





This project has received funding from the European Union's Horizon 2020 research and innovation programme under the grant agreement number 839937. The European Union is not liable for any use that may be made of the information contained in this document, which is merely representing the authors' view.

	U-CERT. Calculated EPB Assessment										
Cluster	Chustor	Cluster	Cluster	Nama	Unite	in: Inite	dicators				
Overall EP indicators	-	-	-	Overall non-renewable primary energy use	kWh/m ²	kWh	Description Calculated according to H5 in Annex H in ISO 52000-1 121: thus, considering compensation between different energy carriers and the effect of exported energy.				
Overall EP indicators	-	-	-	Overall total primary energy use	kWh/m ²	kWh	Calculated according to H4 in Annex H in ISO 52000-1 [2]; thus, not considering compensation between different energy carriers nor the effect of exported energy.				
Overall EP indicators Overall EP indicators	-	-	-	Summer thermal comfort Winter thermal comfort	K-h K-h	-					
Overall EP indicators	-	-	-	Domestic Hot Water (DHW) thermal comfort	K·h	-					
Overall EP indicators	1	1	-	Overall non-renewable primary energy use	kWh/m ² kWh/m ²	kWh kWb	Calculated non considering compensation between different energy carriers and the effect of exported energy. Considering the whole rememble originary energy energy constraints of the exported energy.				
Overall EP indicators	-	-	-	Overall renewable primary energy production Overall renewable primary energy use	kWh/m ²	kWh					
Overall EP indicators	-	-	-	Overall equivalent CO2 emissions	kg/m ²	-	Calculated following H5 in Annex H in ISO 52000-1 [2]; thus, considering compensation between different energy carriers and the effect of exported energy.				
Overall EP indicators Overall EP indicators	-	-	-	Renewable electricity generation by onsite PV Renewable electricity generation by onsite wind turbines	kWh/m ²	kWh kWh					
Overall EP indicators	-	-	-	Renewable electricity generation by onsite CHP	kWh/m ²	kWh					
Overall EP indicators	-	-	-	Renewable electricity from onsite PV self-used	kWh/m ²	kWh					
Overall EP indicators Overall EP indicators	-	-	-	Renewable electricity from onsite wind turbines self-used Renewable electricity from onsite CHP self-used	kWh/m ²	kwn kWh					
Overall EP indicators	-	-	-	Renewable electricity exported to non-EPB uses by onsite PV	kWh/m ²	kWh					
Overall EP indicators	-	-	-	Renewable electricity exported to non-EPB uses by onsite wind to	tur kWh/m ²	kWh					
Overall EP indicators Overall EP indicators	-	-	-	Renewable electricity exported to non-EPB uses by onsite CHP Renewable electricity exported to the grid by onsite PV	kWh/m ²	kwn kWh					
Overall EP indicators	-	-	-	Renewable electricity exported to the grid by onsite wind turbin	es kWh/m ²	kWh					
Overall EP indicators	-	-	-	Renewable electricity exported to the grid by onsite CHP	kWh/m ²	kWh					
Overall EP indicators	-	-	-	Energy needs per cooling	kWh/m ²	-					
Overall EP indicators	-	-	-	Energy needs per DHW	kWh/m ²	-					
Overall EP indicators	-	-	-	Energy needs per humidification & dehumidification	kWh/m ²	-					
Overall EP indicators	-	-		Energy needs per lighting	%	-	The indicator of the lighting energy needs would be the percentage of the occupied hours of the year when artificial lighting is needed, because daylight alone can't meet the minimum illuminance threshold [19]				
Overall EP indicators	-	per energy vector i	-	Energy use per heating	kWh/m ²	kWh					
Overall EP indicators	-	per energy vector / per energy vector /	-	Energy use per cooling Energy use per DHW	kWh/m ²	kWh kWh					
Overall EP indicators	-	per energy vector i	-	Energy use per humidification & dehumidification	kWh/m ²	kWh					
Overall EP indicators	-	per energy vector i	-	Energy use per mechanical ventilation	kWh/m ²	kWh					
Overall EP indicators Partial EP indicators	- Envelope performance indicators	per opague envelope construction /	-	Energy use per lighting Thermal transmittance	W/(m ² ·K	kWh					
Partial EP indicators	Envelope performance indicators	per opaque envelope construction i	per layered material j	Name of material	-	-					
Partial EP indicators Partial EP indicators	Envelope performance indicators Envelope performance indicators	per opaque envelope construction <i>i</i> per opaque envelope construction <i>i</i>	per layered material j per layered material j	Thickness Conductivity	m W/K	-					
Partial EP indicators	Envelope performance indicators	per opaque envelope construction i	per layered material j	Density	kg/m ³	-					
Partial EP indicators Partial EP indicators	Envelope performance indicators	per opaque envelope construction <i>i</i>	per layered material <i>j</i> per layered material <i>j</i>	Specific heat Colour or absortance (only for outter layered material)	J/(kg·K)	-	- (a g dark medium linht etc.)				
Partial EP indicators	Envelope performance indicators	per window/skylight <i>i</i>	-	Thermal transmittance	W/(m ² ·K	-					
Partial EP indicators Partial EP indicators	Envelope performance indicators	per window/skylight <i>i</i>	-	Opening control Solar shading presence	-	-	e. g., manual or fixed windows, open/closed detection to act on HVAC, based on sensor data, etc.)				
Partial EP indicators	Envelope performance indicators	per window/skylight i	-	Solar shading besence Solar shading technology	-	-	(e.g., awning, blinds, shutters, etc.)				
Partial EP indicators Partial EP indicators	Envelope performance indicators	per window/skylight <i>i</i> per window/skylight <i>i</i>	-	Solar shading control Solar shading potential	- 96	-	(e.g., manual, motorized, automation based on sensor data, combined control with HVAC, predictive control, etc.) Accordina to ISO 18292 [201				
Partial EP indicators	Envelope performance indicators	per window/skylight i	-	Glass thermal transmittance	W/(m ² ·K	-					
Partial EP indicators	Envelope performance indicators	per window/skylight <i>i</i>	-	Glass solar factor	- W/(m ² /	-					
Partial EP indicators	Envelope performance indicators	per window/skylight /		Frame colour or absoptance	-	-	(e.g., dark, medium, light, etc.)				
Partial EP indicators Partial EP indicators	Envelope performance indicators	per window/skylight <i>i</i> per thermal bridge <i>i</i>	- per type of junction <i>i</i>	Air permeability class	- W(m-K)	-	According to EN 12207				
Partial EP indicators	Envelope performance indicators	per thermal bridge i	per type of junction j	Length	m	-					
Partial EP indicators Partial EP indicators	Envelope performance indicators Technical building systems performance indic	- per service / or combination of services (- 'i.€ -	Building air change rate at 50 Pa General description	1/h	-	This indicator should be measured by means of a Blower Door test according to EN 13829 [21] whenever possible				
Partial EP indicators	Technical building systems performance indi	ca per service / or combination of services (ί.ε -	Services linked to the system		-	(e.g., heating, cooling, DHW, humidification & dehumidification, mechanical ventilation, lighting, etc.)				
Partial EP indicators Partial EP indicators	Technical building systems performance indic Technical building systems performance indic	ca per service / or combination of services (ca per service / or combination of services (i.∈ - i.∈ Generation	Rated general installation efficiency Technology	%	-	(e.a., conventional boiler, condensina boiler, air-to-air heat pumo, electric heater, etc.)				
Partial EP indicators	Technical building systems performance indic	ca per service / or combination of services (i.€ Generation	Energy vector	-		(e.g., electricity, natural gas, LPG, biomass, etc.)				
Partial EP indicators Partial EP indicators	Technical building systems performance indic Technical building systems performance indic	ca per service / or combination of services (ca per service / or combination of services (i.∈ Generation i.∈ Generation	Rated power Renewable contribution (if applicable)	kW %	-					
Partial EP indicators	Technical building systems performance indi	ca per service <i>i</i> or combination of services (i.e Generation	Metering	-	-					
Partial EP indicators Partial EP indicators	Technical building systems performance indic Technical building systems performance indic	a per service / or combination of services (a per service / or combination of services (i.∈ Generation (i.€ Storage	Capacity	- m ³	-	(e.g., on-orr control, control according to tixee priority list; control according to dynamic priority list; c				
Partial EP indicators	Technical building systems performance indic	ca per service / or combination of services (i.€ Storage	Control	-	-	(e.g., continuous storage operation, scheduled storage operation, load prediction-based storage operation, flexible control according to external signals, etc.).				
Partial EP indicators Partial EP indicators	Technical building systems performance indic Technical building systems performance indic	ca per service / or combination of services (ca per service / or combination of services (i.∈ Distribution i.∈ Distribution	lypology of circuit Insulation of pipes	-	-	(e.g., two-pipe, tour-pipe, recirculation, etc.) Further detail may be included				
Partial EP indicators	Technical building systems performance india	ca per service <i>i</i> or combination of services (i.€ Distribution	Ciculation device	-	-	(e.g., pumps, fans, etc.). Further detail may be included				
Partial EP indicators Partial EP indicators	Technical building systems performance indic Technical building systems performance indic	ca per service / or combination of services (i.e Emission	Technology	-	-	(e.g., ani-an control, mun-sage control, variable speed circulation device control based on internal signals or on external signals). (e.g., radiators, heated floor, fancolis, etc.)				
Partial EP indicators	Technical building systems performance india Technical building systems performance india	ca per service <i>i</i> or combination of services ((i.€ Emission	Control Reporting of performance	-	-	(e.g., central automatic control, individual room control with communication between controllers and to BACS, individual room control, individual room control with communication and occupancy detection).				
Partial EP indicators	Technical building systems performance indic Technical building systems performance indic	ca Lighting	-	Technology	-	-	(e.g., Leninarreporting or Kris, instorna oada, forecassing and/or benchinarking, predictive management, and raut detection, etc.). (e.g., LED, dichroic, futorescent, etc.).				
Partial EP indicators Partial EP indicators	Technical building systems performance indic Technical building systems performance indic	ca Lighting	-	Overall rated power	W	-	- (a n manual swaening extinction signal automatic dataction atc.)				
Partial EP indicators	Renewable electrcity performance indicators	Photovoltaics	-	Technology	-	-	(e.g., monosystslilline, polycrystalline, etc.).				
Partial EP indicators Partial EP indicators	Renewable electrcity performance indicators Renewable electrcity performance indicators	Photovoltaics Photovoltaics	-	Installed peak power Rated efficiency	kWp %	-					
Partial EP indicators	Renewable electrcity performance indicators	Photovoltaics	-	Orientation	0	-					
Partial EP indicators Partial EP indicators	Renewable electrcity performance indicators Renewable electrcity performance indicators	Photovoltaics Photovoltaics	-	Inclination Possibility to export electricity to the grid	-	-					
Partial EP indicators	Renewable electrcity performance indicators	Photovoltaics	-	Inverter type	-	-	(e.g., central inverter, power optimizer + inverter, or microinverters).				
Partial EP indicators Partial EP indicators	Renewable electrcity performance indicators Renewable electrcity performance indicators	Wind turbines	-	Reporting of performance Technology	-	-	(e.g., current generation data, actual values and historical data, performance evaluation including forecast and/or benchmarking, predictive management, and fault detection, etc.).				
Partial EP indicators	Renewable electrcity performance indicators	Wind turbines	-	Installed peak power	kWp	-					
Partial EP indicators Partial EP indicators	Renewable electricity performance indicators	Wind turbines Wind turbines	-	Possibility to export electricity to the grid	- 20	-					
Partial EP indicators	Renewable electrcity performance indicators	Wind turbines	-	Reporting of performance	-	-	(e.g., current generation data, actual values and historical data, performance evaluation including forecast and/or benchmarking, predictive management, and fault detection, etc.).				
Partial EP indicators	Renewable electricity performance indicators	CHP	-	Installed peak power	kWp	-					
Partial EP indicators	Renewable electrcity performance indicators	CHP	-	Rated efficiency for thermal generation	96	-					
Partial EP indicators	Renewable electricity performance indicators	Storage		Technology	-	-	(e.g., dedicated battery storage, dedicated thermal energy storage, etc.).				
Partial EP indicators Partial EP indicators	Renewable electrcity performance indicators Renewable electrcity performance indicators	Storage	-	Installed peak capacity Control	kWh	-	(a n direct storage of on-site production controlled based on and signals, ontimision the use of forally generated electricity, possibility to feed back into the arid, etc.)				
Partial EP indicators	Renewable electricity performance indicators	Storage	-	Reporting of performance	-	-	(e.g., uner soulde of on size production, combined base on yind anymais, quantinating the base to functionary generated exections?) approximating transmit for exercise of the size of charge grade exercises and the source of the size of charge grade exercises? (e.g., current state of charge, extual values and historical data, performance evaluation including forecast and/or benchmarking, predictive management, and fault detection, etc.).				
Smart Readiness indicator Smart Readiness indicator	- Impact scores	-	-	Overall score Energy savings on site	-	-					
Smart Readiness indicator	Impact scores	-	-	Flexibility for the grid and storage	-	-					
Smart Readiness indicator Smart Readiness indicator	Impact scores	-	-	Confort Convenience	-	-					
Smart Readiness indicator	Impact scores	-	-	Wellbeing and health	-	-	-				
Smart Readiness indicator Smart Readiness indicator	Impact scores Impact scores	1	-	Maintenance and fault prediction Information to occupants		-					
Smart Readiness indicator	Impact scores	-	-	Total	-	-					
Smart Readiness indicator Smart Readiness indicator	Domain scores	-	-	meaung DWH	-	-					
Smart Readiness indicator	Domain scores	-	-	Cooling Controlled ventilation	-	-					
Smart Readiness indicator	Domain scores	-	-	Lighting	-	-					
Smart Readiness indicator	Domain scores	-	-	Dynamic envelope Renewable generation & storage	-	-					
Smart Readiness indicator	Domain scores	-	-	EV charging	-	-					
Smart Readiness indicator Smart Readiness indicator	Domain scores Domain scores	-	-	Monitoring & control Total	-	-	- Calculated accordin to ALDREN D2.2				
Indoor Environmental Quality	-	-	-	Overall score	-	-	Calculated accordin to ALDREN D2.2				
Indoor Environmental Quality Indoor Environmental Quality	-	-	-	spring score Summer score	-	-	Laicuistea accorain to ALDREN D2.2 Calcuistea accorain to ALDREN D2.2 Calcuistea accorain to ALDREN D2.2				
Indoor Environmental Quality	-	-	-	Fall score	-	-	Calculated accordin to ALDREN D22				
indoor Environmental Quality Cost	-	per energy vector i	-	Annual cost	€/y	-					

formation; control according to dynamic priority list, predicted information and external signals).





User-Centred Energy Performance Assessment and Certification

Case Study 1					
Nama	Linite D	Dresence	Indicators		
Overall non-renewable primary energy use	kWh/m ²	C			
Overall total primary energy use Summer thermal comfort	kWh/m* K·h	2			
Winter thermal comfort Domestic Hot Water (DHW) thermal comfort	K·h K·h				
Overall non-renewable primary energy use	kWh/m ²	0			
Overall renewable primary energy production Overall renewable primary energy use	kWh/m ²	1	Deals with electricity produced - only from renewable sources. Could be calculated indirectly taken into account the exported energy. Deals with electricity produced - only from renewable sources.		
Overall equivalent CO2 emissions Renewable electricity generation by onsite PV	kg/m ² kWh/m ²	2			
Renewable electricity generation by onsite vivid turbines	kWh/m ²				
Renewable electricity generation by onsite CHP Renewable electricity from onsite PV self-used	kWh/m ² kWh/m ²				
Renewable electricity from onsite wind turbines self-used	kWh/m ²				
Renewable electricity inom onsite China Senabed Renewable electricity exported to non-EPB uses by onsite PV	kWh/m ²				
Renewable electricity exported to non-EPB uses by onsite wind turbines Renewable electricity exported to non-EPB uses by onsite CHP	kWh/m ² kWh/m ²				
Renewable electricity exported to the grid by onsite PV	kWh/m ²				
Renewable electricity exported to the grid by onsite whild turbines	kWh/m ²				
Energy needs per heating Energy needs per cooling	kWh/m ² kWh/m ²				
Energy needs per DHW	kWh/m ²				
Energy needs per humidification & dehumidification Energy needs per mecanical ventilation	kWh/m ²				
Energy needs per lighting Energy use per heating	% kWh/m ²	0			
Energy use per cooling	kWh/m ²	2			
Energy use per DHW Energy use per humidification & dehumidification	kWh/m ²	2			
Energy use per mechanical ventilation	kWh/m ²	2			
Thermal transmittance	W/(m ² ·K)	2			
Name of material Thickness	- m				
Conductivity	W/K kg/m ³				
Specific heat	J/(kg·K)				
Thermal transmittance	- W/(m ² ·K)	2			
Opening control Solar shading presence	-	2			
Solar shading technology Solar shading control	-	0			
Solar shading potential	%	0			
Glass thermal transmittance Glass solar factor	-	0	ZTA?		
Frame thermal transmittance Frame colour or absoptance	W/(m ² ·K)				
Air permeability class	- W(m.K)				
Length	m	2	- 10		
General description	-	2			
Services linked to the system Rated general installation efficiency	- %	2			
Technology Energy vector	-	2			
Rated power Renewable contribution (if applicable)	kW %	2			
Metering Control	-	0	Panalian andronana in sustana		
Capacity	m ³	1	Mencioned in DHW, no quantities		
Control Typology of circuit	-	1	Specified preference in systems Some data is given		
Insulation of pipes Ciculation device	-	0	Only for ventilation		
Control	-	0			
Control					
Reporting of performance Technology	-	0			
Overall rated power Control	-	1	Indirect data W/m2 per each zone		
Technology Installed neak power	- kWp				
Rated efficiency	%	0			
Inclination	•				
Possibility to export electricity to the grid Inverter type	-				
Reporting of performance Technology	-				
Installed peak power Rated efficiency	kWp %				
Possibility to export electricity to the grid	-				
Reporting of performance Technology	-				
Installed peak power Rated efficiency for thermal generation	kWp %				
Rated efficiency for power generation	%				
Installed peak capacity	kWh				
Control Reporting of performance	-				
Overall score Energy savings on site	-				
Flexibility for the grid and storage Comfort	-				
Convenience Wellbeing and health	-				
Maintenance and fault prediction	-				
Information to occupants Heating	-				
DWH Cooling	-				
Controlled ventilation	<u> </u>	0			
Dynamic envelope	-				
EV charging	-	0			
Monitoring & control Overall score	-				
Spring score	-				
Summer score	-				
Summer score Fall score Winter score	-				
Summer score Fall score Winter score Annual cost	- - - €/y	0	faamaata		
Summer score Fall score Winter score Annual cost Includes thermal capacity of the	- - €/y building, Level	0 0 0 0	Comments of technical systems. No scale or graphic content, it may be hard to read for a final non-expert user.		



			Case Study 2a
Name	Units	Presence	Comments
Overall non-renewable primary energy use	kWh/m ² kWh/m ²	0	
Summer thermal comfort	K·h	0	
Winter thermal comfort Domestic Hot Water (DHW) thermal comfort	K·h K·h		
Overall non-renewable primary energy use	kWh/m ² kWh/m ²		
Overall renewable primary energy use	kWh/m ²	0	
Overall equivalent CO2 emissions Renewable electricity generation by onsite PV	kg/m² kWh/m²	0	
Renewable electricity generation by onsite wind turbines	kWh/m ²		
Renewable electricity generation by onsite CHP Renewable electricity from onsite PV self-used	kWh/m ² kWh/m ²	2	
Renewable electricity from onsite wind turbines self-used	kWh/m ²	2	
Renewable electricity exported to non-EPB uses by onsite PV	kWh/m ²		
Renewable electricity exported to non-EPB uses by onsite wind turbines Renewable electricity exported to non-EPB uses by onsite CHP	kWh/m ² kWh/m ²		
Renewable electricity exported to the grid by onsite PV	kWh/m ²		
Renewable electricity exported to the grid by onsite wind turbines Renewable electricity exported to the grid by onsite CHP	kWh/m ² kWh/m ²		
Energy needs per heating	kWh/m ²		
Energy needs per DHW	kWh/m ²		
Energy needs per humidification & dehumidification	kWh/m ² kWh/m ²		
Energy needs per lighting	%	0	
Energy use per neating Energy use per cooling	kWh/m ²	2	
Energy use per DHW	kWh/m ² kWh/m ²	2	
Energy use per mechanical ventilation	kWh/m ²	1	Auxiliary elec. = pumps, fans and fixed lighting
Energy use per lighting Thermal transmittance	kWh/m ² W/(m ² ·K)	1	Auxiliary elec. = pumps, fans and fixed lighting
Name of material	-		
Conductivity	W/K		
Density Specific heat	kg/m ³ J/(kg·K)		
Colour or absoptance (only for outter layered material)	- W/(m ² .//)		
Opening control	-		
Solar shading presence Solar shading technology	-		
Solar shading control Solar shading potential	- %		
Glass thermal transmittance	W/(m ² ·K)		
Glass solar factor Frame thermal transmittance	- W/(m ² ·K)		
Frame colour or absoptance Air permeability class	-		
Linear thermal transmittance	W(m·K)		
Length Building air change rate at 50 Pa	m 1/h		
General description Services linked to the system	-		
Rated general installation efficiency Technology	%	0	
Energy vector	-	2	
Rated power Renewable contribution (if applicable)	kW %		
Metering Control	-	2	
Capacity	m ³		
Typology of circuit	-		
Insulation of pipes Ciculation device	-		
Control	-	1	Only required for ventilation service
Control	-		
Technology	-		
Overall rated power Control	- W	0	
Technology	-	0	Area of collectore
Rated efficiency	%	0	
Inclination	•		
Possibility to export electricity to the grid Inverter type	-		
Reporting of performance	-		
Installed peak power	kWp		
Possibility to export electricity to the grid	-		
Reporting of performance Technology	-		
Installed peak power Rated efficiency for thermal generation	kWp %		
Rated efficiency for power generation	%		
Installed peak capacity	- kWh		
Control Reporting of performance	-		
Overall score Energy savings on site	-		
Flexibility for the grid and storage	-		
Convenience	-		
Wellbeing and health Maintenance and fault prediction	-		
Information to occupants	-		
DWH	-		
Cooling Controlled ventilation	-		
Lighting Dynamic envelope	-		
Renewable, generation & storage	-		
Monitoring & control	-	0	
Spring score	-		
Summer score Fall score	-		
Winter score	- F/v		
	-/ 3		Comments
i solar triennal systems is also included—also, radon measures. Not easily understandable	i or a final no	mexpert us	er, the graphical weatgrips annow mexistent, the only graph is the energy scale. Includes also recommendations for cost-effective measures with estimated



			Case Study 2b
Name	Units	Presence	Indicators Comments
Overall non-renewable primary energy use	kWh/m ² kWh/m ²	0	
Summer thermal confort	K·h	0	
Winter thermal comfort Domestic Hot Water (DHW) thermal comfort	K·h K·h	0	
Overall non-renewable primary energy use	kWh/m ² kWh/m ²	0	
Overall renewable primary energy use	kWh/m ²	0	
Overall equivalent CO2 emissions Renewable electricity generation by onsite PV	kg/m ² kWh/m ²	0	
Renewable electricity generation by onsite wind turbines	kWh/m ²	0	
Renewable electricity generation by onsite CHP Renewable electricity from onsite PV self-used	kWh/m ²	2	
Renewable electricity from onsite wind turbines self-used	kWh/m ²	2	
Renewable electricity exported to non-EPB uses by onsite PV	kWh/m ²	0	
Renewable electricity exported to non-EPB uses by onsite wind turbines Renewable electricity exported to non-EPB uses by onsite CHP	kWh/m ² kWh/m ²	0	
Renewable electricity exported to the grid by onsite PV	kWh/m ²	0	
Renewable electricity exported to the grid by onsite wind turbines Renewable electricity exported to the grid by onsite CHP	kWh/m ² kWh/m ²	0	
Energy needs per heating	kWh/m ²	0	
Energy needs per DHW	kWh/m ²	0	
Energy needs per humidification & dehumidification Energy needs per mecanical ventilation	kWh/m ² kWh/m ²	0	
Energy needs per lighting	% kWb/m ²	0	
Energy use per cooling	kWh/m ²	2	
Energy use per DHW Energy use per humidification & dehumidification	kWh/m ² kWh/m ²	2	
Energy use per mechanical ventilation	kWh/m ²	1	Auxiliary elec. = pumps, fans and fixed lighting
Energy use per lighting Thermal transmittance	κWh/m² W/(m²⋅K)	1	Auxiliary elec. = pumps, fans and fixed lighting
Name of material Thickness	- m	0	
Conductivity	W/K	0	
Density Specific heat	кg/m ^{-r} J/(kg·K)	0	
Colour or absoptance (only for outter layered material)	- W/(m ² ·K)	0	
Opening control	-	0	
Solar shading presence Solar shading technology	-	0	
Solar shading control Solar shading potential	- %	0	
Glass thermal transmittance	W/(m ² ·K)	0	
Frame thermal transmittance	- W/(m ² ·K)	0	
Frame colour or absoptance Air permeability class	-	0	
Linear thermal transmittance	W(m·K)	0	
Building air change rate at 50 Pa	1/h	0	
Services linked to the system	-	0	
Rated general installation efficiency Technology	-	0	
Energy vector Bated power	- kW	2	
Renewable contribution (if applicable)	%	0	
Control	- 7	0	
Capacity Control	- m ³	0	
Typology of circuit Insulation of pipes	-	0	
Ciculation device	-	0	
Technology	-	0	Univ required for ventilation service
Control Reporting of performance	-	0	
Technology Overall rated power	- W	0	
Control	-	0	
Installed peak power	- kWp	1	Area of collectors
Rated efficiency Orientation	% •	0	
Inclination Possibility to export electricity to the grid	-	0	
Inverter type	-	0	
Technology	-	0	
Installed peak power Rated efficiency	kWp %	0	
Possibility to export electricity to the grid Reporting of performance	-	0	
Technology	-	0	
Rated efficiency for thermal generation	%	0	
Rated efficiency for power generation Technology	-	0	
Installed peak capacity Control	kWh -	0	
Reporting of performance	-	0	
Energy savings on site	-	0	
Elexibility for the grid and storage Comfort	-	0	
Convenience Wellbeing and health	-	0	
Maintenance and fault prediction	-	0	
Heating	-	0	
DWH Cooling	-	0	
Controlled ventilation	-	0	
Dynamic envelope	-	0	
EV charging	-	0	
Monitoring & control Overall score	-	0	
Spring score Summer score	-	0	
Fall score Winter score	-	0	
Annual cost	€/y	0	Community
ı solar thermal systems is also included—also, radon measures. Not easily understandable	for a final no	on-expert u	contranents ser, the graphical design is almost inexistent; the only graph is the energy scale. Includes also recommendations for cost-effective measures with estimater



Case Study 3						
Name	Units	Presence	Indicators IComments			
Overall non-renewable primary energy use	kWh/m ²	0				
Summer thermal comfort	Kwn/m K·h	0	Not clear if energy performance indicator is expressed in terms of non renewable or total primary energy			
Winter thermal comfort Domestic Hot Water (DHW) thermal comfort	K-h K-h	0				
Overall non-renewable primary energy use	kWh/m ² kWh/m ²	1	Not clear if energy performance indicator is expressed in terms of non renewable or total primary energy			
Overall renewable primary energy use	kWh/m ²	0				
Overall equivalent CO2 emissions Renewable electricity generation by onsite PV	kg/m ² kWh/m ²	0				
Renewable electricity generation by onsite wind turbines	kWh/m ²	0				
Renewable electricity from onsite PV self-used	kWh/m ²	0				
Renewable electricity from onsite wind turbines self-used Renewable electricity from onsite CHP self-used	kWh/m ² kWh/m ²	0				
Renewable electricity exported to non-EPB uses by onsite PV	kWh/m ²	0				
Renewable electricity exported to non-EPB uses by onsite wind turbines Renewable electricity exported to non-EPB uses by onsite CHP	kWh/m ²	0				
Renewable electricity exported to the grid by onsite PV Renewable electricity exported to the grid by onsite wind turbines	kWh/m ² kWh/m ²	1	Not classified. Only electricity exported appears Not classified. Only electricity exported appears			
Renewable electricity exported to the grid by onsite CHP	kWh/m ²	1	Not classified. Only electricity exported appears			
Energy needs per cooling	kWh/m ²	2				
Energy needs per DHW Energy needs per humidification & dehumidification	kWh/m ² kWh/m ²	2				
Energy needs per namaneation a denamaneation Energy needs per mecanical ventilation	kWh/m ²	1	Needs per heating of ventilation air			
Energy needs per lighting Energy use per heating	% kWh/m ²	2				
Energy use per cooling Energy use per DHW	kWh/m ² kWh/m ²	2				
Energy use per humidification & dehumidification	kWh/m ²	0				
Energy use per mechanical ventilation Energy use per lighting	kWh/m ² kWh/m ²	2				
Thermal transmittance Name of material	W/(m ² ·K)	2				
Thickness	m	0				
Density	W/K kg/m ³	0				
Specific heat Colour or absoptance (only for outter layered material)	J/(kg·K) -	0				
Thermal transmittance	W/(m ² ·K)	2				
Solar shading presence	-	0				
Solar shading technology Solar shading control	-	0				
Solar shading potential Glass thermal transmittance	% W/(m ² ·K)	0				
Glass solar factor	- W/(m ² /()	2				
Frame colour or absoptance	-	0				
Air permeability class Linear thermal transmittance	- W(m·K)	2				
Length Building air change rate at 50 Pa	m 1/h	2				
General description	-	2				
Rated general installation efficiency	%	2				
Energy vector	-	2				
Rated power Renewable contribution (if applicable)	kW %	2				
Metering Control	-	0	Some data is given, like Temp ratio for heat recovery			
Capacity	m ³	0				
Typology of circuit	-	0				
Ciculation device	-	1	Energy use (ELEC) of auxiliary devices in heating system			
Control Technology	-	2				
Control Reporting of performance	-	0				
Technology	-	0				
Control		0				
Installed peak power	- kWp	0				
Rated efficiency Orientation	% °	0				
Inclination Possibility to export electricity to the grid	•	0				
Inverter type	-	0				
Technology	-	0				
Rated efficiency	kWp %	0				
Possibility to export electricity to the grid Reporting of performance	-	0				
Technology Installed peak power	- kWp	0				
Rated efficiency for thermal generation	%	0				
Technology	-	0				
Installed peak capacity Control	kWh -	0				
Reporting of performance Overall score	-	0				
Energy savings on site Flexibility for the orid and storage	-	0				
Comfort	-	0				
Wellbeing and health	-	0				
Maintenance and fault prediction	-	0				
Heating DWH	-	0				
Cooling Controlled ventilation	-	0				
Lighting	-	0				
Renewable, generation & storage	-	0				
EV charging Monitoring & control	-	0				
Overall score Spring score	-	0				
Summer score	-	0				
Winter score	-	0				
Annual cost	t/y	0	Comments			
The data is shown in tables is separated accord	ng to differer	nt issues. Go	bod graphical design in 3-label. However, units and data may not be easy for a final non-expert user to understand.			



Case Study 4a					
Mana	Links	D	Indicators		
Name Overall non-renewable primary energy use	kWh/m ²	Presence 1	Comments Total primary energy with compensation of different energy carriers		
Overall total primary energy use Summer thermal comfort	kWh/m ²	1	Total primary energy with compensation of different energy carriers Risk of summer overheation		
Winter thermal comfort	Kih	0	Nisk of summer overheating		
Overall non-renewable primary energy use	K·h kWh/m ²	1	It could be calculated but is not directly shown		
Overall renewable primary energy production	kWh/m ²	2			
Overall equivalent CO2 emissions	kg/m ²	2			
Renewable electricity generation by onsite PV Renewable electricity generation by onsite wind turbines	kWh/m ² kWh/m ²	2			
Renewable electricity generation by onsite CHP	kWh/m ²	0			
Renewable electricity from onsite PV self-used Renewable electricity from onsite wind turbines self-used	kWh/m ²	0			
Renewable electricity from onsite CHP self-used	kWh/m ²	0			
Renewable electricity exported to non-EPB uses by onsite in a turbines	kWh/m ²	0			
Renewable electricity exported to non-EPB uses by onsite CHP Renewable electricity exported to the grid by onsite PV	kWh/m ² kWh/m ²	0			
Renewable electricity exported to the grid by onsite wind turbines	kWh/m ²	0			
Energy needs per heating	kWh/m ²	2			
Energy needs per cooling Energy needs per DHW	kWh/m ² kWh/m ²	0			
Energy needs per humidification & dehumidification	kWh/m ²	0			
Energy needs per mecanical ventilation Energy needs per lighting	%	0			
Energy use per heating Energy use per cooling	kWh/m ² kWh/m ²	2			
Energy use per DHW	kWh/m ²	2			
Energy use per humidification & dehumidification Energy use per mechanical ventilation	kWh/m ²	0			
Energy use per lighting Thermal transmittance	kWh/m ² W/(m ² ·K)	2			
Name of material	-	2			
Conductivity	m W/K	2			
Density Specific heat	kg/m ³ J/(kg·K)	0			
Colour or absoptance (only for outter layered material)	- W/(m ² ·K)	0			
Opening control	-	0			
Solar shading presence Solar shading technology	-	0			
Solar shading control Solar shading potential	- %	0			
Glass thermal transmittance	W/(m ² ·K)	0			
Frame thermal transmittance	W/(m ² ·K)	0			
Frame colour or absoptance Air permeability class	-	0			
Linear thermal transmittance Length	W(m·K) m	2			
Building air change rate at 50 Pa General description	1/h	1	Depends on the season. Pressure is not specified		
Services linked to the system	-	2			
Technology	-	2			
Energy vector Rated power	- kW	2			
Renewable contribution (if applicable) Metering	-	0			
Control Capacity	- m ³	1	Mentioned only in cooling system		
Control	-	0			
Insulation of pipes	-	1	Heat losses in distribution pipes are considered		
Control	-	0			
Technology Control	-	0			
Reporting of performance Technology	-	0			
Overall rated power	w	0			
Technology	-	0			
Rated efficiency	%	0			
Inclination	•	0			
Possibility to export electricity to the grid Inverter type	-	2			
Reporting of performance Technology	-	0			
Installed peak power Rated efficiency	kWp %	0			
Possibility to export electricity to the grid		0			
Technology	-	0			
Installed peak power Rated efficiency for thermal generation	kWp %	0			
Rated efficiency for power generation Technology	-	0			
Installed peak capacity Control	kWh	0			
Reporting of performance	-	0			
Energy savings on site	-	0			
Elexibility for the grid and storage Comfort	-	0			
Convenience Wellbeing and health	-				
Maintenance and fault prediction Information to occupants	-	0			
Heating DWH	-	0			
Cooling Controlled ventilation		0			
Lighting	-	0			
Dynamic envelope Renewable, generation & storage	-	0			
EV charging Monitoring & control	-	0			
Overall score		0			
Summer score		0			
Winter score	-	0			
Annual cost	t/y	0	Comments		
Very technical report, there is plenty of calculations. No grap	hics, only th	e scale of e	nergy performance indicator - very small size of characters. There is a lot of information about the inertia of the external walls.		



Case Study 4b					
Name	Units	Presence	Indicators Comments		
Overall non-renewable primary energy use	kWh/m ²	1	Heat losses in distribution pipes are considered		
Overall total primary energy use Summer thermal comfort	kWh/m [*] K·h	2			
Winter thermal comfort Domestic Hot Water (DHW) thermal comfort	K·h K·h				
Overall non-renewable primary energy use	kWh/m ² kWh/m ²				
Overall renewable primary energy use	kWh/m ²	0			
Overall equivalent CO2 emissions Renewable electricity generation by onsite PV	kg/m² kWh/m²				
Renewable electricity generation by onsite wind turbines	kWh/m ²				
Renewable electricity generation by onsite Chin Renewable electricity from onsite PV self-used	kWh/m ²				
Renewable electricity from onsite wind turbines self-used Renewable electricity from onsite CHP self-used	kWh/m ² kWh/m ²	2			
Renewable electricity exported to non-EPB uses by onsite PV Renewable electricity exported to non-EPB uses by onsite wind turbines	kWh/m ² kWh/m ²				
Renewable electricity exported to non-EPB uses by onsite CHP	kWh/m ²				
Renewable electricity exported to the grid by onsite PV Renewable electricity exported to the grid by onsite wind turbines	kWh/m ²				
Renewable electricity exported to the grid by onsite CHP Energy needs per heating	kWh/m ² kWh/m ²				
Energy needs per cooling	kWh/m ²				
Energy needs per binw Energy needs per humidification & dehumidification	kWh/m ²				
Energy needs per mecanical ventilation Energy needs per lighting	kWh/m² %				
Energy use per heating	kWh/m ² kWh/m ²				
Energy use per DHW	kWh/m ²				
Energy use per numidification & dehumidification Energy use per mechanical ventilation	kWh/m ²				
Energy use per lighting Thermal transmittance	kWh/m ² W/(m ² ⋅K)				
Name of material Thickness	 m				
Conductivity	W/K				
Specific heat	кg/m J/(kg·K)				
Colour or absoptance (only for outter layered material) Thermal transmittance	- W/(m ² ·K)				
Opening control Solar shading presence	-				
Solar shading technology Solar shading control	-				
Solar shading control	%				
Glass thermal transmittance Glass solar factor	w/(m→k) -				
Frame thermal transmittance Frame colour or absoptance	W/(m ² ·K) -				
Air permeability class	- W(m·K)				
Length Building air change rate at 50 Pa	m 1/h	0	Depends on the season. Dressure is not specified		
General description	-	0	Bepende on the seducity in ressure to not specified		
Rated general installation efficiency	%	0			
Energy vector	-	2			
Rated power Renewable contribution (if applicable)	kW %				
Metering Control	-	0	Mentioned only in cooling system		
Capacity Control	m ³				
Typology of circuit	-	2	Hast lorger in distribution ninge are considered		
Ciculation device	-	2	Treat rosses in distribution pipes are considered		
Technology	-				
Control Reporting of performance	-				
Technology Overall rated power	- W				
Control Technology	-				
Installed peak power Rated efficiency	kWp %				
Orientation	0				
Possibility to export electricity to the grid	-	2			
Reporting of performance	-				
Installed peak power	- kWp				
Rated enciency Possibility to export electricity to the grid	-				
Reporting of performance Technology	-				
Installed peak power Rated efficiency for thermal generation	kWp %				
Rated efficiency for power generation Technology	% -				
Installed peak capacity Control	kWh				
Reporting of performance	-				
Energy savings on site	-				
Comfort	-				
Convenience Wellbeing and health	-				
Maintenance and fault prediction Information to occupants	-				
Heating DWH	-				
Cooling Controlled ventilation	-				
Lighting Dynamic envelope	-	0			
Renewable, generation & storage	-				
Monitoring & control	-	0			
Overall score	-				
Summer score Fall score	-				
Winter score Annual cost	- €/y				
Very technical report, there is plenty of calculations. No gray	ohics, only th	e scale of e	Comments nergy performance indicator - very small size of characters. There is a lot of information about the inertia of the external walls.		



Case Study 5a						
Name	Linite	Dresence	Indicators Comments			
Overall non-renewable primary energy use	kWh/m ²	0				
Overall total primary energy use Summer thermal comfort	kWh/m ²	0				
Winter thermal comfort	K·h	0				
Domestic Hot Water (DHW) thermal comfort Overall non-renewable primary energy use	K·h kWh/m ²	0				
Overall renewable primary energy production	kWh/m ²	0				
Overall renewable primary energy use Overall equivalent CO2 emissions	kWh/m ² kg/m ²	2				
Renewable electricity generation by onsite PV	kWh/m ²	0				
Renewable electricity generation by onsite wind turbines Renewable electricity generation by onsite CHP	kWh/m ²	0				
Renewable electricity from onsite PV self-used	kWh/m ²	0				
Renewable electricity from onsite CHP self-used	kWh/m ²	0				
Renewable electricity exported to non-EPB uses by onsite PV	kWh/m ²	0				
Renewable electricity exported to non-EPB uses by onsite wind tarbines Renewable electricity exported to non-EPB uses by onsite CHP	kWh/m ²	0				
Renewable electricity exported to the grid by onsite PV Renewable electricity exported to the grid by onsite wind turbines	kWh/m ² kWh/m ²	0				
Renewable electricity exported to the grid by onsite CHP	kWh/m ²	0				
Energy needs per heating Energy needs per cooling	kWh/m ² kWh/m ²	2				
Energy needs per DHW	kWh/m ²	0				
Energy needs per humidification & dehumidification Energy needs per mecanical ventilation	kWh/m² kWh/m²	0				
Energy needs per lighting	%	0	-005			
Energy use per realing Energy use per cooling	kWh/m ²	1	nRPE			
Energy use per DHW	kWh/m ²	1	nRPE			
Energy use per mechanical ventilation	kWh/m ²	0				
Energy use per lighting	kWh/m ² W/(m ² ·K)	1	nRPE			
Name of material	-	0				
Conductivity	m W/K	0				
Density Specific heat	kg/m ³	0				
Colour or absoptance (only for outter layered material)		0				
Thermal transmittance Opening control	W/(m ² ·K)	2				
Solar shading presence	-	0				
Solar shading technology Solar shading control	-	0				
Solar shading potential Glass thermal transmittance	% W/(m ² ·K)	0				
Glass solar factor	-	2				
Frame thermal transmittance Frame colour or absoptance	W/(m ⁻ ·K) -	0				
Air permeability class	- W(m:K)	0				
Length	m	0				
Building air change rate at 50 Pa General description	1/h -	0				
Services linked to the system Rated general installation efficiency	- %	2				
Technology	-	2				
Rated power	- kW	2				
Renewable contribution (if applicable) Metering	-	0				
Control	-	0				
Control	-	0				
Typology of circuit Insulation of pipes	-	0				
Ciculation device	-	0				
Technology	-	0				
Control Reporting of performance	-	0				
Technology Overall rated power	-	0				
Control	-	0				
Installed peak power	- kWp	0				
Rated efficiency	%	0				
Inclination	°	0				
Possibility to export electricity to the grid	-	0				
Reporting of performance Technology	-	0				
Installed peak power	kWp «	0				
Possibility to export electricity to the grid	-	0				
Reporting of performance Technology	-	0				
Installed peak power	kWp	0				
Rated efficiency for thermal generation Rated efficiency for power generation	%	0				
Technology Installed peak capacity	- kWh	0				
Control Reporting of performance	-	0				
Overall score	-	0				
Energy savings on site Flexibility for the grid and storage	-	0				
Comfort	-	0				
Wellbeing and health	-	0				
Maintenance and fault prediction Information to occupants	-	0				
Heating DWH	-	0				
Cooling	-	0				
Lighting	-	0				
Dynamic envelope Renewable, generation & storage	-	0				
EV charging	-	0				
Overall score	-	0				
Spring score	-	0				
Fall score	-	0				
Annual cost	€/y	0				
	Alc	ot of informa	Comments tion is shown as scales (energy need, nREP per service.).			
	~ ~					



Case Study 5b					
Name	Units	Presence	Indicators Comments		
Overall non-renewable primary energy use	kWh/m ²	0301100	voranom		
Overall total primary energy use Summer thermal comfort	kWh/m ² Kib				
Winter thermal comfort	K·h				
Domestic Hot Water (DHW) thermal comfort Overall non-renewable primary energy use	K·h kWh/m ²	2			
Overall renewable primary energy production	kWh/m ²	0			
Overall renewable primary energy use Overall equivalent CO2 emissions	kWh/m ² kg/m ²	2			
Renewable electricity generation by onsite PV	kWh/m ²				
Renewable electricity generation by onsite wind turbines Renewable electricity generation by onsite CHP	kWh/m ² kWh/m ²				
Renewable electricity from onsite PV self-used	kWh/m ²				
Renewable electricity from onsite wind turbines self-used Renewable electricity from onsite CHP self-used	kWh/m ² kWh/m ²				
Renewable electricity exported to non-EPB uses by onsite PV	kWh/m ²				
Renewable electricity exported to non-EPB uses by onsite wind turbines Renewable electricity exported to non-EPB uses by onsite CHP	kWh/m ²				
Renewable electricity exported to the grid by onsite PV	kWh/m ²				
Renewable electricity exported to the grid by onsite wind turbines Renewable electricity exported to the grid by onsite CHP	kWh/m ² kWh/m ²				
Energy needs per heating	kWh/m ²	2			
Energy needs per cooling Energy needs per DHW	kWh/m ² kWh/m ²	2			
Energy needs per humidification & dehumidification	kWh/m ²				
Energy needs per mecanical ventilation Energy needs per lighting	kWh/m² %				
Energy use per heating	kWh/m ²	1	nRPE		
Energy use per cooling	kWh/m ² kWh/m ²	1	nRPE		
Energy use per humidification & dehumidification	kWh/m ²	0			
Energy use per mechanical ventilation	kWh/m ² kWh/m ²	1	Ventilation and pumping		
Thermal transmittance	W/(m ² ·K)	2	pav 2		
Name of material Thickness	- m				
Conductivity	W/K				
Density Specific heat	kg/m³ J/(ka·K)				
Colour or absoptance (only for outter layered material)	-	0			
I hermal transmittance Opening control	w/(m²⋅K) -	2			
Solar shading presence	-				
Solar shading control	-				
Solar shading potential	% W/(m ² ·K)				
Glass solar factor	-	2			
Frame thermal transmittance Frame colour or absontance	W/(m ² ·K)				
Air permeability class	-				
Linear thermal transmittance Length	W(m·K) m				
Building air change rate at 50 Pa	1/h				
Services linked to the system	-	2			
Rated general installation efficiency	%	2			
Energy vector	-	2			
Rated power Renewable contribution (if applicable)	kW %	2			
Metering	-				
Control	- m ³				
Control Turnel and financia	-				
Insulation of pipes	-				
Ciculation device Control	-	2	Flow type (constant_etc.)		
Technology	-	0			
Reporting of performance	-				
Technology Overall rated power	-	0			
Control	-	0			
Technology Installed peak power	- kWp				
Rated efficiency	%	0			
Inclination	•				
Possibility to export electricity to the grid	-				
Reporting of performance	-				
I echnology Installed peak power	- kWp				
Rated efficiency	%				
Reporting of performance	-				
Technology Installed neak nower	- kWp				
Rated efficiency for thermal generation	%				
Rated efficiency for power generation Technology	-				
Installed peak capacity	kWh				
Reporting of performance	-				
Overall score Energy savings on site	-				
Flexibility for the grid and storage	-				
Comfort Convenience	-				
Wellbeing and health	-				
Information to occupants	-				
Heating DWH	-				
Cooling	-				
Controlled ventilation Lighting	-	0			
Dynamic envelope	-				
EV charging	-				
Monitoring & control Overall score	-				
Spring score	-				
Summer score Fall score	-				
Winter score	-				
Annuar COSt	т/У	0	Comments		
	A lot	of information	tion is shown as scales (energy need, nREP per service.).		



Case Study 5c						
Name	Units	Presence	Indicators Comments			
Overall non-renewable primary energy use	kWh/m ²	0				
Overall total primary energy use Summer thermal comfort	kWh/m* K·h					
Winter thermal comfort	K·h					
Domestic Hot Water (DHW) thermal comfort Overall non-renewable primary energy use	K·h kWh/m ²	2				
Overall renewable primary energy production	kWh/m ²	0				
Overall renewable primary energy use Overall equivalent CO2 emissions	kWh/m* ka/m²	2				
Renewable electricity generation by onsite PV	kWh/m ²	2				
Renewable electricity generation by onsite wind turbines Renewable electricity generation by onsite CHP	kWh/m ²					
Renewable electricity generation by onsite China Renewable electricity from onsite PV self-used	kWh/m ²	2				
Renewable electricity from onsite wind turbines self-used	kWh/m ²					
Renewable electricity won onsite CHP sendaged Renewable electricity exported to non-EPB uses by onsite PV	kWh/m ²					
Renewable electricity exported to non-EPB uses by onsite wind turbines	kWh/m ²					
Renewable electricity exported to the grid by onsite PV	kWh/m ²					
Renewable electricity exported to the grid by onsite wind turbines	kWh/m ²					
Energy needs per heating	kWh/m ²	2				
Energy needs per cooling	kWh/m ²	2				
Energy needs per DHW Energy needs per humidification & dehumidification	kWh/m ² kWh/m ²					
Energy needs per mecanical ventilation	kWh/m ²					
Energy needs per lighting Energy use per heating	% kWh/m ²	0	nRPE			
Energy use per cooling	kWh/m ²	1	nRPE			
Energy use per DHW Energy use per humidification & dehumidification	κWh/m ⁴ kWh/m ²	1	nRPE			
Energy use per mechanical ventilation	kWh/m²	1	Ventilation and pumping			
Energy use per lighting Thermal transmittance	kWh/m ² W/(m ² ·K)	1	nRPE			
Name of material	-	0				
I hickness Conductivity	m W/K					
Density	kg/m ³					
Specific neat Colour or absoptance (only for outter layered material)	J/(kg·K) -					
Thermal transmittance	W/(m ² ·K)	2				
Solar shading presence	-					
Solar shading technology Solar shading control	-					
Solar shading potential	%					
Glass thermal transmittance Glass solar factor	W/(m ² ·K)	0				
Frame thermal transmittance	W/(m ² ·K)	0				
Frame colour or absoptance Air permeability class	-					
Linear thermal transmittance	W(m·K)					
Length Building air change rate at 50 Pa	m 1/h					
General description	-	2				
Rated general installation efficiency	%	2				
Energy vector	-	2				
Rated power	kW	2				
Metering	-	0				
Control Capacity	- m ³					
Control	-					
Typology of circuit Insulation of pipes	-					
Ciculation device	-	1	Energy use for ventilation and pumping in general			
Technology	-					
Control Reporting of performance	-	0				
Technology	-	1	Could be estimed by efficiency			
Overall rated power Control	- W	2				
Technology	-					
Rated efficiency	%					
Orientation Inclination	o 0					
Possibility to export electricity to the grid	-					
Reporting of performance	-					
Technology	- kWp					
Rated efficiency	%					
Possibility to export electricity to the grid Reporting of performance	-					
Technology	-					
Rated efficiency for thermal generation	кwp %					
Rated efficiency for power generation	%					
Installed peak capacity	kWh					
Control Reporting of performance	-					
Overall score	-					
Flexibility for the grid and storage	-					
Comfort	-					
Wellbeing and health	-					
Maintenance and fault prediction Information to occupants	-					
Heating	-					
Cooling	-					
Controlled ventilation	-	0				
Dynamic envelope	-					
Renewable, generation & storage EV charging	-					
Monitoring & control	-	0				
Spring score	-					
Summer score Fall score	-					
Winter score	-					
Annual cost	€/y	0	Comments			
	A lot	t of informa	tion is shown as scales (energy need, nREP per service.).			



			Case Study 6a
Name	Units	Presence	Indicators Comments
Overall non-renewable primary energy use	kWh/m ²	0	
Overall total primary energy use Summer thermal comfort	kWh/m ²	2	
Winter thermal comfort	K·h		
Domestic Hot Water (DHW) thermal comfort Overall non-renewable primary energy use	K·h kWh/m ²		
Overall renewable primary energy production	kWh/m ²	0	
Overall renewable primary energy use	kWh/m ²	2	
Renewable electricity generation by onsite PV	kWh/m ²	0	
Renewable electricity generation by onsite wind turbines	kWh/m ²		
Renewable electricity generation by onsite CHP Renewable electricity from onsite PV self-used	kWh/m ²		
Renewable electricity from onsite wind turbines self-used	kWh/m ²		
Renewable electricity from onsite CHP self-used Renewable electricity exported to non-EPB uses by onsite PV	kWh/m ²		
Renewable electricity exported to non-EPB uses by onsite wind turbines	kWh/m ²		
Renewable electricity exported to non-EPB uses by onsite CHP Renewable electricity exported to the grid by onsite PV	kWh/m ² kWh/m ²		
Renewable electricity exported to the grid by onsite vird turbines	kWh/m ²		
Renewable electricity exported to the grid by onsite CHP	kWh/m ² kWh/m ²	0	Hasting dagraa day temporatura chawa
Energy needs per needing	kWh/m ²	0	rreating degree day temperature shown
Energy needs per DHW	kWh/m ²		
Energy needs per numidification & denumidification Energy needs per mecanical ventilation	kWh/m ²		
Energy needs per lighting	%	0	
Energy use per realing Energy use per cooling	kWh/m ²	2	
Energy use per DHW	kWh/m ²	2	
Energy use per numidification & dehumidification Energy use per mechanical ventilation	kWh/m ²	2	
Energy use per lighting	kWh/m ²	2	
I hermal transmittance Name of material	w/(m²⋅K) -	1	General heat loss coefficient is mentioned
Thickness	m		
Density	w/K kg/m ³		
Specific heat	J/(kg·K)		
Colour or absoptance (only for outter layered material) Thermal transmittance	- W/(m ² ·K)	1	General heat loss coefficient is mentioned
Opening control	-		
Solar shading technology			
Solar shading control Solar shading potential	- %		
Glass thermal transmittance	W/(m ² ·K)		
Glass solar factor	- W/(m ² ·K)		
Frame colour or absoptance	-		
Air permeability class Linear thermal transmittance	- W(m·K)		
Length	m		
General description	1/h -		
Services linked to the system Pated general installation efficiency	- 9/		
Technology	-		
Energy vector Rated power	- kW	2	
Renewable contribution (if applicable)	%		
Metering Control	-		
Capacity	m ³		
Typology of circuit	-		
Insulation of pipes	-		
Control	-		
Technology Control	-		
Reporting of performance	-		
l echnology Overall rated power	- W		
Control			
Installed peak power	- kWp		
Rated efficiency	%	0	
Inclination	•		
Possibility to export electricity to the grid Inverter type	-		
Reporting of performance	-		
Installed peak power	- kWp		
Rated efficiency Possibility to export electricity to the grid	%		
Reporting of performance	-		
l echnology Installed peak power	- kWp		
Rated efficiency for thermal generation	%		
Rated efficiency for power generation Technology	% -		
Installed peak capacity	kWh		
Reporting of performance			
Overall score Energy savings on site	-		
Flexibility for the grid and storage	-		
Comfort Convenience	-		
Wellbeing and health			
Information to occupants	-		
Heating DWH	<u> </u>		
Cooling	-		
Lighting	-	0	
Dynamic envelope	-		
EV charging	-		
Monitoring & control Overall score	-		
Spring score	-		
Fall score	-		
Winter score	- F/v		
, mildin colat	~/ y	0	Comments
Energy needs, envelope and technical systems data are not	t included. So	ome graphi	c scales are shown on the first page to assess the building; other graphics represents the energy use per each energy carrier



Case Study 6b						
Name	Units	Presence	Indicators Comments			
Overall non-renewable primary energy use	kWh/m ²	0				
Summer thermal comfort	Kvh	0				
Winter thermal comfort Domestic Hot Water (DHW) thermal comfort	K·h K·h	0				
Overall non-renewable primary energy use	kWh/m ²	0				
Overall renewable primary energy production Overall renewable primary energy use	kWh/m ²	2				
Overall equivalent CO2 emissions	kg/m ²	2				
Renewable electricity generation by onsite PV Renewable electricity generation by onsite wind turbines	kWh/m ²	0				
Renewable electricity generation by onsite CHP Renewable electricity from onsite PV self-used	kWh/m ² kWh/m ²	0				
Renewable electricity from onsite wind turbines self-used	kWh/m ²	0				
Renewable electricity from onsite CHP self-used Renewable electricity exported to non-EPB uses by onsite PV	kWh/m ² kWh/m ²	0				
Renewable electricity exported to non-EPB uses by onsite wind turbines	kWh/m ²	0				
Renewable electricity exported to hon-EPB uses by onsite CHP Renewable electricity exported to the grid by onsite PV	kWh/m ²	0				
Renewable electricity exported to the grid by onsite wind turbines	kWh/m ²	0				
Energy needs per heating	kWh/m ²	1	Heating degree day TP shown			
Energy needs per cooling Energy needs per DHW	kWh/m ² kWh/m ²	0				
Energy needs per humidification & dehumidification	kWh/m ²	0				
Energy needs per mecanical ventilation Energy needs per lighting	kWh/m [*] %	0				
Energy use per heating	kWh/m ²	2				
Energy use per DHW	kWh/m ²	2				
Energy use per humidification & dehumidification	kWh/m ² kWh/m ²	2				
Energy use per lighting	kWh/m ²	2				
L hermal transmittance Name of material Thickness	w/(m²⋅K) - m	1	General heat loss coefficient is mentioned			
Conductivity	W/K	0				
Specific heat	J/(kg·K)	0				
Colour or absoptance (only for outter layered material) Thermal transmittance Opening approx	- W/(m ² ·K)	0	General heat loss coefficient is mentioned			
Solar shading presence	-	0				
Solar shading technology Solar shading control	-	0				
Solar shading potential	% W/(m².k)	0				
Glass solar factor	-	0				
Frame thermal transmittance Frame colour or absoptance	W/(m ² ·K)	0				
Air permeability class	- W(m.K)	0				
Length	m	0				
Building air change rate at 50 Pa General description	1/h -	0				
Services linked to the system Rated general installation efficiency	- %	0				
Technology	-	0				
Rated power	- kW	0				
Renewable contribution (if applicable) Metering	-	0				
Control	- m ³	0				
Control	-	0				
I ypology of circuit Insulation of pipes	-	0				
Ciculation device Control	-	0				
Technology	-	0				
Reporting of performance	-	0				
Technology Overall rated power	- W	0				
Control Technology	-	0				
Installed peak power	kWp «	0				
Orientation	26 e	0				
Inclination Possibility to export electricity to the grid	-	0				
Inverter type Reporting of performance	-	0				
Technology	-	0				
Rated efficiency	%	0				
Possibility to export electricity to the grid Reporting of performance	-	0				
Technology Installed peak power	- kWp	0				
Rated efficiency for thermal generation	%	0				
Rated efficiency for power generation Technology	-	0				
Installed peak capacity Control	kWh -	0				
Reporting of performance	-	0				
Energy savings on site	-	0				
Comfort	-	0				
Wellbeing and health	-	0				
Maintenance and fault prediction Information to occupants	-	0				
Heating	-	0				
Cooling	-	0				
Lighting	-	0				
Dynamic envelope Renewable, generation & storage	-	0				
EV charging Monitoring & control	-	0				
	-	0				
Spring score Summer score	-	0				
Fall score Winter score	-	0				
Annual cost	€/y	0	Comments			
Energy needs, envelope and technical systems data are no	t included. S	ome graphi	c scales are shown on the first page to assess the building; other graphics represents the energy use per each energy carrier			



Case Study 7			
Name	Units	Presence	Indicators IComments
Overall non-renewable primary energy use	kWh/m ²	0	
Overall total primary energy use	кWh/m* K·h		
Winter thermal comfort Domestic Hot Water (DHW) thermal comfort	K-h K-h	0	
Overall non-renewable primary energy use	kWh/m ²	0	
Overall renewable primary energy production Overall renewable primary energy use	kWh/m ²	0	
Overall equivalent CO2 emissions	kg/m ²	2	
Renewable electricity generation by onsite PV Renewable electricity generation by onsite wind turbines	kWh/m ²	0	
Renewable electricity generation by onsite CHP Renewable electricity from onsite PV self-used	kWh/m ² kWh/m ²	0	
Renewable electricity from onsite wind turbines self-used	kWh/m ²	0	
Renewable electricity irom onsite CHP self-used Renewable electricity exported to non-EPB uses by onsite PV	kWh/m ²	0	
Renewable electricity exported to non-EPB uses by onsite wind turbines Renewable electricity exported to non-EPB uses by onsite CHP	kWh/m ² kWh/m ²	0	
Renewable electricity exported to the grid by onsite PV	kWh/m ²	0	
Renewable electricity exported to the grid by onsite wind turbines Renewable electricity exported to the grid by onsite CHP	kWh/m* kWh/m²	0	
Energy needs per heating	kWh/m ²	0	
Energy needs per Cooling Energy needs per DHW	kWh/m ²	0	
Energy needs per humidification & dehumidification Energy needs per mecanical ventilation	kWh/m ² kWh/m ²	0	
Energy needs per lighting	%	0	
Energy use per rooling	kWh/m ²	2	
Energy use per DHW Energy use per humidification & dehumidification	kWh/m ² kWh/m ²	2	
Energy use per mechanical ventilation	kWh/m ²	2	
Energy use per lighting Thermal transmittance	W/(m ² ·K)	2	
Name of material Thickness	- m	0	
Conductivity Density	W/K	0	
Specific heat	J/(kg·K)	0	
Colour or absoptance (only for outter layered material) Thermal transmittance	- W/(m ² ·K)	0	
Opening control Solar shading presence	-	0	
Solar shading technology	-	0	
Solar shading control Solar shading potential	- %	0	
Glass thermal transmittance Glass solar factor	W/(m ² ⋅K)	0	
Frame thermal transmittance	W/(m ² ·K)	0	
Air permeability class	-	0	
Linear thermal transmittance Length	W(m·K) m	0	
Building air change rate at 50 Pa General description	1/h -	0	
Services linked to the system Rated general installation efficiency	- %	2	
Technology	-	2	Nak sasaifaalli. saakiaaad
Rated power	- kW	2	Not specifically mentioned
Renewable contribution (if applicable) Metering	-	0	
Control Capacity	- m ³	0	
Control Tunglogy of girguit	-	0	
Insulation of pipes	-	0	
Ciculation device Control	-	0	Some explanations are printted
Technology Control	-	0	
Reporting of performance	-	0	
Overall rated power	w	2	
Control Technology	-	0	
Installed peak power Rated efficiency	kWp %	0	
Orientation Inclination	o o	0	
Possibility to export electricity to the grid	-	0	
Reporting of performance	-	0	
Installed peak power	- kWp		
Rated efficiency Possibility to export electricity to the grid	-	0	
Reporting of performance	-	0	
Installed peak power	kWp	0	
Rated efficiency for thermal generation Rated efficiency for power generation	%	0	
Technology Installed peak capacity	- kWh	0	
Control Reporting of performance	-	0	
Overall score	-	0	
Flexibility for the grid and storage	-	0	
Comfort Convenience	-	0	
Wellbeing and health Maintenance and fault prediction	-		
Information to occupants	-	0	
DWH Carlier	-	0	
Controlled ventilation	-	0	
Lighting Dynamic envelope	-	0	
Renewable, generation & storage EV charging	-	0	
Monitoring & control	-	0	
Spring score	-	0	
Fall score	-	0	
Winter score Annual cost	- €/y	0	
Some graphical scales are shown and some to up	derstand hi	the final use	Comments ar. The organization of the data could be more readable, changing the multi-choices questions for summous tables
Some graphical scales are shown, not easy to up	Gerardi u by	une mildi US	ne organization of the data could be more readable, changing the muta-choices questions for summary tables.



Case Study 8			
Name	Linits	Presence	Indicators Comments
Overall non-renewable primary energy use	kWh/m ²	0	
Overall total primary energy use Summer thermal comfort	kWh/m ² K·h	1	Indirectly by sum nren and ren Qualitative indicator
Winter thermal comfort	K·h	1	Qualitative indicator
Overall non-renewable primary energy use	K·h kWh/m ²	2	
Overall renewable primary energy production	kWh/m ²	2	
Overall renewable primary energy use Overall equivalent CO2 emissions	kwn/m kg/m ²	2	
Renewable electricity generation by onsite PV	kWh/m ²	2	
Renewable electricity generation by onsite Wind turbines Renewable electricity generation by onsite CHP	kWh/m ²	0	
Renewable electricity from onsite PV self-used	kWh/m ²	2	
Renewable electricity from onsite Wind turbines self-used Renewable electricity from onsite CHP self-used	kWh/m ²	0	
Renewable electricity exported to non-EPB uses by onsite PV	kWh/m ²		
Renewable electricity exported to non-EPB uses by onsite wind turbines Renewable electricity exported to non-EPB uses by onsite CHP	kWh/m ²		
Renewable electricity exported to the grid by onsite PV	kWh/m ²		
Renewable electricity exported to the grid by onsite wind tarbines	kWh/m ²		
Energy needs per heating	kWh/m ²		
Energy needs per DHW	kWh/m ²		
Energy needs per humidification & dehumidification	kWh/m ² kWh/m ²		
Energy needs per highting	%	0	
Energy use per heating Energy use per cooling	kWh/m ² kWh/m ²	1	Primary energy per technical system
Energy use per DHW	kWh/m ²	1	Primary energy per technical system
Energy use per humidification & dehumidification	kWh/m ² kWh/m ²	0	Drimary anarray nar tachnical system
Energy use per lighting	kWh/m ²	1	Primary energy per technical system Primary energy per technical system
Thermal transmittance	W/(m ² ·K)	1	Global of the whole building
Thickness	- m		
Conductivity	W/K kg/m ³		
Specific heat	J/(kg·K)		
Colour or absoptance (only for outter layered material) Thermal transmittance	- W/(m ² ·K)		
Opening control	-		
Solar shading bresence Solar shading technology	-		
Solar shading control Solar shading potential	- %		
Glass thermal transmittance	W/(m ² ·K)		
Glass solar factor Frame thermal transmittance	- W/(m ² ·K)		
Frame colour or absoptance	-		
Linear thermal transmittance	- W(m·K)		
Length Building air change rate at 50 Pa	m 1/h		
General description	-	0	
Services linked to the system Rated general installation efficiency	- %	2	
Technology	-	2	
Rated power	- kW	2	
Renewable contribution (if applicable) Metering	% -	2	
Control	- -		
Capacity Control	- m		
Typology of circuit	-		
Ciculation device	-		
Control Technology	-		
Control	-		
Technology	-	2	
Overall rated power	W	2	
Technology	-	2	
Installed peak power Rated efficiency	kWp %	2	
Orientation	o o		
Possibility to export electricity to the grid	-		
Inverter type Reporting of performance	-		
Technology	-	2	
Rated efficiency	ктир %	2	
Possibility to export electricity to the grid Reporting of performance	-		
Technology	-	2	
Installed peak power Rated efficiency for thermal generation	kWp %	2	
Rated efficiency for power generation	%	2	
Installed peak capacity	- kWh		
Control Reporting of performance	-		
Overall score	-		
Energy savings on site Flexibility for the grid and storage	-		
Comfort Convenience	-		
Wellbeing and health	-		
Maintenance and fault prediction Information to occupants	-		
Heating DWH	-		
Cooling	-		
Controlled ventilation	-	0	
Dynamic envelope	-		
EV charging	-		
Monitoring & control	-		
Spring score	-		
Summer score Fall score	-		
Winter score	-		
Annuar COSt	т/У	0	Comments
Good presence of data, with various visual graphs and table	s. Qualitative	comfort is	evaluated with simples qualifications that are easy to understand. Particular space dedicated to energy renovations scenarios



		Case Study 9
Name	Linite Droce	Indicators
Overall non-renewable primary energy use	kWh/m ²	
Overall total primary energy use Summer thermal comfort	kWh/m ² K·h	
Winter thermal comfort	K·h	
Overall non-renewable primary energy use	kWh/m ²	
Overall renewable primary energy production	kWh/m ² kWh/m ²	0 1 Share of renewable energy
Overall equivalent CO2 emissions	kg/m ²	2
Renewable electricity generation by onsite PV Renewable electricity generation by onsite wind turbines	kWh/m ² kWh/m ²	Generated renewable energy in general Generated renewable energy in general
Renewable electricity generation by onsite CHP	kWh/m ²	
Renewable electricity from onsite evidence and self-used	kWh/m ²	
Renewable electricity from onsite CHP self-used Renewable electricity exported to non-EPB uses by onsite PV	kWh/m ² kWh/m ²	
Renewable electricity exported to non-EPB uses by onsite wind turbines	kWh/m ²	
Renewable electricity exported to non-EPB uses by onsite CHP Renewable electricity exported to the grid by onsite PV	kWh/m ²	
Renewable electricity exported to the grid by onsite wind turbines	kWh/m ²	
Energy needs per heating	kWh/m ²	 Heating Degree Days. The calculated normalized energy use per heating could be assumed as Energy needs per heating.
Energy needs per cooling Energy needs per DHW	kWh/m ² kWh/m ²	
Energy needs per humidification & dehumidification	kWh/m ²	
Energy needs per mecanical ventilation Energy needs per lighting	%	
Energy use per heating Energy use per cooling	kWh/m ² kWh/m ²	2 The normalized energy use is presented in the EPC. The actual one is presented in the energy audit summary and in the energy audit report 2 The normalized energy use is presented in the EPC. The actual one is presented in the energy audit summary and in the energy audit report
Energy use per DHW	kWh/m ²	2 The normalized energy use is presented in the EPC. The actual one is presented in the energy audit summary and in the energy audit report
Energy use per humidification & dehumidification Energy use per mechanical ventilation	kWh/m ² kWh/m ²	2 2 The normalized energy use is presented in the EPC. The actual one is presented in the energy audit summary and in the energy audit report
Energy use per lighting	kWh/m ²	2 The normalized energy use is presented in the EPC. The actual one is presented in the energy audit summary and in the energy audit report
Name of material	•	 Information about the materials is available in sheet "Building description" of the summary, as well as in the energy audit report
Thickness Conductivity	m W/K	Information about the thicknesses is available in sheet "Building description" of the summary, as well as in the energy audit report O
Density Specific beat	kg/m ³	
Colour or absoptance (only for outter layered material)	=	
Thermal transmittance Opening control	W/(m ⁺ ·K) -	
Solar shading presence Solar shading technology	-	<u> </u>
Solar shading control	-	0
Glass thermal transmittance	W/(m ² ·K)	
Glass solar factor Frame thermal transmittance	- W/(m ² ·K)	0 Information about the glass solar factor is normally available in sheet "Building description" of the summary, and it is available in the energy audit report 0
Frame colour or absoptance	-	
Linear thermal transmittance	W(m·K)	
Building air change rate at 50 Pa	m 1/h	U Information about the Building air change rate is available in the energy audit report
General description Services linked to the system	-	General description is available in the summary and in the energy audit report
Rated general installation efficiency Technology	-	2
Energy vector	-	2 1 Only for bosting carrier Dated active is acceptly, weights in the accept, with recent
Renewable contribution (if applicable)	%	1 Only for heating service: Rated power is normally available in the energy audit report. 1 Minimun of SCOP/SEER is defined. Information about the metering is available in the energy audit report
Metering Control	-	C Information about the metering is available in the energy audit report C Information about the control is available in sysetms description in the energy audit report
Capacity Control	m ³	0 0 Information about the control is available in systems description in the energy audit report
Typology of circuit		Information about the control of a database in systems description in the chargy dudit report
Ciculation device		
Control Technology	-	Information about the control is available in sysetms description in the energy audit report O
Control Reporting of performance	-	Information about the control is available in sysetms description in the energy audit report
Technology Overall rated power	- W	1 Not filled "Generator Type"
Control	-	
Installed peak power	- kWp	
Rated efficiency Orientation	% •	
Inclination Possibility to export electricity to the grid	-	
Inverter type Percenter type Percent	-	
Technology	-	0
Rated efficiency	kwp %	
Possibility to export electricity to the grid Reporting of performance	-	
Technology Installed peak power	- kWp	<u> </u>
Rated efficiency for thermal generation	%	
Technology	-	
Installed peak capacity Control	-	
Reporting of performance Overall score	-	<u>0</u>
Energy savings on site Elexibility for the grid and storage		2
Comfort Company of the second se		0
Wellbeing and health		
Maintenance and fault prediction	-	
Heating DWH	-	0
Cooling Controlled ventilation	-	0
Lighting	-	0
Dynamic envelope Renewable, generation & storage	-	<u> </u>
EV charging Monitoring & control	-	0
Overall score Spring score	-	0
Summer score	-	0
Winter score		
Annual cost	t/y	μναγρασκ period calculated for different energy renovation scenarios. Annual cost, investment, savings, SPB, IRR, NPV, NPVQ are presented in the energy Comments
Good work at graphical design, all the data is shown in tables. Good orientation in renov on the results from an energy audit conducted. The full doc	vation scenarios to	the final user, calculating costs, energy savings and pay-back periods. Many colourful graphs and scales. Note: EPC for existing building is issued only based s of: D; Energy audit report - free text, but minimal required content is regulated; 2: Summary for conducted energy audit; 3: EPC.



			Case Study 10b
Name	Units	Presence	Indicators IComments
Overall non-renewable primary energy use	kWh/m ²	0	
Overall total primary energy use Summer thermal comfort	kWh/m² K·h	2	
Winter thermal comfort	K·h	0	
Overall non-renewable primary energy use	k√n kWh/m²	0	
Overall renewable primary energy production	kWh/m ²	2	
Overall equivalent CO2 emissions	kg/m ²	2	
Renewable electricity generation by onsite PV Renewable electricity generation by onsite wind turbines	kWh/m ² kWh/m ²	0	
Renewable electricity generation by onsite CHP	kWh/m ²	0	
Renewable electricity from onsite PV self-used Renewable electricity from onsite wind turbines self-used	kWh/m ²	0	
Renewable electricity from onsite CHP self-used	kWh/m ²	0	
Renewable electricity exported to non-EPB uses by onsite PV Renewable electricity exported to non-EPB uses by onsite wind turbines	kWh/m ²	0	
Renewable electricity exported to non-EPB uses by onsite CHP Renewable electricity exported to the grid by onsite PV	kWh/m ² kWh/m ²	0	
Renewable electricity exported to the grid by onsite wind turbines	kWh/m ²	0	
Renewable electricity exported to the grid by onsite CHP Energy needs per heating	kWh/m ² kWh/m ²	0	
Energy needs per cooling	kWh/m ²	0	
Energy needs per humidification & dehumidification	kWh/m ²	0	
Energy needs per mecanical ventilation Energy needs per lighting	kWh/m ² %	0	
Energy use per heating	kWh/m ²	2	
Energy use per cooling Energy use per DHW	kWh/m ² kWh/m ²	2	
Energy use per humidification & dehumidification	kWh/m ²	0	
Energy use per lighting	kWh/m ²	1	General "Usages recenses"
Thermal transmittance Name of material	W/(m ² ·K)	2	
Thickness	m	2	
Density	kg/m ³	0	
Specific heat Colour or absoptance (only for outter layered material)	J/(kg·K) -	0	
Thermal transmittance	W/(m ² ·K)	2	
Solar shading presence	-	0	
Solar shading technology Solar shading control	-	0	
Solar shading potential	%	0	
Glass thermal transmittance Glass solar factor	-	2	
Frame thermal transmittance Frame colour or absoptance	W/(m ² ·K)	2	
Air permeability class	-	0	
Length	m	2	
Building air change rate at 50 Pa General description	1/h -	0	
Services linked to the system Rated general installation efficiency	- %	2	
Technology	-	2	
Rated power	- kW	0	
Renewable contribution (if applicable) Metering	-	0	
Control	- m ³	0	
Control	-	0	
Typology of circuit Insulation of pipes	-	0	
Ciculation device	-	0	Only in ventilation corvine
Technology	-	2	
Reporting of performance	-	0	
Technology Overall rated power	- W	0	
Control	-	0	
Installed peak power	kWp	0	
Orientation	% °	0	
Inclination Possibility to export electricity to the grid	-	0	
Inverter type Reporting of performance	-	0	
Technology	-	0	
Rated efficiency	куур %	0	
Possibility to export electricity to the grid Reporting of performance	-	0	
Technology Installed peak power	- kWp	0	
Rated efficiency for thermal generation	%	0	
Rated efficiency for power generation Technology	% -	0	
Installed peak capacity Control	kWh -	0	
Reporting of performance Overall score	-	0	
Energy savings on site	-	2	
Comfort	-	0	
Convenience Wellbeing and health	-		
Maintenance and fault prediction	-	0	
Heating	-	0	
Cooling	-	0	
Controlled ventilation	-	0	
Dynamic envelope	-	0	
EV charging	-	0	
Monitoring & control Overall score	-	0	
Spring score Summer score	-	0	
Fall score	-	0	
Annual cost	€/у	2	• • • •
Possibility of improving the organisation data and classifying the different parameters (e.g. envelope	characteri	Comments stics). Good work promoting the energy renovation of buildings, calculating the cost of measures and economic and energy savings per technical system



Case Study 11a			
Name	Units	Presence	Indicators Comments
Overall non-renewable primary energy use	kWh/m ²	0	
Overall total primary energy use Summer thermal comfort	kWh/m* K·h	1	Evaluated by district heating consumption
Winter thermal comfort	K·h	0	
Overall non-renewable primary energy use	kWh/m ²	0	
Overall renewable primary energy production	kWh/m ²	0	
Overall renewable primary energy use Overall equivalent CO2 emissions	kg/m ²	0	
Renewable electricity generation by onsite PV	kWh/m ²	2	
Renewable electricity generation by onsite wind turbines Renewable electricity generation by onsite CHP	kWh/m ²	0	
Renewable electricity from onsite PV self-used	kWh/m ²	0	
Renewable electricity from onsite CHP self-used	kWh/m ²	0	
Renewable electricity exported to non-EPB uses by onsite PV	kWh/m ²	0	
Renewable electricity exported to non-EPB uses by onsite CHP	kWh/m ²	0	
Renewable electricity exported to the grid by onsite PV Penewable electricity exported to the grid by opsite wind turbines	kWh/m ²	0	
Renewable electricity exported to the grid by onsite Wind to bries Renewable electricity exported to the grid by onsite CHP	kWh/m ²	0	
Energy needs per heating Energy needs per cooling	kWh/m ² kWh/m ²	0	
Energy needs per DHW	kWh/m ²	0	
Energy needs per humidification & dehumidification Energy needs per mecanical ventilation	kWh/m ² kWh/m ²	0	
Energy needs per lighting	%	0	
Energy use per heating Energy use per cooling	kWh/m ² kWh/m ²	2	
Energy use per DHW	kWh/m ²	0	
Energy use per humidification & dehumidification Energy use per mechanical ventilation	kWh/m ²	0	Included in total declared electricity consumption
Energy use per lighting	kWh/m ²	2	
Name of material	• • • • • • • • • • • • • • • • • • •	2	
Thickness Conductivity	m W/K	2	
Density	kg/m ³	0	
Specific heat Colour or absoptance (only for outter layered material)	J/(kg·K) -	0	
Thermal transmittance	W/(m ² ·K)	0	
Solar shading presence	-	2	
Solar shading technology Solar shading control	-	2	
Solar shading potential	%	Ő	
Glass thermal transmittance Glass solar factor	W/(m ⁻ ·K) -	0	
Frame thermal transmittance	W/(m ² ·K)	0	
Air permeability class	-	0	
Linear thermal transmittance Length	W(m·K)	0	
Building air change rate at 50 Pa	1/h	0	
Services linked to the system	-	2	
Rated general installation efficiency Technology	%	0	
Energy vector	-	0	
Rated power Renewable contribution (if applicable)	kW %	0	
Metering Control	-	0	
Capacity	m ³	2	
Control Typology of circuit	-	2	
Insulation of pipes	-	2	
Control	-	2	
Technology Control	-	2	
Reporting of performance	-	0	
Overall rated power	w	2	
Control Technology	-	2	Described system but technology is not mentioned
Installed peak power	kWp «	1	Area dedicated for solar pannels
Orientation	0	0	
Inclination Possibility to export electricity to the grid	-	0	
Inverter type Percentage of performance	-	0	
Technology	-	0	
Installed peak power	kWp %	0	
Possibility to export electricity to the grid Reporting of performance	-	0	
Technology	-	0	
Installed peak power Rated efficiency for thermal generation	kWp %	0	
Rated efficiency for power generation	%	0	
Installed peak capacity	- kWh	0	
Control Reporting of performance	-	2	
Overall score	-	0	
Flexibility for the grid and storage	-	0	
Comfort Convenience	-	0	
Wellbeing and health Maintenance and fault prediction	-	0	
Information to occupants	-	0	
Heating DWH	-	0	
Cooling	-	0	
Lighting	-	0	
Dynamic envelope Renewable, generation & storage	-	0	
EV charging	-	0	
Monitoring & control Overall score	-	0	
Spring score	-	0	
Fall score	-	0	
Annual cost	- €/y	2	
ry detailed data about installations but other is needed, as energy needs or envelope te	chnical chara	cterises. Po	Comments ssibility of improving the readability throughout the implementation of tables for the presentation of the data. Moreover, the "free redaction" format could



Case Study 11b			
Nama	Links	Draganaa	Indicators
Overall non-renewable primary energy use	kWh/m ²	O	
Overall total primary energy use Summer thermal comfort	kWh/m ² K·h	1	Evaluated by district heating consumption
Winter thermal comfort	Kıh	0	
Domestic Hot Water (DHW) thermal comfort Overall non-renewable primary energy use	K·h kWh/m ²	0	
Overall renewable primary energy production	kWh/m ²	0	
Overall renewable primary energy use Overall equivalent CO2 emissions	kWh/m ⁻ kg/m ²	0	
Renewable electricity generation by onsite PV	kWh/m ²	0	
Renewable electricity generation by onsite wind turbines Renewable electricity generation by onsite CHP	kWh/m ² kWh/m ²	0	
Renewable electricity from onsite PV self-used	kWh/m ²	0	
Renewable electricity from onsite wind turbines self-used Renewable electricity from onsite CHP self-used	kWh/m ² kWh/m ²	0	
Renewable electricity exported to non-EPB uses by onsite PV	kWh/m ²	0	
Renewable electricity exported to non-EPB uses by onsite wind turbines Renewable electricity exported to non-EPB uses by onsite CHP	kWh/m ²	0	
Renewable electricity exported to the grid by onsite PV	kWh/m ²	0	
Renewable electricity exported to the grid by onsite wind turbines Renewable electricity exported to the grid by onsite CHP	kWh/m ² kWh/m ²	0	
Energy needs per heating	kWh/m ²	0	
Energy needs per cooling Energy needs per DHW	kWh/m ²	0	
Energy needs per humidification & dehumidification	kWh/m ²	0	
Energy needs per hecanical ventilation Energy needs per lighting	%	0	
Energy use per heating	kWh/m ²	2	
Energy use per Cooling Energy use per DHW	kWh/m ²	0	
Energy use per humidification & dehumidification	kWh/m ² kWh/m ²	0	
Energy use per mechanical ventilation Energy use per lighting	kWh/m ²	0	
Thermal transmittance	W/(m ² ·K)	0	
Thickness	m	2	
Lonauctivity Density	W/K kg/m ³	0	
Specific heat	J/(kg·K)	0	
Thermal transmittance (only for outter layered material)	- W/(m ² ·K)	0	
Opening control Solar shading presence	-	0	
Solar shading presence Solar shading technology	-	0	
Solar shading control Solar shading potential	- %	0	
Glass thermal transmittance	W/(m ² ·K)	0	
Frame thermal transmittance	W/(m ² ·K)	0	
Frame colour or absoptance Air permeability class	-	0	
Linear thermal transmittance	W(m·K)	0	
Length Building air change rate at 50 Pa	m 1/h		
General description Services linked to the system	-	2	
Rated general installation efficiency	%	0	
Energy vector	-	2	
Rated power Renewable contribution (if applicable)	kW %	0	
Metering	-	0	
Control Capacity	- m ³	2	
Control Turpelogue of girquit	-	2	
Insulation of pipes	-	2	
Ciculation device Control	-	2	
Technology	-	2	
Reporting of performance	-	0	
Technology Overall rated power	- W	2	
Control	-	2	
Installed peak power	- kWp	2	Area dedicated for solar pannels
Rated efficiency Orientation	% °	0	
Inclination	0	0	
Inverter type	-	0	
Reporting of performance Technology	-	0	
Installed peak power	kWp	0	
Possibility to export electricity to the grid	-	0	
Reporting of performance Technology	-	0	
Installed peak power	kWp	0	
Rated efficiency for power generation	26 %	0	
Technology Installed peak capacity	- kWh	2	
Control	-	2	
Overall score	-	00	
Energy savings on site Elexibility for the grid and storage	-	0	
Comfort	-	0	
Wellbeing and health	-	0	
Maintenance and fault prediction	-	0	
Heating	-	0	
Cooling	-	0	
Controlled ventilation	-	0	
Dynamic envelope	-	0	
Renewable, generation & storage EV charging	-	0	
Monitoring & control Overall score	-	0	
Spring score	-	0	
Summer score Fall score	-	0	
Winter score	-	0	
	с/у	2	Comments
ry detailed data about installations but other is needed, as energy needs or envelope tec	hnical chara	cterises. Po	ssibility of improving the readability throughout the implementation of tables for the presentation of the data. Moreover, the "free redaction" format could







This project has received funding from the European Union's Horizon 2020 research and innovation programme under the grant agreement number 839937. The European Union is not liable for any use that may be made of the information contained in this document, which is merely representing the authors' view.

