

BUILDING INTEGRATION OF SOLAR THERMAL SYSTEMS

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Abstract: *A solar thermal system (STS) is considered to be building integrated, if for a building component this is a prerequisite for the integrity of the building's functionality. If the building integrated STS (BISTS) is dismantled, dismantling includes or affects the adjacent building component which will have to be replaced partly or totally by a conventional building component. This applies mostly to the case of structurally bonded modules but applies as well to other cases, like in the case of replacing with BISTS one of the walls in a double wall facade. Generally, the benefits of building integration include: building envelope, thermal and optical performances, costs and aesthetics. The objective of this paper is to present some innovative designs that are used worldwide so far.*

Keywords: *solar thermal system, building integration, innovative designs.*

1. INTRODUCTION

All the forms of energy in the world are basically solar in origin. Oil, coal, natural gas and woods were originally produced by photosynthetic processes, followed by complex chemical reactions in which decaying vegetation was subjected to very high temperatures and pressures over a long period of time. Even the wind and tide energy have a solar origin since they are caused by differences in temperature in various regions of the earth. The greatest advantage of solar energy as compared with other forms of energy is that it is clean and can be supplied without any environmental pollution. Over the past century fossil fuels have provided most of our energy because these are much cheaper and more convenient than energy from alternative energy sources, and until recently environmental pollution has been of little concern [1,2].

In the time when the world is debating on climate change issues which is basically due to use of fossil fuel, the use of solar energy in various form is relevant. The existing buildings are responsible for use of large amount of energy for lighting, heating, cooling and use of various energy run equipments mostly powered by fossil energy. Today's intention should be to replace this fossil fuel by solar energy which is free and available in abundance [3]. But solar thermal technologies are not yet playing the important role they deserve in the reduction of buildings' fossil energy consumption and consequent greenhouse gas emissions, even though the increasing oil price has recently started to budge the market [4].

