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Modeling multi effect distillation powered by CSP in TRNSYS

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Abstract

This work presents the results of using a new tool to simulate the cogeneration of water and electricity with Concentrating Solar Power (CSP) and Forward Feed Multi-Effect-Desalination (FF-MED) plants, by adding a new functionality to the System Advisor Model (SAM) developed by the US National Renewable Energy Laboratory (NREL). The controlling strategy of the MED model is presented in detail, and a case study application is shown. This study compares the results obtained with a CSP plant operating in San Diego, CA, with four different cooling systems: an MED/Seawater Cooling Circuit (SWCC), dry cooling, wet cooling, and a SWCC standalone. The results show that the usage of an MED/SWCC system in cogeneration with a CSP plant can be feasible and has the potential to be economically interesting.

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1. Introduction

Concentrating Solar Power (CSP) and desalination processes can be a solution to solve the problems of water scarcity and sustainable electricity production in many zones around the globe where both these commodities are in short supply [1]. Multi-effect-distillation (MED), together with Reverse Osmosis (RO) and Multi-Stage Flash (MSF)

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