EuroPHit

D3.4_PHPP Result Sheets

DRAFT

CS15

André Tournon Sur Rhône

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]

Contract N°: SI2.645928

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Technical References

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Project Title	Improving the energy performance of step-by-step refurbishment and integration of renewable energies
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Table of Contents

List of tables and figures

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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 André.

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 .

1 Existing building: PHPP Result Sheet

1.1 PHPP Result sheet of the existing building

EnerPHit verification

Building:	House Andre Tournon Sur Rhone
Street:	
Postcode/City:	Tournon sur Rhone
Country:	France
Building type:	Single Family House
Climate:	Tournon avec masque LAMP Temp 1960-1990
Altitude of building site (in [m] above sea level):	168
Home owner/client:	Andre
Street:	
Postcode/City:	

Architecture:		Mechanical System:	
Street:		Street:	
Postcode/City:		Postcode/City:	
Energy consulting:		Certification:	
Street:		Street:	
Postcode/City:		Postcode/City:	

Year of Construction:	2014	Interior temperature winter [C°]	20.0	Interior temp. summer [C°]	25.0
Number of dwelling units:	1	Internal heat gains winter [W/m²]	2.1	IHG summer [W/m²]	2.1
Number of Occupants:	4.4			Spec. capacity [Wh/K per m² TFA]	180
Exterior vol. V_e:	731.7 m³			Mechanical cooling:	

Specific building demands with reference to the treated floor area

				Requirements	Fulfilled?*
	Treated floor area	155.0	m²		
Space heating	Annual heating demand	173	kWh/(m²a)	25 kWh/(m²a)	no
	Heating load	71	W/m²	-	-
Space cooling	Overall specific space cooling demand		kWh/(m²a)	-	-
	Cooling load		W/m²	-	-
	Frequency of overheating (> 25 °C)	0.0	%	-	-
Primary Energy	Heating, cooling, dehumidifying, DHW,	463	kWh/(m²a)	310 kWh/(m²a)	no
	DHW, space heating and auxiliary electricity	422	kWh/(m²a)	-	-
	Specific primary energy reduction through solar electricity		kWh/(m²a)	-	-
Airtightness	Pressurization test result n_{50}	5.0	1/h	1 1/h	no

EnerPHit (Modernisierung): Bauteilkennwerte

Building envelope	Exterior insulation to ambient air	0.25	W/(m²K)	-	-
Average U-Values	Exterior insulation underground	1.96	W/(m²K)	-	-
	Interior insulation to ambient air	0.45	W/(m²K)	-	-
	Interior insulation underground	0.44	W/(m²K)	-	-
	Thermal bridges ΔU	0.03	W/(m²K)	-	-
	Windows	2.67	W/(m²K)	-	-
	External doors	2.50	W/(m²K)	-	-
Ventilation system	Effective heat recovery efficiency	0	%	-	-

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

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

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

Retrofit steps

1.2 Overall refurbishment Plan

1.2.1 Retrofit steps:

The first step is chosen as to create the largest energy reduction upfront: retrofit of walls, windows and installation of a new MVHR unit can reduce the heating demand by 55%. An average n50 of 3.5 h-1 is assumed after realisation of this first step.

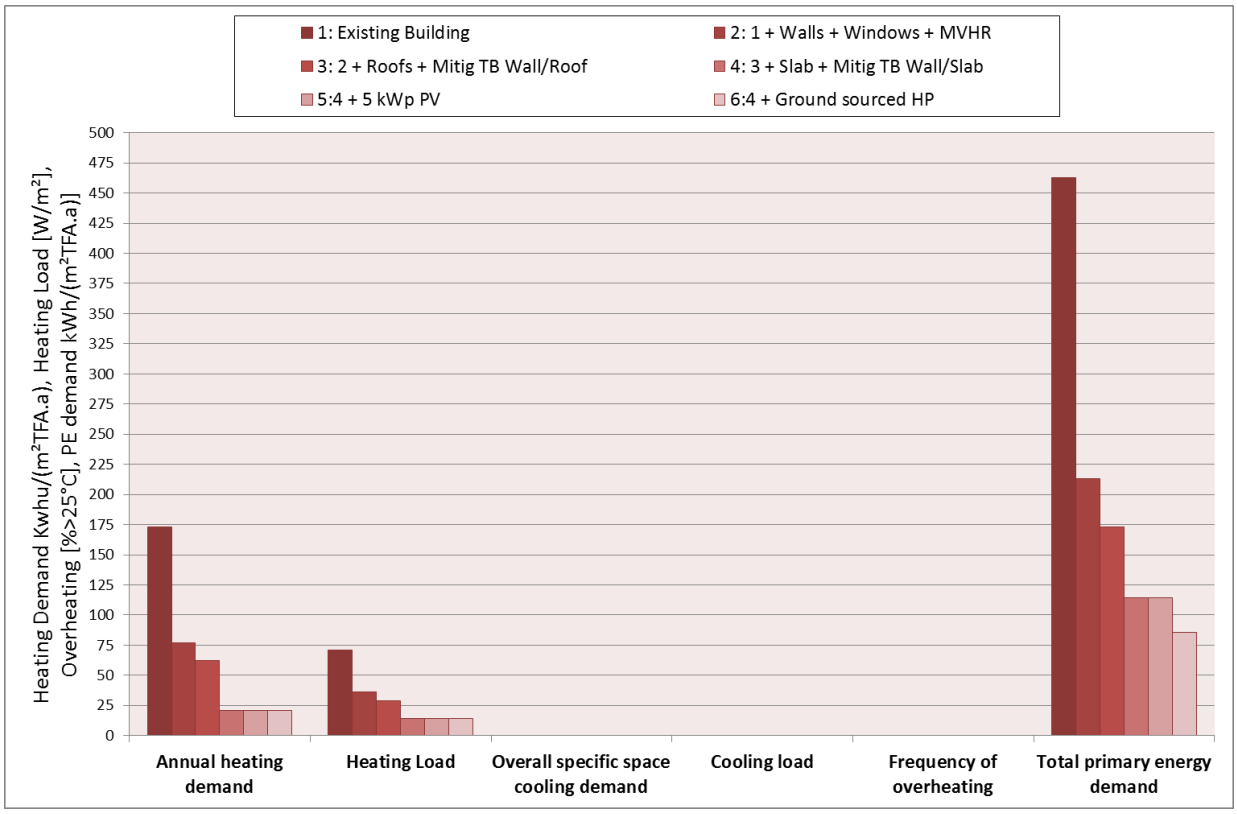
After the second step with installation of a new roof, the reduction in energy demand is less visible as the roof is already relatively well insulated. An average n50 of 2.5 is assumed at the end of this second step.

The final third step will bring another significant gain on energy efficiency as slabs will be insulated from the basement, and the staircase will be insulated from the inside with an airtight door between the staircase and the basement.The required EnerPHit airtightness level n50=1 h-1 will be obtained at this stage.

Step	Year	Measure	Specific Heating Demand	Specific Primary Energy Demand	Specific Useful Energy from Renewable Sources
1	2013	Existing Building	173	463	0
2	2015	Walls + Windows + MVHR	78	215	0
3	2016	Roofs	70	190	0
4	2017	Slabs	22	114	0
5	2020	5 kW PV	22	114	37
6 (instead of 5)	2025	6 kW Brine heat pump with ground probes	22	86	48

Figure 2: Overview refurbishment steps

1.2.2 Efficiency Improvements



Figue 3: Overview energy efficiency improvement according to the overall refurbishment plan

2 Completion of step-by-step refurbishment to EnerPHit

2.1 PHPP Result Sheet of the completed EnerPHit standard

EnerPHit verification

Building:	House Andre Tournon Sur Rhone
Street:	
Postcode/City:	Tournon sur Rhone
Country:	France
Building type:	Single Family House
Climate:	Tournon avec masque LAMP Temp 1960-1990
Altitude of building site (in [m] above sea level):	168
Home owner/client:	Andre
Street:	
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Architecture:		Mechanical System:	
Street:		Street:	
Postcode/City:		Postcode/City:	
Energy consulting:		Certification:	
Street:		Street:	
Postcode/City:		Postcode/City:	

Year of Construction:	2014	Interior temperature winter [C°]	20.0	Interior temp. summer [C°]	25.0
Number of dwelling units:	1	Internal heat gains winter [W/m²]	2.1	IHG summer [W/m²]	2.1
Number of Occupants:	4.4			Spec. capacity [Wh/K per m² TFA]	180
Exterior vol. V_e:	731.7 m³			Mechanical cooling:	

Specific building demands with reference to the treated floor area

				Requirements	Fulfilled?*
	Treated floor area	155.0	m²		
Space heating	Annual heating demand	21	kWh/(m²a)	25 kWh/(m²a)	yes
	Heating load	14	W/m²	-	-
Space cooling	Overall specific space cooling demand		kWh/(m²a)	-	-
	Cooling load		W/m²	-	-
	Frequency of overheating (> 25 °C)	0.0	%	-	-
Primary Energy	Heating, cooling, dehumidifying, DHW,	114	kWh/(m²a)	127 kWh/(m²a)	yes
	DHW, space heating and auxiliary electricity	74	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

EnerPHit (Modernisierung): Bauteilkennwerte

Building envelope	Exterior insulation to ambient air	0.11	W/(m²K)	-	-
Average U-Values	Exterior insulation underground	0.16	W/(m²K)	-	-
	Interior insulation to ambient air	0.10	W/(m²K)	-	-
	Interior insulation underground	0.12	W/(m²K)	-	-
	Thermal bridges ΔU	0.01	W/(m²K)	-	-
	Windows	0.87	W/(m²K)	-	-
	External doors	0.80	W/(m²K)	-	-
Ventilation system	Effective heat recovery efficiency	92	%	-	-

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

EnerPHit building retrofit (acc. to heating demand)? yes

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