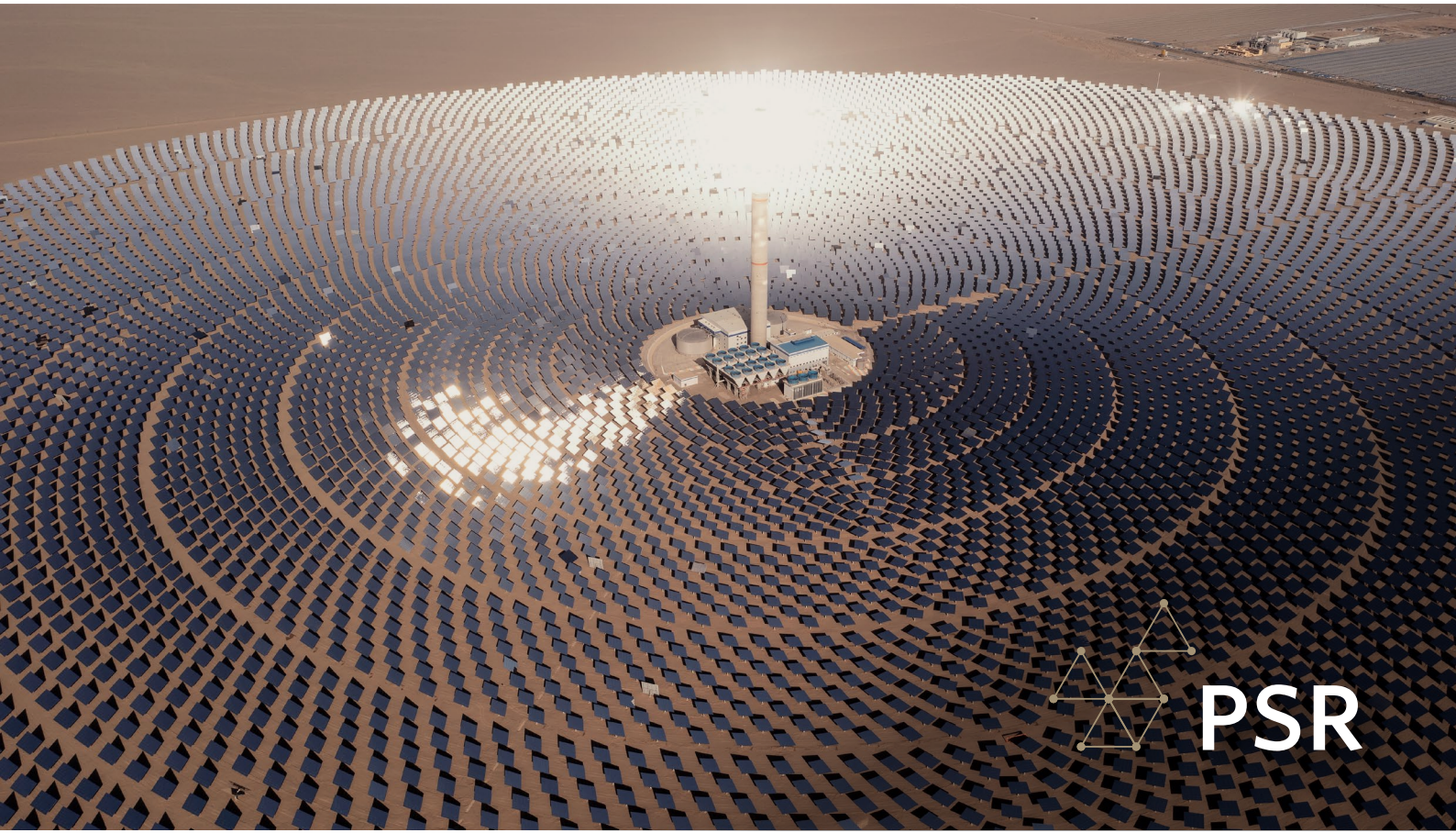


SDDP VERSION 17.1



New features

► **CONCENTRATED SOLAR POWER (CSP)**

Now SDDP presents a specific agent for the users to model CSPs. The general idea is that the sun is reflected by mirrors (panels) that focus sunlight on a receiver in which a fluid is heated. In the most usual configuration of CSP plants, parabolic mirrors concentrate the heat at the focus, through which the fluid passes. All CSP configurations aim to use sunlight to heat this fluid, which when hot is stored in thermally insulated tanks. When the plant is started, the fluid leaves the tank and generates water vapor, which drives a turbine to produce electricity.

It is also plausible to point out that, similarly to other renewable sources, the user can introduce the CSP generation scenarios directly into the SDDP model or use the Time Series Lab (TSL) to generate them. For more information on this, please check the TSL methodology and user manuals.



For more details on CSP, please refer to the SDDP user manual.

▶ OTHER IMPROVEMENTS

The Dashboard has been redesigned, having now four worksheets:

- ▶ **Input data:** presents the P10, P90 and the average of the hydro inflow energy values.
- ▶ **Solution quality:** presents:
 - (i) the convergence report; (ii) pie chart having the breakdown of operating costs (non-zero terms of SDDP's objective function); (iii) pie chart having the breakdown of revenues; (iv) the 2D heatmap that shows the share of violation penalties and deficit in the cost of each stage/scenario; and (v) the 2D heatmap that shows the convergence processes per iteration and stage.
- ▶ **Violations:** SDDP selects the constraints that present the most representative violations and shows the (i) average and (ii) maximum violations at each stage of the study horizon.
- ▶ **Results:**
 - **Costs & revenues:** (i) average operating costs per stage; (ii) average revenues per stage; (iii) dispersion of operating costs per stage; (iv) dispersion of revenues per stage.
 - **Marginal costs:** (i) annual marginal cost by sub-system; (ii) marginal cost per stage per sub-system.
 - **Generation:** generation graphs.
 - **Risk:** the deficit risk by sub-system.

▶ The Excel export/import options have been added for the following data:

- Fuel consumption rate and availability on “Complementary data > Fuel > Fuel availability”.
- Thermal emission coefficient on “Complementary data > Emissions”.
- Sum of interconnection modification on “Complementary data > Interconnection”.
- Geographical location of buses “Basic data > Electric network > Bus configuration”.
- Penalties of the single reservoir constraints on “Complementary data > Hydro plants > Single reservoir constraints”.

▶ New features for the hourly representation:

- ▶ **Contingencies:** security constraints for transmission circuits can now be addressed in hourly runs with linearized power flow. This option is available on the “Basic data > Electric network > Circuit configuration > Contingency” screen.

▶ NEW OUTPUTS

The main new outputs of the SDDP model are presented below:

▶ Hydro plants:

- **“Viol. of security energy const. by res. set”**: violation of security energy constraint by reservoir set
- **“Viol. of alert energy const. by res. set”**: violation of alert energy constraint by reservoir set
- **“Viol. of flood control energy const. by res. set”**: violation of flood control energy constraint by reservoir set
- **“Hydro tailwater elevation”**: hydro plant tailwater elevation

▶ Emissions:

- **“Emission budget violation”**

▶ CSPs:

- **“CSP joint reserve”**: joint reserve for a CSP is defined as the difference between the maximum capacity and its injection.
- **“CSP non-exclusive joint reserve”**: CSP joint reserve that can be shared between non-exclusive requirements.

▶ PSR CLOUD

PSR Cloud is our web-based computational environment that enables running SDDP without the need of investing in high-performance computers. It is a pay-per-run and per processor scheme in which the users may select the desired number of processors for each execution. The machines available for execution are constantly upgraded.

More details about PSR Cloud at <http://psr.cloud/>.

PSR offers to all SDDP users the free use of up to 64 processor-hours in PSR Cloud; please contact PSR at sddp@psr-inc.com for more details.

