

RENEWABLE ENERGY SERVICES

After years of relative inactivity, the solar thermal electric industry is experiencing renewed activity and investment. In the current energy market context, many companies have been created in the past few years to develop and build solar thermal electric plants based on the central receiver concept. Most, if not all of these companies, are in need of a core set of software components that can support their efforts in design, simulation, optimization, and even operation.

Designing these systems require the optimization of the different components of the solar plant (heliostat field, tower height, receiver type and size, etc.). There are a large number of parameters (cost models of all components, price of electricity produced as a function of time, solar resources, land cost, etc.) that need to be taken into account in order to design the most cost efficient plant possible. Additionally, the plant designers need to be able to predict precisely the performance of the plant over its life time in order to properly predict the cost of the electricity produced. During operations, the plant operators also need to use software that support the start up of the plant in the morning (heating of the receiver using the sun with partial field focus, hot spot management, proper control of the receiver thermal loop, etc.). There is also a need for simulation of the plant for training of the operators. The suite of software tools that we have developed over the past 25 years is supporting all of the above mentioned functions.



Over the past 25 years we have been involved in the development of central receiver plant software, be it design, optimization or operation. Most of the currently available related software has been developed more than 30 years ago in FORTRAN. Tietronix has been developing the next generation of solar thermal software and used these for different studies for multiple customers.



The combined knowledge of Solar Thermal principles, design and operation concepts, and advanced software engineering techniques are providing TieSolar some unique advantages and a repository of existing software components that are unique. Different studies have shown that a good design done by the appropriate tool can improve the efficiency of a Solar Plant by a few percent, which in the lifetime of a plant can equate to many millions dollars. Our software is able to truly optimize the design of the solar plant components. Using advanced math algorithms, it allows the plant designers to define the plant that produces the least expensive energy based on the location, solar resources available, and specific conditions of the plant environment.

