D3.4_PHPP Result Sheets

DRAFT

CS03

Hotel Restaurant Valcanover

INTELLIGENT ENERGY – EUROPE II

Energy efficiency and renewable energy in buildings

IEE/12/070

EuroPHit

[Improving the energy performance of step-by-step refurbishment and integration of renewable energies]

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Abstract

This document provides a short overview of the efficiency improvement of a step-by-step refurbishment to EnerPHit standard to be undertaken for the project Hotel Restaurant Valcanover

First, the result sheet of the project´ s current status will present the calculated energy consumption of the existing building.

The PHPP result sheet of the completed EnerPHit retrofit will present the energy demand estimated for the completion of the project according to the overall refurbishment plan . The EnerPHit standard will be achieved by refurbishing the existing building according to the Passivhaus principles. The thermal protection of all the dissipating surfaces will be improved by adding an external insulation. The airtightness of the building will be realized taking care of realizing a continuous layer in all the connection points. The existing windows will be replaced with triple glazed windows with insulated frame. Furthermore the building will also be enlarged adding two new volumes and using Passivhaus suitable components. From the point of view of the building services we will install four different ventilation units with heat recovery and we will replace the existing gas boiler with a more efficient heat generator, probably a water-water heat pump. We will add photovoltaic panels on the roof.

Figure 1: The existing building [ZEPHIR, 2013]

Existing building: PHPP Result Sheet

1.1 PHPP Result sheet of the existing building

EnerPHit verification

Building:	Hotel Restaurant Valcanover
Street:	
Postcode/City:	
Country:	Italy
Building type:	Masonry construction
Climate:	Pergine
Altitude of building site (in [m] above sea level):	459
Home owner/client:	
Street:	
Postcode/City:	

Architecture:		Mechanical System:	
Street:		Street:	
Postcode/City:		Postcode/City:	
Energy consulting:	ZEPHIR	Certification:	
Street:		Street:	
Postcode/City:	Pergine Valsugana	Postcode/City:	

Year of Construction:	1928	Interior temperature winter [C°]	20.0	Interior temp. summer [C°]	25.0
Number of dwelling units:	1	Internal heat gains winter [W/m²]	9.4	IHG summer [W/m²]	9.9
Number of Occupants:	37.0			Spec. capacity [Wh/K per m² TFA]	204
Exterior vol. V_e:	2948.8 m³			Mechanical cooling:	x

Specific building demands with reference to the treated floor area

				Requirements	Fulfilled?*
	Treated floor area	584.6	m²		
Space heating	Annual heating demand	**269**	**kWh/(m²a)**	25 kWh/(m²a)	**no**
	Heating load	**128**	**W/m²**	-	**-**
Space cooling	Overall specific space cooling demand	**4**	**kWh/(m²a)**	-	**-**
	Cooling load	**13**	**W/m²**	-	**-**
	Frequency of overheating (> 25 °C)		%	-	**-**
Primary Energy	Heating, cooling, dehumidifying, DHW,	**868**	**kWh/(m²a)**	425 kWh/(m²a)	**no**
	DHW, space heating and auxiliary electricity	445	kWh/(m²a)	-	**-**
	Specific primary energy reduction through solar electricity		kWh/(m²a)	-	**-**
Airtightness	Pressurization test result n_{50}	**10.0**	**1/h**	1 1/h	**no**

* empty field: data missing; '-': no requirement

I confirm that the values given herein have been determined following the PHPP methodology and were determined based on the characteristics of the building. The PHPP calculations are attached to this application.

EnerPHit building retrofit (acc. to heating demand)? **no**

Name: ______ Company: ______ Registration number PHPP: ______

Surname: ______ Issued on: ______

Signature

Figure 2: Specific energy efficiency values of the existing building modelled with PHPP 9 Beta

2 Retrofit steps

2.1 Overall refurbishment Plan

2.1.1 Retrofit steps:

The building will be probably refurbished in four different steps. A detailed plan of the different steps with a detailed time schedule has not been developed so far. Here we present a preliminary plan of the possible steps.

The building will not only be refurbished, some parts will also be demolished and some new extension will be realized. In particular the second floor will be demolished and reconstructed with a larger treated floor area. Also at the ground level a new extension will be constructed in order to increase the area devoted to the restaurant. All the new parts of the building will be realized using cross laminated timber.

Step	Year	Measure	Specific Heating Demand	Specific Primary Energy Demand	Additional Specific Renewable Energy Gains
0	2013	Existing	269 kWh/m^{2}a	868 kWh/m^{2}a	
1	2015	Demolition and reconstruction of the second floor of the building	98.2 kWh/m^{2}a		
2	2016	Realization of the extension of the ground level and insulation of all the external walls	31.2 kWh/m^{2}a		
3	2017	Energy retrofitting of the existing part of the ground level (windows, airtightness, ventilation, floor slab insulation)	27.5 kWh/m^{2}a		
4	2018	Energy retrofitting of the existing part of the first level (windows, airtightness, ventilation)	17.8 kWh/m^{2}a		

Figure 3: Overview refurbishment steps

2.1.2 Efficiency Improvements

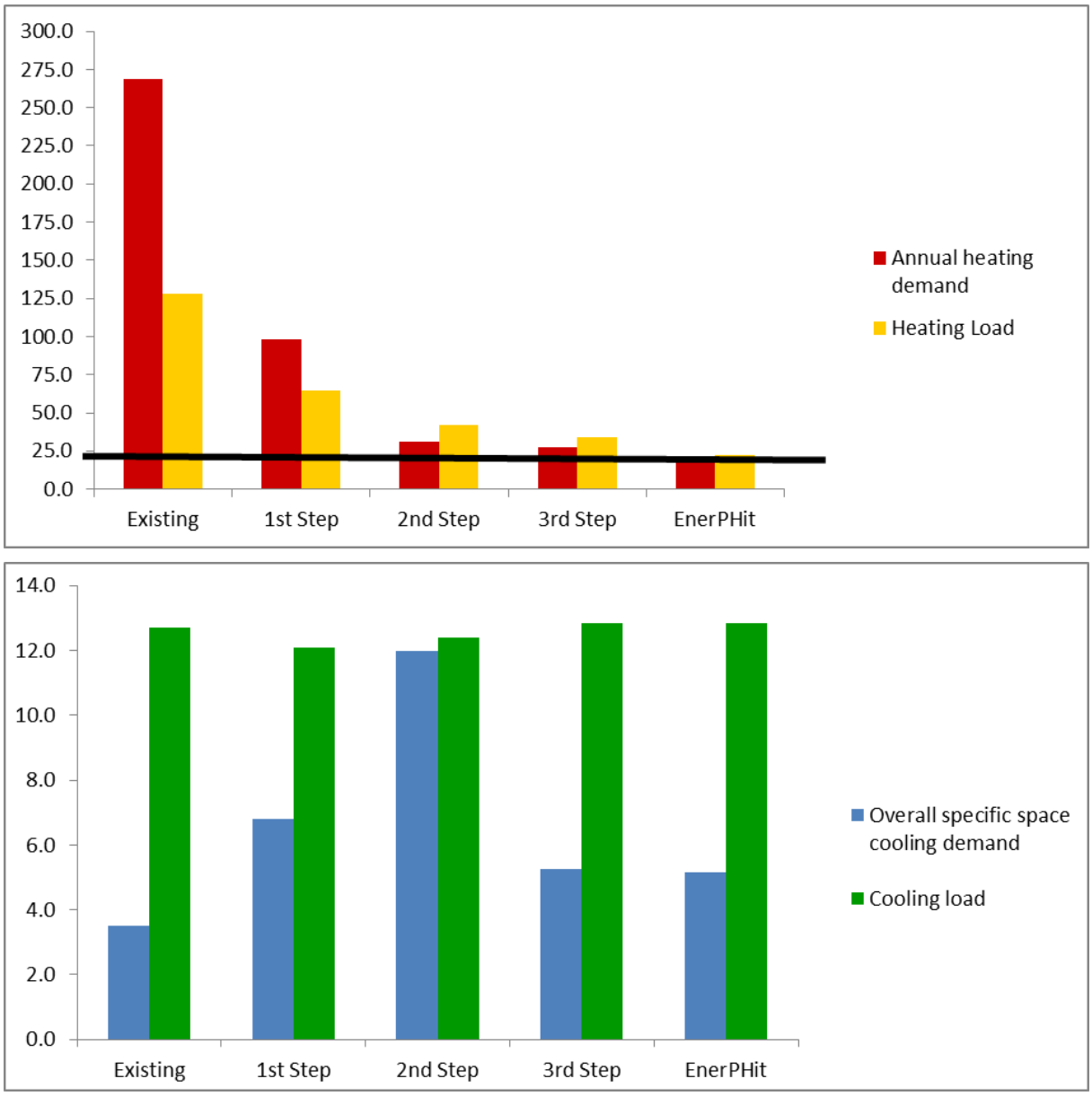

Figure 4: Overview energy efficiency improvement according to the overall refurbishment plan

3 Completion of step-by-step refurbishment to EnerPHit

3.1 PHPP Result Sheet of the completed EnerPHit standard

EnerPHit verification

Building:	Hotel Restaurant Valcanover		
Street:			
Postcode/City:			
Country:	Italy		
Building type:	Masonry construction		
Climate:	Pergine		
Altitude of building site (in [m] above sea level):	459		
Home owner/client:			
Street:			
Postcode/City:			
Architecture:		Mechanical System:	
Street:		Street:	
Postcode/City:		Postcode/City:	
Energy consulting:	ZEPHIR	Certification:	
Street:		Street:	
Postcode/City:	Pergine Valsugana	Postcode/City:	
Year of Construction:	1928	Interior temperature winter [C°]	20.0
Number of dwelling units:	1	Internal heat gains winter [W/m²]	9.4
Number of Occupants:	37.0		
Exterior vol. V_e:	3281.5 m³		
Interior temp. summer [C°]	25.0		
IHG summer [W/m²]	9.9		
Spec. capacity [Wh/K per m² TFA]	204		
Mechanical cooling:	x		

Specific building demands with reference to the treated floor area

				Requirements	Fulfilled?*
	Treated floor area	723.4	m²		
Space heating	Annual heating demand	18	kWh/(m²a)	25 kWh/(m²a)	yes
	Heating load	22	W/m²	-	-
Space cooling	Overall specific space cooling demand	5	kWh/(m²a)	-	-
	Cooling load	13	W/m²	-	-
	Frequency of overheating (> 25 °C)		%	-	-
Primary Energy	Heating, cooling, dehumidifying, DHW,		kWh/(m²a)	123 kWh/(m²a)	
	DHW, space heating and auxiliary electricity		kWh/(m²a)	-	-
	Specific primary energy reduction through solar electricity		kWh/(m²a)	-	-
Airtightness	Pressurization test result n_{50}	1.0	1/h	1 1/h	yes

* empty field: data missing; '-': no requirement

EnerPHit building retrofit (acc. to heating demand)?

I confirm that the values given herein have been determined following the PHPP methodology and were determined based on the characteristics of the building. The PHPP calculations are attached to this application.

Name:	Company:	Registration number PHPP:
Surname:	Issued on:	
		Signature

Figure 5: Specific energy efficiency values of the completed project modelled with PHPP 9 Beta