meteo|control
Energy & Weather Services

SOLAR POWER FORECAST

*Secure grid operation –
profitable market integration*

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TO FOSTER SECURE GRID OPERATION AND MORE PROFITABLE MARKET INTEGRATION:

HOW YOU CAN GENERATE MORE PRECISE SOLAR POWER FORECASTS BY COMBINING NUMERICAL WEATHER FORECAST MODELS AND ADDITIONAL STATISTICAL PROCESSES.

DAY-AHEAD FORECAST

For the calculation, meteocontrol relies on a forecast model developed in-house. The combination of numerical weather forecast models and statistical processes enables even more precise forecasts compared to conventional approaches.

Taking historic measured values into account, machine learning can be used to provide an optimized forecast for your system and even for your entire portfolio.

meteocontrol obtains irradiation forecasts from renowned institutes such as the German Meteorological Service (DWD), the European Centre for Medium Range Weather Forecasts (ECMWF) or NASA. A temperature forecast is also integrated into the model to allow for the temperature-dependent efficiency of the PV modules.
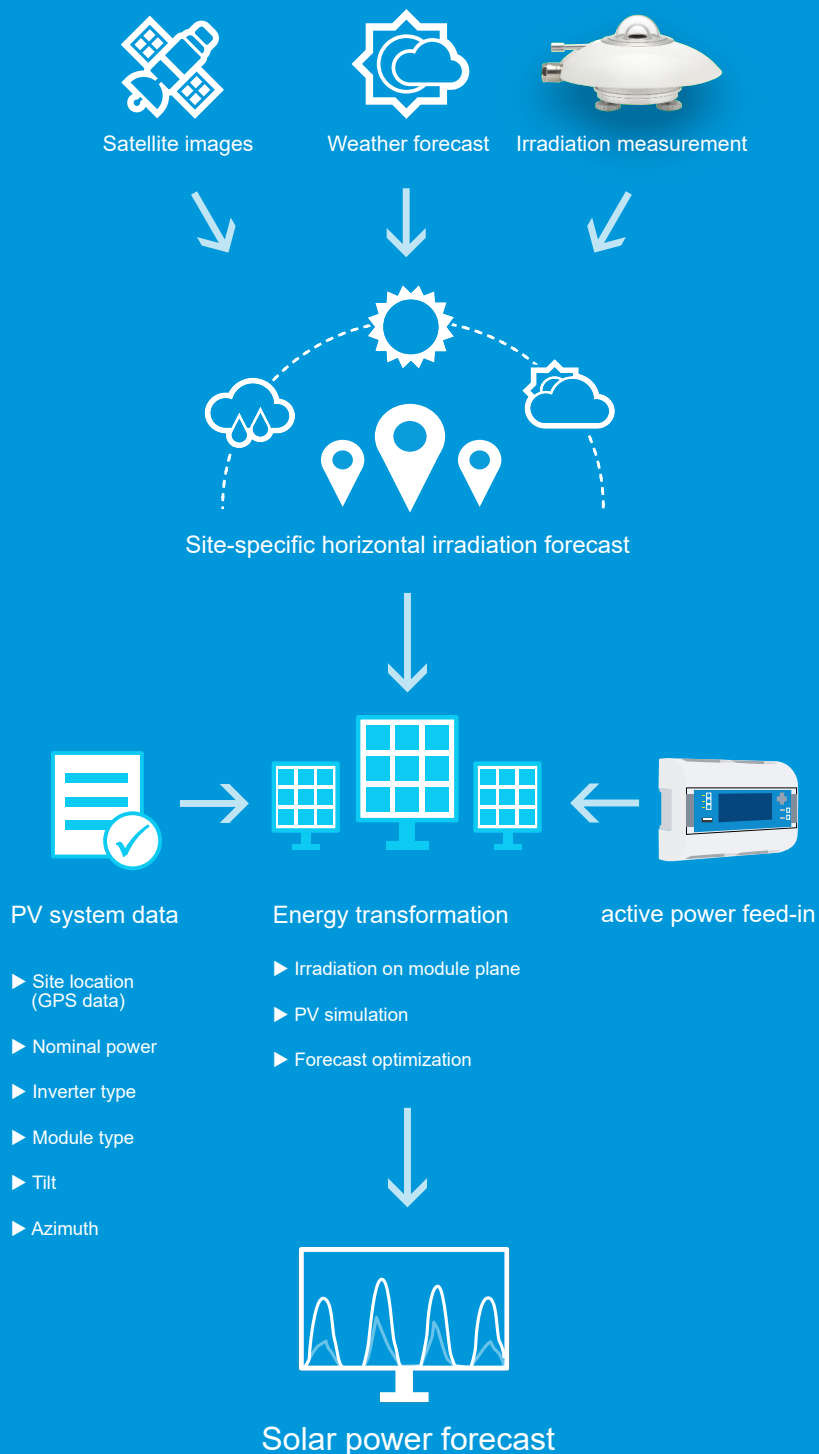
INTRADAY FORECAST

To enable intraday forecasts, the existing day-ahead model was expanded to include cloud-motion forecasts. The precision of the forecast can be significantly increased by using real measured values for active power feed-in which reduces systematic errors of the PV systems.

The use of algorithms for machine learning and the combination of various weather forecast models facilitates the optimization of the forecasts – even for short-term forecasts. The cloud-motion forecasts are derived from satellite images that are obtained every 15 minutes via EUMETSAT and NASA.

OPERATING PRINCIPLE

Satellite images Weather forecast Irradiation measurement

Site-specific horizontal irradiation forecast

PV system data

▶ Site location (GPS data)
▶ Nominal power
▶ Inverter type
▶ Module type
▶ Tilt
▶ Azimuth

Energy transformation

▶ Irradiation on module plane
▶ PV simulation
▶ Forecast optimization

active power feed-in

Solar power forecast

Irradiation forecast

▶ Based on numerical weather forecast models (NWP)

▶ Intraday updates through satellite data

▶ Extensive network of ground measuring stations for the optimization of the combined forecast

▶ Machine learning and neural networks for optimized site-specific forecasts

▶ Monitoring portal featuring more than 45,000 systems as a reference for optimization

Forecast of active power feed-in

▶ Measurement of active power feed-in to optimize the individual site forecast

▶ More than 14 GWp of monitored power worldwide

▶ Monitoring portal featuring more than 45,000 systems

▶ Optimization of the regional forecast based on algorithms for machine learning

REFERENCE CUSTOMERS   GRID OPERATORS

NORDGRÖÖN
Die Energielogistiker

sunnic

50hertz

amprion

TenneT

TRANSNET BW

REQUIRED INFORMATION FOR FORECASTS

Simulation of site-specific active power feed-in

▶ Site location (latitude, longitude)

▶ Nominal power of the PV generator

▶ PV inverter type and number

▶ PV module type and number

▶ Direction (azimuth) and tilt of the PV modules

Individual site optimization

▶ Historic measured values of the active power feed-in

▶ Data basis of at least one year

▶ Optional also online or in real time

Provision of solar power forecasts:

The day-ahead forecasts can be updated hourly. The update of the intraday forecasts occurs every 15 minutes following the arrival of new satellite data. According to your individual requirements, the data can be provided simply and reliably using all common formats (CSV, XML, etc.) and delivery channels (FTP, e-mail, etc.).
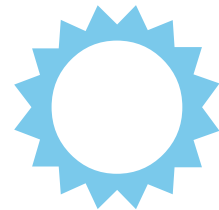
Forecast period and time interval:

Every forecast is available for a period of up to seven days.
The time interval of the forecast for active power feed-in amounts to 15 minutes.