

# REPORT

PUBLIC



## CS 09: AJENA, LONS LE SAUNIER

### RENOVATION APPROACH DOCUMENT

**outPHit**

Deep retrofits made faster, cheaper and more reliable

Call: H2020-LC-SC3-2018-2019-2020 / H2020-LC-SC3-EE-2020-1

**Deliverable D5.2**

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#### OUTPHIT – DEEP RETROFITS MADE FASTER, CHEAPER AND MORE RELIABLE

outPHit pairs such approaches with the rigour of Passive House principles to make deep retrofits cost-effective, faster and more reliable. On the basis of case studies across Europe and in collaboration with a wide variety of stakeholders, outPHit is addressing barriers to the uptake of high quality deep retrofits while facilitating the development of high performance renovation systems, tools for decision making and quality assurance safeguards.

[outphit.eu](http://outphit.eu)



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# **CS07\_AJENA\_LONS LE SAUNIER**

## Renovation Approach Description

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# **CS07\_AJENA\_LONS LE SAUNIER**

Renovation Approach Description

## **1. Executive Summary**

### **FR-CS09, AJENA, Lons le Saunier**



#### **ORIGINAL SITUATION**

1960 concrete built NONRES Building in the outskirts of Lons le Saunier. The building is used as a training centre for the activities of AJENA (training on retrofit!). A well renovated building would be a big plus

#### **MODERNISATION PROPOSAL**

Semi prefabricated global retrofit to EnerPHit level thanks prefabricated North wall and mounted on spot on the South wall. Triple glaze and Comfort ventilation

#### **EFFICIENCY IMPROVEMENT**

The improvement of an EnerPHit renovated building is huge in this cold part of Jura near Geneva: it shows a plus 10x reduction on heating demand

#### **PHPP VERIFICATION SHEET BEFORE RETROFIT**

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## Renovation Approach Description

<sup>2</sup>champ vide: les données sont manquantes; "-": Aucune exigence

## PHPP VERIFICATION SHEET AFTER RETROFIT

## ACTUAL TENDER VERSION

Caractéristiques du bâtiment rapportées à la Surface de Référence Energétique						
	Surface de Référence Energétique m <sup>2</sup>				Critères alternatifs	Conforme?
Chauffer	Besoin de chauffage kWh/(m <sup>2</sup> a)	25			-	oui
	Puissance de chauffe W/m <sup>2</sup>	15			-	-
					10	
Refroidir	froidissement + déshumidification kWh/(m <sup>2</sup> a)	-			-	-
	Puissance de refroidissement W/m <sup>2</sup>	-			-	oui
	Fréquence de surchauffe (> 25°C) %	7			20	oui
	Fréquence d'humidité excessive (> 12 g/kg) %	0				oui
Etanchéité à l'air	Test d'infiltrométrie n <sub>50</sub> 1/h	1,0			1,0	oui
					132	oui
Energie primaire non-renouvelable (EP)	Consommation d' EP kWh/(m <sup>2</sup> a)	116			-	-
	Consommation d'EP-R kWh/(m <sup>2</sup> a)	85			-	-
	Production d'énergie renouvelable (par rapport à kWh/(m <sup>2</sup> a) l'emprise au sol de la zone bâtie)	150			-	-

<sup>2</sup>champ vide: les données sont manquantes; "-": Aucune exigence

**ENERPHIT VERSION WITH Ext Insulation & Prefabs modules (VIP)**

Caractéristiques du bâtiment rapportées à la Surface de Référence Energétique					
	Surface de Référence Energétique m <sup>2</sup>		Critères alternatifs		Conforme ?
Chauffer	Besoin de chauffage kWh/(m <sup>2</sup> a)	278,1	≤ 25	-	oui
	Puissance de chauffe W/m <sup>2</sup>	14	-	-	-
Refroidir	froidissement + déshumidification kWh/(m <sup>2</sup> a)	12	≤ -	-	-
	Puissance de refroidissement W/m <sup>2</sup>	-	-	-	-
Fréquence de surchauffe (> 25°C) %		11	≤ -	-	non
	Fréquence d'humidité excessive (> 12 g/kg) %	0	≤ 10	20	oui
Etanchéité à l'air	Test d'infiltrométrie n <sub>50</sub> 1/h	1,0	≤ 1,0		oui
Energie primaire non-renouvelable (EP)	Consommation d' EP kWh/(m <sup>2</sup> a)	101	≤ 120		oui
Energie primaire renouvelable (EP-R)	Consommation d'EP-R kWh/(m <sup>2</sup> a)	65	≤ -	-	-
	Production d'énergie renouvelable (par rapport à l'emprise au sol de la zone bâtie)	150	IV -	-	-

<sup>2</sup>champ vide; les données sont manquantes; "-"; Aucune exigence

## CURRENT SITUATION

Work on site on hybrid concept: Int insulation, prefab module setup on site.

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## Renovation Approach Description

### **CHALLENGES OF THE PROJECT**

Int. Insulation to prefab module set up on site

### **RENOVATION APPROACH USED**

Internal Insulation on the “blind” north wall. On the south wall: mounted on site “wooden boxes” to hold insulation. Comfort ventilation with high performance heat recovery. Air tightness and reduced thermal bridges

### **OTHER DOWNLOADABLE MATERIALS (optional)**

Pictures of the work on site



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## Renovation Approach Description



# **CS07\_AJENA\_LONS LE SAUNIER**

Renovation Approach Description

## **2. Description of the existing building**

Short description of existing building

Add an outside picture

### **2.1. Building data**

Year of construction:	1960
Treated Floor Area:	278
Number of floors:	2
Number of apartments:	
Building typology (residential / other):	nonres
Main construction type (e.g. massive)	masonry

### **2.2. Owner data**

Name:	Ajena,	Association	Jurassienne	Energie
Renouvelable				
City:	Lons Le Saunier			
Type (private / housing association):	Association			

### **2.3. Location description**

Jura, Alpine climate, Geneva climate data

### **2.4. Original situation**

Very simple reinforced concrete building. Plain façade. No renovation since beginning

### **2.5. Plans and pictures of the existing building**

- Plans: 1 Groundfloor Plan / 1 section or elevation if available
- Pictures: 1-2 pictures maximum, inside or outside

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## Renovation Approach Description

### Envelope of the existing building

#### **External walls**

Material:	Reinforced concrete
Thickness:	55 [cm]
Surface (Render / Brick / Cladding):	concrete
U-Value:	2,245 [W/(m <sup>2</sup> K)]

#### **Floor slab / Basement ceiling**

Material:	Reinforced concrete + slab
Thickness:	305 [cm]
Surface (Render / Brick / Cladding):	xxx
U-Value:	2,8 [W/(m <sup>2</sup> K)]

#### **Roof / Top floor ceiling**

Material:	Tiles
Thickness:	4,1 [cm]
Surface (Render / Brick / Cladding):	xxx
U-Value:	xxx [W/(m <sup>2</sup> K)]

#### **Windows**

Material:	Simple glazing
Thickness:	xxx [cm]
Material (Wood / Plastic / Aluminium):	xxx
U-Value (Uw, installed):	5 [W/(m <sup>2</sup> K)]

## **2.6. Technical equipment of the existing building**

#### **Ventilation**

Ventilation concept:	windows ventilation
Add short description if required	

#### **Heating, Cooling and DHW**

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## Renovation Approach Description

Heating:	fuel
Cooling:	none
Domestic hot water:	fuel

## 2.7. Energy efficiency of the existing building

### Passive House Planning Package (PHPP)

PHPP calculation:	PHPP_9.6
Space heating demand:	361 [kWh/(m <sup>2</sup> a)]
Heating Load:	121 [W/m <sup>2</sup> ]
Overheating frequency:	9 %
Cooling demand:	- [kWh/(m <sup>2</sup> a)]
Cooling Load:	- [W/m <sup>2</sup> ]
Primary Energy Demand:	607 [kWh/(m <sup>2</sup> a)]
PER Demand:	748 [kWh/(m <sup>2</sup> a)]

### Final Energy demand

Final energy demand gas:	0 [kWh/(m <sup>2</sup> a)]
Final energy demand oil:	361 [kWh/(m <sup>2</sup> a)]
Final energy demand electricity:	607/2,58 [kWh/(m <sup>2</sup> a)]
Final energy demand other:	0 [kWh/(m <sup>2</sup> a)]

### Available consumption before renovation

Annual energy consumption gas:	0 [kWh/(m <sup>2</sup> a)]
Annual energy consumption oil:	361 [kWh/(m <sup>2</sup> a)]
Annual energy consumption electricity:	607/2,58 [kWh/(m <sup>2</sup> a)]
Annual energy consumption other:	0 [kWh/(m <sup>2</sup> a)]

### Available energy costs before renovation

Annual energy costs gas:	unk [€/(m <sup>2</sup> a)]
Annual energy costs oil:	unk [kWh/(m <sup>2</sup> a)]
Annual energy costs electricity:	unk [kWh/(m <sup>2</sup> a)]
Annual energy costs other:	unk [kWh/(m <sup>2</sup> a)]

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## Renovation Approach Description

### PHPP verification sheet before retrofit

Caractéristiques du bâtiment rapportées à la Surface de Référence Energétique			Critères alternatifs	Conforme? <sup>2</sup>
	≤	≥		
<b>Chauffer</b>				
Surface de Référence Energétique m <sup>2</sup>	278,1			
Besoin de chauffage kWh/(m <sup>2</sup> a)	361			
Puissance de chauffe W/m <sup>2</sup>	121			
<b>Refroidir</b>				
froidissement + déshumidification kWh/(m <sup>2</sup> a)	-			
Puissance de refroidissement W/m <sup>2</sup>	-			
Fréquence de surchauffe (> 25°C) %	9			
Fréquence d'humidité excessive (> 12 g/kg) %	0			
<b>Etanchéité à l'air</b>				
Test d'infiltrométrie n <sub>50</sub> 1/h	1,0			
<b>Energie primaire non-renouvelable (EP)</b>				
Consommation d' EP kWh/(m <sup>2</sup> a)	607			
<b>Energie primaire renouvelable (EP-R)</b>				
Consommation d'EP-R kWh/(m <sup>2</sup> a)	748			
Production d'énergie renouvelable (par rapport à kWh/(m <sup>2</sup> a) l'emprise au sol de la zone bâtie)	150			
			Critères	
			25	-
			-	-
			10	
			-	20
			1,0	
			-	
			376	391
			120	136

<sup>2</sup>champ vide: les données sont manquantes; "-": Aucune exigence

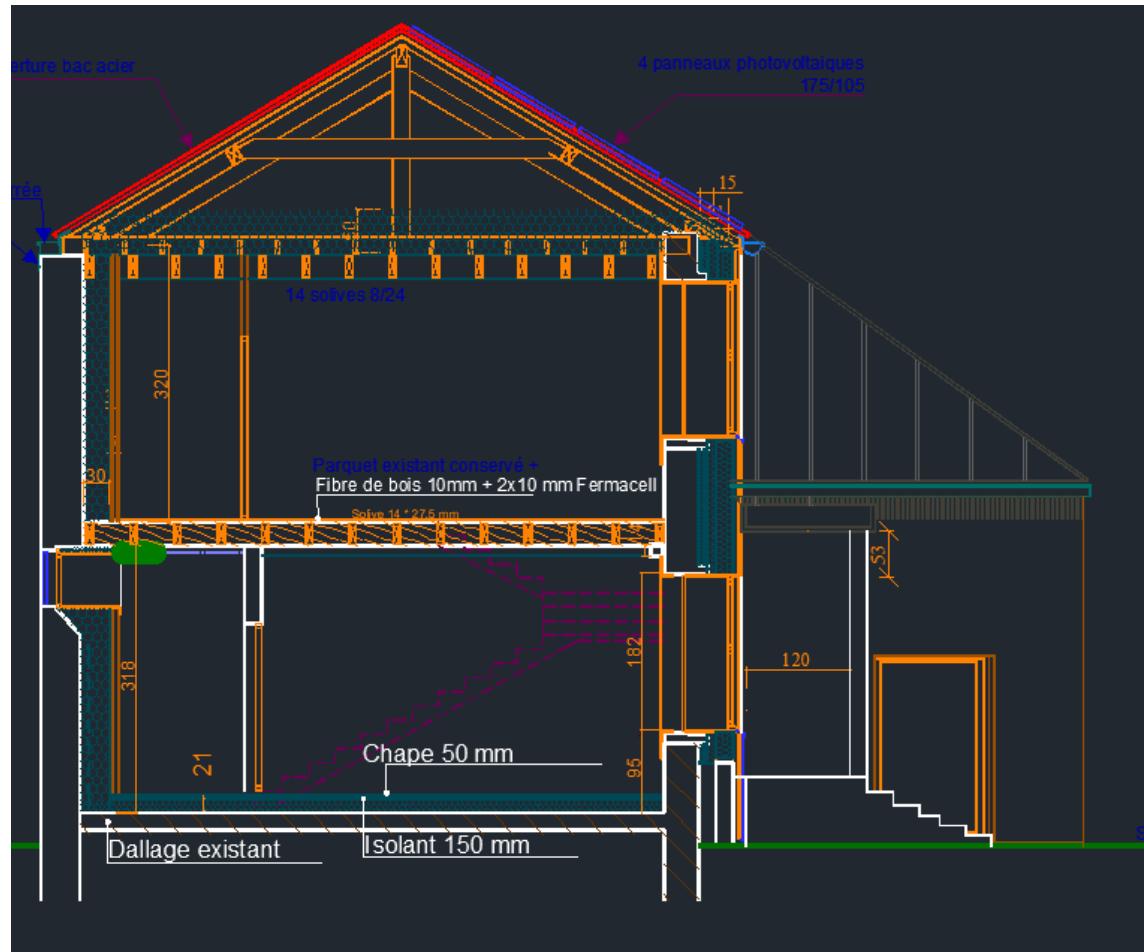
# CS07\_AJENA\_LONS LE SAUNIER

## Renovation Approach Description

### 3. Renovation approach description

Short description of renovation approach building:

- Interior insulation on north wall
- Exterior insulation on south wall
- Air tightness, comfort ventilation with HR
- RES implemented on south roof



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## Renovation Approach Description



FACADE SUD-EST

### 3.1.

#### EnerPHit standard approach

EnerPHit standard target (class):	Classic? Plus?
Climate Zone	cool temperate
EnerPHit verification method:	calculation

### 3.2. Design / Consultancy teams

Name:	Ahlem Paris / Plan9
City:	Lons le Saunier/ Nancy
Type (private / housing association)	SARL

### 3.3. Design / Construction periods

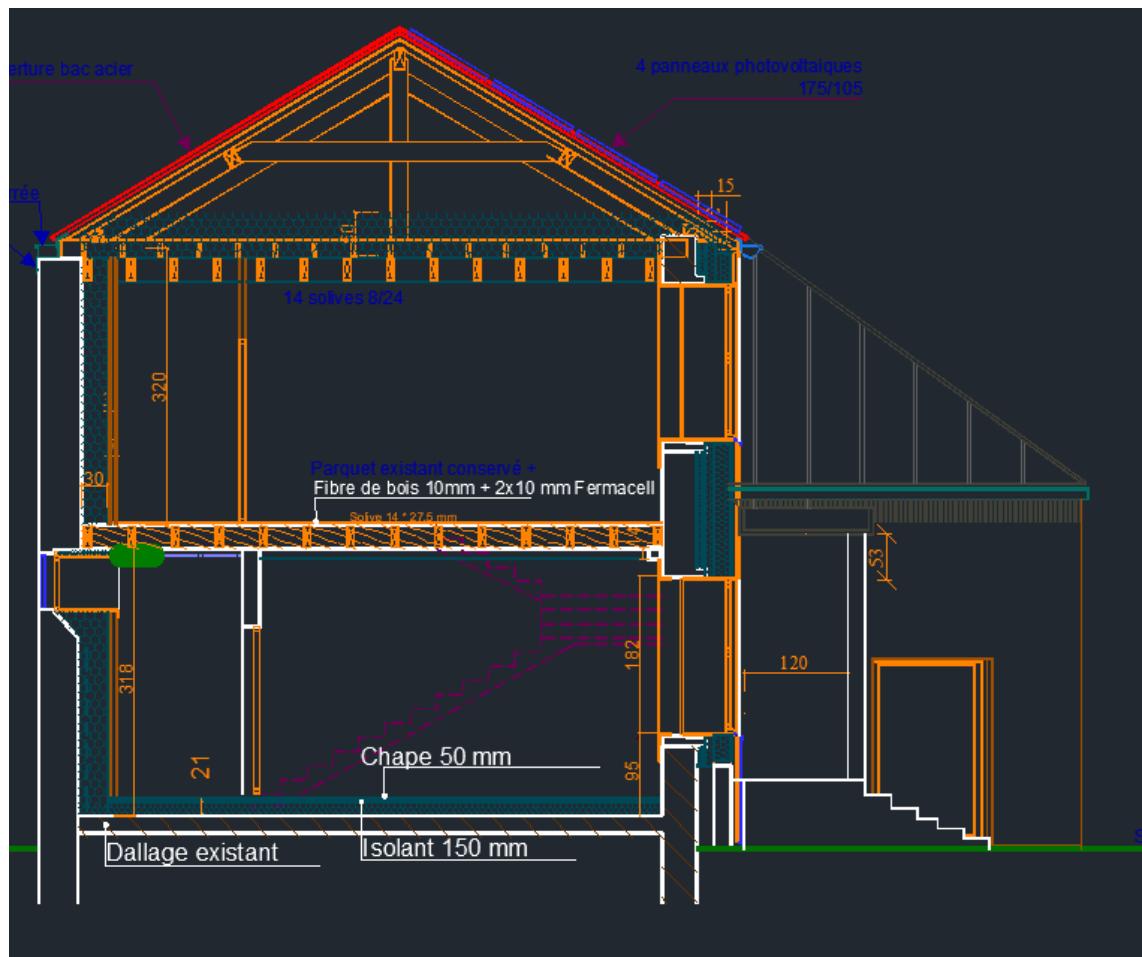
Design period:	xx.2020 – xx.2022
Construction period:	xx.2022 – xx.2023

### 3.4. Plans and pictures of the renovation

- Plans: 1-2 Groundfloor Plans / 1 section and elevation if available
- Details: 2-3 connection details

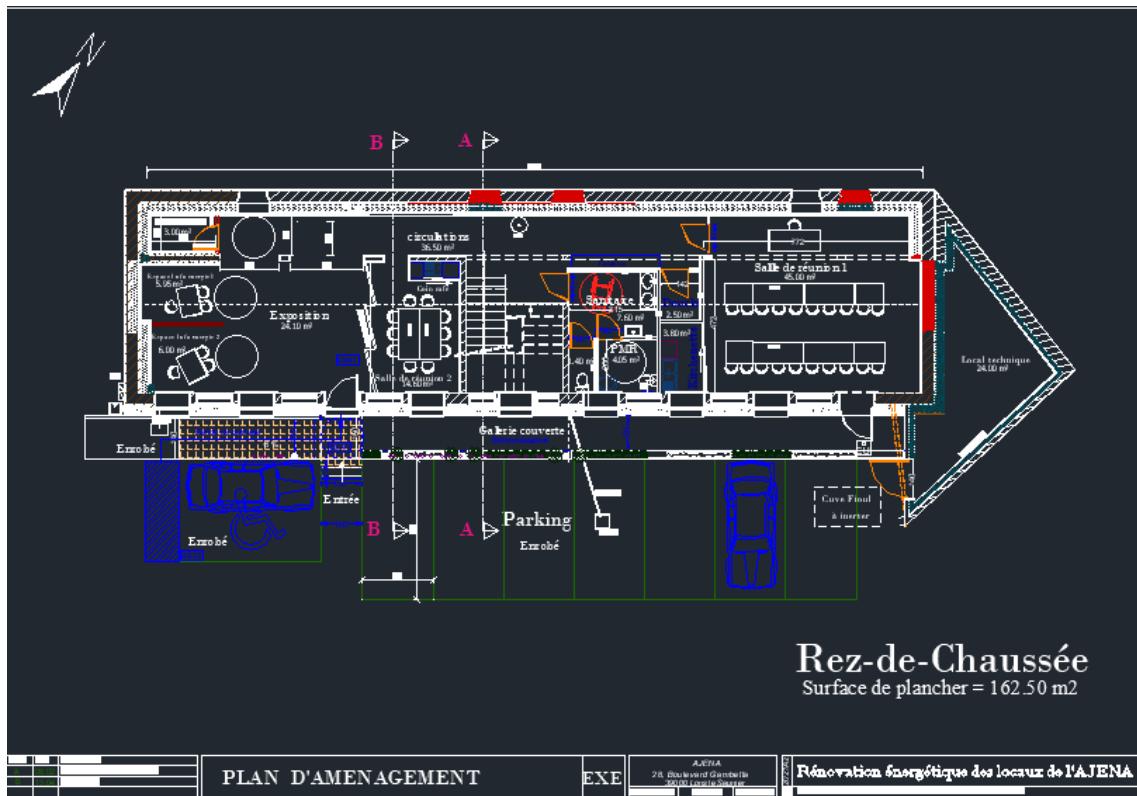
# CS07\_AJENA\_LONS LE SAUNIER

## Renovation Approach Description



# CS07\_AJENA\_LONS LE SAUNIER

## Renovation Approach Description



# **CS07\_AJENA\_LONS LE SAUNIER**

## Renovation Approach Description

### **3.5. Envelope of the renovated building**

#### **External walls**

Material:	Reinforced concrete + Internal or external insulation
Thickness:	91 [cm]
Surface (Render / Brick / Cladding):	concrete / cladding
U-Value:	0,16 [W/(m <sup>2</sup> K)]

#### **Floor slab / Basement ceiling**

Material:	concrete / slab
Thickness:	51,5 [cm]
Surface (Render / Brick / Cladding):	xxx
U-Value:	0,16 [W/(m <sup>2</sup> K)]

#### **Roof / Top floor ceiling**

Material:	tiles over insulation
Thickness:	52 [cm]
Surface (Render / Brick / Cladding):	tiles
U-Value:	0.086 [W/(m <sup>2</sup> K)]

#### **Windows**

Material:	MINCO triple glazing
Thickness:	xxx [cm]
Material (Wood / Plastic / Aluminium):	Wood alu
U-Value (Uw, installed):	0,88 [W/(m <sup>2</sup> K)]

### **3.6. Technical equipment of the renovated building**

#### **Ventilation**

Ventilation concept (central / decentral)	SWEGON F RX (central)
Ventilation heat recovery efficiency	90 %
Ventilation specific efficiency	0,45 [Wh/m <sup>3</sup> ]
Ventilation standard air flow rate	950 [m <sup>3</sup> /h]

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## Renovation Approach Description

Add short description if required

### Heating, Cooling and DHW

Heating:	Wood pellets
Cooling:	none
Domestic hot water:	Direct elec

## 3.7. Summer comfort

Add short description of summer comfort approach, include

- Summer ventilation
- Temporary summer shading
- Fixed shading
- Reduction of internal heat gains
- Active Cooling if applicable

## 3.8. Energy efficiency of the renovated building

### Passive House Planning Package (PHPP)

PHPP calculation:	PHPP_9.6.X
Space heating demand:	25 [kWh/(m <sup>2</sup> a)]
Heating Load:	15 [W/m <sup>2</sup> ]
Overheating frequency:	7 %
Cooling demand:	- [kWh/(m <sup>2</sup> a)]
Cooling Load:	- [W/m <sup>2</sup> ]
Primary Energy Demand:	116 [kWh/(m <sup>2</sup> a)]
PER Demand:	85 [kWh/(m <sup>2</sup> a)]
Airtightness n50 target:	1,0 1/h

### Final Energy demand

Final energy demand gas:	0 [kWh/(m <sup>2</sup> a)]
Final energy demand oil:	0 [kWh/(m <sup>2</sup> a)]
Final energy demand electricity:	xxx [kWh/(m <sup>2</sup> a)]
Final energy demand other:	xxx [kWh/(m <sup>2</sup> a)]

# CS07\_AJENA\_LONS LE SAUNIER

## Renovation Approach Description

### PHPP verification sheet after retrofit

Caractéristiques du bâtiment rapportées à la Surface de Référence Energétique		
		Critères alternatifs
<b>Chauffer</b>	Surface de Référence Energétique m <sup>2</sup> Besoin de chauffage kWh/(m <sup>2</sup> a) Puissance de chauffe W/m <sup>2</sup>	278,1 25 15
<b>Refroidir</b>	froidissement + déshumidification kWh/(m <sup>2</sup> a) Puissance de refroidissement W/m <sup>2</sup>	- -
	Fréquence de surchauffe (> 25°C) %	7
	Fréquence d'humidité excessive (> 12 g/kg) %	0
<b>Etanchéité à l'air</b>	Test d'infiltrométrie n <sub>50</sub> 1/h	1,0
<b>Energie primaire non-renouvelable (EP)</b>	Consommation d' EP kWh/(m <sup>2</sup> a)	116
<b>Energie primaire renouvelable (EP-R)</b>	Consommation d'EP-R kWh/(m <sup>2</sup> a) Production d'énergie renouvelable (par rapport à kWh/(m <sup>2</sup> a) l'emprise au sol de la zone bâtie)	85 150
		≤      ≥
		25      - -      - -      - 10      - 20      - 1,0      - 132      - -      - -      -
		Conforme? <sup>2</sup>
		oui - oui oui oui - - -

<sup>2</sup>champ vide: les données sont manquantes; "-": Aucune exigence

# **CS07\_AJENA\_LONS LE SAUNIER**

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### **3.9. Predicted energy savings**

In space heating demand:	361 – 25 [kWh/(m <sup>2</sup> a)]
Primary Energy Demand:	607 - 116 [kWh/(m <sup>2</sup> a)]
PER Demand:	748 – 85 [kWh/(m <sup>2</sup> a)]
Final energy demand gas:	0 [kWh/(m <sup>2</sup> a)]
Final energy demand oil:	0 [kWh/(m <sup>2</sup> a)]
Final energy demand electricity:	xxx [kWh/(m <sup>2</sup> a)]
Final energy demand other:	xxx [kWh/(m <sup>2</sup> a)]

### **3.10. RES strategy**

Short description of the RES strategy

#### **PV Systems**

Location (Pitched / flat roof or façade):	Pitched + Facade
Orientation (East / South / West):	South
PV Technology (Amorph/Mono/Poly):	xxx
PV area:	300 [m <sup>2</sup> ]
Installed kW Peak	0,4 +0,3 [kW]
Annual electricity yield absolute:	38959 [kWh/a]

#### **Solar Thermal Systems**

Location (Pitched / flat roof or façade):	none
Orientation (East / South / West):	none
Technology (Flat Plate / Evacuated tube):	none
Solar collector area:	xxx [m <sup>2</sup> ]
Solar contribution (DHW/Heating/Both):	xxx
Annual solar contribution absolute:	xxx [kWh/a]

Add picture if available

s. above

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Renovation Approach Description

### **4. Project challenges and opportunities**

Air tightness

Add pictures, sketches, details, diagrams, if available

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Renovation Approach Description

### **5. Current project status**

Work on site. Heating body removed

Add pictures, sketches, details, diagrams, if available

## **CS07\_AJENA\_LONS LE SAUNIER**

Renovation Approach Description

### **6. Lessons learnt and guidelines for replication**

Short description of the lessons learnt, if available

Add pictures, sketches, details, diagrams, if available

## **CS07\_AJENA\_LONS LE SAUNIER**

Renovation Approach Description

### **7. Pre-Monitoring description (if applicable)**

No monitoring. Non res building !

Add pictures, sketches, details, diagrams, if available