

# Dynamic Modelling of a Flat-Plate Solar Collector for Control Purposes

Saioa Herrero López

Susana López Pérez

Itzal del Hoyo Arce

Iván Mesonero Dávila

IK4-TEKNIKER, Spain,

{saioa.herrero,susana.lopez,itzal.delhoyo,ivan.mesonero}  
@tekniker.es

Two different dynamic models of a flat-plate solar collector with different levels of detail have been developed in the Modelica language under Dymola<sup>®</sup> software: Detailed Model, and Simplified Model.

These models have been both worked out within the Ambassador Project (Onillon, 2014). In this project, models of district heating components are conducted for control purposes, including a solar plant model.

The present article describes in detail each of these flat-plate solar collector models along with their development process (e.g., assumptions taken into account). Both models have been favourably validated, and the corresponding validation process along with the results obtained are presented, as well as the corresponding discussion and conclusions. The model's validation has been conducted by comparing the model's simulation results with the experimental results obtained in the IK4-TEKNIKER Solar Thermal Test Rig.

## References

- E. Onillon. District energy flow optimization taking into account building flexibilities. *2nd Sustainable Places International Conference*, 2014.