



TOWARDS AN ACTION PLAN

Energy Efficient Housing in the UNECE Region

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Energy Efficient rehabilitation in residential districts as seen from a social, environmental and economic policy perspective

Núria Pedrals Pugès
Director-General for Quality in the Building and
Rehabilitation of Dwellings
Department of the Environment and Housing
Government of Catalonia



ENERGY AND CO2 MITIGATION IMPACT OF THE REHABILITATION

The following table shows the impact of energy rehabilitation in housing through the improvement actions on the thermal envelope with public aid in 2006, 2007 and 2008.

Years	Budget for Work €	Subsidies	No. of dwellings	Energy saving kWh/year	% of savings	TOE (t) Oil Equivalent	CO ₂ (t)
2006	12,900,000	1,007,363.38	738	687,000	14	58.90	309.555
2007	2,700,000	1,052,414.63	2232	224,714	22	19.24	101.120
2008	7,500,000	2,913,280.25	1569	670,453	23.5	57.39	301.700
Total	23,000,000	4,973,058.76	4539	1,583,067	19.2	116.29	712.370

The total energy savings obtained ranged between 5% and 55%, depending on the type of work carried out. The total saving was 116.29 tonnes of oil, the equivalent of 712.37 tonnes of CO₂, representing an average saving of 19.2% after the implementation of the rehabilitation work.



CONCEPT OF ENERGY-EFFICIENT REHABILITATION (I)

DEFINITION

- Set of actions to improve the existing buildings, which introduces:
 - The energy efficiency vector as a driving force.
 - Preventive maintenance guaranteeing a return on the investment in the form of the building's useful, sustainable life.
 - Information and increased user awareness as a guarantee of final energy efficiency.



CONCEPT OF ENERGY-EFFICIENT REHABILITATION (II)

HOW

REHABILITATION PROCESS:

DIAGNOSIS

➤ SOCIAL:

- Characterisation of the social fabric (single-parent families, age of population, etc.).
- Parameterisation of consumer habits (surveys, energy bills).

➤ OF THE STATE OF THE BUILDING (safety, habitability, functionality).

➤ ENERGY EFFICIENCY:

- Parameterisation of the thermal envelope (prospecting, thermographs, flow metering, leakage analysis, etc.).
- Hygrometric analysis of buildings (real use).



CONCEPT OF ENERGY-EFFICIENT REHABILITATION (III)

REHABILITATION PROCESS:

(continued)

ACTIONS

- Rehabilitation actions without the need to vacate the building.
- Improves internal habitability:
 - Rehabilitation of existing problems.
 - Passive (renovation of the thermal envelope: opaque and transparent part) and active (improving the efficiency of installations) rehabilitation actions
ALWAYS FROM THE OUTSIDE.
- Proactive participation of the user to guarantee proper subsequent use.
- Incorporation of renewable energies.
- Preventive maintenance.
- Maintenance technique.



CAN JOFRESA. TERRASSA

SPECIFIC OBJECTIVES PROJECT

- To renovate the facades of buildings in order to reduce demand to between 20-30% below that set by the regulations (50-60% of current consumption): insulation of facades and installation of double glazing.
- Installing thermal hot water systems (SHW) and heating, based on cogeneration with natural gas. Securing a contract between residents–ADIGSA–company, which may reduce the cost of energy (price per kWh) to end users by 20%.
- Securing the large-scale involvement of residents in the definition of proposals, their implementation and the maintenance of the systems: decisions, uses which lead to savings, and monitoring.

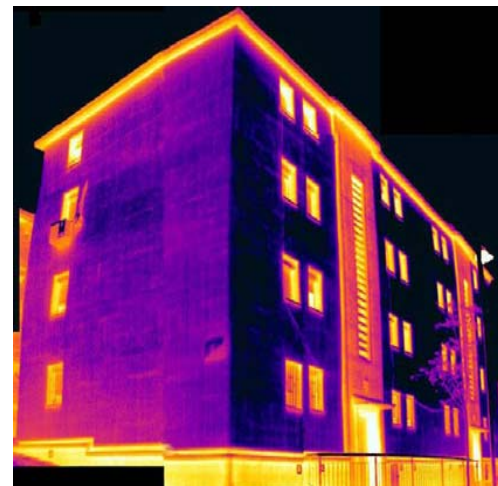
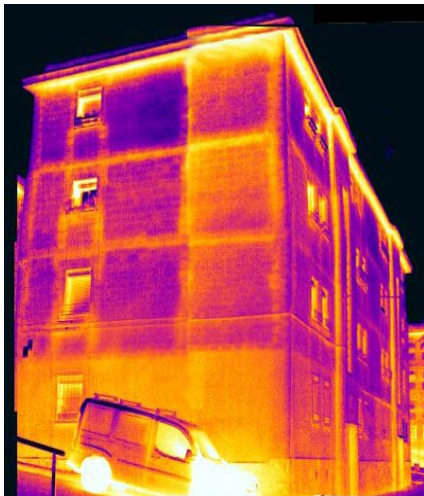




VERDUM- RESHAPE

ACTIONS REALISED IN VERDUM DISTRICT- BARCELONA

- Energy study of buildings.
- Energy evaluation of envelope, saving 31% of energy consumption.
- Energy evaluation of the improvements by users communities





VERDUM- RESHAPE

- Execution of works.
- communication the results to the users.



Comparative of result before/after the intervention



REVITASUD PROJECT

MAIN GOALS IN THE PILOT PROJECTS OF ADIGSA IN REVITASUD

The REVITASUD project has included partners from other cities as Toulouse, Saragossa and Vitoria. The main goals are:

- Redefinition and improvement of rehabilitation projects.
- Introduction of environmental criteria in projects and in works.
- Application of new buildings energy standards for rehabilitation.
- Facilitation of the communication and involvement of residents.



STUDIES AND PROJECTS REALIZED IN THE REVITASUD FRAMEWORK



Verdum, Barcelona:
1.464 viviendas

La Guineueta,
Barcelona: 1.518
viviendas

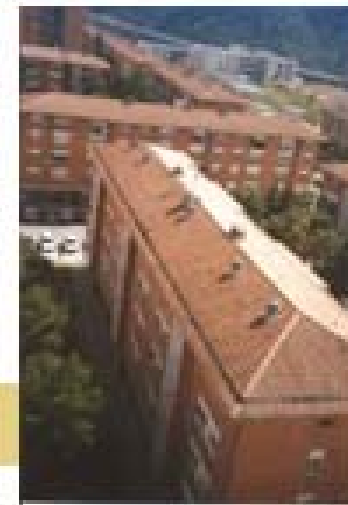


Sant Llorenç, Terrassa: 1.750 viviendas



25 de setembre, Rubí:
536 viviendas

Bons Aires, Martorell:
1.264 viviendas





“ECODISTRICT PROJECT”

ECODISTRICT PROJECT GOALS

- To develop and apply new environmental analysis and diagnosis tools in a pilot district managed by ADIGSA.
- To define proposals for environmental improvement in ADIGSA districts.
- To establish Measures to save economic resources.
- To improve the quality of life in districts.
- In order to reach these objectives a complete environmental diagnosis of two districts in Granollers (598 dwellings).

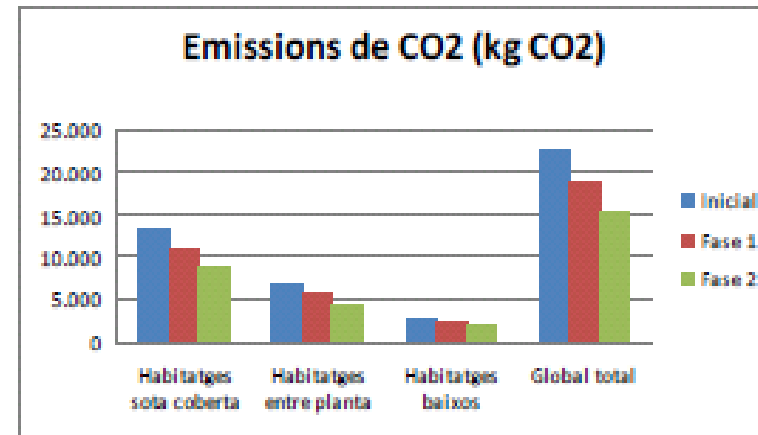


PLANOLES BUILDING REHABILITATION

ADIGSA has been rehabilitated a building with 9 dwellings, between 2006 and 2008 were renovated the U value in façade was reduced.

Hypotheses considered:

	Mean transmittance (W/m ² k)		
	Initial	Final	Minimum CTE/DEE
North facade	1.23	0.77	0.57
South facade	1.71	0.54	0.57
East/west facade	1.22	0.42	0.57



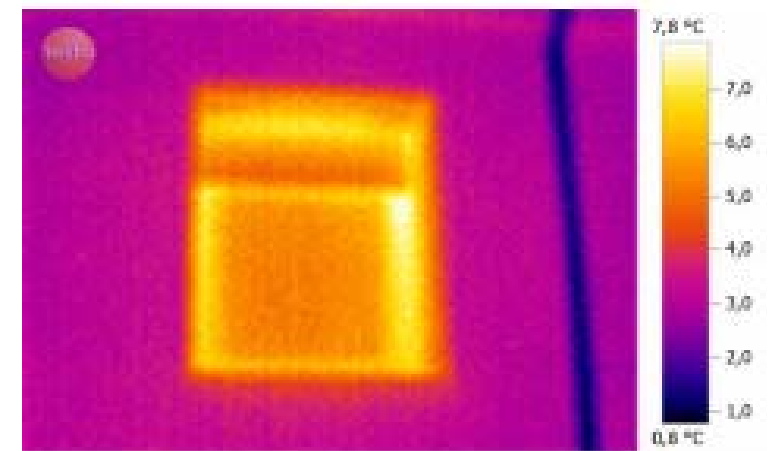


PLANOLES BUILDING RESULTS

- Reducing the heating demand and CO₂ emissions by around 47%
 - 50% in top-floor dwellings
 - 49% in mid-floor dwellings
 - 30% in ground-floor dwellings
- Reducing CO₂ emissions by more than 7 tonnes per year
- Public housing as an example of good practices
- Environmentally friendly materials
- Control and monitoring of housing



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MANY THANKS FOR YOUR ATTENTION