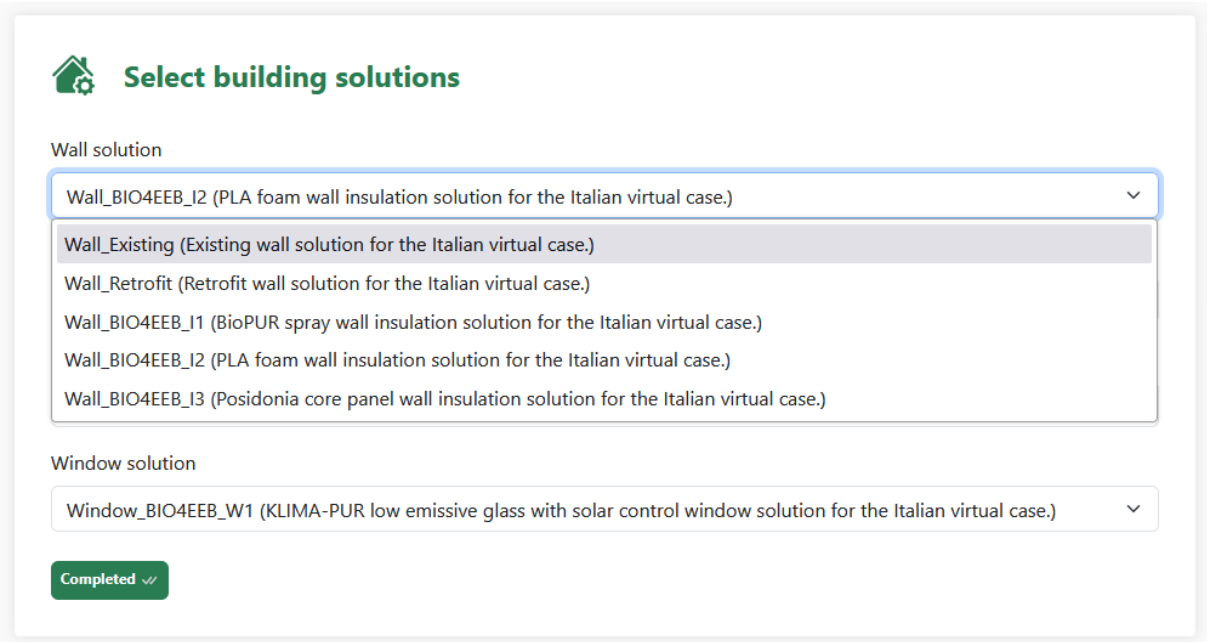

Figure 6: Insulation solutions the user can choose to simulate.

Co-funded by the European Union

Co-funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or European Health and Digital Executive Agency (HADEA). Neither the European Union nor the granting authority can be held responsible for them.

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

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

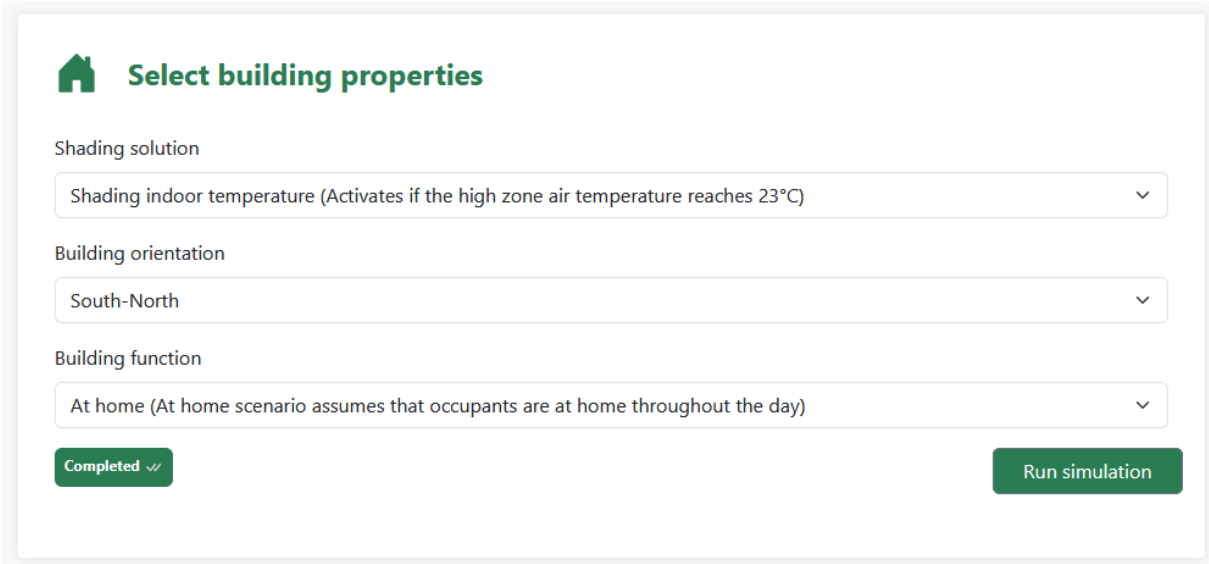

Figure 8: Create simulation - third block. Run simulation button below.

Co-funded by the European Union

Co-funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or European Health and Digital Executive Agency (HADEA). Neither the European Union nor the granting authority can be held responsible for them.

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.

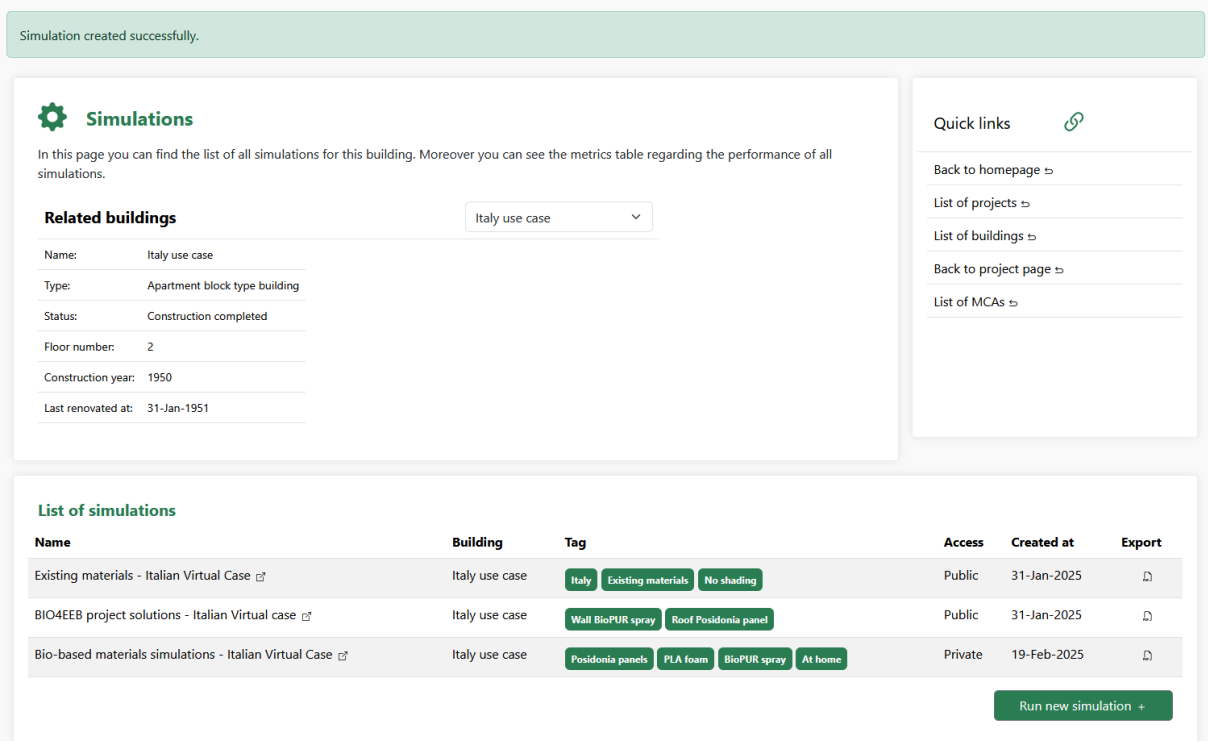

Figure 9: Simulation ran successfully and listed in the simulations list page.

Co-funded by the European Union

Co-funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or European Health and Digital Executive Agency (HADEA). Neither the European Union nor the granting authority can be held responsible for them.

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.

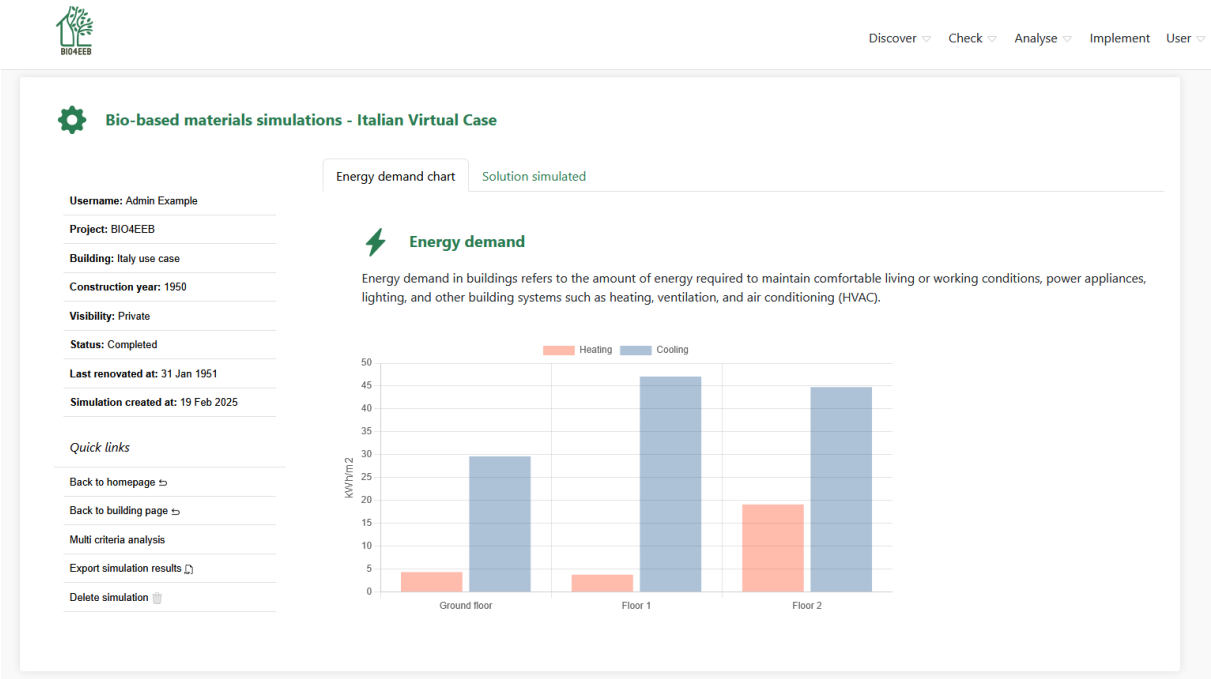

Figure 10: Energy demand (heating, cooling) for each floor of the building.

Co-funded by the European Union

Co-funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or European Health and Digital Executive Agency (HADEA). Neither the European Union nor the granting authority can be held responsible for them.

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.

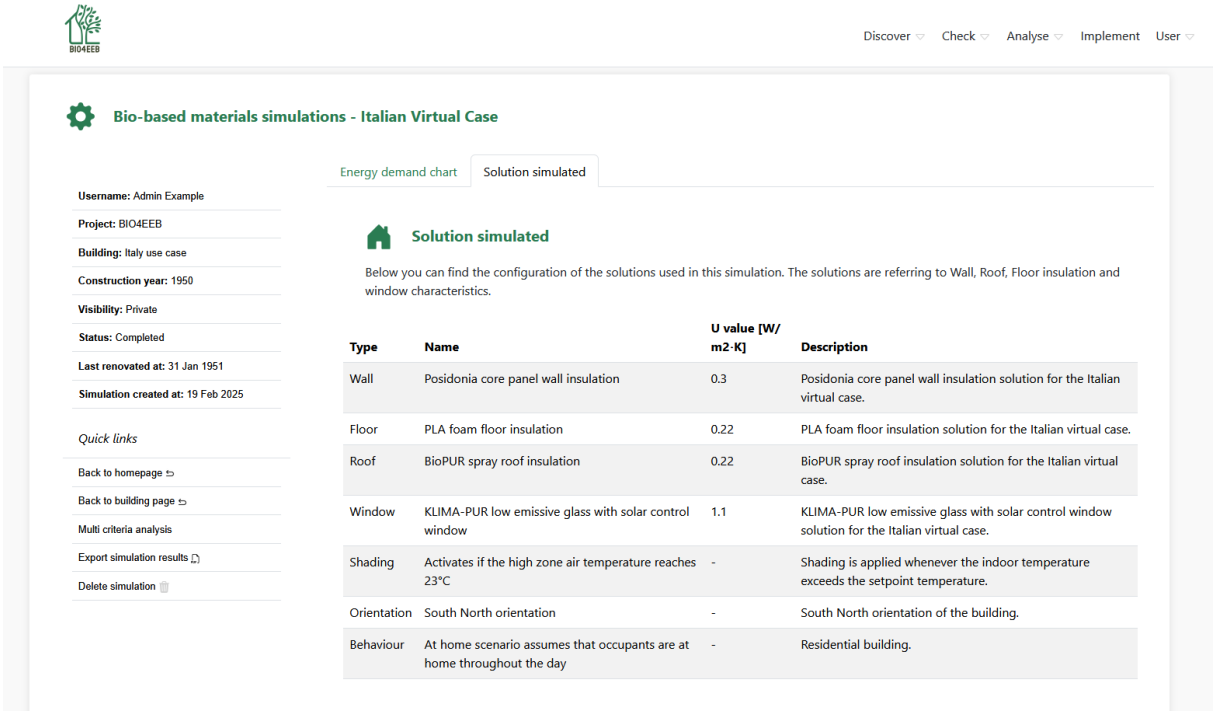

Figure 11: Solution simulated tab.

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.

Co-funded by the European Union

Co-funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or European Health and Digital Executive Agency (HADEA). Neither the European Union nor the granting authority can be held responsible for them.

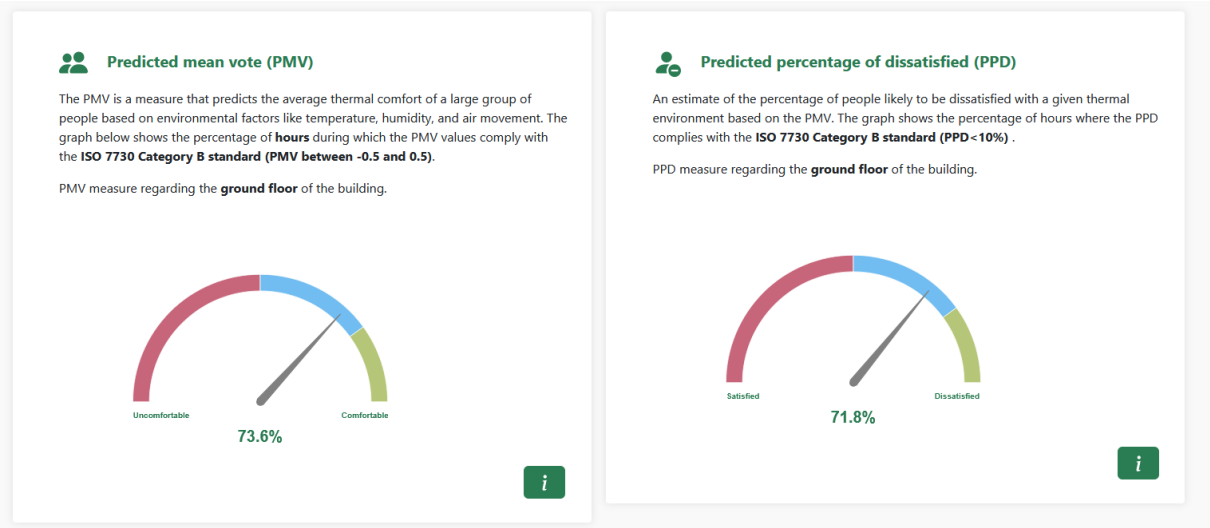

Figure 12: Predicted mean vote (PMV) and Predicted percentage of dissatisfied (PPD) results.

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.

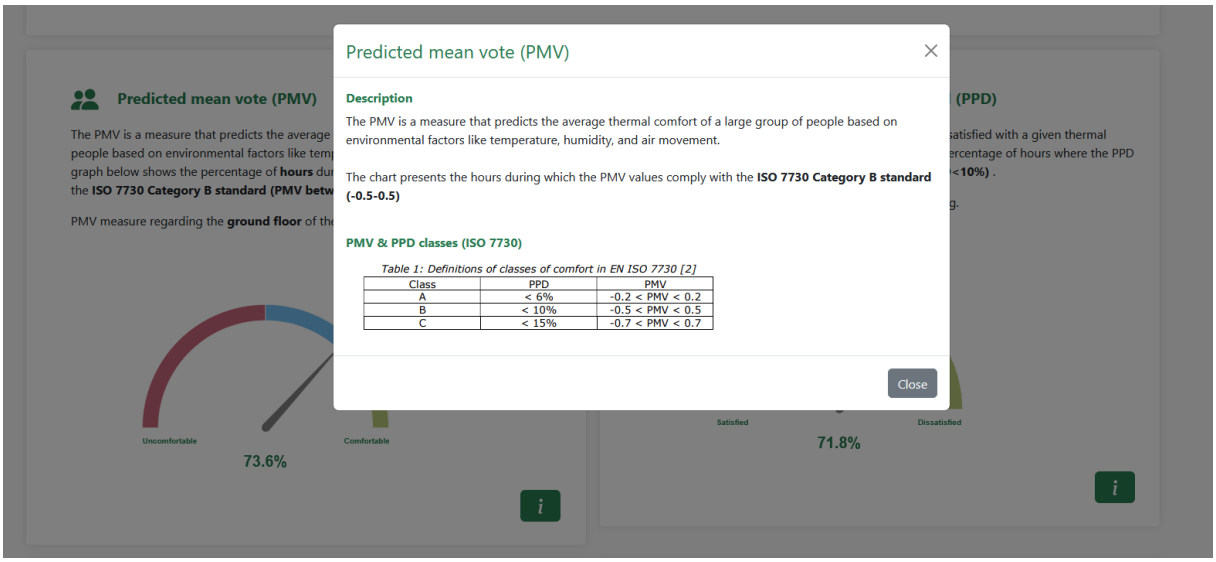

Figure 13: Information about the comfort indicator.

Co-funded by the European Union

Co-funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or European Health and Digital Executive Agency (HADEA). Neither the European Union nor the granting authority can be held responsible for them.

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.

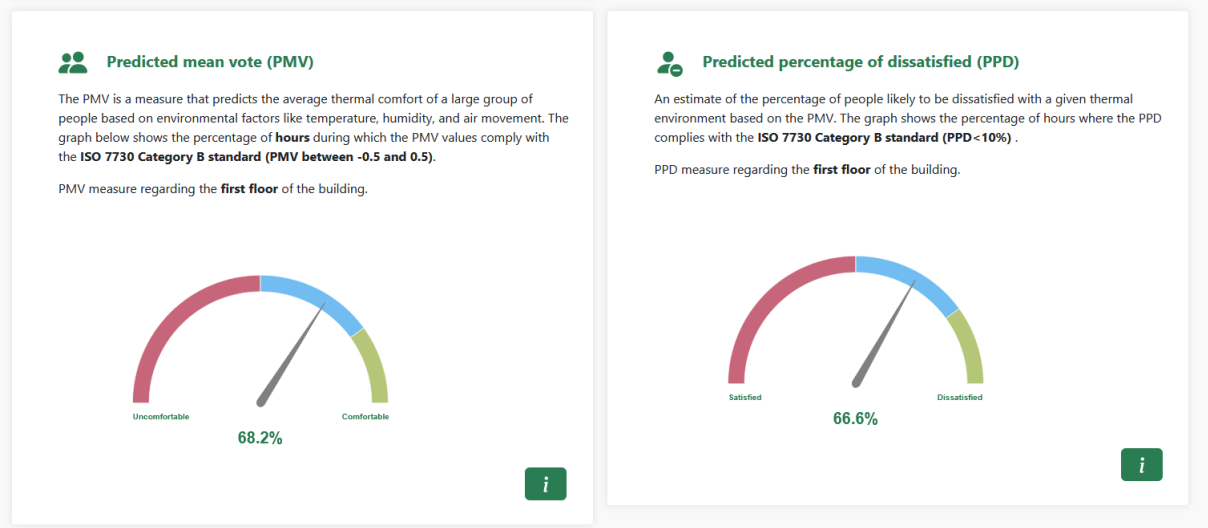

Figure 14: Comfort indicator charts for the first floor.

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).

Co-funded by the European Union

Co-funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or European Health and Digital Executive Agency (HADEA). Neither the European Union nor the granting authority can be held responsible for them.

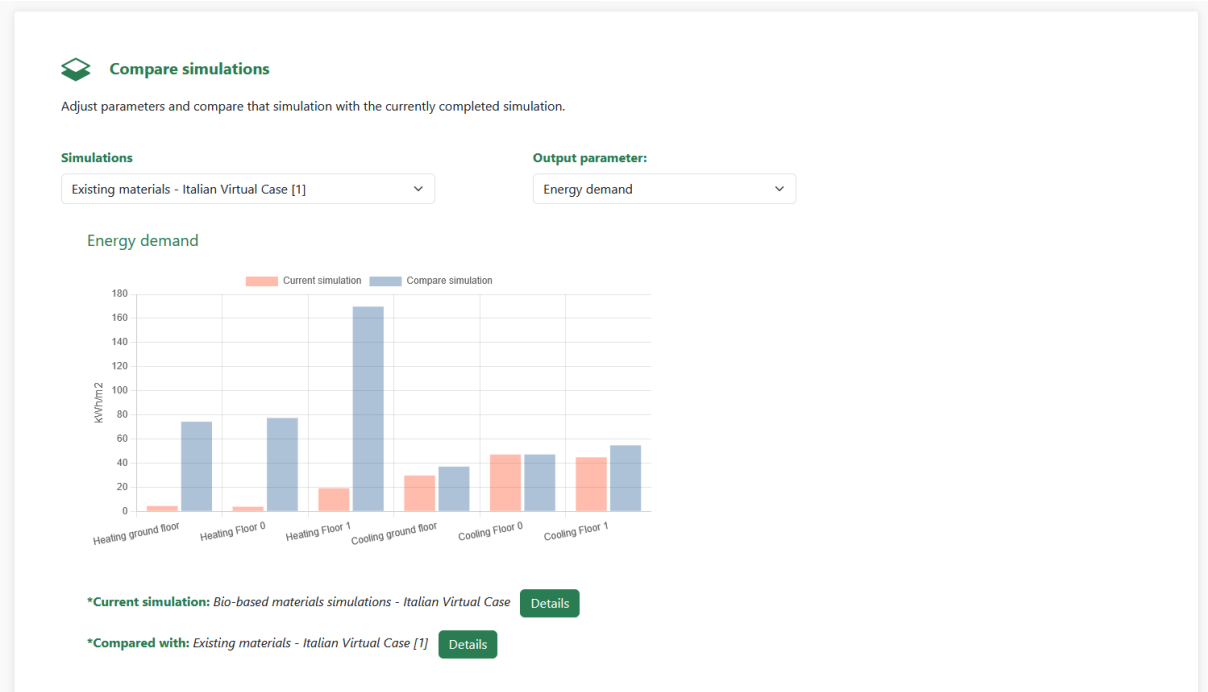

Figure 15: Simulation comparison of energy demand.

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.

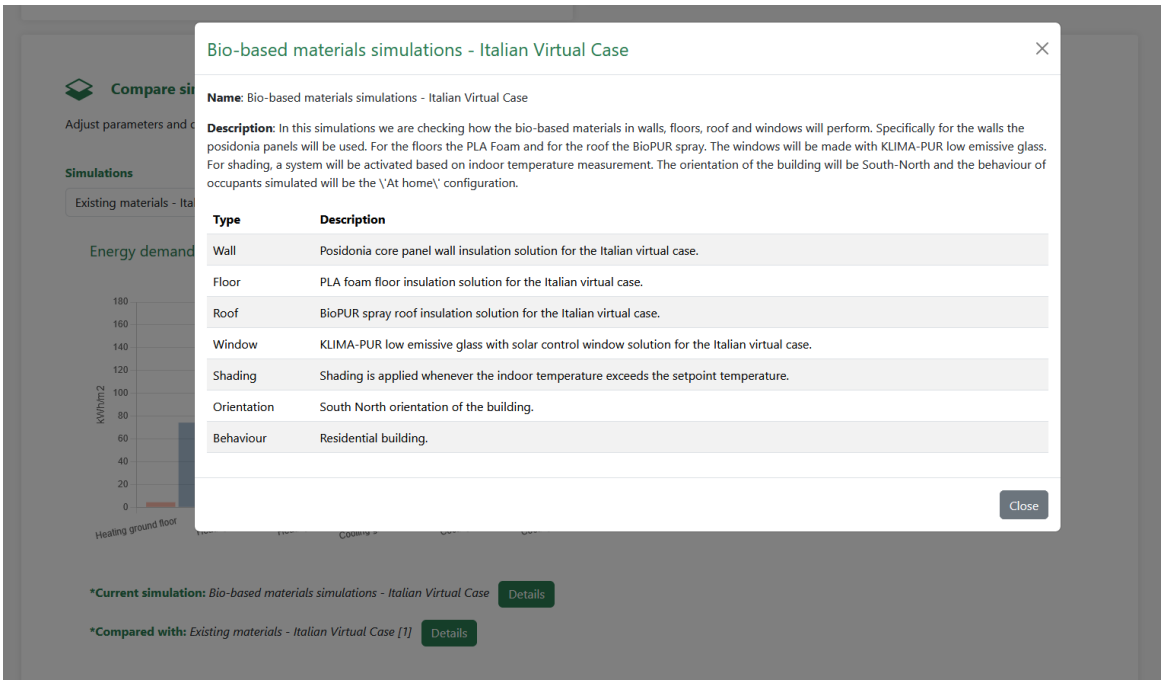

Figure 16: Details button showing simulation configuration.

Co-funded by the European Union

Co-funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or European Health and Digital Executive Agency (HADEA). Neither the European Union nor the granting authority can be held responsible for them.

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%).

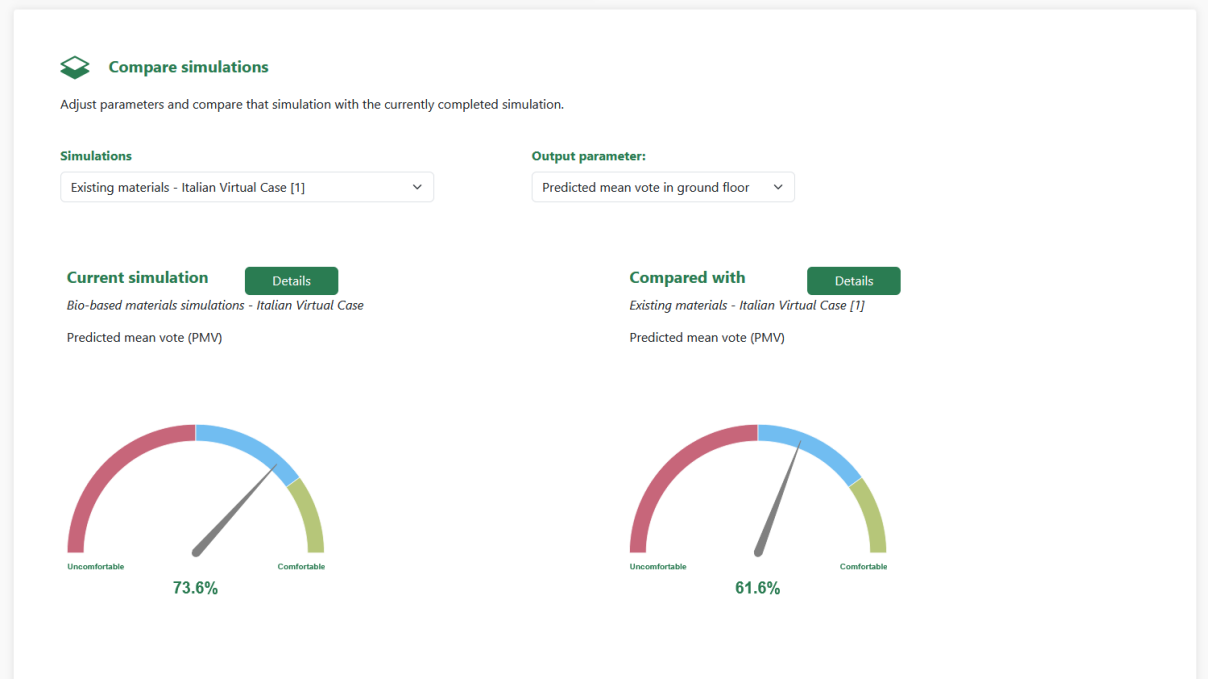

Figure 17: PMV comfort indicators comparison.

Co-funded by the European Union

Co-funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or European Health and Digital Executive Agency (HADEA). Neither the European Union nor the granting authority can be held responsible for them.

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

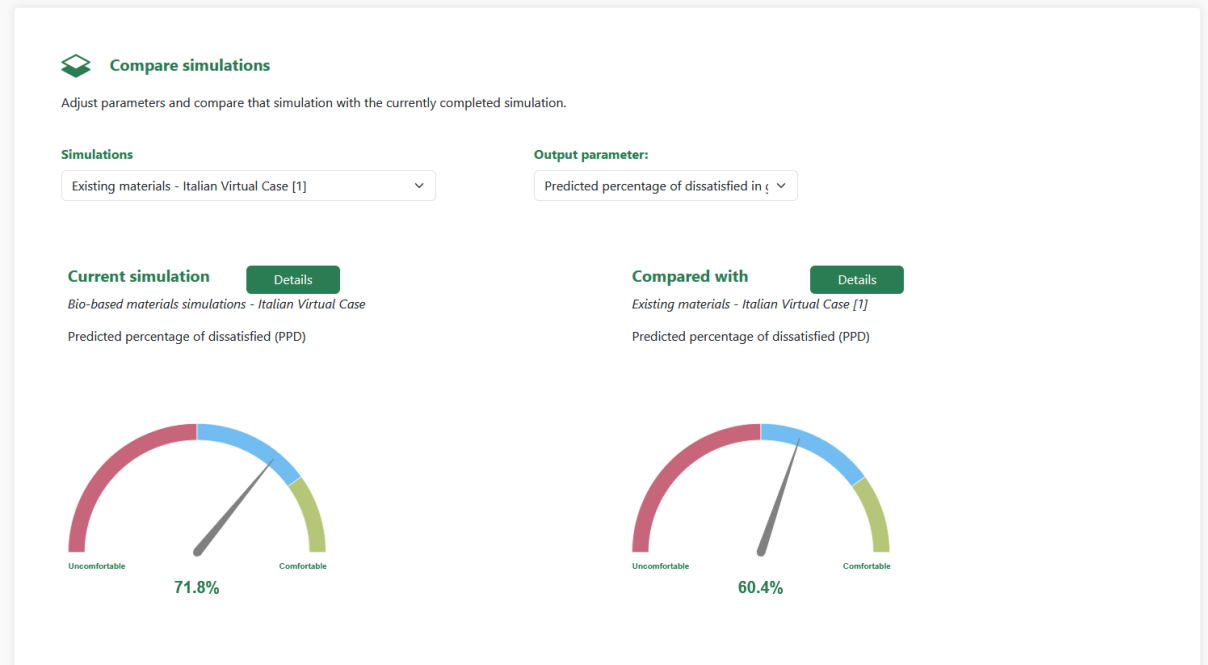

Figure 18: PPD comfort indicators comparison.

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.

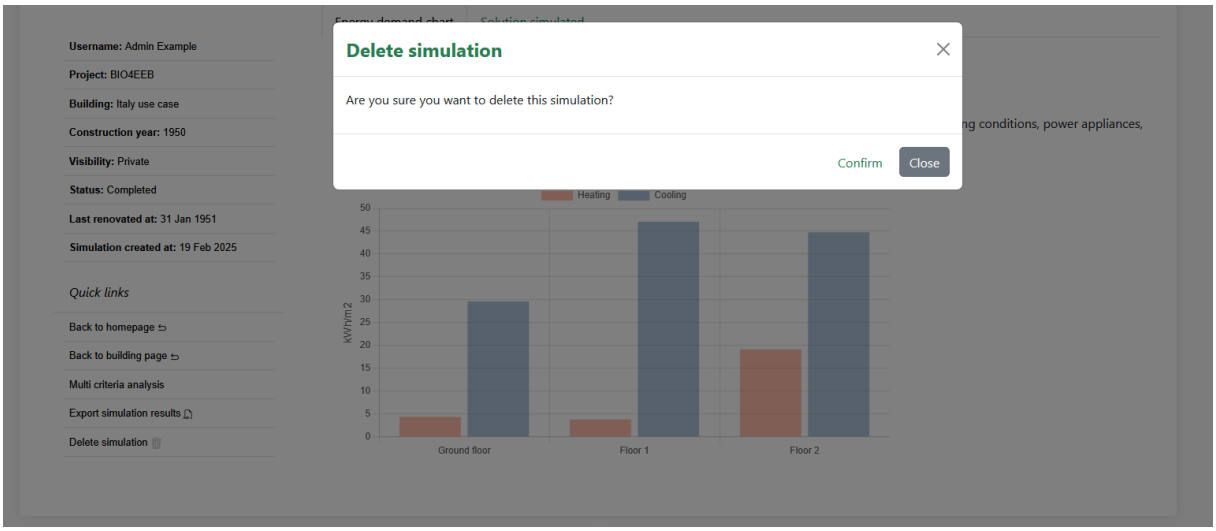

Figure 19: Delete & Export simulation functionalities.

Co-funded by the European Union

Co-funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or European Health and Digital Executive Agency (HADEA). Neither the European Union nor the granting authority can be held responsible for them.