Since power system components have a finite dynamics, forecasting of power production and consumption is necessary to ensure the system is balanced at all times. A critical horizon where forecast is needed is 24h ahead, which corresponds both to a major trading cycle on the electricity market and to the operating cycle of most building-level energy management systems. The intermittent nature of variable renewable sources (wind power and solar photovoltaics) makes this forecasting more and more challenging.

### Results for different configurations

The SVR-CSEM prediction algorithm is compared to EURAC Research prediction models. Power data are from a 662 kWp CdTe PV power plant in Bolzano (Northern Italy), and the 24h ahead numerical weather prediction (NWP) input data are from the European Center for Medium-Range Weather Forecasts (ECMWF). A one-year dataset of power output measurements and numerical weather forecasts is used for training (2012) and another one for validation (2013).

When all available inputs are taken into account (global horizontal irradiance and air temperature from numerical weather forecasts, past measurements of global horizontal irradiance, and solar almanac), the best SVR algorithm achieves a root-mean-square error of 9.3% relative to the nominal power of the plant, beating the persistence model nearly by a factor of two.