Distributed energy generation: Case study of a mountain school campus in Italy


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ABSTRACT: Distributed energy generation is a technologically feasible reality. That requires rethinking buildings as nodes in a network for energy production and utilization and implementing best strategies according to the characteristics of the site. This paper concerns an ecologically sustainable school campus in the city of Contigliano (Rieti, Italy) that has specific environmental characters. Climate in the valley is continental: very cold in winter (which lasts 140 days) and hot in summer with wide temperature ranges. For this reason the valley records the lowest temperatures in Italy during the period from April to September. The research was carried out considering envelope characteristics, infrastructures and available renewable energy sources, taking into account the economic and environmental impacts with a particular attention to CO2 emissions reduced by 93% if compared with traditional systems. The project of the school complex was analyzed by energy analysis. This has led to excellent results with a significant reduction of greenhouse gas emissions and a considerable reduction of energy consumption. © 2013 WIT Press.

KEYWORDS: building; carbon emission; climate conditions; economic impact; electricity generation; energy use; environmental impact; greenhouse gas; mountain environment; renewable resource, Italy; Lazio; Rieti

REFERENCES