



MODELING OF INNOVATIVE SOLAR SYSTEMS INTEGRATED IN THE BUILDING ENVELOPE FOR THE PRODUCTION OF THERMOELECTRIC ENERGY



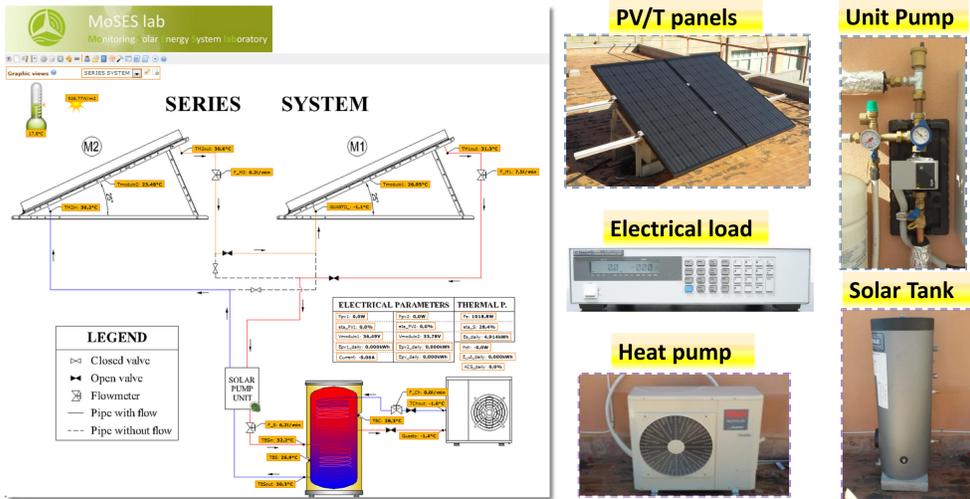
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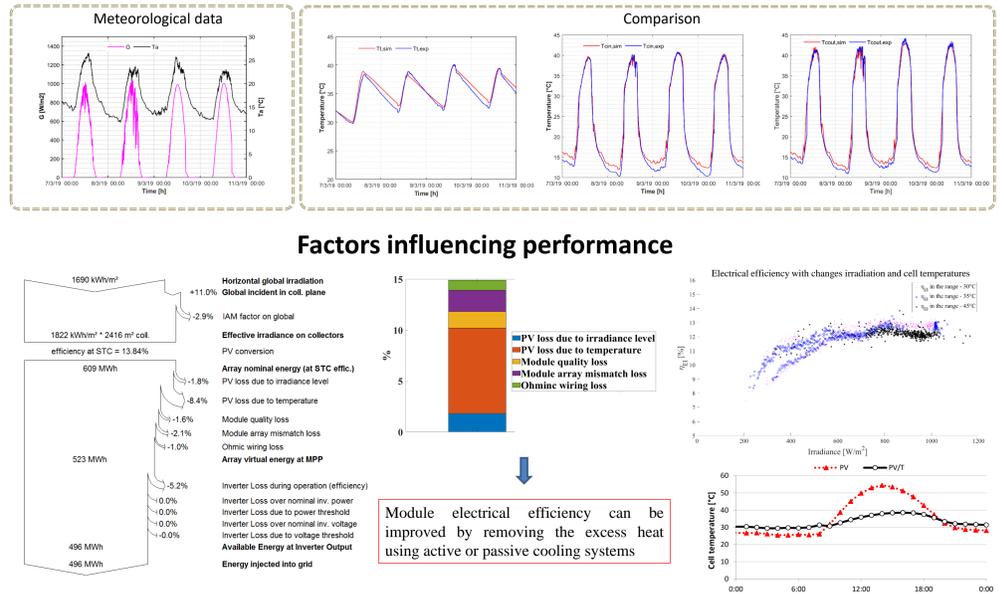
PILOT PV/T PLANT

The pilot PV/T system installed at the University of Catania is designed for allowing the simultaneous management of both electric and thermal loads. It is possible to switch the electrical and hydronic connections of the collector to modify the operating conditions of the parallel-to-series connection of the PV/T modules. The system is continuously monitored through an online platform.

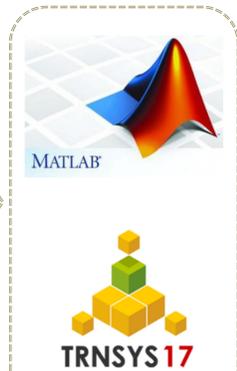
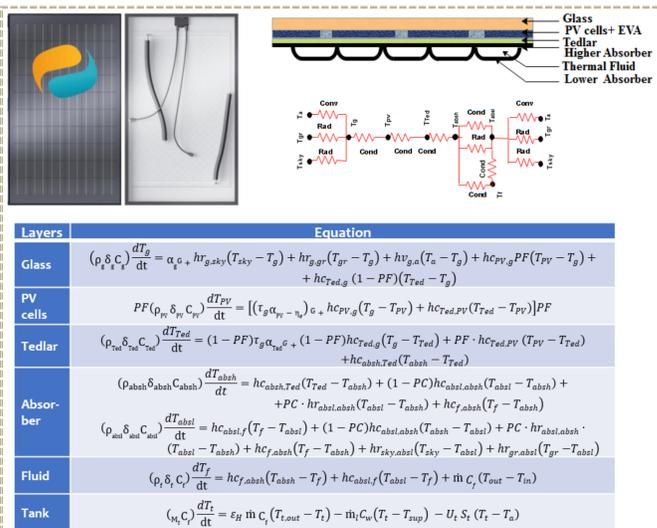
Acquisition System and Experimental Pilot Plant



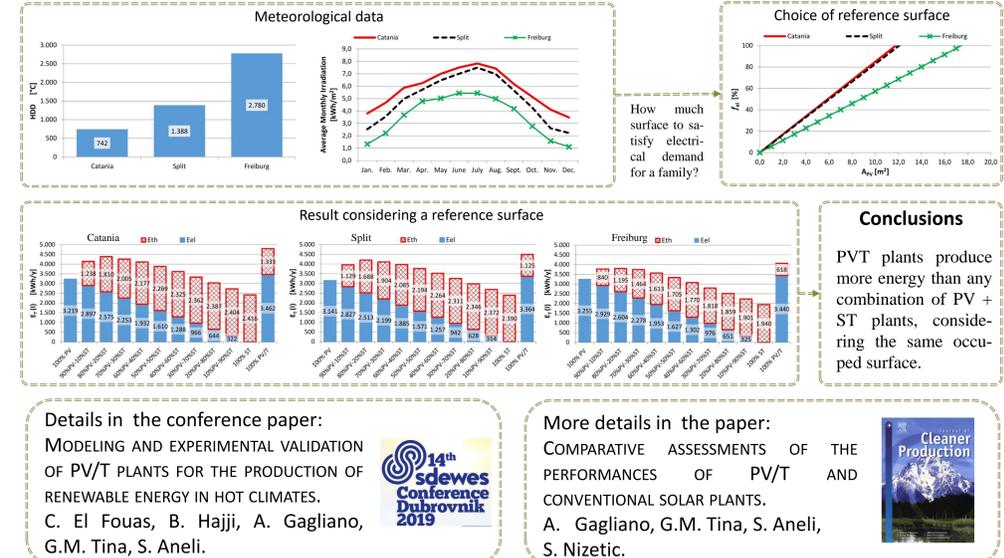
Validation



Digital model



Comparison among PV/T and conventional solar plant



BUILDING SOLAR THERMAL FAÇADES (BSTF)

New EU ambitious targets from renewables make more and more necessary to satisfy the energy needs of buildings through renewable energy sources. The application of solar systems in the façades of buildings can contribute to making a building sustainable, producing renewable energy and contributing to reducing energy losses.

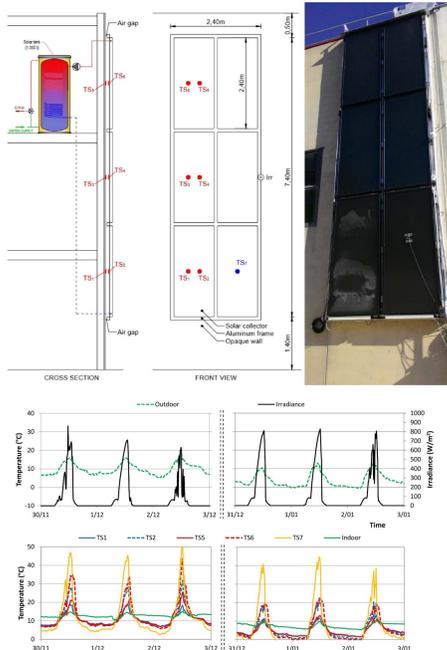
OTHER PV/T TECNOLOGIES - Evacuated tube PV/T collector

Many types of PV/T panels are made starting from the photovoltaic panel and adding to it a thermal absorber.

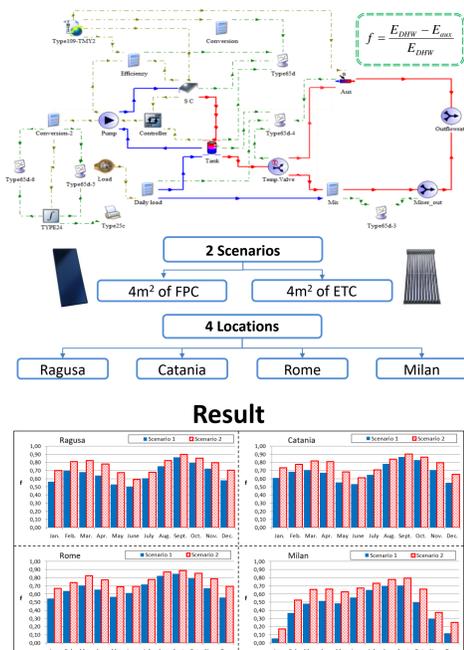
During a period of research at the University of Lleida (E), a new PV/T panel technology was studied, very similar to a vacuum tube solar thermal panel. This panel is able to easily integrate into the building facade.



Experimental v-BSTF prototype



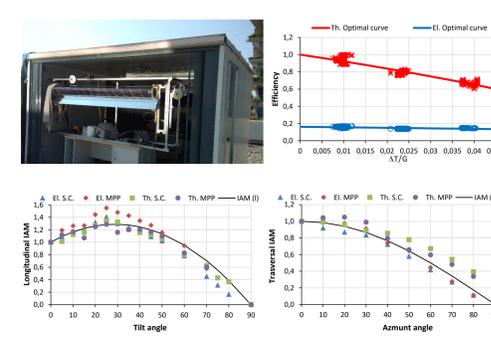
Simulation for DHW



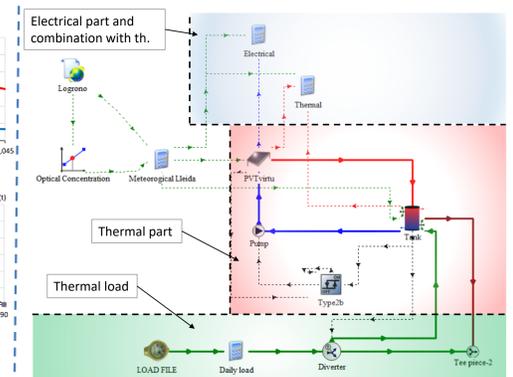
Conclusions

A BSTF constituted by just 4m² of FPC covers much more than 50% of the DHW demand in each cities except for Milan where ETC collectors are needed.

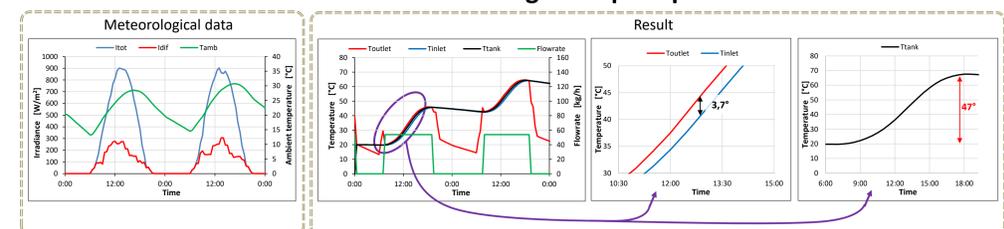
Characterization



TRNSYS Model



Simulation and design of a pilot plant



More details in the paper: ANALYSIS OF THE PERFORMANCE OF A BUILDING SOLAR THERMAL FAÇADE (BSTF) FOR DOMESTIC HOT WATER PRODUCTION. A. Gagliano, F. Nocera, S. Aneli.

