InCUBE

sustainable building innovations

Training on the InCUBE P-Guide

Stelios Zikos (CERTH) | Mark de la Vieter (NEC)

22-6-2026

14 May 2025 | Zaragoza

This project is funded by the European Union's 'Horizon Europe Research & Innovation programme' under grant agreement no. 101069610. This publication reflects the authors' view only and the European Commission is not responsible for any use that may be made of the information it contains.

Agenda

- **Introduction to the InCUBE P-Guide**
- **Walk through of the P-Guide**
- **Application to the Zaragoza demo site**
- **Hands-on training on P-Guide**
- **Question round**

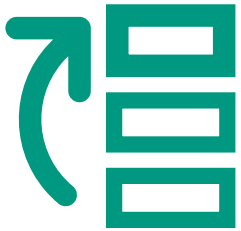
This project is funded by the European Union's 'Horizon Europe Research & Innovation programme' under grant agreement no. 101069610. This publication reflects the authors' view only and the European Commission is not responsible for any use that may be made of the information it contains.

P-GUIDE OVERVIEW

This project is funded by the European Union's 'Horizon Europe Research & Innovation programme' under grant agreement no. 101069610. This publication reflects the authors' view only and the European Commission is not responsible for any use that may be made of the information it contains.

What is the InCUBE Planning Guide (P-GUIDE)?

A tool that can help you choose the **best way** to renovate your building



Allows a user to look at **different indicators** like:

- Cost
- Time needed for the work
- User comfort
- Environmental impact
- Energy savings

Accessible anywhere via a web browser

This project is funded by the European Union's 'Horizon Europe Research & Innovation programme' under grant agreement no. 101069610. This publication reflects the authors' view only and the European Commission is not responsible for any use that may be made of the information it contains.

P-GUIDE: Key Challenges Addressed

Key Challenges & P-GUIDE Solutions

Difficulty in decision-making

→ *addressed via visualizations and recommendations*

Complexity

→ *addressed via breakdown into renovation actions*

Change in priorities

→ *addressed via re-configurations*

Who can use the P-GUIDE?

P-GUIDE is intended to be used by

white-collar workers

involved in the deep renovation of buildings

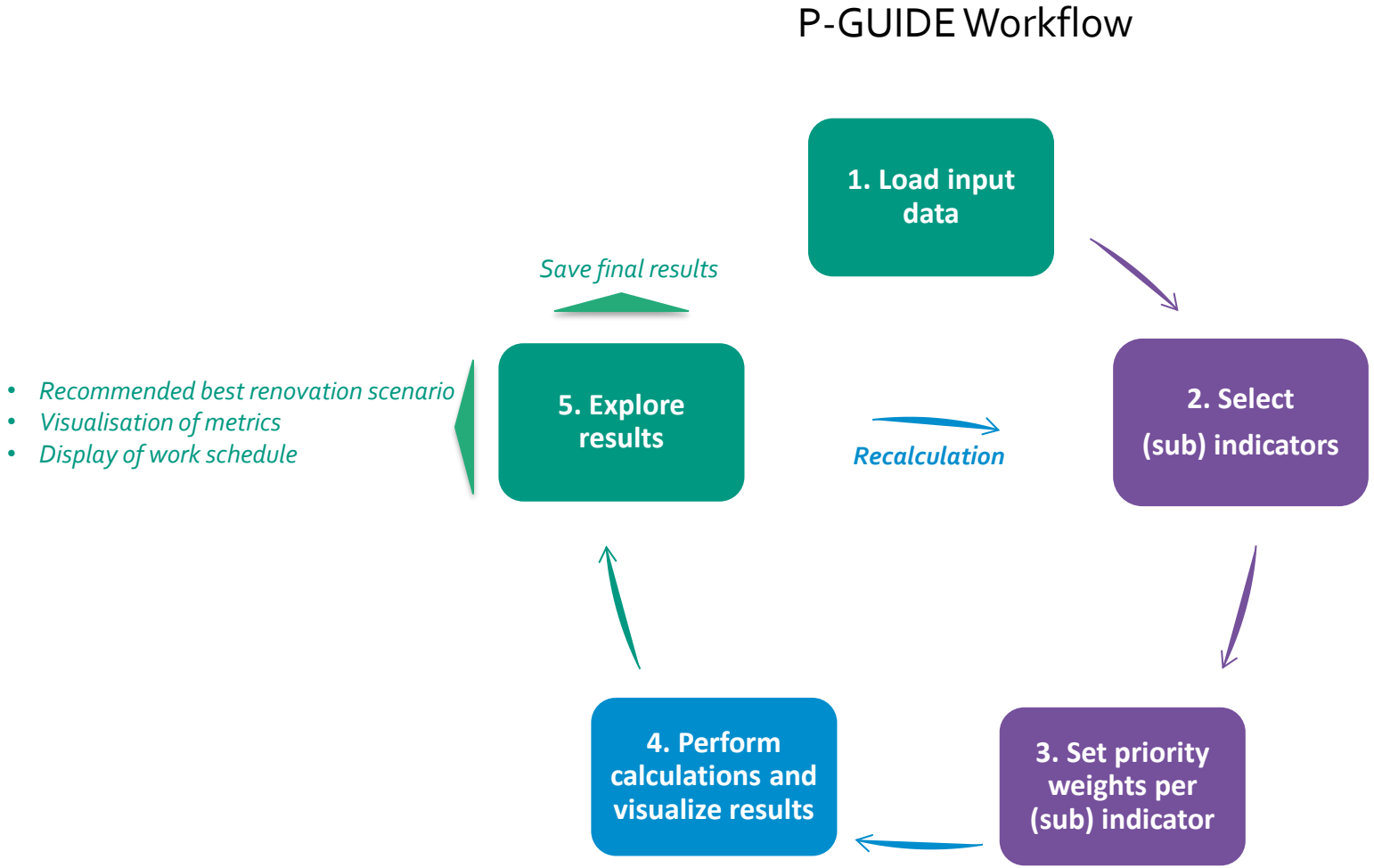
Renovation Planners

Decision-makers

WALKTHROUGH OF P-GUIDE

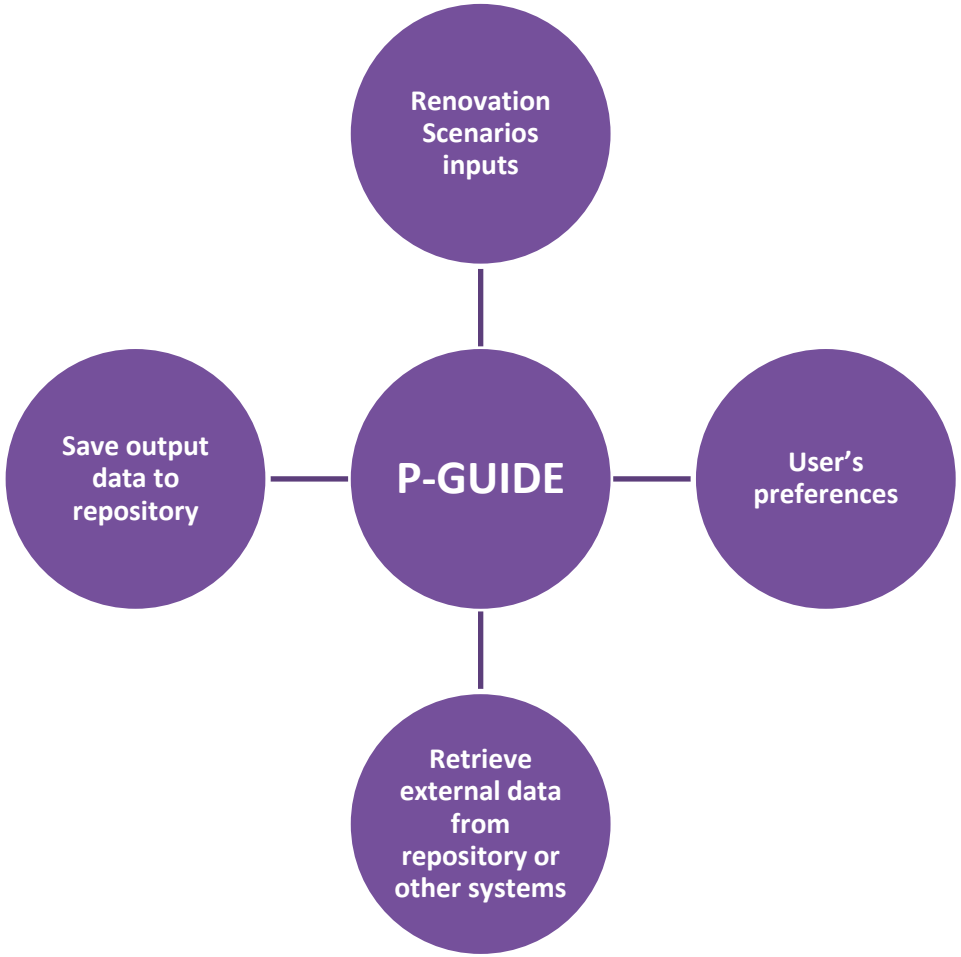
This project is funded by the European Union's 'Horizon Europe Research & Innovation programme' under grant agreement no. 101069610. This publication reflects the authors' view only and the European Commission is not responsible for any use that may be made of the information it contains.

Planning Guide: How it works



This project is funded by the European Union's 'Horizon Europe Research & Innovation programme' under grant agreement no. 101069610. This publication reflects the authors' view only and the European Commission is not responsible for any use that may be made of the information it contains.

Planning Guide: Interactions



This project is funded by the European Union's 'Horizon Europe Research & Innovation programme' under grant agreement no. 101069610. This publication reflects the authors' view only and the European Commission is not responsible for any use that may be made of the information it contains.

Planning Guide: Input data

P-Guide can evaluate **up to four** different renovation scenarios currently.

Each renovation scenario is described by:	Title / ID
	List of interventions in the renovation project
	Sub-indicators' values considering all the interventions → *Pre-defined by the user or calculated by other tools*
	Standardized format (human readable & machine-readable JSON format)

Future work: Exploring a user-friendly way to insert renovation scenarios definitions by adding a specific section in the UI.

This project is funded by the European Union's 'Horizon Europe Research & Innovation programme' under grant agreement no. 101069610. This publication reflects the authors' view only and the European Commission is not responsible for any use that may be made of the information it contains.

Planning Guide: Input data

Scenario #1 (Baseline)
Scenario #2
Installation of thermal insulation on the entire building’s thermal envelope
Replacement of the windows
Installation of photovoltaic (PV) panels
Installation of industrialized structure for vertical communication zones
Scenario #3
Installation of thermal insulation on the entire building’s thermal envelope
Replacement of the windows
Scenario #4
Installation of photovoltaic (PV) panels
Installation of industrialized structure for vertical communication zones

This project is funded by the European Union’s 'Horizon Europe Research & Innovation programme' under grant agreement no. 101069610. This publication reflects the authors’ view only and the European Commission is not responsible for any use that may be made of the information it contains.

Planning Guide: Indicators and sub-indicators (1/2)

KPI	Sub-indicator	Unit	Description
1.Environmental	Overall project waste	kg	The overall waste during the scenario's renovation phase
	Life Cycle Global Warming Potential	kgCO2eq/year/m2	Total CO2 emissions of the renovated site
2. Energy	Decrease in Total Energy Consumption	%	Percentage decrease in energy consumption of the renovated site in comparison to its pre-renovated state
	Savings in Primary Energy consumption for heating	%	Percentage decrease in primary energy consumption for heating needs of the site in comparison to its pre-renovated state
	Savings in Primary Energy consumption for cooling	%	Percentage decrease in primary energy consumption for cooling needs of the site in comparison to its pre-renovated state
	Increase in RES based electricity production	kWh	Increase in electricity produced by Renewable Energy Sources and utilized for electricity needs for the site in comparison to its pre-renovated state
	Increase in RES based heating production	kWh	Increase in electricity produced by Renewable Energy Sources and utilized for heating needs for the site in comparison to its pre-renovated state
3. Cost and Financial	Total Life Cycle Cost	€/year	Total yearly life cycle cost of the renovated site
	Payback period (of the renovation project)	years	Expected payback period of the investment for the whole renovation process of the site

This project is funded by the European Union's 'Horizon Europe Research & Innovation programme' under grant agreement no. 101069610. This publication reflects the authors' view only and the European Commission is not responsible for any use that may be made of the information it contains.

Planning Guide: Indicators and sub-indicators (2/2)

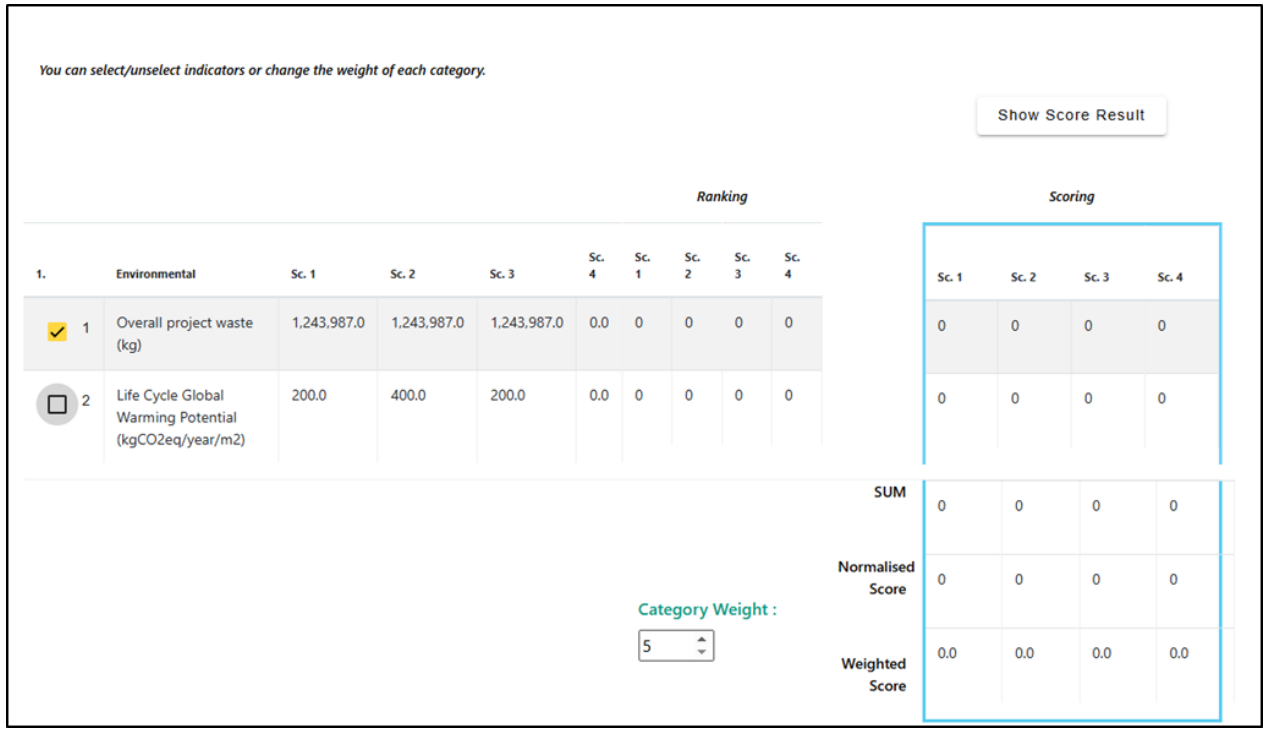
KPI	Sub-indicator	Unit	Description
4. User Disruption	Disruption Index	-	Index describing the whole disruption levels during the renovation phase of the site
5. SRI Index Impact	Total SRI score	%	Index describing the Smart Readiness of the site post renovation
	Smart readiness score for each impact criterion	%	Index describing the Smart Readiness score for each impact criterion (Energy efficiency, Comfort, Information to occupants, etc.) of the site post renovation
	Smart readiness score for each key functionality	%	Index describing the Smart Readiness score for each key functionality (Building, user, grid) of the site post renovation
	SRI class	-	SRI class of the site post renovation
6. Retrofitting Time	Duration in days or hours	Days or hours	The duration of the renovation scenario process of the site

This project is funded by the European Union's 'Horizon Europe Research & Innovation programme' under grant agreement no. 101069610. This publication reflects the authors' view only and the European Commission is not responsible for any use that may be made of the information it contains.

Planning Guide: Calculation Methodology

The P-GUIDE considers:

- The selected indicators and sub-indicators by the user
- The optionally set weight (1-9) per each category (indicator)



You can select/unselect indicators or change the weight of each category.

Show Score Result

1.	Environmental	Sc. 1	Sc. 2	Sc. 3	Sc. 4	Sc. 1	Sc. 2	Sc. 3	Sc. 4	Sc. 1	Sc. 2	Sc. 3	Sc. 4
		Ranking								*Scoring*			
☑ 1	Overall project waste (kg)	1,243,987.0	1,243,987.0	1,243,987.0	0.0	0	0	0	0	0	0	0	0
☐ 2	Life Cycle Global Warming Potential (kgCO2eq/year/m2)	200.0	400.0	200.0	0.0	0	0	0	0	0	0	0	0
										SUM	0	0	0	0
										Normalised Score	0	0	0	0
										Weighted Score	0.0	0.0	0.0	0.0

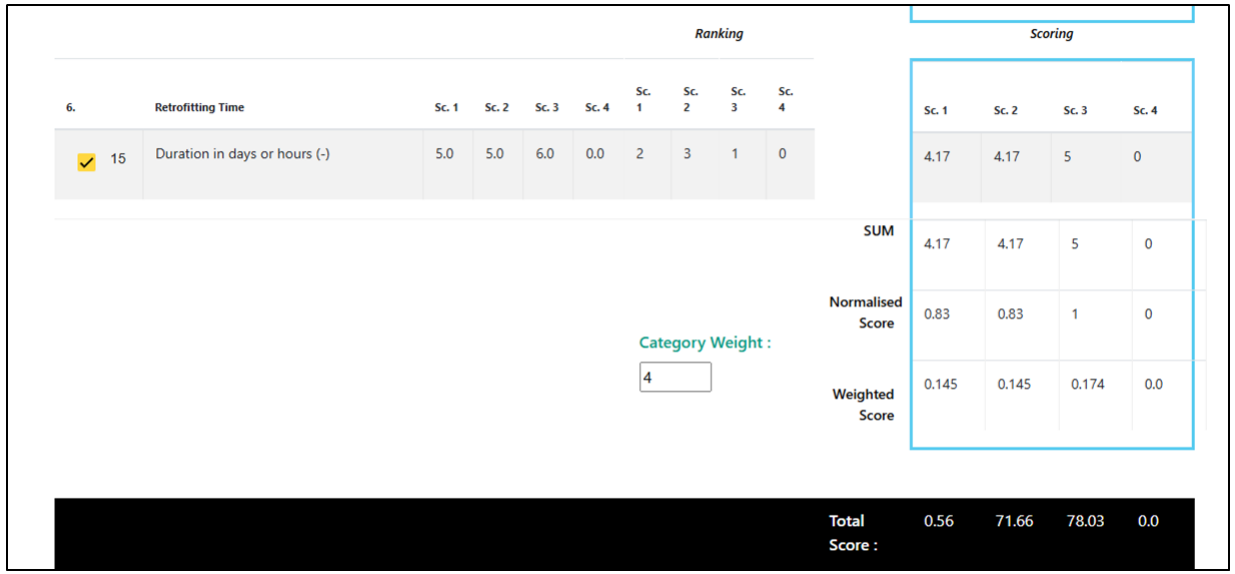
Category Weight : 5

This project is funded by the European Union's 'Horizon Europe Research & Innovation programme' under grant agreement no. 101069610. This publication reflects the authors' view only and the European Commission is not responsible for any use that may be made of the information it contains.

Planning Guide: Calculation Methodology

→ Normalised scores (per indicator and scenario)
→ Weighted scores (per indicator and scenario)
→ Total score (per each scenario)

- Recommended scenario: The scenario with the highest score



						Ranking				Scoring			
6.	Retrofitting Time	Sc. 1	Sc. 2	Sc. 3	Sc. 4	Sc. 1	Sc. 2	Sc. 3	Sc. 4	Sc. 1	Sc. 2	Sc. 3	Sc. 4
☑ 15	Duration in days or hours (-)	5.0	5.0	6.0	0.0	2	3	1	0	4.17	4.17	5	0
									SUM	4.17	4.17	5	0
									Normalised Score	0.83	0.83	1	0
								Category Weight : 4	Weighted Score	0.145	0.145	0.174	0.0
									Total Score :	0.56	71.66	78.03	0.0

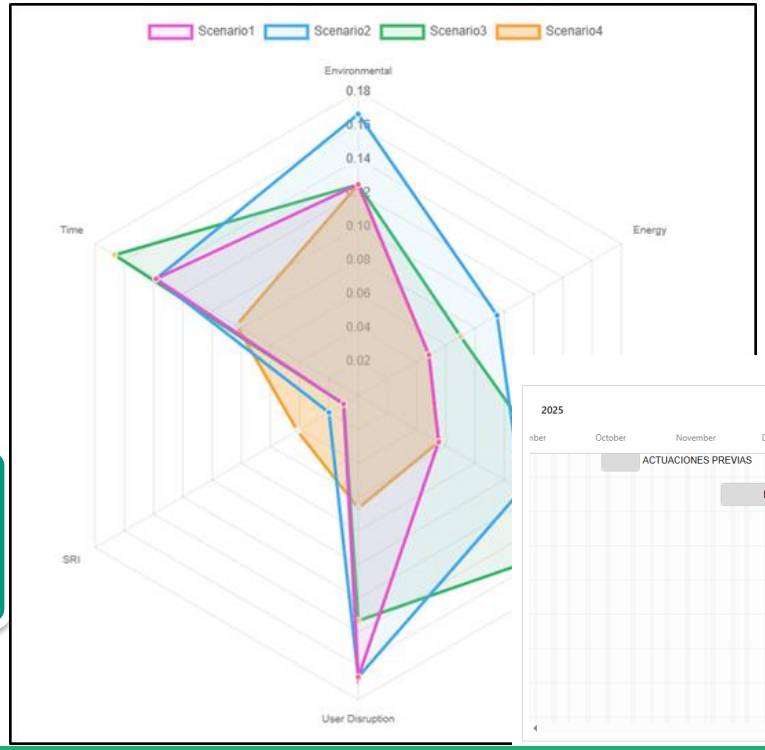
This project is funded by the European Union's 'Horizon Europe Research & Innovation programme' under grant agreement no. 101069610. This publication reflects the authors' view only and the European Commission is not responsible for any use that may be made of the information it contains.

Planning Guide: Outputs

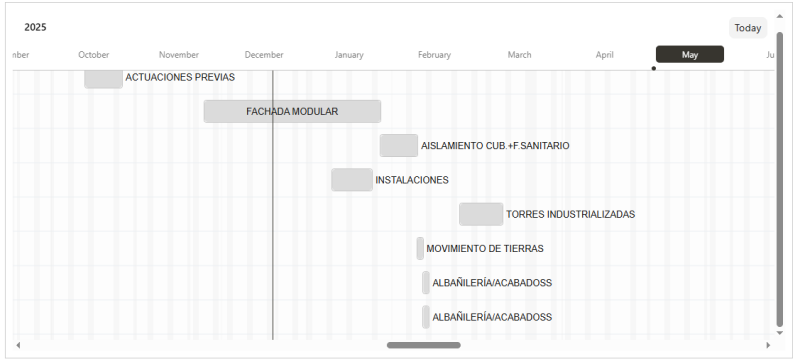
- Calculated score for each renovation scenario (higher is better)
- Title and included activities of the best scenario
- A spider chart comparing all scenarios per indicator category
- Gantt chart proposal for best renovation scenario (if information is available)

Scenario Description

-Installation of thermal insulation on the entire building's thermal envelope
-Replacement of the windows.
-Installation of photovoltaic (PV) panels.
-Installation of photovoltaic thermal (PVT) hybrid solar panels



GANTT chart of the optimal scenario



This project is funded by the European Union's 'Horizon Europe Research & Innovation programme' under grant agreement no. 101069610. This publication reflects the authors' view only and the European Commission is not responsible for any use that may be made of the information it contains.

Planning Guide: Re-calculations and exporting of results

- **Reconfiguration in terms of selected sub-indicators** and the **weight per each indicator** can be applied by the user, in order to re-calculate.
  - No need to load the input data again
  - This can lead to the proposal of a different optimal renovation scenario

- The option to store the result in the repository database is provided to the user through the 'Store result in the Digital Building Logbook' button

- Option to download the results as a file (PDF, JSON)

This project is funded by the European Union's 'Horizon Europe Research & Innovation programme' under grant agreement no. 101069610. This publication reflects the authors' view only and the European Commission is not responsible for any use that may be made of the information it contains.

P-GUIDE APPLICATION TO THE ZARAGOZA DEMO SITE

This project is funded by the European Union's 'Horizon Europe Research & Innovation programme' under grant agreement no. 101069610. This publication reflects the authors' view only and the European Commission is not responsible for any use that may be made of the information it contains.

Application of P-GUIDE TO ZARAGOZA

Three renovation scenarios to evaluate (ES demo site)
Scenario #2
Installation of thermal insulation on the entire building's thermal envelope
Replacement of the windows
Installation of photovoltaic (PV) panels
Installation of industrialized structure for vertical communication zones
Scenario #3
Installation of thermal insulation on the entire building's thermal envelope
Replacement of the windows
Scenario #4
Installation of photovoltaic (PV) panels
Installation of industrialized structure for vertical communication zones

This project is funded by the European Union's 'Horizon Europe Research & Innovation programme' under grant agreement no. 101069610. This publication reflects the authors' view only and the European Commission is not responsible for any use that may be made of the information it contains.

HANDS-ON TRAINING

This project is funded by the European Union's 'Horizon Europe Research & Innovation programme' under grant agreement no. 101069610. This publication reflects the authors' view only and the European Commission is not responsible for any use that may be made of the information it contains.

Practical Instructions for Training

Visit the web page: http://160.40.51.98:4000/dss

No user login is required for this demonstration

Visit the web page

This project is funded by the European Union's 'Horizon Europe Research & Innovation programme' under grant agreement no. 101069610. This publication reflects the authors' view only and the European Commission is not responsible for any use that may be made of the information it contains.

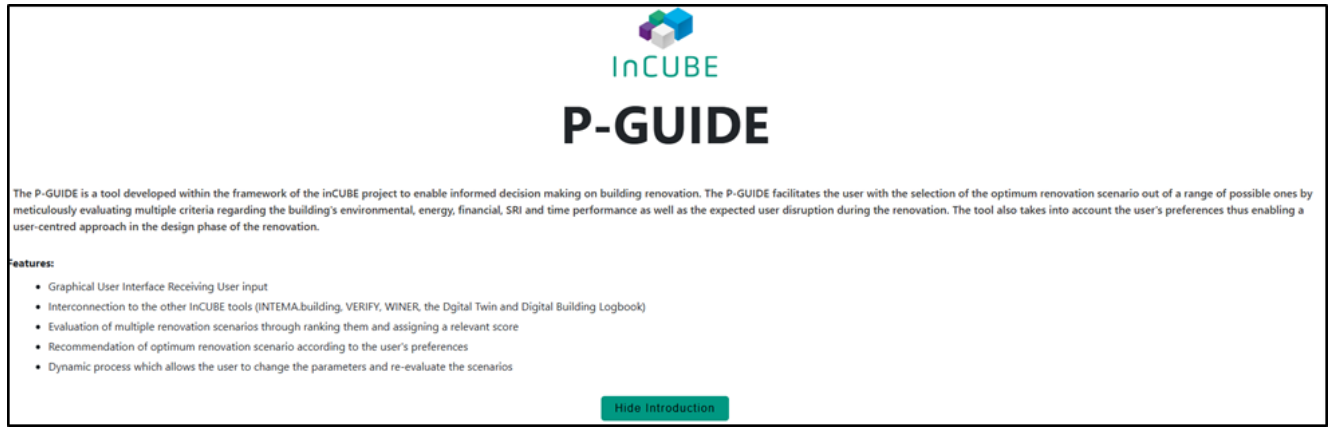
Practical Instructions for Training

Step 1: Click on the green button '**Hide introduction**'

Step 2: Select demo site from the list: **Spanish demo**

Step 3: Select scenarios: Select '**Scenario 2**' and '**Scenario 3**' from the dropdown menus

Step 4: Press on the **Load** button to load the data



This project is funded by the European Union's 'Horizon Europe Research & Innovation programme' under grant agreement no. 101069610. This publication reflects the authors' view only and the European Commission is not responsible for any use that may be made of the information it contains.

Practical Instructions for Training

Interventions included in each renovation scenario

Scenario #2
Installation of thermal insulation on the entire building’s thermal envelope
Replacement of the windows
Installation of photovoltaic (PV) panels
Installation of industrialized structure for vertical communication zones
Scenario #3
Installation of thermal insulation on the entire building’s thermal envelope
Replacement of the windows

This project is funded by the European Union’s 'Horizon Europe Research & Innovation programme' under grant agreement no. 101069610. This publication reflects the authors’ view only and the European Commission is not responsible for any use that may be made of the information it contains.

Practical Instructions for Training

1st Run (Default settings)

All sub-indicators are selected by default.
All KPI categories priorities are set to 1 by default.

Press on the Show Score Result button to perform the calculations.
Check the results.

Step 5: Press on the **Show Score Result** button

2nd Run (Focused evaluation)

Unselect sub-indicators: 10, 11, 12, 13, 14 (SRI and Disruption related)

Step 6: **Unselect** sub-indicators: 10, 11, 12, 13, 14 (SRI and Disruption related)

Press on the Show Score Result button to perform the calculations.
Check the revised results.

Step 7: Press on the **Show Score Result** button

This project is funded by the European Union's 'Horizon Europe Research & Innovation programme' under grant agreement no. 101069610. This publication reflects the authors' view only and the European Commission is not responsible for any use that may be made of the information it contains.

Hand-on Training:
3rd Run (Weight-Adjusted evaluation)

Set category weights: Set higher priority = 3 for Time and Cost

Press on the Show Score Result button to perform the calculations.

Check the revised results.

Set category weights: Set higher priority = 6 for Environmental and Energy

Press on the Show Score Result button to perform the calculations.

Check the revised results.

Export data as downloadable PDF file.

Step 8: Set category weights:
Set higher priority = 3 for Time and Cost

Step 9: Press on the **Show Score Result** button

Step 10: Set category weights: **Set higher priority = 6 for Environmental and Energy**

Step 11: Press on the **Show Score Result** button

Step 12: Press on '**Export data as PDF file**'

This project is funded by the European Union's 'Horizon Europe Research & Innovation programme' under grant agreement no. 101069610. This publication reflects the authors' view only and the European Commission is not responsible for any use that may be made of the information it contains.

Questions?
Key Takeaways from Training?

This project is funded by the European Union's 'Horizon Europe Research & Innovation programme' under grant agreement no. 101069610. This publication reflects the authors' view only and the European Commission is not responsible for any use that may be made of the information it contains.

Thank you!

For more details, contact:

Mr. Stelios Zikos, szikos@iti.gr , CERTH-ITI
Mr. Nikos Tarsounas, tarsounasnikos@iti.gr , CERTH-ITI

This project is funded by the European Union's 'Horizon Europe Research & Innovation programme' under grant agreement no. 101069610. This publication reflects the authors' view only and the European Commission is not responsible for any use that may be made of the information it contains.

This project is funded by the European Union’s 'Horizon Europe Research & Innovation programme' under grant agreement no. 101069610. This publication reflects the authors’ view only and the European Commission is not responsible for any use that may be made of the information it contains.

www.incubeproject.eu

This project is funded by the European Union's 'Horizon Europe Research & Innovation programme' under grant agreement no. 101069610. This publication reflects the authors' view only and the European Commission is not responsible for any use that may be made of the information it contains.