INFINITE
BUILDINGRENOVATION
Industrialised envelope solutions

eurac
research

Comfort Plugin

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Online, 11/06/24

INFINITE project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No **958397**

Aim

Why a plugin for energy and comfort?

Comfort plugin - Aims

- Hourly Evaluation of the building's performance both in terms of energy efficiency and thermal comfort using the ISO52016 trough the python library : pybuildingenergy (https://pypi.org/project/pybuildingenergy/) and the ENCOME tool -> recast EPBD
- Connection of geometric and performance information of the facade components manually or directly from the BIM using the Open BIM-P API.
- Assessment of possible improvements (Energy Conservation Measure) to be applied, considering energy, comfort, and economic aspects.

Comfort plugin –Virtual Demo Spain

Building characteristics

C1 **Roof 1**: flat roof

C2 **Roof 2:** flat roof

S1 **Floor 1:** with crawl space

F1 **Façade 1:** East

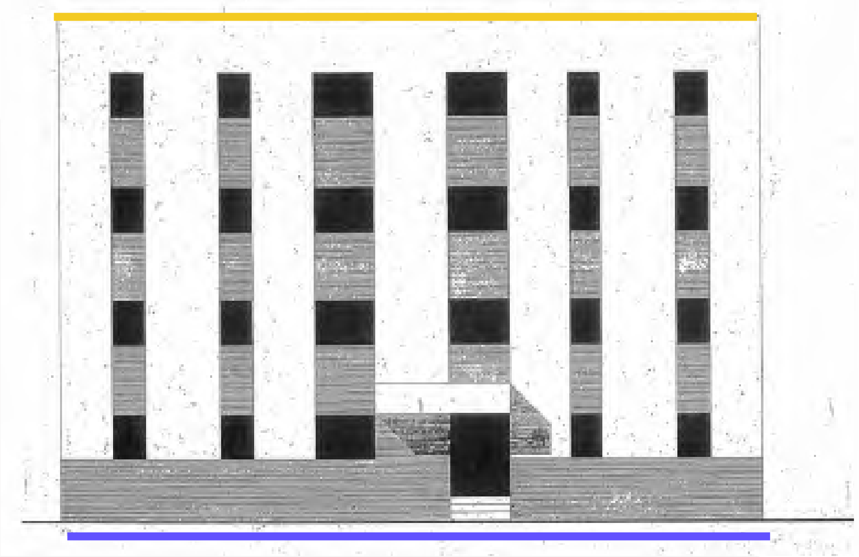
F2 **Façade 2:** West

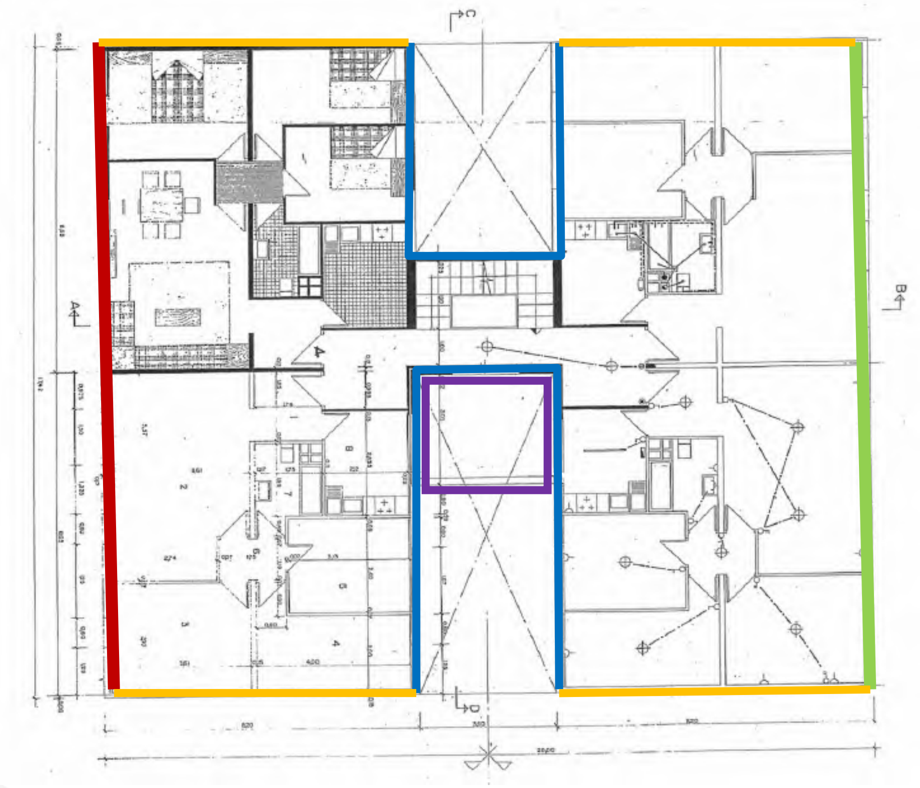
F3 **Façade 3:** North

M1 **Adiabatic party wall 1**

BUILDING TYPE

- Number of dwellings per floor: 4
- Number of floors: 4 floors
- Constructed area (1 dwelling): 72m2 built
- Useful area: 61.2m2
- Useful area of common elements: 110.5 m2 built.





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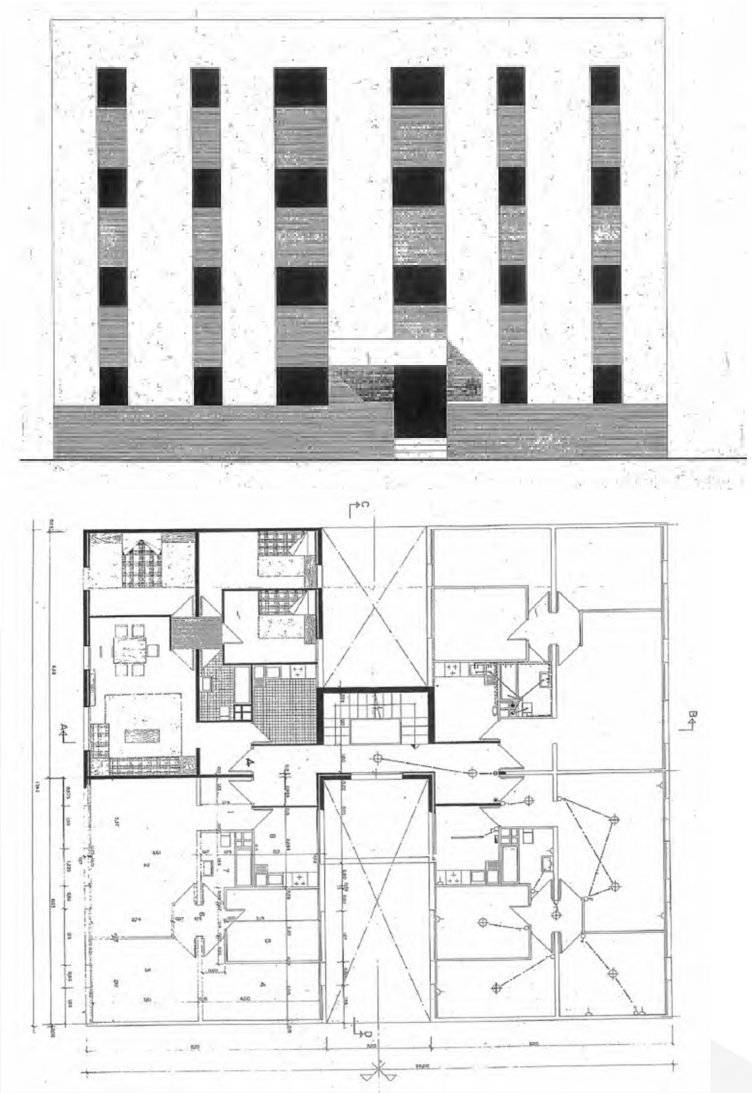
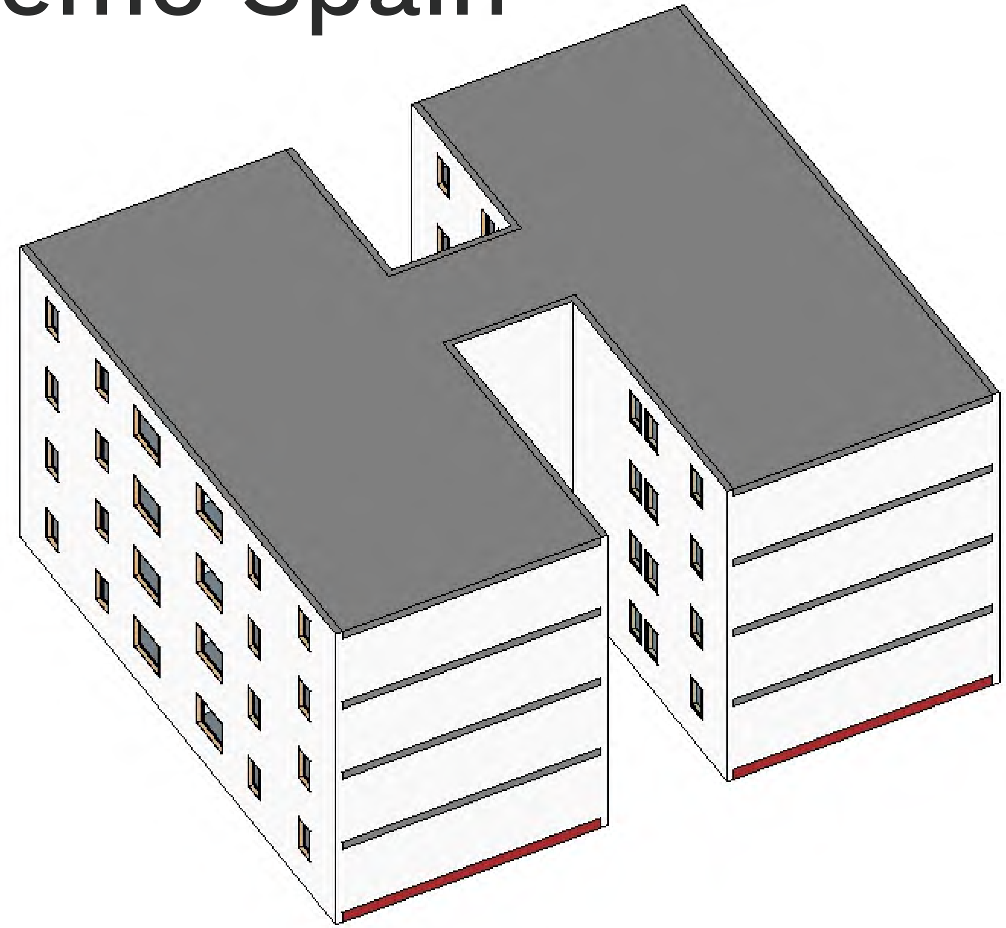
Modelling and BIM-P interaction





Taking the plans and elevations as reference, the building is modelled in Revit. Only the heated volumes are considered, leaving out the staircase

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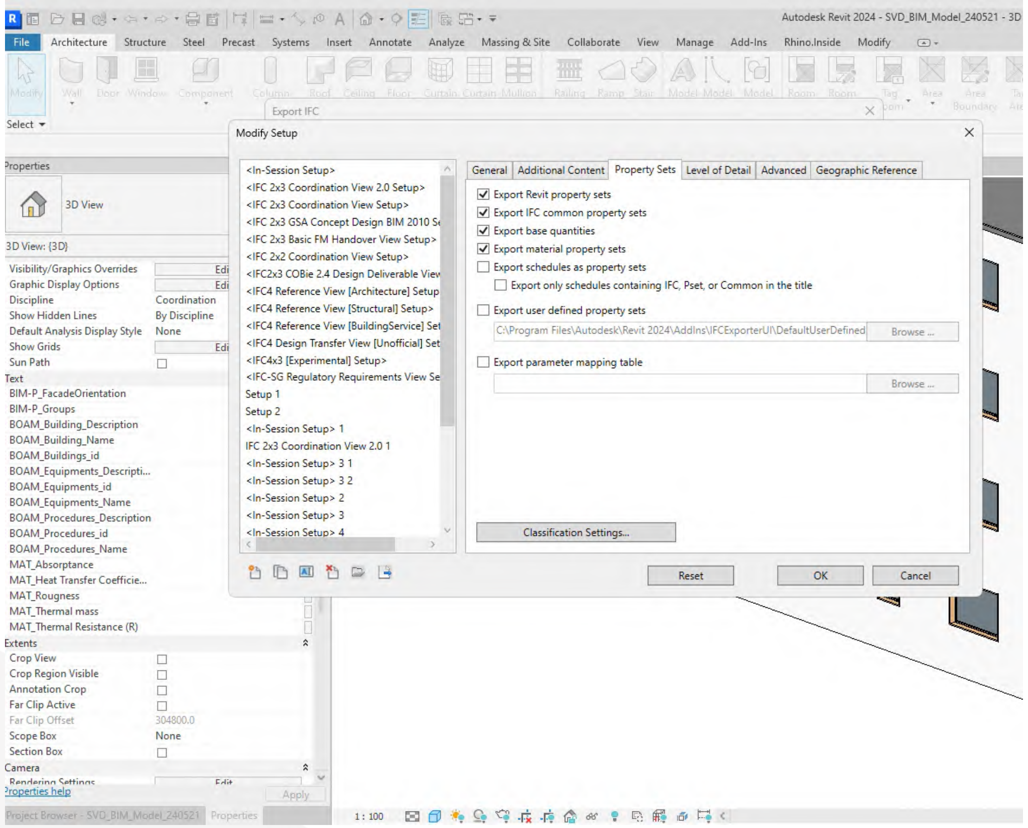
Modelling and BIM-P interaction


Autodesk Revit 2024 - SVD_BIM_Model_240521 - 3D
File
Architecture
Structure
Steel
Precast
Systems
Insert
Annotate
Analyze
Massing & Site
Collaborate
View
Manage
Add-Ins
Rhino.Inside
Modify
Select
Export IFC
Modify Setup
<In-Session Setup>
<IFC 2x3 Coordination View 2.0 Setup>
<IFC 2x3 Coordination View Setup>
<IFC 2x3 GSA Concept Design BIM 2010 Se
<IFC 2x3 Basic FM Handover View Setup>
<IFC 2x2 Coordination View Setup>
<IFC2x3 COBie 2.4 Design Deliverable View
<IFC4 Reference View [Architecture] Setup
<IFC4 Reference View [Structural] Setup>
<IFC4 Reference View [BuildingService] Set
<IFC4 Design Transfer View [Unofficial] Set
<IFC4x3 [Experimental] Setup>
<IFC-SG Regulatory Requirements View Se
Setup 1
Setup 2
<In-Session Setup> 1
IFC 2x3 Coordination View 2.0 1
<In-Session Setup> 3 1
<In-Session Setup> 3 2
<In-Session Setup> 2
<In-Session Setup> 3
<In-Session Setup> 4
General
Additional Content
Property Sets
Level of Detail
Advanced
Geographic Reference
Browse ...
Browse ...
Classification Settings...
Reset
OK
Cancel
Properties help
Apply
Project Browser - SVD_BIM_Model_240521
Properties
1 : 100

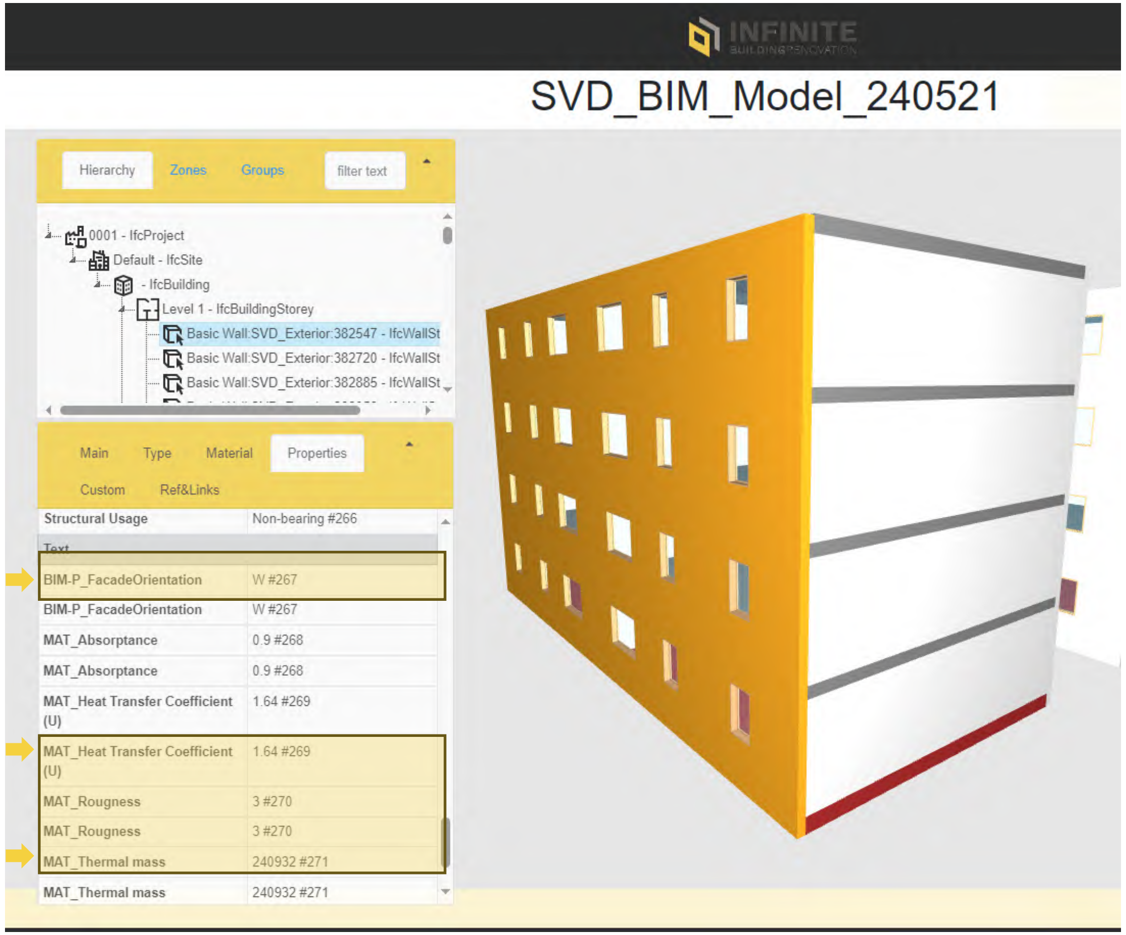
☑ Export Revit property sets
☑ Export IFC common property sets
☑ Export base quantities
☑ Export material property sets
☐ Export schedules as property sets
☐ Export only schedules containing IFC, Pset, or Common in the title
☐ Export user defined property sets
C:\Program Files\Autodesk\Revit 2024\AddIns\IFCExporterUI\DefaultUserDefined
☐ Export parameter mapping table

Properties

3D View

3D View: {3D}

Visibility/Graphics Overrides	Edi
Graphic Display Options	Edi
Discipline	Coordination
Show Hidden Lines	By Discipline
Default Analysis Display Style	None
Show Grids	Edi
Sun Path	☐
Text	
BIM-P_FacadeOrientation	
BIM-P_Groups	
BOAM_Building_Description	
BOAM_Building_Name	
BOAM_Buildings_id	
BOAM_Equipments_Descripti...	
BOAM_Equipments_id	
BOAM_Equipments_Name	
BOAM_Procedures_Description	
BOAM_Procedures_id	
BOAM_Procedures_Name	
MAT_Absorptance	
MAT_Heat Transfer Coefficie...	
MAT_Rougness	
MAT_Thermal mass	
MAT_Thermal Resistance (R)	
Extents	
Crop View	☐
Crop Region Visible	☐
Annotation Crop	☐
Far Clip Active	☐
Far Clip Offset	304800.0
Scope Box	None
Section Box	☐
Camera	
Rendering Settings	Edit


INFINITE
BUILDING RENOVATION
Hierarchy
Zones
Groups
filter text
Main
Type
Material
Properties
Custom
Ref&Links

SVD_BIM_Model_240521

- 0001 - IfcProject
  - Default - IfcSite
    - IfcBuilding
      - Level 1 - IfcBuildingStorey
        - Basic Wall:SVD_Exterior:382547 - IfcWallSt
        - Basic Wall:SVD_Exterior:382720 - IfcWallSt
        - Basic Wall:SVD_Exterior:382885 - IfcWallSt

Structural Usage	Non-bearing #266
Text	
BIM-P_FacadeOrientation	W #267
BIM-P_FacadeOrientation	W #267
MAT_Absorptance	0.9 #268
MAT_Absorptance	0.9 #268
MAT_Heat Transfer Coefficient (U)	1.64 #269
MAT_Heat Transfer Coefficient (U)	1.64 #269
MAT_Rougness	3 #270
MAT_Rougness	3 #270
MAT_Thermal mass	240932 #271
MAT_Thermal mass	240932 #271

ORIENTATION

U-VALUE

THERMAL MASS

Export of the model in IFC format and import into INFINITE BIM-p with verification of the parameters of the imported elements

Live DEMO

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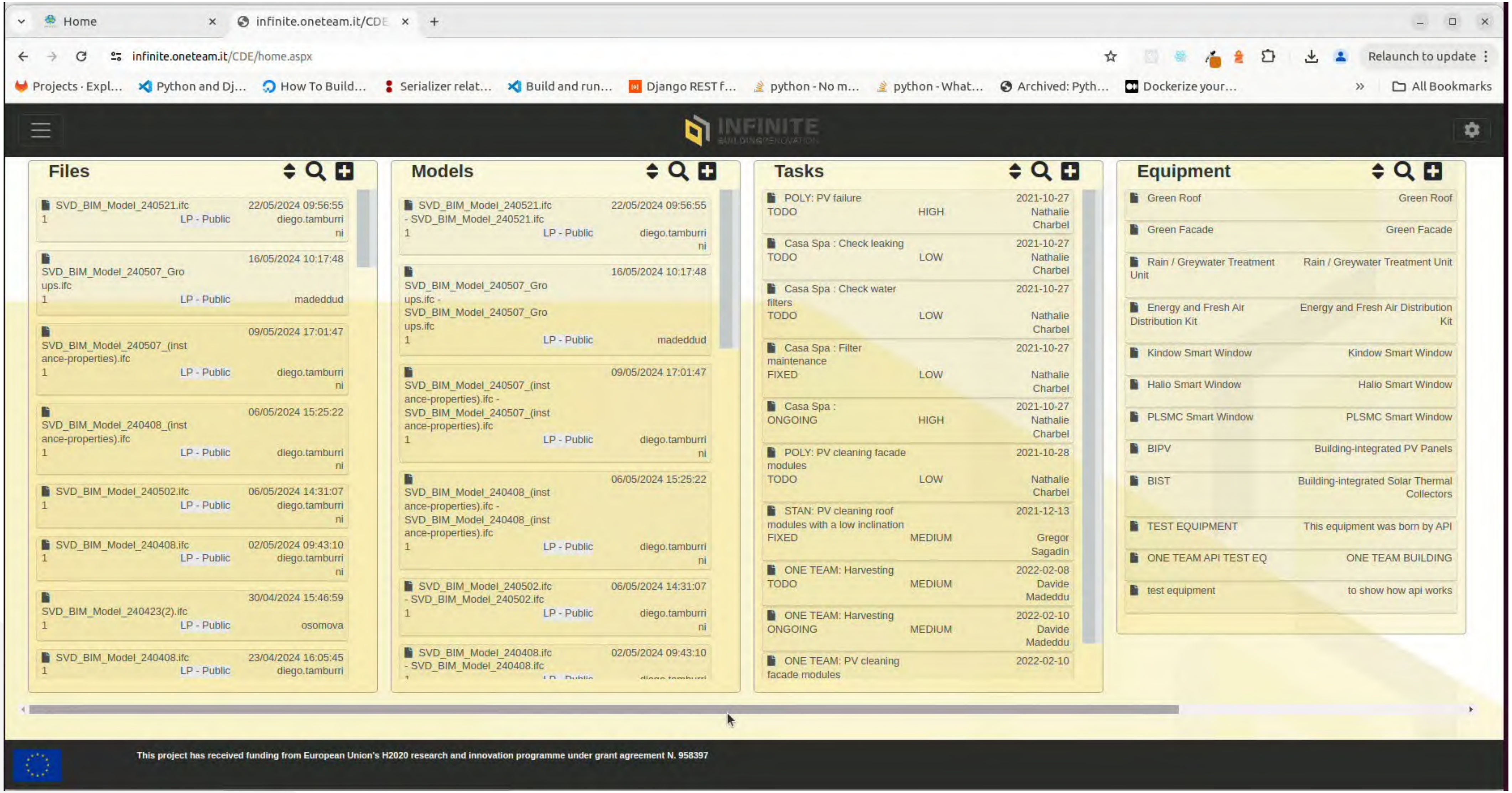


Files

File	Date	Version	Access	User
SVD_BIM_Model_240521.ifc	22/05/2024 09:56:55	1	LP - Public	diego.tamburrini
SVD_BIM_Model_240507_Groups.ifc	16/05/2024 10:17:48	1	LP - Public	madeddud
SVD_BIM_Model_240507_(instance-properties).ifc	09/05/2024 17:01:47	1	LP - Public	diego.tamburrini
SVD_BIM_Model_240408_(instance-properties).ifc	06/05/2024 15:25:22	1	LP - Public	diego.tamburrini
SVD_BIM_Model_240502.ifc	06/05/2024 14:31:07	1	LP - Public	diego.tamburrini
SVD_BIM_Model_240408.ifc	02/05/2024 09:43:10	1	LP - Public	diego.tamburrini
SVD_BIM_Model_240423(2).ifc	30/04/2024 15:46:59	1	LP - Public	osomova
SVD_BIM_Model_240408.ifc	23/04/2024 16:05:45	1	LP - Public	diego.tamburri

Models

Model	Date	Version	Access	User
SVD_BIM_Model_240521.ifc - SVD_BIM_Model_240521.ifc	22/05/2024 09:56:55	1	LP - Public	diego.tamburrini
SVD_BIM_Model_240507_Groups.ifc - SVD_BIM_Model_240507_Groups.ifc	16/05/2024 10:17:48	1	LP - Public	madeddud
SVD_BIM_Model_240507_(instance-properties).ifc - SVD_BIM_Model_240507_(instance-properties).ifc	09/05/2024 17:01:47	1	LP - Public	diego.tamburrini
SVD_BIM_Model_240408_(instance-properties).ifc - SVD_BIM_Model_240408_(instance-properties).ifc	06/05/2024 15:25:22	1	LP - Public	diego.tamburrini
SVD_BIM_Model_240502.ifc - SVD_BIM_Model_240502.ifc	06/05/2024 14:31:07	1	LP - Public	diego.tamburrini
SVD_BIM_Model_240408.ifc - SVD_BIM_Model_240408.ifc	02/05/2024 09:43:10	1	LP - Public	diego.tamburri

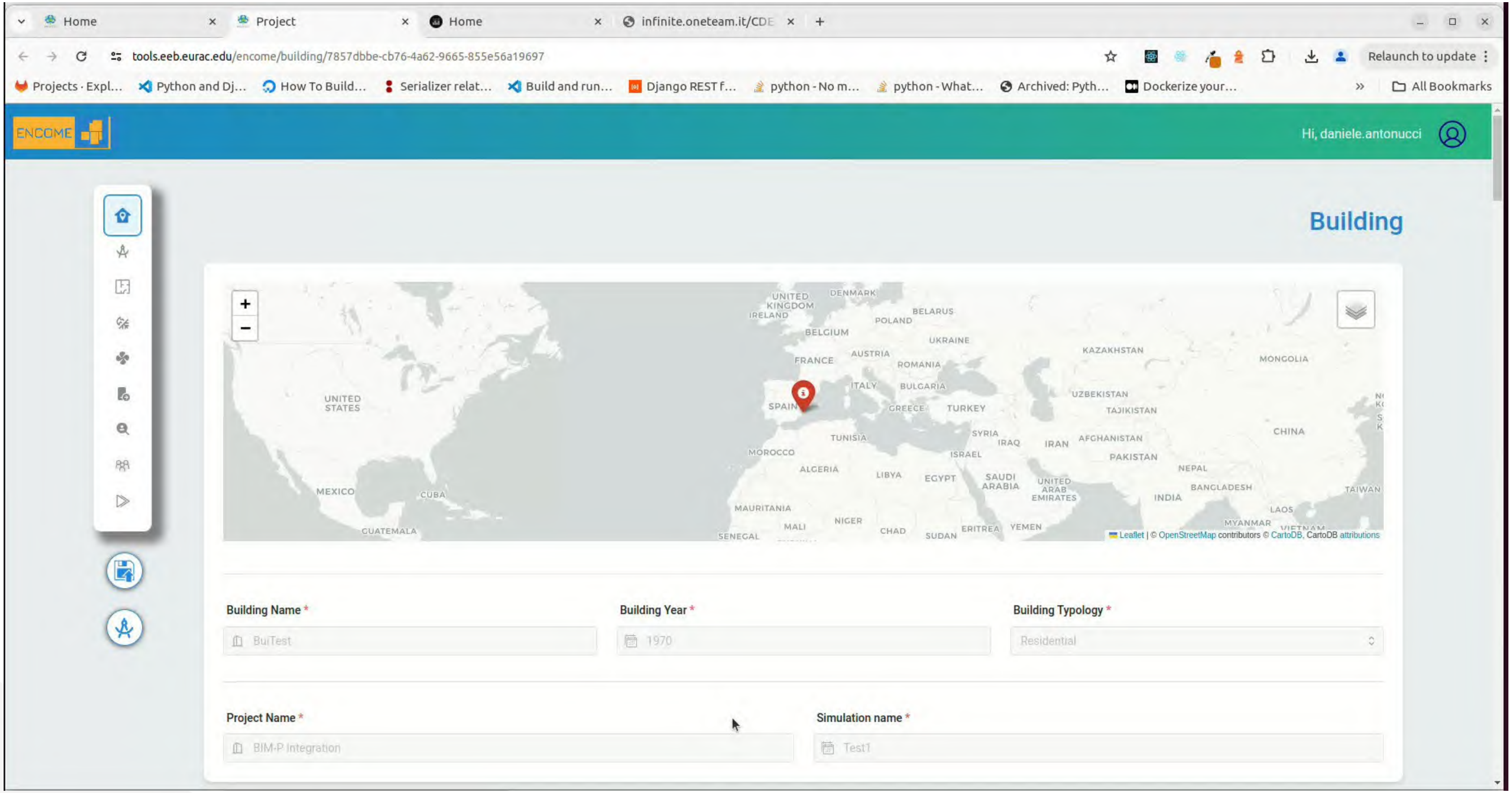
Tasks

Task	Status	Priority	Date	Assignee
POLY: PV failure	TODO	HIGH	2021-10-27	Nathalie Charbel
Casa Spa : Check leaking	TODO	LOW	2021-10-27	Nathalie Charbel
Casa Spa : Check water filters	TODO	LOW	2021-10-27	Nathalie Charbel
Casa Spa : Filter maintenance	FIXED	LOW	2021-10-27	Nathalie Charbel
Casa Spa :	ONGOING	HIGH	2021-10-27	Nathalie Charbel
POLY: PV cleaning facade modules	TODO	LOW	2021-10-28	Nathalie Charbel
STAN: PV cleaning roof modules with a low inclination	FIXED	MEDIUM	2021-12-13	Gregor Sagadin
ONE TEAM: Harvesting	TODO	MEDIUM	2022-02-08	Davide Madeddu
ONE TEAM: Harvesting	ONGOING	MEDIUM	2022-02-10	Davide Madeddu
ONE TEAM: PV cleaning facade modules			2022-02-10	

Equipment

Equipment	Description
Green Roof	Green Roof
Green Facade	Green Facade
Rain / Greywater Treatment Unit	Rain / Greywater Treatment Unit
Energy and Fresh Air Distribution Kit	Energy and Fresh Air Distribution Kit
Kindow Smart Window	Kindow Smart Window
Halio Smart Window	Halio Smart Window
PLSMC Smart Window	PLSMC Smart Window
BIPV	Building-integrated PV Panels
BIST	Building-integrated Solar Thermal Collectors
TEST EQUIPMENT	This equipment was born by API
ONE TEAM API TEST EQ	ONE TEAM BUILDING
test equipment	to show how api works

This project has received funding from European Union's H2020 research and innovation programme under grant agreement N. 958397


Home
Project
Home
infinite.oneteam.it/CDE
tools.eeb.eurac.edu/encome/building/7857dbbe-cb76-4a62-9665-855e56a19697
Relaunch to update
Projects · Expl...
Python and Dj...
How To Build...
Serializer relat...
Build and run...
Django REST f...
python - No m...
python - What...
Archived: Pyth...
Dockerize your...
All Bookmarks
ENCOME
Hi, daniele.antonucci
UNITED KINGDOM
IRELAND
DENMARK
BELARUS
POLAND
BELGIUM
UKRAINE
FRANCE
AUSTRIA
ROMANIA
KAZAKHSTAN
MONGOLIA
ITALY
BULGARIA
SPAIN
GREECE
TURKEY
UZBEKISTAN
TAJIKISTAN
UNITED STATES
CHINA
TUNISIA
SYRIA
IRAQ
IRAN
AFGHANISTAN
MOROCCO
ISRAEL
PAKISTAN
NEPAL
ALGERIA
LIBYA
EGYPT
SAUDI ARABIA
UNITED ARAB EMIRATES
BANGLADESH
TAIWAN
MEXICO
CUBA
INDIA
MAURITANIA
LAOS
MALI
NIGER
CHAD
SUDAN
ERITREA
YEMEN
MYANMAR
GUATEMALA
SENEGAL
Leaflet | © OpenStreetMap contributors © CartoDB, CartoDB attributions

Building

Building Name * BuiTest

Building Year * 1970

Building Typology * Residential

Project Name * BIM-P Integration

Simulation name * Test1

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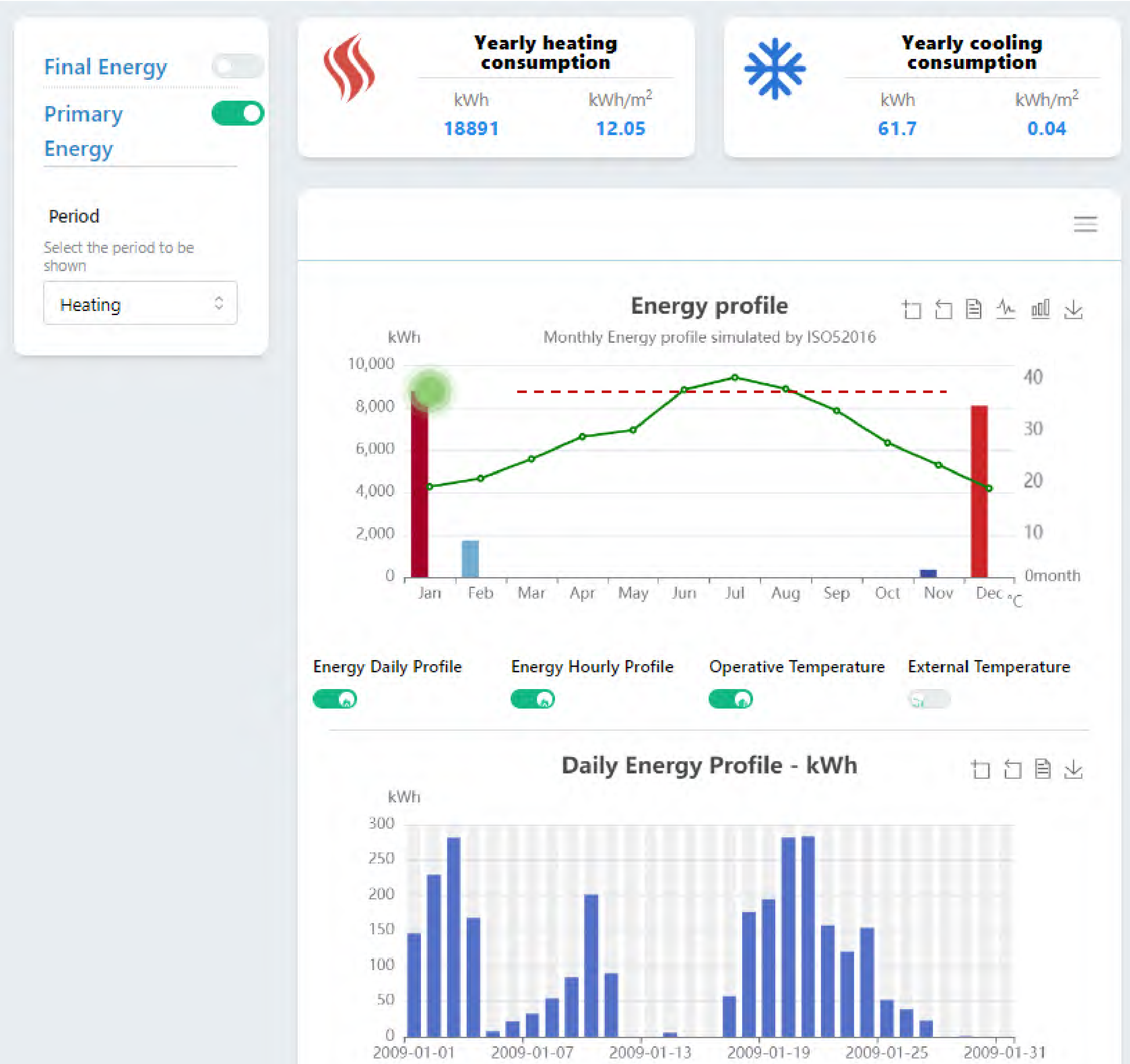
Energy Results



Final Energy ○

Primary Energy ●

Period

Select the period to be shown

Heating

Yearly heating consumption

kWh	kWh/m^2
18891	12.05

Yearly cooling consumption

kWh	kWh/m^2
61.7	0.04

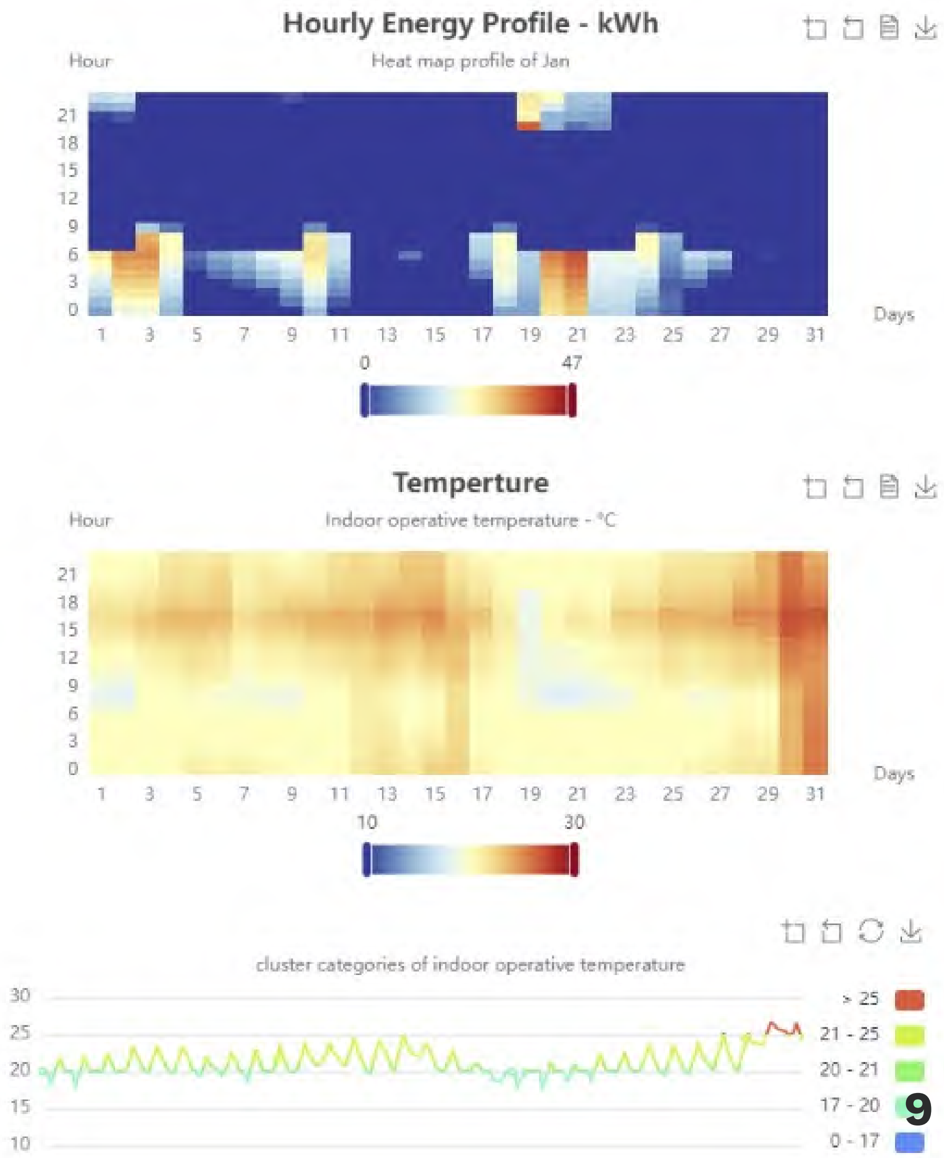
Energy Daily Profile ●

Energy Hourly Profile ●

Operative Temperature ●

External Temperature ○

Energy profile
Monthly Energy profile simulated by ISO52016
kWh
10,000
8,000
6,000
4,000
2,000
0
40
30
20
10
0month
°C
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Daily Energy Profile - kWh
kWh
300
250
200
150
100
50
0
2009-01-01
2009-01-07
2009-01-13
2009-01-19
2009-01-25
2009-01-31



Simulate, Innovate, and Elevate

Energy Conservation Measures makes your building

Consortium

Coordinator

eurac research

Project Partners

HUYGEN INGENIEURS & ADVISEURS

GreenDelta

EDERA

GRÜN STATT GRAU

one team

nobatek INEF4 INSTITUT POUR LA TRANSITION ENERGETIQUE

BOUYGUES CONSTRUCTION

RUBNER

LEITAT managing technologies

IRI UL Institute for Innovation and Development of University of Ljubljana

GENERALITAT VALENCIANA
Vicepresidencia Segunda
y Conselleria de Vivienda
y Arquitectura Bioclimática

IVE INSTITUTO VALENCIANO de la EDIFICACIÓN

NextSense

SYNAGE

SERNEO ÉTUDES & INNOVATIONS TECHNIQUES

VORTICE

CASA SPA

vilogia

Stanovanjskopodjetje

FANTI GROUP COSTRUIRE IN LEGNO

INFINITE
BUILDINGRENOVATION

Thank you

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