BEST PRACTICE IN ITALY – ENERGY EFFICIENT CITIES

BASIC INFORMATION

Title of the Best Practice

An innovative approach of energy requalification: use of community funds (EEEF) and application of Energy Performance Contract for the Ducal Palace, headquarters of the Military Academy of Modena

Energy efficiency measures implemented in the building:

- replacement of the existing generators with high efficiency condensing generators and cogeneration module
- restructuring of the distribution network of hot water
- replacement of the old cast iron radiators with new ones steel heating bodies with thermostatic valves
- new control and regulation system for the heating system
- ceiling insulation with insulating mat
- installation of new windows with high thermal efficiency
- old plaster removal and insulation of opaque vertical walls with new thermal-dehumidifying heat-cell plaster

Location:

City: Modena

Region: Emilia-Romagna

Country: Italy

GoogleMaps link:

https://www.google.com/maps/place/Accademia+Militare/@44.6485328,10.9283201,18.5z/data=!4m19!1m13!4m12!1m4!2m2!1d11.3382364!2d44.5223478!4e1!1m6!1m2!1s0x477fef15da4ca319:0xa71b11f6a8dd805a!2saccademia+militare+modena!2m2!1d10.929063!2d44.6483311!3m4!1s0x477fef15da4ca319:0xa71b11f6a8dd805a!8m2!3d44.6483311!4d10.929063

Partners involved:

- Municipality of Modena, Piazza Grande 16 - 41121 Modena, Web: https://www.comune.modena.it, owner
- Ministry of Defence, Via XX Settembre 8 - 00187 Roma, Web: https://www.difesa.it, tenant
- University of Studies of Modena and Reggio Emilia, via Università 4 - 41121 Modena, Web: https://www.unimore.it/, designer
- AESS – Energy and Sustainable Development Agency, via Caruso 3 - 41122 Modena, Web: https://www.aess-modena.it, advisor

Implementation year: 2017 - 2020

Photos:

Source: University of Studies of Modena and Reggio Emilia

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SYSTEM CHARACTERISTICS

Brief Description:

The building was built in 1291, but the current architectural appearance was conferred by the architect Avanzini in 1634. State-owned, with a restriction of scientific restoration, it is currently the headquarters of the Military Academy. The palace hosts several use destinations with different energy needs: is equipped with a centralized system for heating and domestic hot water with generation system from traditional boilers, the distribution system has pipes with non-existent or deteriorated insulation, emission system with old cast iron radiators, climatic and manual regulation. The thermal dispersions of the building envelope are high due to the obsolete and inefficient type of windows and the opaque non-thermally insulated structures with deteriorated plasters. An economic obstacle to the possibility of intervention is the scarcity of funds available to the property. From the technical point of view, the obstacle is constituted by the inadequacy of the normally used calculation tools based on a static model to correctly predict the behaviour of the building.

FINANCIAL SOURCES AND FINANCING DETAILS

Total investment value: 12.000.000,00 €

Sources of financing:

- design and tender phases: European Energy Efficiency Fund;
- realization of the intervention phase: PREPAC-Program for the Energy Refurbishment of public buildings of the Central Administration, ROP-ERDF Emilia-Romagna Energy Fund, Thermal Account state incentive and Energy Performance Contracting

Energy savings: 13.300 MWh/y

Cost savings: 1.200.000,00 €/y

PROJECT IMPLEMENTATION BENEFITS

The intervention on the structures allows the reduction of the need for heating, with direct economic benefit. The new plant equipment will allow to adapt the indoor climate to the different needs of use of the various areas in which the building is articulated. The installation of a cogeneration system favours the self-consumption of electricity

The setting up of the contract according to the EPC model allows the best management of technical-economic risk and the availability of low-cost public financing favours the participation of private capital thanks to the reduction of financial risk

ADDITIONAL INFORMATION

Calculation tools based on a dynamic model (Trnsys) have been used, which allow to simulate and predict the behaviour of the building with greater precision and to optimize the programming of the regulation system.