MARIE
INFORMATION
AND TRAINING

MARIE TRAINING PROGRAM FOR IMPROVEMENT IN ENERGY EFFICIENCY (EE) OF EXISTING BUILDINGS

F1 | BEST PRACTICES COLLECTION

Best Practice Name:	Energy regeneration of existing residential building
Code:	IT_RE_CO_11

Best Practice Description:

Type:	x	Action for improvement in the EE		Training experience (*)

Description:

Refurbishment of a building of the '60s with a basement, a ground floor and one attic. The original building was characterized by concrete masonry in the basement and cavity walls on the ground floors and attic. The heating system consisted of an oil boiler of 50 kW and heating elements iron to the different floors. The hydro-health was composed of iron pipes present and the windows are double air chamber on wooden frame.
Interventions provided:
- **Wall insulation** by the application on profile exterior of the masonry panels of expanded polystyrene sintered with addition of graphite with a thickness cm.16. This material is lightweight, eco-friendly and recyclable and has a transmittance U = 0.031W/mK.
The reference values adopted for the redeveloped housing are: Thermal transmittance of opaque vertical structures - 0.15 W/m2K; Thermal transmittance of opaque horizontal structures - 0.13 W/m2K; Thermal transmittance of internal partitions - 0.8 W/m2K; Thermal transmittance of transparent enclosures (average glass / frame) 1.0 W/m2K
- **Thermal bridges** The redevelopment of the building has been structured in such a way as to limit and undo as much as possible thermal bridges on the existing building pre intervention
- In particular:
  - cover-cement not isolated;
  - concrete slabs protruding from the building as part of the roof and balconies;
  - single-glazed windows or double-glazed but without gaskets;
  - bins blinds;
  - non-insulated exterior walls;
  - continuation of the thresholds of openings (windows and doors) from inside to outside;
  - pipes of the heating system not isolated;
  - leakage of heat from uncontrolled or unwanted areas
- Inserting **solar panels** on the main flap for the production of hot water (DHW).
- Housing of **photovoltaic system** on the west-site of the building
- Collection of **rainwater** for irrigation and for cisterns, through the burial of a **storage** tank with a capacity of 9200 liters.
-. Installing a **heating and cooling system** using geothermal heat pump in vertical exchange.
-. Using **radiant systems** for the diffusion of heat in low temperature environments.
-. Installing a **mechanical ventilation system** and recovery unity with

	argon cavity (Uw = 1.2 W/m2K) - **Windows**. triple glazing low-emissivity double room and argon gas inside; the structure of the frame and of the uprights is in soft wood with height of 9 cm. - **Shading and solar control** through summer sunscreens

Location:	Pino Torinese (TO)			Country:		Italy		
Contact (team):	E2lab – Architects Chiara Borsero, Maurizio Maggi, Luca Tartaglia							
Type of building:		Tertiary		x	Residential			Mixed
Property:		Public		x	Private			Mixed
Management:		Public		x	Private			Mixed
Fields of action:	x	Construction		x	Maintenance			Use
		Energy generation and distribution						Other
	x	Replacement or implementation of renewable energies						*Which ones?*

Please, evaluate if the following processes take place in the Best Practice that you are describing in this form:

	Yes	No
The **data collection** has been complete and rigorous	x	
Communication and awareness processes have been developed to disseminate this practice	x	
Training actions have been provided		x
Product and services have been improved		x
Jobs have been created		
Sustainable financial models have been applied	x	
Agreements or **collaboration models** have been defined between parties		x

Positive impact tested in the following fields (add quantitative data if you have):

ENERGY EFFICIENCY IMPROVEMENT (EE)	Epi = 12.9 kWh / sq.m. year >>> passive house The production of domestic hot water using solar thermal is designed to cover 80% of the annual heat demand The energy consumed pass from 400 kWh/ sq.m. year to approximately 16.7 kWh/ sq.m. year Energy savings results: - electricity production from PV is going to be 4.264 kWh/year with 2.452 kg CO_2 avoided - thermal energy production from solar panels is going to be 2.428 kWh/year with 673 kg CO_2 avoided Thanks to annual savings on the cost of heating and the annual return of the solar panels, the ROI is going to be in 12 years if executed with a capital subsidy (40% grant) from the Piedmont Region. In the absence of regional contribution in 13 years using the deduction of 55% of redevelopment energy and / or 36% of all maintenance.
FINANCIAL	The project has benefited of a co-financing regional from Regione

COVERAGE	Piemonte
EMPLOYABILITY POTENTIAL	
OTHER	Classification: A class
DIFFICULTIES	

Agents involved in this experience:

	Legislation agencies
x	Public promoters
	Private promoters
x	Technical public institutions
x	Technicians of the private sphere (professional associations ...)
x	Builders
	Industrial
	Facility Managers (property managers, cleaning companies ...)
	Energy supply companies
	Users/owners (homeowners association, schools ...)
x	Other:installers

GAPS	

(*) ***RR_ BB _ FF_ NN***

RR *Country:* ***CY*** *(Cyprus),* ***FR*** *(France),* ***GR*** *(Greece),* ***IT*** *(Italy),* ***MA*** *(Macedonia),* ***MT*** *(Malta),* ***PO*** *(Portugal),* ***SL*** *(Slovenia),* ***SP*** *(Spain)*

BB *Type of building:* ***RE*** *(residential),* ***TE*** *(tertiary),* ***MX*** *(mixed)*

FF *Field of action:* ***CO*** *(construction),* ***MA*** *(maintenance),* ***US*** *(use),* ***EN*** *(energy generation and distribution),* ***OT*** *(other) (in case of affecting more than one field of action choose the most relevant)*

NN *Number of the practice:* ***01, 02, 03…***

(*)IN CASE OF A TRAINING EXPERIENCE:

Course name:	
Duration:	*Training hours/ECTS*
Web:	
Director/a:	
Who is it aimed:	*Profile of trainees*
Objectives:	*What enables this training?*
Program:	
Methodology:	*Format (face-to-face, on-line), structure of sessions, visits, case studies, evaluation systems, dynamic sessions, other aspects ...*

X *I agree to bring this experience to the database of the MARIE project, which will create a comprehensive training program for improving the energy efficiency of buildings in the area of the Mediterranean.*