

## Plant Design and Optimizing Operations with EBSILON®Professional

### Additional modules:

#### EbsScript

PASCAL-based programming language that allows the automation of calculation processes and the programming of individual components.

#### EbsOpen

Comprehensive OLE-COM class library for EBSILON®Professional that can be integrated into all common automation and programming environments like e.g. MS Visual Studio.net or the VBA environments of the MS Office products.

#### EbsValidate

Determination of the most probable operating process parameters from overdetermined operational data.

#### EbsOptimize

Genetic optimizer with comfortable input of the parameters to be optimized.

#### OEM-GTLib

Gas turbine library with detailed performance characteristics based on officially released manufacturer data.

#### EbsBoiler

Additional components for the detailed mapping of the boiler.

#### EbsDesal

Component for mapping a stage of an MSF desalination plant.

#### And also EbsHTML.

### STEAG Energy Services GmbH

Wetzbach 35  
D-64673 Zwingenberg  
Telefon: +49 6251 1059-0  
Telefax: +49 6251 1059-29  
info@ebsilon.com  
www.ebsilon.com  
www.steag-systemtechnologies.com  
© STEAG Energy Services GmbH 2011



Foto: DLR/Lannert



# EBSILON®Professional

**We make the sun calculable!**

EBSILON®Professional is a simulation system for thermodynamic cycle processes that is used for plant design and optimization.

Benefits for EBSILON®Professional users:

- intuitive handling
- open software architecture
- high computing speed
- convergence reliability
- individual support by our team of experts

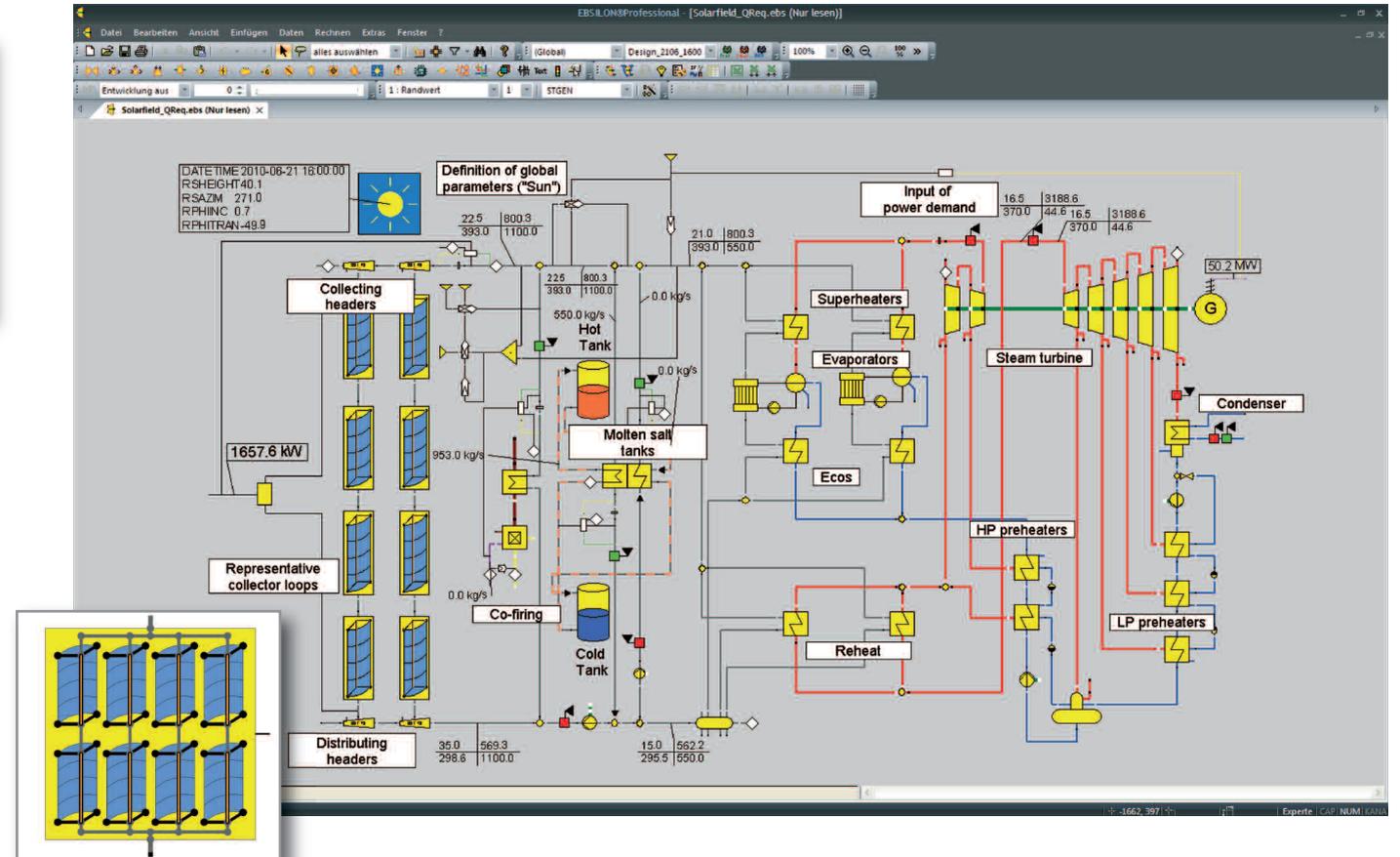
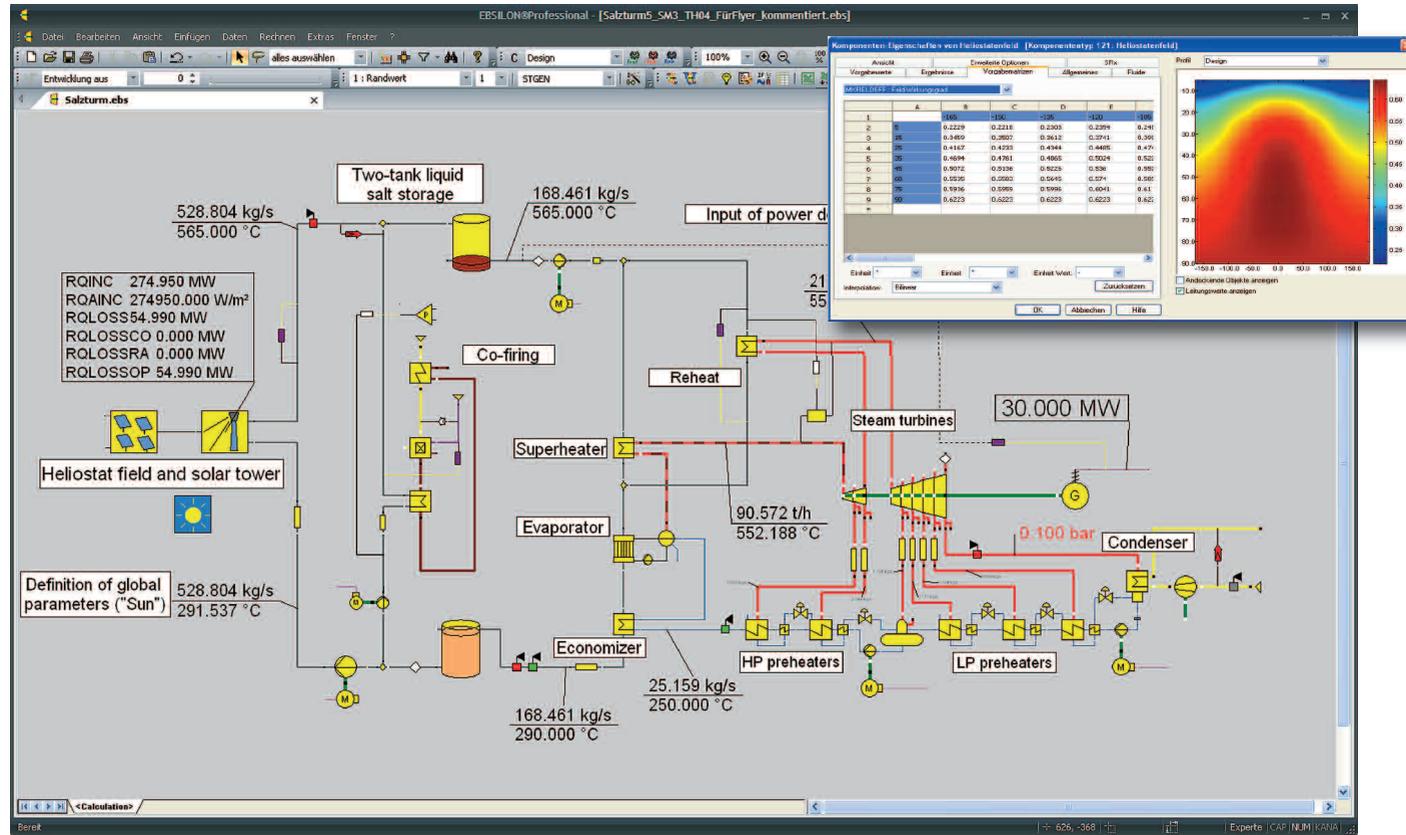
In cooperation with the German Aerospace Center (DLR), we have developed the solar library EbsSolar.

EbsSolar: Fields of Application

- Investigation of site and technology using the easily configurable solar field components
- Detailed thermodynamic design and simulation of a solar field by mapping of representative collector strings
- Annual return calculation for the complete system including storage
- Import of meteorologic data via MS Excel interface
- Research and development by using own algorithms instead of the integrated defaults
- Plant model for online monitoring systems

[www.steag-systemtechnologies.com](http://www.steag-systemtechnologies.com)

## In cooperation with the German Aerospace Center (DLR), we have developed the solar library EbsSolar.



### EbsSolar: Range of Functions

EbsSolar comprises the solar components solar collector, heliostat field, solar tower (receiver), thermal distributing header and collecting header. It is suited for the detailed mapping of linefocussing and point-focussing solar thermal systems. The comprehensive solar collector component calculates with standardized optical and thermal efficiency models and is able to simulate parabolic trough and linear Fresnel-type collectors. The heliostat field is the latest development of EbsSolar; it is considered

as a global unit defined by characteristic fields. The solar tower as the receiver in the point-focussing system calculates the transfer of the radiated solar power into the heat transfer fluid. Heat losses and pressure losses of the distributing and collecting headers are defined in the thermal distributing and collecting header component. Regarding the simulation of the storage system direct and indirect storage components are available. The indirect storage calculates the temporally variable temperature field of the storage material in

the case of the non-steady state heat transfer, keeping consistency with the steady state calculation. By means of the thermal direct storage it is possible to e.g. model a two-tank liquid salt storage and to conduct an annual return calculation considering the loading and unloading processes using the internal methods of EBSILON®Professional. All components can be parameterized individually, directly via the GUI or by using a database. Many of the specification values of the components can be defined by parameter-dependent calculation

formulae, precisely transferring the operating behavior of the power plant into the model. All common heat transfer fluids like thermal oil, molten salt, and water/steam are stored in the material data library of EBSILON®Professional. For mapping solar fields with different alignment and tilt in one model an angle calculation is available, optionally at global or local level.