

- ENERPAT (Energy Planning Assessment Tool), is an application that enables professionals in the building sector (architects, urban planners, builders, technicians and municipal managers) to assess the state of the residential building stock and define rehabilitation strategies to improve the energy efficiency of the buildings
- The application integrates the data obtained from the Energy Performance Certificates provided by the Catalan Institute of Energy (ICAEN), the cadastre and the census sections, together with geographic information
- The rehabilitation measures are based on the ICAEN simulation tool and the "Long-term strategy for energy rehabilitation in the building sector in Spain" (ERESEE 2014)



Are you an urban planner or urban environmental manager?







Are you an urban planner or urban environmental manager?

User says:

Yes, I work in the urban quality department of the municipality of Sant Cugat del Vallès







Are you interested in developing refurbishing programmes for residential buildings in your municipality?

User says:

Yes, I work in the urban quality department of the municipality of Sant Cugat del Vallès



Enerpat says:

ENERPAT offers you the information you need to carry them out, step by step



ENERPAT BUILDINGS TO REFURBISH FINAL REPORT SEARCH A MUNICIPALITY REHABILITATION SCENARIOS INTERVENTIONS PILL All contractions



Enerpat says:

First, you have to select the municipality on the map





ENERPAT Rehabilitate your city SEARCH & MUNICIPALITY REHABILITATION SCENARIOS INTERVENTIONS BUILDINGS TO REFURBISH FINAL REPORT (3)

Clusters in Sant Cugat del Vallès **

ENERSI has grouped the buildings of the municipality with similar characteristics into nine clusters (CL). This table contains information about the energy efficiency of the buildings included in each cluster.





Enerpat says:

Then, in the second step, the residential buildings stock is classified into groups according to their year of construction, use, number of floors and building characteristics



ENERPAT

Rehabilitate your city

SEARCH & MUNICIPALITY

REHABILITATION SCENARIOS

INTERVENTIONS

BUILDINGS TO REFURBISH FINAL REPORT

15

Cluster nº 7

Cluster of multi-family buildings built between 1981 and 1990. They are considered buildings constructed generally with walls with air chamber and thermal Insulation, flat roof and air chamber under first floor stab.

Rehabilitation measure	Housing to be applied	Cost per unit	Energy savings	Return (years)
Passive measures to be applied: • Apply insulation on the outside of the facade • Install PVC windows and low emissivity glass • Insulate the roof by the exterior	1161	12030€	40,3% - 49,6%	17,3 - 40,7
Al. Natural gas condensing boder	609	1946,2€	17,3% - 22,5%	6.2 - 15.7
 Multifamily housing heat pump 	40	1140€	2,6%	30.4
9. Aerothermal heat pump for hot and cold water for sanitary use	0	8500€	5196 - 63,196	16 - 32,4

The ICAEN simulator of rehabilitation measures for residential buildings does not include interventions on façade exteriors. Because of this, the suggestion is to place the insulation in the outer wall.

Cluster nº 8

Cluster of single-family buildings built between 1991 and 2011 with 1 to 3 floors. They are considered to be buildings constructed generally with walls with air chamber and thermal insulation, sloping roof without air chamber and air chamber under first floor slab.

Rehabilitation measure	Housing to be applied	Cost per unit	Energy savings	Return (years)
Passive measures to be applied! • Apply insulation on the outside of the facade • Install PVC windows and low emissivity glass • Insulate the roof by the exterior	660	236694	29.6%+38.8%	29,2+>50
43. Natural gas condensing boiler	391	26004	13,8% - 21,3%	5,8 - 17,8
H. Pelles bailer	ð	7650€	9,1% - 15,8%	17 - 50
46. Single family housing heat pump	30	2120€	4.2%	21.6
A7. Aerothermal heat pump for hot and cold water for sanitary use	3	\$500€	42,7% - 55%	15.5 - 22.2



Enerpat says:

In the third step, the rehabilitation measures proposed for each of the groups are shown, including the cost of the investment, the energy savings and the return on investment









In the fourth step, the location of the buildings to be rehabilitated is displayed on the map





At the end of the process, you can save all the information that have been provided in each step



Step 1: Select a municipality







The map shows the Energy Performance Certificates of residential buildings at three scales: municipality, county and province



ENERPAT

STEP 1: SELECT A MUNICIPALITY

ENERPAT Rehabilitate your city SEARCH & MUNICIPALITY REHABILITATION SCENARIOS INTERVENTIONS BUILDINGS TO REFURBISH FINAL REPORT 717



Enerpat says:

The map shows the Energy Performance Certificates of residential buildings at three scales: municipality, county and province

Enerpat says:

To begin with, you have to locate the municipality of Sant Cugat del Vallès



ENERPAT

STEP 1: SELECT A MUNICIPALITY

ENERPAT

Rehabilitate your city





Enerpat says:

The map shows the Energy Performance Certificates of residential buildings at three scales: municipality, county and province

Enerpat says:

To begin with, you have to locate the municipality of Sant Cugat del Vallès

User says:

OK, I have found it. After selecting it on the map, the energy rating scales appear in a box on the right





and province

Enerpat says:

To begin with, you have to locate the municipality of Sant Cugat del Vallès

User says:

OK, I have found it. After selecting it on the map, the energy rating scales appear in a box on the right



Enerpat says:

In this box, you can see the total number of residential buildings with an Energy Performance Certificate in the municipality, and their corresponding energy label

STEP 1: SELECT A MUNICIPALITY



ENERPAT

Rehabilitate your city



User says:

OK, I have found it. After selecting it on the map, the energy rating scales appear in a box on the right





Enerpat says:

In this box, you can see the total number of residential buildings with an Energy Performance Certificate in the municipality, and their corresponding energy label

User says:

I see on this scale that the majority of certified buildings belong to category E



STEP 1: SELECT A MUNICIPALITY

ENERPAT

Rehabilitate your city



appear in a box on the right



Enerpat says:

In this box, you can see the total number of residential buildings with an Energy Performance Certificate in the municipality, and their corresponding energy label

User says:

I see on this scale that the majority of certified buildings belong to category E



User says:

Also, I see on the map that the orange color of the label E predominates in the municipality



ENERPAT

Rehabilitate your city





In this box, you can see the total number of residential buildings with an Energy Performance Certificate in the municipality, and their corresponding energy label

User says:

I see on this scale that the majority of certified buildings belong to category E



User says:

Also, I see on the map that the orange color of the label E predominates in the municipality

User says:

One question, why is the number of dwellings (5,679) smaller than the number of dwellings in the municipality?

ENERPAT

Rehabilitate your city



User says:

I see on this scale that the majority of certified buildings belong to category E



User says:

Also, I see on the map that the orange color of the label E predominates in the municipality

User says:

One question, why is the number of dwellings (5,679) smaller than the number of dwellings in the municipality?



Enerpat says:

The number of dwellings is smaller because only those that have an Energy Performance Certificate are considered

ENERPAT

Rehabilitate your city



the municipality

User says:

One question, why is the number of dwellings (5,679) smaller than the number of dwellings in the municipality?



Enerpat says:

The number of dwellings is smaller because only those that have an Energy Performance Certificate are considered

Enerpat says:

Then, ENERPAT classifies the residential buildings with an Energy Performance Certificate into groups to determine the appropriate rehabilitation measures for each group



Step 2: Refurbishing scenarios



Paquets d'edificis en Sant Cugat del Vallès **

ENERSI ha agrupat la teva selecció en nou paquets de edificis similars. En la següent gràfica s'observa la qualificació energètic paquet.

	Total	PE 1 😡	PE 2 🔞	PE 3 🚱	PE 4 🔞	PE 5 🔞	PE 6 🔞
Nº Habitatges existents	5028	160	138	59	192	124	287
Nº Habitatges a rehabilitar	5028	160	138	59	192	124	287
% Habitatges a rehabilitar	100%	100% ▼	100% 🔻	100% 🔻	100% 🔻	100% 🔻	100%



Clusters in Sant Cugat del Vallès **

ENERSI has grouped the buildings of the municipality with similar characteristics into nine clusters (CL). This table contains information about the energy efficiency of the buildings included in each cluster.

Total CL1 0 CL2 D CL3 @ CL4 @ CL5 @ CL6 @ CL7 @ CL8 @ CL 9 @ Number of certified dwellings 5028 1.6P 287 1161 2227 Number of dwellings to rehabilitate 5028 150 138 50 192 124 287 1161 680 2227 % dwellings to rehabilitate 100% 100% * 100% * 100% * 100% • 100% • 100% • 100% * 100% * 100% * Energy consumption and CO2 emisions Non-renewable primary energy (tep) CD2 emissions + Energy labels Total



Enerpat says:

Here you see the residential buildings with an Energy Performance Certificate grouped into nine groups (G1, G2, G3... G9)



ENERPAT



Clusters in Sant Cugat del Vallès **

ENERSI has grouped the buildings of the municipality with similar characteristics into nine clusters (CL). This table contains information about the energy efficiency of the buildings included in each cluster.





Enerpat says:

Here you see the residential buildings with an Energy Performance Certificate grouped into nine groups (G1, G2, G3... G9)

Enerpat says:

The table above indicates the number of dwellings in each group and, to the left, the total number of certified homes in the municipality (5,679). For each group, you can set the percentage of dwellings to be renovated to determine the cost of their rehabilitation, the energy savings achieved and the energy label they would obtain after the reform



STEP 2: REFURBISHING SCENARIOS



of dwellings in each group and, to the left, the total number of certified homes in the municipality (5,679). For each group, you can set the percentage of dwellings to be renovated to determine the cost of their rehabilitation, the energy savings achieved and the energy label they would obtain after the reform

Enerpat says:

Before selecting the percentage of dwellings to be rehabilitated in each group, we recommend that you analyze the current situation of the buildings as reflected in these graphs: "Energy consumption and emissions", and "Energy ratings"



ENERPAT



label they would obtain after the reform

Enerpat says:

Before selecting the percentage of dwellings to be rehabilitated in each group, we recommend that you analyze the current situation of the buildings as reflected in these graphs: "Energy consumption and emissions", and "Energy ratings"

Enerpat says:

The top graph shows the total non-renewable primary energy consumed by the buildings of each group; the lower one, the CO2 emissions



ENERPAT



Clusters in Sant Cugat del Vallès **

ENERSI has grouped the buildings of the municipality with similar characteristics into nine clusters (CL). This table contains information about the energy efficiency of the buildings included in each cluster.



Enerpat says:

Before selecting the percentage of dwellings to be rehabilitated in each group, we recommend that you analyze the current situation of the buildings as reflected in these graphs: "Energy consumption and emissions", and "Energy ratings"

Enerpat says:

The top graph shows the total non-renewable primary energy consumed by the buildings of each group; the lower one, the CO2 emissions

User says:

And what do the two bars in each group represent?



ENERPAT

Clusters in Sant Cugat del Vallès **

ENERSI has grouped the buildings of the municipality with similar characteristics into nine clusters (CL). This table contains information about the energy efficiency of the buildings included in each cluster.

	Total	CL1 Ø	CL2 0	CL3 0	CL 4 @	CL5 0	CL 6 0	CL 7 @	CL8 @	CL 9 @
lumber of certified dwellings	5028	160	138	59	192	124	287	1161	680	2227
umber of dwellings to rehabilitate	5028	160	138	59	192	124	287	1161	680	2227
6 dwellings to rehabilitate	100%	100% •	100% •	100% •	100% *	100% •	100% •	100% *	100% •	100% •
 Energy consumption and CO2 emision 	ons									
Non-renewable primary energy (tep)	2014 3824	274 264	25% 18k	104 34	344 42k	124 36h	854 47b	2104 107%	243k 88k	3344 2314
CD2 emissions	1974 1104					1 man				71x 44
Energy labels										
Trant										

User says:

And what do the two bars in each group represent?



Enerpat says:

The solid bar indicates the current consumption of primary energy and the production of emissions of all the buildings in each group. The shaded bar represents the sum of the primary energy consumption and emissions after the rehabilitation of the buildings of the group, according to the percentage applied to it. The direction of the arrow that links both bars indicates the increase or decrease that would result from the rehabilitation





Clusters in Sant Cugat del Vallès **

ENERSI has grouped the buildings of the municipality with similar characteristics into nine clusters (CL). This table contains information about the energy efficiency of the buildings included in each cluster.





Enerpat says:

The solid bar indicates the current consumption of primary energy and the production of emissions of all the buildings in each group. The shaded bar represents the sum of the primary energy consumption and emissions after the rehabilitation of the buildings of the group, according to the percentage applied to it. The direction of the arrow that links both bars indicates the increase or decrease that would result from the rehabilitation

User says:

¿Y qué representan las barras de la primera columna por la izquierda?



STEP 2: REFURBISHING SCENARIOS



Clusters in Sant Cugat del Vallès **

ENERSI has grouped the buildings of the municipality with similar characteristics into nine clusters (CL). This table contains information about the energy efficiency of the buildings included in each cluster.



energy consumption and emissions after the rehabilitation of the buildings of the group, according to the percentage applied to it. The direction of the arrow that links both bars indicates the increase or decrease that would result from the rehabilitation

User says:

And what do the bars in the first column on the left represent?





Enerpat says:

The total sum of the energy consumed and the emissions produced by the dwellings included in all the groups

STEP 2: REFURBISHING SCENARIOS

ERPAT												
ARCH A MUNICIPALITY REHAB	ILITATION SCE	NARIOS	-0	INTERVENT	IONS (BU	ILDINGS TO) réfurbis	H ()	FINAL	REPORT	User sa
Clusters in Sant Cugat del Vallès ENERSI has grouped the buildings of the m of the buildings included in each cluster.	s ** unicipality with	h similar ch	aracteristic	s into nine c	lusters (CL)	. This table	coritains in	formation a	bout the er	sergy efficie	ency	And w
	100	CL1 @	CL 2 0	0.3 0	CL4 @	CLS Ø	CL6 0	CL7 @	CL 8 @	CL 9 0		
	Total											
Number of certified dwellings	5028	160	138	59	192	124	287	1161	680	2227		
Number of certified dwellings Number of dwellings to rehabilitate	5028 5028	160 160	138 138	59 59	192 192	124 124	287 287	1161	680 680	2227		
Number of certified dwellings Number of dwellings to rehabilitate % dwellings to rehabilitate	100%	160 160 100% •	138 138 100% •	59 59 100% •	192 192 100% •	124 124 100% •	287 287 100% •	1161 1161 100% •	680 680 100% •	2227 2227 100% •		
Number of certified dwellings Number of dwellings to rehabilitate % dwellings to rehabilitate > Energy consumption and CO2 eme	1004i 5028 5028 100%	160 160 100% •	138 138 100% *	59 59 100% •	192 192 100% •	124 124 100% •	287 287 100% •	1161 1161 100% *	680 680 100% •	2227 2227 100% •		
Number of certified dwellings Number of dwellings to rehabilitate % dwellings to rehabilitate > Energy consumption and CO2 emit ~ Energy labels	1004 5028 5028 100%	160 160 100% •	138 138 100% *	59 59 100% •	192 192 100% •	124 134 100% •	287 287 100% •	1161 1161 100% *	680 680 100% •	2227 2227 100% •		

154 005 4 4 0 6 0 15 2 4 1 7 2 16 15 255 35 149 107 349

1 2 7 60 7 13 9 23 7 16 2 33 12 103 IN 40 IN 18 19 19 19

58 67 52 79 57 15 73 111 65 71 67 139 699 336 606 168 14 905

or decrease that would result from the rehabilitation

/S:

hat do the bars in the first n on the left represent?



Enerpat says:

The total sum of the energy consumed and the emissions produced by the dwellings included in all the groups

Enerpat says:

The graph "Energy ratings" shows the classification of the buildings contained in the groups

STEP 2: REFURBISHING SCENARIOS

Savings in energy and carbon emisions

540 87

842 87

Dwellings with Clabel

Owellings with D label

Dweilings with Elabel

Dweilings with Flabel

Dwellings with Glabel

Total



ENERPAT

Rehabilitate your city

SEARCH & MUNICIPALITY

REHABILITATION SCENARIOS

BUILDINGS TO REFURBISH

(4)

FINAL REPORT

S

Clusters in Sant Cugat del Vallès **

ENERSI has grouped the buildings of the municipality with similar characteristics into nine clusters (CL). This table contains information about the energy efficiency of the buildings included in each cluster.

INTERVENTIONS

(3)

	Total	CL1 0	CLZ Ø	0.3 0	CL 4 @	CLS Ø	CL6 @	CL7 @	CL 8 @	CL 9 0
Number of certified dwellings	5028	160	138	59	192	124	287	1161	680	222
Number of dwellings to rehabilitate	5028	160	138	59	192	124	287	1161	680	222
% dwellings to rehabilitate	100%	100% *	100% *	100% *	100% •	100% •	100% *	100% *	100% *	100%
> Energy consumption and CO2 emisi	ons									
 Energy labels 										
Dwellings with A label	10 05	11 28	0 54	0 1	0 5	0 2	Τī	0 3	2.7	T 10
Dwellings with B label	79 200	7 7 7	54 ô	T 4	12 7	1 0	7 8	TR	ē 55	9 90
wellings with C label	154 805	4 2	0 S	0 15	2 4	T 7	2 15	1 250	26 149	107 345
wellings with D label	581 ZA	7 40	7 13	9 23	7 16	2 35	12 103	106 479	110 215	321 824
Oweilings with E label	34 24	58 67	\$2 79	37 18	73 111	85 H	92 139	699 336	805 168	1k 905
oweilings with Flabet	540 87	1 7 1	16 7	4.1	26 24	17 8	60 6	120	71 7	154 22
Owellings with G label	842 87	34 10	19 7	8.0	72 23	63 6	12 8	a 7	59 1	227 24
Total										



Enerpat says:

The total sum of the energy consumed and the emissions produced by the dwellings included in all the groups

Enerpat says:

The graph "Energy ratings" shows the classification of the buildings contained in the groups

Enerpat says:

As in the previous graph, the bar on the left indicates the total number of dwellings with a specific rating within each group, and the number of dwellings of the same class after rehabilitation





Clusters in Sant Cugat del Vallès **

ENERSI has grouped the buildings of the municipality with similar characteristics into nine clusters (CL). This table contains information about the energy efficiency of the buildings included in each cluster.

	Total	CL1 0	CLZ 0	0.3.0	CL 4 @	CL5 Ø	CL 6 @	CL7 0	CL 8 @	CL 9 0
Number of certified dwellings	5028	160	138	59	192	124	287	1161	680	2227
Number of dwellings to rehabilitate	5028	160	138	59	192	124	287	1161	680	2227
% dwellings to rehabilitate	100%	100% •	100% *	100% *	100% *	100% •	100% *	100% *	100% *	100%
Energy consumption and CO2 emision	ons									
 Energy labels 										
Dwellings with A label										
	18 85	11 28	0 24	1 0	0 3	0 2	$\overline{2}$ $\overline{1}$	0 2	2.7	J 10
Dwellings with B label										
	79 200	19 F	54 0	1.4	12 7	1 0	6 5	7 5	6 55	9: 90
Dwellings with C label	1									-
	154 805	4.4	a e	0 15	2 4	1 7	2 15	12 255	26 149	107 349
Owellings with D label	1							1	-	1
	581 24	7 40	7 15	9 23	7 16	2 35	12 103	106 479	110 315	321 824
Oweilings with E label								1	-	
	34 24	58 67	\$2 79	37 15	73 111	40 71	92 139	699 336	405 168	1k 905
Dweilings with Flabel	-							1920		-
	540 87	27 5	16 7	4.1	26 24	17 8	60 6	125 12	71 7	154 22
Dwellings with G label							-	-		-
*	843 87	34 10	39 7	8 0	72 25	63 6	112 6	118 6	39 1	237 24
lotal										

Enerpat says:

The graph "Energy ratings" shows the classification of the buildings contained in the groups

Enerpat says:

As in the previous graph, the bar on the left indicates the total number of dwellings with a specific rating within each group, and the number of dwellings of the same class after rehabilitation

Enerpat says:

Likewise, the first column indicates the values for all the dwellings contained in the groups





As in the previous graph, the bar on the left indicates the total number of dwellings with a specific rating within each group, and the number of dwellings of the same class after rehabilitation

Enerpat says:

Likewise, the first column indicates the values for all the dwellings contained in the groups

Enerpat says:

Below the graphs, the table continues to show the total energy and emission savings achieved in each group, and the investment to be made. Savings and costs can be broken down for active and passive measures



Clusters in Sant Cugat del Vallès **

ENERSI has grouped the buildings of the municipality with similar characteristics into nine clusters (CL). This table contains information about the energy efficiency of the buildings included in each cluster.



Enerpat says:

Likewise, the first column indicates the values for all the dwellings contained in the groups

Enerpat says:

Below the graphs, the table continues to show the total energy and emission savings achieved in each group, and the investment to be made. Savings and costs can be broken down for active and passive measures

User says:

How can I assign the number of dwellings to be rehabilitated in each group?



STEP 2: REFURBISHING SCENARIOS

ENERPAT Rehabilita la teva ciutat EDIFICIS A REHABILITAR INFORME FINAL CERCA UN ÀMBIT ESCENARIS DE REHABILITACIÓ INTERVENCIONS (3) (4)

Paquets d'edificis en Sant Cugat del Vallès **

ENERSI ha agrupat la teva selecció en nou paquets de edificis similars. En la seguent gráfica s'observa la qualificació energètica dels edificis continguts en cada paquet.



Enerpat says:

Below the graphs, the table continues to show the total energy and emission savings achieved in each group, and the investment to be made. Savings and costs can be broken down for active and passive measures

User says:

How can I assign the number of dwellings to be rehabilitated in each group?





In this drop-down menu, the percentage of homes to be rehabilitated is selected

ENERPAT

Rehabilitate your city



User says:

How can I assign the number of dwellings to be rehabilitated in each group?



Enerpat says:

In this drop-down menu, the percentage of homes to be rehabilitated is selected

User says:

So, what do I have to do if my objective is to rehabilitate the minimum number of dwellings to achieve the maximum energy savings?



ENERPAT

Rehabilitate your city





of homes to be rehabilitated is selected

User says:

So, what do I have to do if my objective is to rehabilitate the minimum number of dwellings to achieve the maximum energy savings?





Enerpat says:

In this case it would be necessary to start by rehabilitating the housing groups with the highest percentage of energy savings and emissions, for example applying passive measures, as suggested by the information provided in the table and in the graphs

ENERPAT

Rehabilitate your city

Clusters in Sant Cugat del Vallès **

ENERSI has grouped the buildings of the municipality with similar characteristics into nine clusters (CL). This table contains information about the energy efficiency of the buildings included in each cluster.



of dwellings to achieve the maximum energy savings?



Enerpat says:

In this case it would be necessary to start by rehabilitating the housing clusters with the highest percentage of energy savings and emissions, for example applying passive measures, as suggested by the information provided in the table and in the graphs

User says:

If I rehabilitate 100% of the dwellings in groups CL5, CL6 and CL7 we would only save 17% of energy



STEP 2: REFURBISHING SCENARIOS

ENERPAT

Reh

ate your city										
non-renewable primary energy (rep)	961k 798k	37x 27k	Dex 26k	10x 10x	Jek Jek	Jik Jók	554 - 474	2164 107k	145k 143k	334k 334k
CD2 emissions	1976 162%			- 28 X	124 124	∎ as	104			78. 78.
Energy labels										
Total										
Savings in energy and carbon emisions (%)	1796	0%	0%	0%	0%	50%	45%	50%	0%	6%
Total investment (M€)	22.11M€	0.00M€	0.00M€	0.00M€	0.00M€	1.81M€	5.10M€	15.20M€	0.00M€	0.00M6
 Passive measures 										
Savings in energy and carbon emisions (%)	13.83%	0.00%	0.00%	0.00%	0.0095	45.65%	40.75%	44.95%	0.00%	0.00%
Investment per housing unit	12895€	9408€	3434€	5405€	7125€	13788€	16002€	12031€	.23670€	146566
Total investment (ME)	20.27ME	0.00M€	0.00M€	0.00M€	0.00M€	1.71ME	4.59M€	13.97M€	0.00M€	0.00M6
Return on investment	32.05 Anys	0.00 Artys	0.00 Anys	0.00 Anys	0.00 Anys	33.20 Anys	33.95 Anys	29.00 Anys	0.00 Алуз	0.00 Anys
Refurbishing measures		mare	thore	m See more	more	more	fill See mare	more	Tel See more	mpre
 Active measures 										
Savings in energy and carbon emisions (9i)	3.11%	0.00%	0.00%	0.00%	0,00%	4.02%	4:10%	5.37%	0.00%	0.00%
Investment per housing unit	1172€	-0€	90	06	0€	815€	1279€	1060€	Ŭ€	04
Total investment (ME)	1.84M€	0.00M€	0.00M€	0.00M€	0.00ME	0.10M€	0.51M€	1.23M€	0.00ME	0.00M6
Return on investment	12.11 Anys	0.00 Алуз	0.00 Anys	0.00 Anys	0.00 Anys	17.83 Алуз	10.04 Алуз	12,15 Anys	0.00 Ariys	0.00 Anys
Refurbishing measures		more	more	misee more	more	more	more	more (more	more	more



Enerpat says:

In this case it would be necessary to start by rehabilitating the housing groups with the highest percentage of energy savings and emissions, for example applying passive measures, as suggested by the information provided in the table and in the graphs

User says:

If I rehabilitate 100% of the dwellings in groups G5, G6 and G7 we would only save 17% of energy

User says:

What if I am interested in rehabilitating the dwellings with a minimum investment per home?



ENERPAT Rehabilitate your city CO2 emissions > Energy labels Total Savings in energy and carbon emisions 17% (%) Total investment (M€) 22.11ME 0.00M€ 0.00M€ 0.00M€ 0.00ME 1.81M€ 5.10M€ 15.20M€ 0.00M€ 0.00M4 Passive measures Savings in energy and carbon emisions 13.83% 40.75% 0.00% 0.00% 0.00% 0.0091 45.65% 44.95% 0.00% 0.00% (961 Investment per housing unit 12895€ 94086 34346 5405€ 7125€ 13788€ 16002€ 12031€ 23670€ 14656€ Total investment (ME) 20.27ME 0.00M€ 0.00M€ 0.00ME 1.71ME 4.59M€ 13.97М€ 0.00M€ 0:00ME 0.00ME 32.05 0.00 0.00 0.00 0.00 33:20 33.95 29.00 0.00 Return on investment. 0.00 Anys Artys Anys Arrys. Anys Anys Artys. Anys. Anys Anys TH See CE See See . TE See See : 📶 See See. See . tal See Refurbishing measures more поле ~ Active measures Savings in energy and carbon emisions 3.11% 0.00% 0.00% 0.00% 0.00% 4.02% 4:10% 5.37% 0.00% 0.00% (96) Investment per housing unit 1172€ 815E 1279€ 1060€ 0€ 3€ DE. 0€ Ŭ€ OE 1.23M€ Total investment (M€) 1.84M€ 9.000M€ 9.00M€ 9.000M€ 3M06.0 0.10M€ 0.51M€ 0.00M€ 0.00M€ 12.11 17.83 10.04 12.15 0.00 0.00 0.00 0.00 0.03 Return on investment 00 Anys Anys Artys Arrys. Anvs Anys Anys. Artvs Anys 500 C See See. 1 DB See Sen Sen III See III See III See 00 50e Refurbishing measures more rttone more

in the table and in the graphs

User says:

If I rehabilitate 100% of the dwellings in groups G5, G6 and G7 we would only save 17% of energy



User says:

What if I am interested in rehabilitating the dwellings with a minimum investment per home?



Enerpat says:

Then we should start by rehabilitating groups of dwellings with the lowest cost per unit



Rehabilitate your city

Clusters in Sant Cugat del Vallès **

ENERSI has grouped the buildings of the municipality with similar characteristics into nine clusters (CL). This table contains information about the energy efficiency of the buildings included in each cluster.



save 17% of energy

User says:

What if I am interested in rehabilitating the dwellings with a minimum investment per home?



Enerpat says:

Then we should start by rehabilitating groups of dwellings with the lowest cost per unit

User says:

If the G2, G3 and G4 groups are rehabilitated, we would only save 3% of energy. It is not enough



Rehabilita la teva ciutat

Paquets d'edificis en Sant Cugat del Vallès **

ENERSI ha agrupat la teva selecció en nou paquets de edificis similars. En la següent gràfica s'observa la qualificació energètica dels edificis continguts en cada paquet.





Enerpat says:

Then we should start by rehabilitating groups of dwellings with the lowest cost per unit

User says:

If the G2, G3 and G4 groups are rehabilitated, we would only save 3% of energy. It is not enough



Enerpat says:

One suggestion: the best way to significantly reduce energy consumption and carbon emissions would be to rehabilitate the groups with the largest number of dwellings (those with the highest bars)

Rehabilita la teva ciutat

Clusters in Sant Cugat del Vallès **

ENERSI has grouped the buildings of the municipality with similar characteristics into nine clusters (CL). This table contains information about the energy efficiency of the buildings included in each cluster.



User says:

If the G2, G3 and G4 groups are rehabilitated, we would only save 3% of energy. It is not enough





Enerpat says:

One suggestion: the best way to significantly reduce energy consumption and carbon emissions would be to rehabilitate the groups with the largest number of dwellings (those with the highest bars)

User says:

If the G7, G8 and G9 groups are rehabilitated, savings of up to 30% could be achieved. This value is closer to the municipality's savings objective





ENERPAT

Rehabilita la teva ciutat

	197k 138K	ßk	100 A	3K	24	25	88 28	12k	118 118	62	100	184	88 18+	45%	88 222k	20k	18k	718	463
 Energy labels 																			
Dwellings with A label																			
	18 33	Ξī,	11	0	٥	ō	0	6	a	٥	6	2	2	a	3	2	7	3	10
Dwellings with B label	79 238	19	19	24	24	ĩ	i.	12	12	ï	i.	6	5	1	52	6	33	9	50
Dweilings with C label	154 760	1	a l	ò	0	0	ø	Ŧ	F	1	Ť.	Ŧ	Ŧ	11	253	26	149	107	349
Dweilings with D label	581 IA	Ŧ	F	7	œ.			7	7	2	1	12	12	206	479	110	ns	311	824
Dwellings with Elabel	34 24	50	50	52	52	17	27	55	Ð,	45	40	52	92	699	256	405	160	14	908
Dwellings with Flabel	540 191	27	27	ii	14	Ŧ	Ŧ	26	26	īř	i7	10	60	125	12	n	e.	194	22
Dwellings with G label	043 360	54	54	55	25	8	÷	72	72	65	45	113	ñ	216	1	59	Ŧ.	237	34
Total	\bigcirc																		
Savings in energy and carbon emisions (9i)	30%		0%		0%		0%		0%		0%		0%		50%		39%		359
Total investment (M€)	70.62M€	0.0	OM€	0.0	OM€	0.0	MMO	0,0	ow∈	0,0	00M€	0.0	oM€	15.2	oM€	17.2	SM€	35.4	11M
 Passive measures 																			
Savings In energy and carbon emisions (%)	28.20%	0	00%	0	.00%	0	00%	0	₩00%	. 0	0.00%	0	.00%	44	.95%	34	.20%	:29	(80)
Investment per housing unit	15414€	94	408€	3	434€	5	405€	7	125€	13	788€	16	002€	12	031€	23	670€	14	656
Total Investment (ME)	62.70M€	0.0	OM€	0.0	óM€	0.0	00M€	0.0	0M€	0.0	30M€	0.0	€M0	13.9	7M€	16.1	OM€	32.6	-4M
Return on investment	37.90 Anys		0.00 Anys		0.00 Anys		0.00 Anys		0.00 Anys		0.00 Anys		0.00 Anys	12	19.00 Anys	- 23	9.60 Anys	1	45.1) Any
Refurbishing measures		1	l See nove		See nore	1	i See tiore	9	TSee more	10	nore		15ee nore		See nore	1	1 See	0	l Se mon
 Active measures 																			
Savings in energy and carbon emisions	1.005		nnai		0066	3	004		0.006	1.	0.00	ā	0.000		2764	2	749	2	039



Enerpat says:

One suggestion: the best way to significantly reduce energy consumption and carbon emissions would be to rehabilitate the groups with the largest number of dwellings (those with the highest bars)

User says:

If the G7, G8 and G9 groups are rehabilitated, savings of up to 30% could be achieved. This value is closer to the municipality's savings objective





Enerpat says:

Perfect! If now we look at the energy ratings we see that from A to D have increased to the detriment of E to G

ENERPAT

Rehabilita la teva ciutat

	201 14	2. 7.	11 14	, ,	1. 1.	18 E.	12 12	200 479	110 315	223.024
Dwellings with E label	34 24	50 50	52 52	37 37	5 7	45 40	92 92	699 356	405 160	14 909
Dwellings with Flabel	540 191	27 27	17 17	77	56 56	17 17	60 60	125 12	π y	194 22
Dwellings with G label	643 260	54 54	55 59	<u> </u>	72 72	6 65		210 0	59 i	237 34
Total										
Savings in energy and carbon emisions (9i)	30%	0%	0%	0%	0%	0%	0%	50%	39%	359
Total investment (M€)	70.62M€	0.00M€	0.00M€	D.00M4	0.00M€	0.00M€	0.00M€	15.20M€	17.25M€	35.41M
 Passive measures 										
Savings in energy and carbon emisions (%)	28.20%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	44.95%	34.20%	29,80
Investment per housing unit	15414€	9408€	3434€	5405€	7125€	13788€	16002€	12031€	23670€	14656
Total Investment (ME)	62.70M€	0.00M€	0.00M€	0.00M€	0.00ME	0.00M€	0.00M€	13.97M€	16.10M€	32.64M
Return on investment	37.90 Anys	0.00 Anys	0.00 Anys	0.00 Anys	0.00 Anys	0.00 Anys	0.00 Anys	Z9.00 Anys	39.60 Апуз	45.1 Any
Refurbishing measures		In See	topre	ttiore	more	CIII See more	more	more	more more	COI Se mor
 Active measures 										
Savings in energy and carbon emisions (%)	1.89%	0.0096	0.00%	0.00%	0.00%	0.00%	0.0095	5.37%	5.26%	5.039
Investment per housing unit	1947€	06	06	0€	06	06	06	1060€	1694€	1243
Total investment (M€)	7.92M€	0.00M€	0.00M€	0.00M€	0.00M€	0.00M€	0.00M€	1.23M€	1.15M€	2.7754
Return on investment	16.25 Anys	0.00 Artys	0.00 Anys	0.00 Anys	0.00 Anys	0.00 Anys	0.00 Anys	12.15 Anys	12.84 Anys	19.2 Алу
		more more	more	more	more	more	more more	more	more	mor

User says:

If the G7, G8 and G9 groups are rehabilitated, savings of up to 30% could be achieved. This value is closer to the municipality's savings objective





INTERVENTIONS

Enerpat says:

Perfect! If now we look at the energy ratings we see that from A to D have increased to the detriment of E to G

Enerpat says:

Once the type and number of buildings to be rehabilitated have been identified in accordance with the objectives of the city's action programme, we have access to more detailed information on the rehabilitation measures to be applied

Step 3: Interventions

ENERPAT Rehabilitate your city CERCA UN AMBIT ESCENARIS DE RENABILITACIO INTERVENCIONS EDIFICIS A REHABILITAR INFORME FINAL Paquet d'edificis nº 1

Paquet d'edificis unifamiliars construits abans del 1950 d'entre 1 i 3 plantes. Es consideren edificis construits amb sistemes tradicionals de mun massis i gruixut, predominant la coberta inclinada amb cambra ventilada i amb solera en contacte amb el terreny.

Acció de mitioría	Habitarges a aplicar	Preu per Nabitatge	Estatvi energétic	Retorn (Anyst
Aphaar milloreti passivesi				
Aplicar allument par à l'internor de la Repre Instal lar Reserva P2C i vidre baix enviais Aller la collerte per l'internor	(60	9407€	23,4% - 30,9%	14,1 - 39,2
AZ. Caldera de condensació gasoli	2	26004	19.7% - 23,2%	5.2 + 12.9
A3. Caldara de condensaios gas natural	66	2000€	19,7% - 23,2%	15-10
All. Calders de pellets		2630K	13398-17,598	10,4-41,8

Sham apreximat les accors proposades per restrategia lassocial de Rehabilitació del Minocen de Forment del closer. B per unifamiliar a pluritamiliar entiment que san casos de sana terristiques constructives, uniamétiques i d'entimo sentiars en tan sos varia el maintre d'habitatges per elitino.

Paquet d'edificis nº 2

Paquet d'entificis plunfamiliars construits abans del 1950 d'entre 1 i à plantes. Es consideren entificis construits antil sistemes tradicionais de mun massis i gruixut, predominant la coberta inclinada amb cambra ventilada i amb solera en contacte amb el terreny.

Acclá de miliora	Habitatges a aplicar	Preu per habitatge	Estatvi energittic	Retorn (Anys)
riphear millores passives:				
 Aplicar ellisment per a l'interior de la façana Instal·lar finestras PAC i vicile baix emissiu Allar la coberta per l'interior 	138	54134	22.546 - 3098	13.1-28.3
A1. Celdere de condenseció ges natural	++:	1945,2€	17.9% - 22,5%	8,6+17
AND AND DESCRIPTION OF A DESCRIPTION OF		-114415		- A1 10 1

ENERPAT

Rehabilitate your city

SEARCH & MUNICIPALITY

REHABILITATION SCENARIOS

INTERVENTIONS

FINAL REPORT

15

BUILDINGS TO REFURBISH

Cluster nº 7

Cluster of multi-family buildings built between 1981 and 1990. They are considered buildings constructed generally with walls with air chamber and thermal insulation, flat roof and air chamber under first floor stab.

Rehabilitation measure	Housing to be applied	Cost per unit	Energy savings	Return (years)
Paspive measures to be applied: • Apply insulation on the outside of the facade • Install PVC windows and low emissivity glass • Insulate the roof by the exterior	1151	12030€	40,3%+49,6%	17,3 - 40,7
A1. Natural gas condensing boder	609	1946,2€	17,3% - 22,5%	6.2 - 15.7
45. Multifamily housing Heat pump	40	1140€	2,6%	30.4
49. Aerothermal heat pump for hot and cold water for sanitary use	0	8500€	5196 - 63,196	16 - 32,4

The ICAEN simulator of rehabilitation measures for residential buildings does not include interventions on façade exteriors. Because of this, the suggestion is to place the insulation in the outer wall.

Cluster nº 8

Cluster of single-family buildings built between 1991 and 2011 with 1 to 3 floors. They are considered to be buildings constructed generally with walls with air chamber and thermal insulation, sloping roof without air chamber and air chamber under first floor slab.

Rehabilitation measure	Housing to be applied	Cost per unit	Energy savings	Return (years)
Passive measures to be applied:				
Install PVC windows and low emissivity glass Insulate the roof by the exterior	660	23669€	29,6% + 38,8M	29,2+>50
 Netural gas condensing boiler 	391	26004	13,8% - 21,3%	5,8 - 17,8
H. Pelles bailer	ð	7650€	9,1% - 15,8%	17 - 50
iő. Single family housing heat pump	30	2120K	4,2%	21.6
47. Aerothermal heat pump for hot and cold water for sanitary use	3	3500€	42,7% - 55%	15.5 - 22.2



Enerpat says:

Here you have the rehabilitation measures to be applied in the buildings of the three selected groups: G7, G8 and G9



STEP 3: INTERVENTIONS

ENERPAT

Rehabilitate your city

SEARCH & MUNICIPALITY

REHABILITATION SCENARIOS

INTERVENTIONS

BUILDINGS TO REFURBISH FINAL REPORT

15

Cluster nº 7



Rehabilitation measure	Housing to be applied	Cost per unit	Energy savings	Return (years)
Passive measures to be applied: • Apply insulation on the outside of the facade • Install PVC windows and low emissivity glass • Insulate the roof by the exterior	1161	12030€	40,3% - 49,6%	17,3 - 40,7
A1. Natural gas condensing boiler	609	1946,2€	17,3% - 22,5%	6.2 - 15.7
A5. Multifemily housing Heat pump	40	1140€	2,4%	30.4
A9. Aerothermal heat pump for hot and cold water for sanitary use	0	8500€	5196 - 63,196	16-32,4

The ICAEN simulator of rehabilitation measures for residential buildings does not include interventions on façade exteriors. Because of this, the suggestion is to place the insulation in the outer wall.

Cluster nº 8

Cluster of single-family buildings built between 1991 and 2011 with 1 to 3 floors. They are considered to be buildings constructed generally with walls with air chamber and thermal insulation, sloping roof without air chamber and air chamber under first floor slab.

Rehabilitation measure	Housing to be applied	Cost per unit	Energy savings	Return (years)
Passive measures to be applied! • Apply insulation on the outside of the facade • Install PVC windows and low emosivity glass • Insulate the roof by the extentor	660	256694	29,6% + 38,8M	29,2+>50
43. Natural gas condensing boiler	391	26004	13,8% - 21,3%	5,8 - 17,8
44. Pelles bailer	ð	7650€	9,1% - 15,8%	17 - 50
46. Single family housing hear pump	30	2120€	4,2%	21.6
A7. Acrothermal heat pump for hot and cold water for sanitary use	3	3500€	42,7% - 55%	15.5 - 22.2



Enerpat says:

Here you have the rehabilitation measures to be applied in the buildings of the three selected groups: G7, G8 and G9

Enerpat says:

This table summarizes the characteristics of the dwellings of each group



ENERPAT

STEP 3: INTERVENTIONS

ENERPAT

Rehabilitate your city

SEARCH & MUNICIPALITY

REHABILITATION SCENARIOS

INTERVENTIONS

BUILDINGS TO REFURBISH FINAL REPORT

15

Cluster nº 7

Cluster of multi-family buildings built between 1981 and 1990. They are considered buildings constructed generally with walls with air chamber and thermal insulation, flat roof and air chamber under first floor stab.

Rehabilitation measure	Housing to be applied	Cost per unit	Energy savings	Return (years)
Passive measures to be applied: • Apply insulation on the outside of the facade • Install PVC windows and low emissivity glass. • Insulate the roof by the exterior	1161	12030£	40,3% - 49,6%	17,3 - 40,7
A1. Natural gas condensing boder	609	1946,26	17,3% - 22,5%	6.2 - 15.7
45. Multifamily housing Heat pump	40	1140€	2,696	30.4
49. Aerothermal heat pump for hot and cold water for sanitary use	0	8500€	51% - 63,1%	16 - 32,4

The ICAEN simulator of rehabilitation measures for residential buildings does not include interventions on façade exteriors. Because of this, the suggestion is to place the insulation in the outer wall.

Cluster nº 8

Cluster of single-family buildings built between 1991 and 2011 with 1 to 3 floors. They are considered to be buildings constructed generally with walls with air chamber and thermal insulation, sloping roof without air chamber and air chamber under first floor slab.

Rehabilitation measure	Housing to be applied	Cost per unit	Energy savings	Return (years)
Passive measures to be applied				
Apply insulation on the outside of the facade Install PVC wondows and low emissivity glass Insulate the roof by the exterior	660	23669€	29,6% - 38,8%	29.2 - >50
 Netural gas condensing boiler 	391	26004	13,8% - 21,3%	5,8 - 17,8
H. Pelles bailer	ő	7650€	9,1% - 15,8%	17 - 50
46. Single family housing heat pump	30	2120K	4,2%	21.8
A7. Aerothermal heat pump for hot and cold water for sanitary use	3	3500€	42,7%-55%	15,5 - 22,2



Enerpat says:

Here you have the rehabilitation measures to be applied in the buildings of the three selected groups: G7, G8 and G9

Enerpat says:

This table summarizes the characteristics of the dwellings of each group

Enerpat says:

And the rehabilitation measures to apply



STEP 3: INTERVENTIONS

ENERPAT

Rehabilitate your city

SEARCH & MUNICIPALITY

REHABILITATION SCENARIOS

INTERVENTIONS

BUILDINGS TO REFURBISH FINAL REPORT

Cluster nº 7

Cluster of multi-family buildings built between 1981 and 1990. They are considered buildings constructed generally with walls with air chamber and thermal insulation, flat roof and air chamber under first floor stab.

Rehabilitation measure	Housing to be applied	Cost per unit	Energy savings	Return (years)
Passive measures to be applied: • Apply insulation on the outside of the facade • Install PVC windows and low emissivity glass • Insulate the roof by the exterior	1161	12030€	40,3%+49,6%	17,3 - 40,7
A1. Natural gas condensing boder	609	1946,2€	17,3% - 22,5%	6.2 - 15.7
45. Multifamily housing Heat pump	40	1140€	2,6%	30.4
A9: Aerothermal heat pump for hot and cold water for sanitary use	0	8500€	5196 - 63,196	16-32,4

The ICAEN simulator of rehabilitation measures for residential buildings does not include interventions on Taçade exteriors. Because of this, the suggestion is to place the insulation in the outer wall.

Cluster nº 8

Cluster of single-family buildings built between 1991 and 2011 with 1 to 3 floors. They are considered to be buildings constructed generally with walls with air - chamber and thermal insulation, sloping roof without air chamber and air chamber under first floor slab.

Rehabilitation measure	Housing to be applied	Cost per unit	Energy savings	Return (years)
Passive measures to be applied				
Apply insulation on the outside of the facade Install PVC vandows and low emissivity glass Insulate the roof by the exterior	660	23669€	29,5% + 38,8%	29,2+>50
43. Natural gas condensing boiler	391	26004	13,8% - 21,3%	5,8 - 17,8
44. Pelles bailer	ð	7650€	9,1% - 15,8%	17 - 50
A6. Single family housing heat pump	30	2120€	4,2%	21.6
A7. Aerothermal heat pump for hot and cold water for senitary use	3	3500€	42,7%-55%	15.5 - 22.2



Enerpat says:

Here you have the rehabilitation measures to be applied in the buildings of the three selected groups: G7, G8 and G9

Enerpat says:

This table summarizes the characteristics of the dwellings of each group

Enerpat says:

And the rehabilitation measures to apply

User says:

Can the suggested measures be modified?



ENERPAT

Rehabilitate your city

SEARCH & MUNICIPALITY

REHABILITATION SCENARIOS

DS INTERVENTIONS

BUILDINGS TO REFURBISH FINAL REPORT

15

Cluster nº 7

Cluster of multi-family buildings built between 1981 and 1990. They are considered buildings constructed generally with walls with air chamber and thermal Insulation, flat roof and air chamber under first floor stab.

Rehabilitation measure	Housing to be applied	Cost per unit	Energy savings	Return (years)
Passive measures to be applied: • Apply insulation on the outside of the facade • Install PVC windows and low emissivity glass • Insulate the roof by the exterior	1161	12030€	40,3% - 49,6%	17,3 - 40,7
A1. Natural gas condensing boder	609	1946,2€	17,3% - 22,5%	6.2 - 15.7
A5. Multifemily housing Heat pump	40	1140€	2,6%	30.4
A9. Aerothermal heat pump for hot and cold water for sanitary use	0	8500€	5196 - 63,196	16-32,4

The ICAEN simulator of rehabilitation measures for residential buildings does not include interventions on Taçade exteriors. Because of this, the suggestion is to place the insulation in the outer wall.

Cluster nº 8

Cluster of single-family buildings built between 1991 and 2011 with 1 to 3 floors. They are considered to be buildings constructed generally with walls with air chamber and thermal insulation, sloping roof without air chamber and air chamber under first floor slab.

Rehabilitation measure	Housing to be applied	Cost per unit	Energy savings	Return (years)
Passive measures to be applied				
 Apply insulation on the outside of the facade Install PVC windows and low emissivity glass Insulate the roof by the exterior 	660	236694	29,6%+38,8%	29,2+>50
 Netural gas condensing boiler 	391	26004	13,8% - 21,3%	5,8 - 17,8
H. Pelles bailer	ð	7650€	9,1% - 15,8%	17 - 50
A6. Single family housing heat pump	30	2120€	4,2%	21.6
A7. Aerothermal heat pump for hot and cold water for sanitary use	3	3500€	42,7% - 55%	15.5 - 22.2

Enerpat says:

And the rehabilitation measures to apply

User says:

Can the suggested measures be modified?





Enerpat says:

No. These measures are based on the "Long-term Strategy for Energy Renovation in the Building Sector in Spain" and the data provided by the energy rehabilitation measures simulator for residential buildings of ICAEN



Rehabilitate your city

Rehabilitation measure	Housing to be applied	Cost per unit	Energy savings	Return (years)
Passive measures to be applied/				
Apply insulation on the outside of the facade Install PVC windows and low emissivity glass Insulate the roof by the extentor	660	236696	29,6%+38,8%	29.2+*50
A3. Natural gas condensing boiler	391	26004	13,8% - 21,3%	5,8 - 17,8
A4. Pellet baller	ð	7650€	9,1% - 15,8%	17 - 50
A5. Single family housing heat pump	30	2120K	4,2%	21.6
A7. Acrothermal heat pump for hos and cold water for sanitary use	3	8500€	42,7% - 55%	15.5 - 22.2

The ICAEN simulator of rehabilitation measures for residential buildings does not include interventions on façade exteriors. Because of this, the suggestion is to place the insulation in the outer wall.

Cluster nº 9

Cluster of multi-family buildings built between 1991 and 2011. Buildings constructed generally with walls with air chamber and thermal insulation, flat roof and air chamber under first floor slab.

Rehabilitation measure	Housing to be applied	Cost per unit	Energy savings	Return (years)
Passive measures to be applied: • Insulate insulation in the facade air chamber • Install PVC windows and low emissivity glass • Insulace the roof by the interior	2227	14656€	24,2%+35,4%	40.2 ->50
A1. Natural gas condensing boiler	1247	1946.2€	1490 - 20,996	9-26
A5. Multifamily housing heat pump	126	1140€	316	32.4
A8. Aerothermal heat pump for hot and cold water for sanitary use	23	86004	42,3% - 54,1%	31.6 - 46.5

The ICAEN simulator of reliabilitation measures for residential buildings does not include interventions on façade exteriors. Because of this, the suggestion is to place the insulation in the air chamber.

< REHABILITATION SCENARIOS

BUILDINGS TO REFURBISH >

User says:

Can the suggested measures be modified?



Enerpat says:

No. These measures are based on the "Long-term Strategy for Energy Renovation in the Building Sector in Spain" and the data provided by the energy rehabilitation measures simulator for residential buildings of ICAEN

Enerpat says:

Next, you will be able to find out the location of the dwellings to be rehabilitated

Step 4: Buildings to be rehabilitated







Enerpat says:

All of the buildings to be rehabilitated included in the selected groups are shown in the map



STEP 4: BUILDINGS TO BE REHABILITATED



ENERPAT

Rehabilitate your city

SEARCH & MUNICIPALITY

REHABILITATION SCENARIOS

(2)

INTERVENTIONS (3)

FINAL REPORT BUILDINGS TO REFURBISH

Buildings to refurbish in Sant Cugat del Vallès

Table view Graph view Download Map view

Show 10 . entries

Year	Surface	Usage	Floors	α	Energy savings (kWh/m2)		Emission reduction (kg/m2)	
					Current	Refurbished	Current	Refurbished
1999	93	Unifamilier	5	9	134,94	94.73	28.39	19.93
2001	1910 -	Unifamilia r	\$	9.	167.65	117.69	35.31	24.79
2005	66	Unifamiliar	6	9	75.41	46.88	15.78	9.75
2007	48.35	Unifamiliar	5	9	223.33	156.78	37.83	26.56
1999	102	Unifamiliar	4	9	84.51	53.26	17.25	10.83
1999	63	Unifemilier	4	9	157.93	108.52	26.75	18.38
1995	78.4	Unifamiliar	5	9	83.52	51.77	17.47	10.81
1997	0.7	Unifamiliar	4	9	102.8	63.25	21.73	13.37
1996	90	Unifemilier	7	9,1	127,14	78.85	26.57	16.45
1994	120	Unifemiliar	4	9.1	129.69	79.91	27.36	16.85
	Year 1999 2001 2005 2007 1999 1999 1995 1995 1997 1998 1994	Year Surface 1999 93 2001 111 2005 66 2007 48.35 1999 102 1999 63 1995 78.4 1995 75.4 1995 89 1995 120 1995 121	Year Surface Usage 1999 93 Ueifamiliar 2001 111 Ueifamiliar 2005 66 Ueifamiliar 2007 48.35 Ueifamiliar 1999 102 Ueifamiliar 1999 63 Ueifamiliar 1999 63 Ueifamiliar 1999 63 Ueifamiliar 1995 78.4 Ueifamiliar 1995 86 Ueifamiliar 1995 86 Ueifamiliar 1995 93.4 Ueifamiliar 1995 120 Ueifamiliar	Year Surface Usage Picors 1999 93 Ucifamiliar 5 2001 111 Ucifamiliar 5 2005 66 Urifamiliar 6 2007 48.35 Unifamiliar 5 1999 102 Ucifamiliar 5 1999 63 Ucifamiliar 4 1995 78.4 Ucifamiliar 4 1995 07 Ucifamiliar 5 1999 07 Ucifamiliar 5 1995 78.4 Ucifamiliar 4 1995 120 Ucifamiliar 4 1995 120 Ucifamiliar 4	Year Surface Usage Floors CL 1999 93 Ueifamiliar 5 9 2001 111 Ueifamiliar 5 9 2005 66 Ueifamiliar 6 9 2005 48.35 Ueifamiliar 5 9 1999 102 Ueifamiliar 5 9 1999 102 Ueifamiliar 5 9 1999 102 Ueifamiliar 5 9 1999 63 Ueifamiliar 4 9 1995 78.4 Ueifamiliar 4 9 1995 07 Ueifamiliar 4 9 1995 86 Ueifamiliar 4 9 1995 86 Ueifamiliar 5 9 1995 86 Ueifamiliar 4 9	Year Surface Usage Picors CL Current 1999 93 Ueifamiliar 5 9 134.94 2001 111 Urifamiliar 5 9 134.94 2001 111 Urifamiliar 5 9 167.65 2005 66 Urifamiliar 6 9 75.41 2007 48.35 Urifamiliar 5 9 223.33 1999 102 Urifamiliar 5 9 04.51 1999 102 Urifamiliar 4 9 157.93 1995 78.4 Urifamiliar 4 9 157.93 1995 78.4 Urifamiliar 4 9 102.8 1995 78.4 Urifamiliar 4 9 102.8 1997 07 Urifamiliar 4 9 102.8 1999 98 Urifamiliar 4 9 127.14 1994 120	Year Surface Usage Hoors CL Currents Refurbative 1999 93 Unifamiliar 5 9 134.94 94.73 2001 111 Unifamiliar 5 9 167.65 117.69 2005 66 Unifamiliar 6 9 75.41 46.88 2007 48.35 Unifamiliar 5 9 223.33 156.78 1999 102 Unifamiliar 5 9 04.51 53.26 1999 63 Unifamiliar 5 9 157.93 108.52 1999 63 Unifamiliar 4 9 102.8 63.25 1999 78.4 Unifamiliar 4 9 102.8 63.25 1999 78.4 Unifamiliar 4 9 102.8 63.25 1999 07 Unifamiliar 7 9 127.14 78.65 1999 120 Unifamiliar 4	Year Surface Usage Floors CL Current Refurbladies Current 1999 93 Ueifamiliar 5 9 134.94 94.73 28.39 2001 111 Urifamiliar 5 9 167.65 117.69 35.31 2005 66 Urifamiliar 6 9 75.41 46.88 15.73 2007 48.35 Urifamiliar 5 9 22.33 156.78 37.33 2007 48.35 Urifamiliar 5 9 22.33 156.78 37.33 1999 102 Urifamiliar 5 9 22.33 156.78 37.33 1999 102 Urifamiliar 5 9 23.33 108.52 26.75 1999 63 Urifamiliar 4 9 157.93 108.52 21.73 1995 78.4 Urifamiliar 4 9 102.9 63.25 21.73 1997

< INTERVENTIONS

FINAL REPORT



S

Enerpat says:

All of the buildings to be rehabilitated included in the selected groups are shown in the map

Enerpat says:

The same information is provided in this list



ENERPAT

STEP 4: BUILDINGS TO BE REHABILITATED





Enerpat says:

All of the buildings to be rehabilitated included in the selected groups are shown in the map

Enerpat says:

The same information is provided in this list

User says:

If I get closer, I can identify the location of the buildings in the map









Enerpat says:

All of the buildings to be rehabilitated included in the selected groups are shown in the mapt

Enerpat says:

The same information is provided in this list

User says:

If I get closer, I can identify the location of the buildings in the map



User says:

I see now that there are buildings in need of rehabilitation, but they have not been included in the selected percentages



The same information is provided in this list

User says:

If I get closer, I can identify the location of the buildings in the map



User says:

I see now that there are buildings in need of rehabilitation, but they have not been included in the selected percentages



Enerpat says:

No problem, you can change the percentages of buildings to be rehabilitated in each group

ENERPAT Rehabilitate your city							
CERCA UN AMBIT	ESCENARIS DE REHABILITACIÓ		INTERVENCIONS		EDIFICIS A REHABILITAR		INFORME FINAL
-0		-0		3		۲	

Paquets d'edificis en Sant Cugat del Vallès **

ENERSI ha agrupat la teva selecció en nou paquets de edificis similars. En la seguent gràfica s'observa la qualificació energètica dels edificis continguts en cada paquet.



If I get closer, I can identify the location of the buildings in the map

User says:

I see now that there are buildings in need of rehabilitation, but they have not been included in the selected percentages



Enerpat says:

No problem, you can change the percentages of buildings to be rehabilitated in each group

User says:

I change the percentages again



2





need of rehabilitation, but they have not been included in the selected percentages



Enerpat says:

No problem, you can change the percentages of buildings to be rehabilitated in each group

User says:

I change the percentages again



User says:

Now, the building that I am interested in appears as one of the buildings to be rehabilitated





Enerpat says:

No problem, you can change the percentages of buildings to be rehabilitated in each group

User says:

I change the percentages again

User says:

Now, the building that I am interested in appears as one of the buildings to be rehabilitated



Enerpat says:

After selecting a building on the map, its characteristics are displayed in a window





User says:

I change the percentages again



User says:

Now, the building that I am interested in appears as one of the buildings to be rehabilitated



Enerpat says:

After selecting a building on the map, its characteristics are displayed in a window

Enerpat says:

In this link, detailed information about the building to be rehabilitated can be obtained from the ENERHAT application





Now, the building that I am interested in appears as one of the buildings to be rehabilitated



Enerpat says:

After selecting a building on the map, its characteristics are displayed in a window

Enerpat says:

In this link, detailed information about the building to be rehabilitated can be obtained from the ENERHAT application

Enerpat says:

To finish, you can generate a report with the information about the buildings to be rehabilitated and the measures to be applied



Step 5: Final report



and the second se		the second s	and the second se	and the local sector of th	design and the second se				
 Tetal	PE 1	PE 2	PE 3	PE.4	PE 3	PE®	PET	PEE	PE 9





Here you can print or save a document that contains all the information generated in the previous steps



STEP 5: FINAL REPORT



We hope we have answered your questions. If you need more information, please write to arc@salle.url.edu







We hope we have answered your questions. If you need more information, please write to arc@salle.url.edu

User says:

Thanks, and see you soon





2017 ©ARC Engineering and Architecture La Salle arc.salleurl.edu