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Boosting Green Energy in Urban Areas

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Monitoring energy performance in Province of Turin

During the project Cities on Power were analysed the energy and environmental performances of four public buildings in the province of Turin

(three schools and one leisure center).

Middle school “Manzoni”, city of Nichelino

Middle school “Gobetti”, city of Beinasco

Primary school “Catti”, city of San Mauro

Leisure center for the game of bowls “Allende”, city of Collegno

The methodology followed aims to define an energy consumption model extremely realist in order to model the solutions and validate them. To establish the model, an experimental monitoring was realised. A lot of data was collected on the building, through the use of infrared camera or a heat flow meter. The model is validated thanks to the consumption bills of the previous years. The monitoring consisted of : 1) spot measurements of thermal insulation characteristics of roof and external wall such as thermograph and conductance measurements using heat flow method, 2) monitoring of the energy and environmental quantities at long term such as temperature, CO², relative humidity, opening/closing windows, flow rate and calorie counter, 3) spot measurements of environment performance such as thermal and visual comfort. The collected data was processed in order to identify the main problems and the related interventions which can be adopted.



Figure 1: Province of Turin

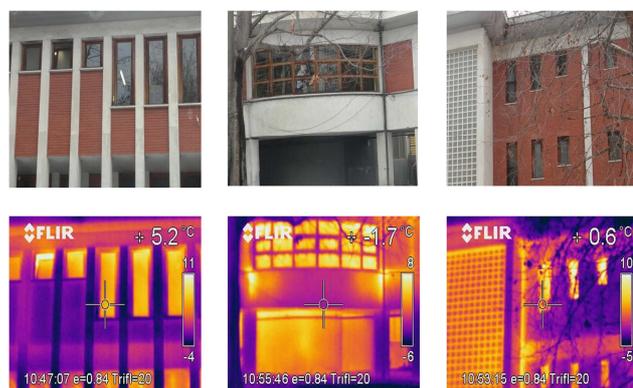


Figure 2: Middle School “Manzoni” - Thermography

Through the calibration of the calculation model, the identified solutions were then simulated and the obtained results have been highlighted with the retrofit solutions in terms of both energy and economic savings. The results of the energy monitoring will be delivered to the public shareholders of the buildings, which will be able to program the redevelopment energy use on the basis of payback time calculated during the CoP project activities. The interventions will be funded directly by public funds or through the involvement of private entities such as ESCO". The measured data and analysis allow to conclude that in the monitored school buildings the energy consumption is strongly related with the thermal comfort and health of building users.

The indoor air quality depends on the values of air temperature, humidity level, and concentration of pollutants. It is known that acceptable indoor air quality values are achieved in a few cases. Inevitably, those who go to school may present recurrent symptoms of discomfort ranging from headaches to dry throat, from irritation to nose, throat and eyes. In many cases, these symptoms can be attributed to temperature and humidity conditions in the building. Indoor air temperatures above 20 ° C can cause both waste of energy than reduction of the values of indoor relative humidity and consequent discomfort for the building users. The lack of efficient air exchange inside, can on the one hand cause energy consumption but on the other hand a poor quality of the air itself with high concentrations of CO₂ deficiency of oxygen and not optimal relative humidity values.

Conference on the results of the pilot projects of Turin at Restructura

Between 21 and 24 November Restructura took place, the largest fair on construction which is organized every year in Turin: www.restructura.com. In this event, Environment Park has organized a conference on the results of the energy monitoring in the three school buildings planned in the project Cities on Power.

Energy Local Action Plan of the Province of Turin endorsed

On the 24th of December 2013 the Executive Body of the Province of Turin endorsed the Local Action Plan for Renewable Energy released as main Cities on Power project output. The Action Plan was, submitted to the Provincial Council for the final endorsement. The drafting of the Plan was a very intensive process involving active participation of many stakeholders. As a matter of fact, several meetings with relevant stakeholders have been organized in order to share ideas and build up possible partnerships. The stakeholders with high level of interest and influence had the opportunity to address the final version of the Action Plan towards the needs and opportunities of the whole province. The Action Plan listed 22 actions in several fields of activity with the objective of reducing by 24% of the energy consumption in 2020, boosting the share of renewable energy up to 21% of final energy consumptions and provide an overall reduction of CO2 emissions of more than 42% from the baseline year 1990.



Figure 3: Stakeholders meeting in Torino (6th of December 2013)

The IT-tool available for the Province of Turin



Figure 4: IT tool-box presentation (13th of November 2013)

Within the Cities on Power project the IT-toolbox was one of the most powerful expected instruments. This cloud application aims at promoting the use of renewable energy sources in urban areas, involving directly the end user and bringing her/him in a guided tour inside their buildings energy demand and supply. More information at:

www.provincia.torino.gov.it/ambiente/energia/progetti/CoP/strumento_informatico.

The workshop organized by the Province of Torino on the 13th of November 2013 launched officially the online platform called "Portale Solare". The audience was a mixture of territorial associations (environmental, professionals), SMEs and local authorities and the media paid attention to the event and the tool. A video of the meeting is available at www.youtube.com/watch?v=HL00ub36yrE.

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