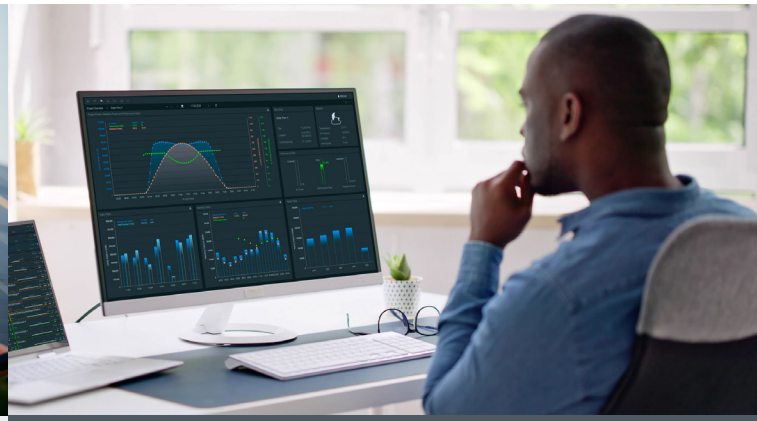

be4vision
Our Monitoring Portal for Your Solar PV Systems

Getting started or levelling up?

- → You are looking for a partner who offers genuine expertise for your business, more than just a monitoring software?
- → You want to have full visibility of your asset's operations and KPIs, such as power and yield, at a glance?
- → You are planning to level up to a new, multi-compatible monitoring software?

Tailored to your specific requirements!

Then **be4vision** is the ideal tool for you.



be4vision helps

Asset Owners and Plant Operators

keep on track with a full operations overview.

be4vision supports

Control Rooms and O&Ms

with their monitoring, troubleshooting and maintenance work.

be4vision shows

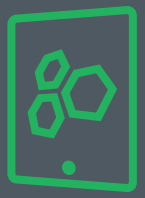
Investors and Asset Managers

status and progress of their investments.

be4vision is a winner!

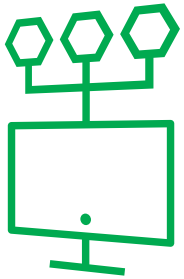
Monitoring with focus

Comprehensive, precise and reliable – **be4vision** leverages your PV plant management to higher efficiency.



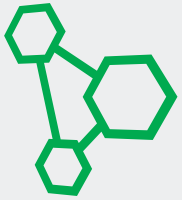
Versatile application

Being web-based, **be4vision** also runs on mobile devices such as tablets, and offers an intuitive user interface that can be configured with ease.



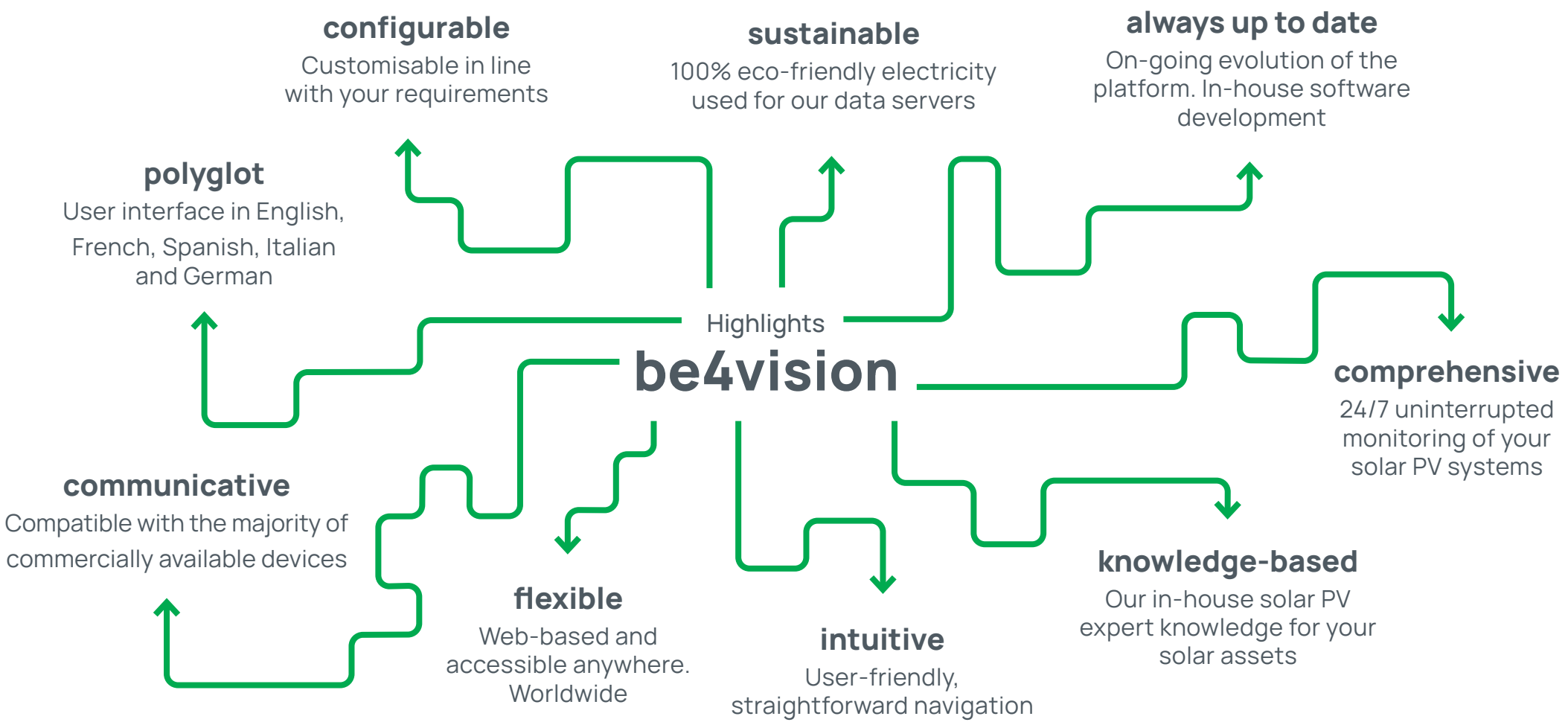
For big and small

Stand-alone system or larger PV portfolio? Commercial rooftop or fully-fledged utility-scale PV power plant? All system sizes benefit from **be4vision's** clear KPI overviews and reliable data for in-depth performance analyses and focused cost-effective interventions.



Multi-compatible

be4vision keeps communication flowing with a wide range of industry-standard components. This multi-compatibility is built-in by default; more interfaces can be added. We can also integrate your legacy systems and offer customised solutions for embedding systems of more complex architectures.


configurable
Customisable in line with your requirements
sustainable
100% eco-friendly electricity used for our data servers
always up to date
On-going evolution of the platform. In-house software development
polyglot
User interface in English, French, Spanish, Italian and German
Highlights
be4vision
comprehensive
24/7 uninterrupted monitoring of your solar PV systems
communicative
Compatible with the majority of commercially available devices
flexible
Web-based and accessible anywhere. Worldwide
intuitive
User-friendly, straightforward navigation
knowledge-based
Our in-house solar PV expert knowledge for your solar assets

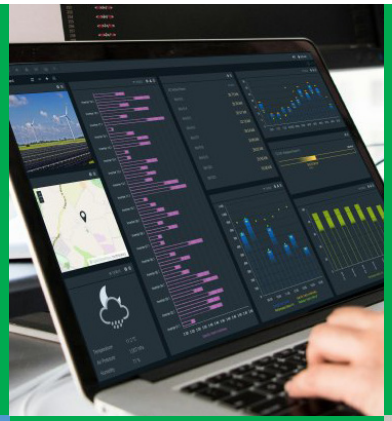
Our services

be4vision's Powerful Portfolio

Click through the topics that interest you

Monitoring

Control room view with KPI snapshots. Specific device views with status details and alarms for underperformance or other issues.



Analysis

Solid data source for performance analyses and yield forecasts. Evaluation in diagrams and tables with flexible export options.

Workflow

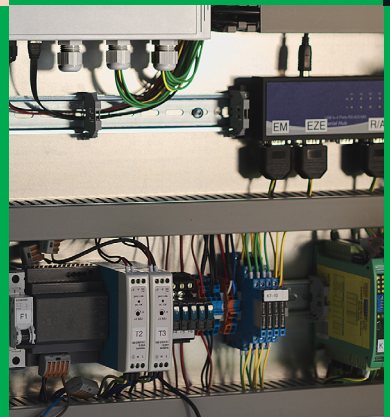
Support and recording of the entire implementation cycle: from commissioning through to plant O&M.

Connectivity

Interoperability with all asset stakeholders, from installed field devices and loggers through to power grid and trading actors. Remote control access to the plant.

SaaS

"Software as a Service" – we take care of everything. No hassle for you with software installation, server hosting and data security.



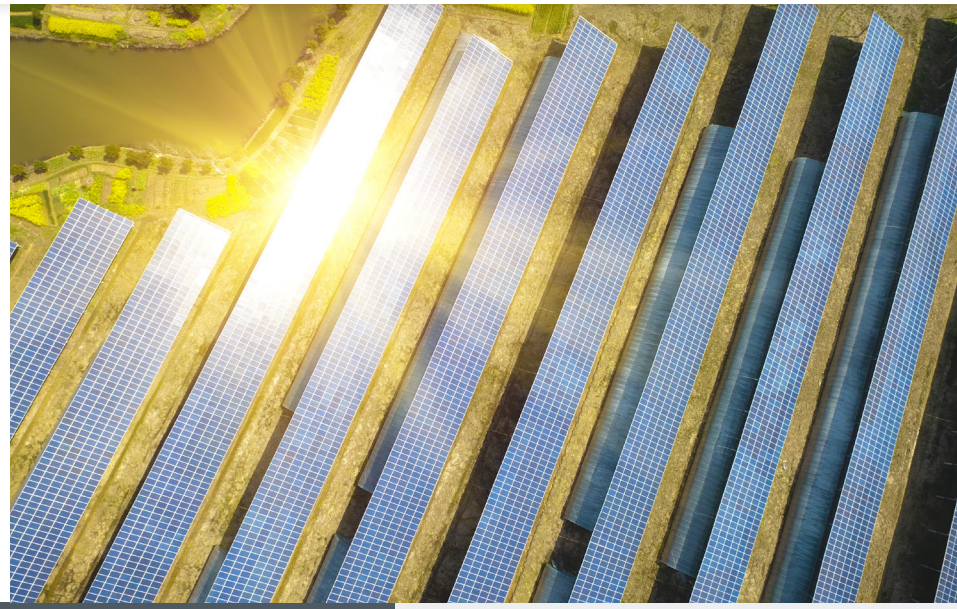
Contact

Our team of renewable energy experts offers first-hand support. Count on us to find the best solution for your specific requirements.

Key insights at a glance

Monitoring

From the overall control room view of your asset portfolio to specific detailed plant views – **be4vision** keeps you in the loop. Vital performance metrics, equipment status or specifics of a possible power curtailment by the grid operator – it's all available in a few clicks. For end-to-end monitoring, efficient maintenance and profitable plant operations!



Control Room

Your assets are presented in a compact and concise manner in the Control Room dashboard, with all vital metrics for power output, yield and inverter availability. Not set in stone, but flexibly customisable.

KPI Dashboard

Create your own KPI dashboards. Conveniently, with predefined widgets and your own image files. Completely flexible, with adjustable data cycles and access rights.

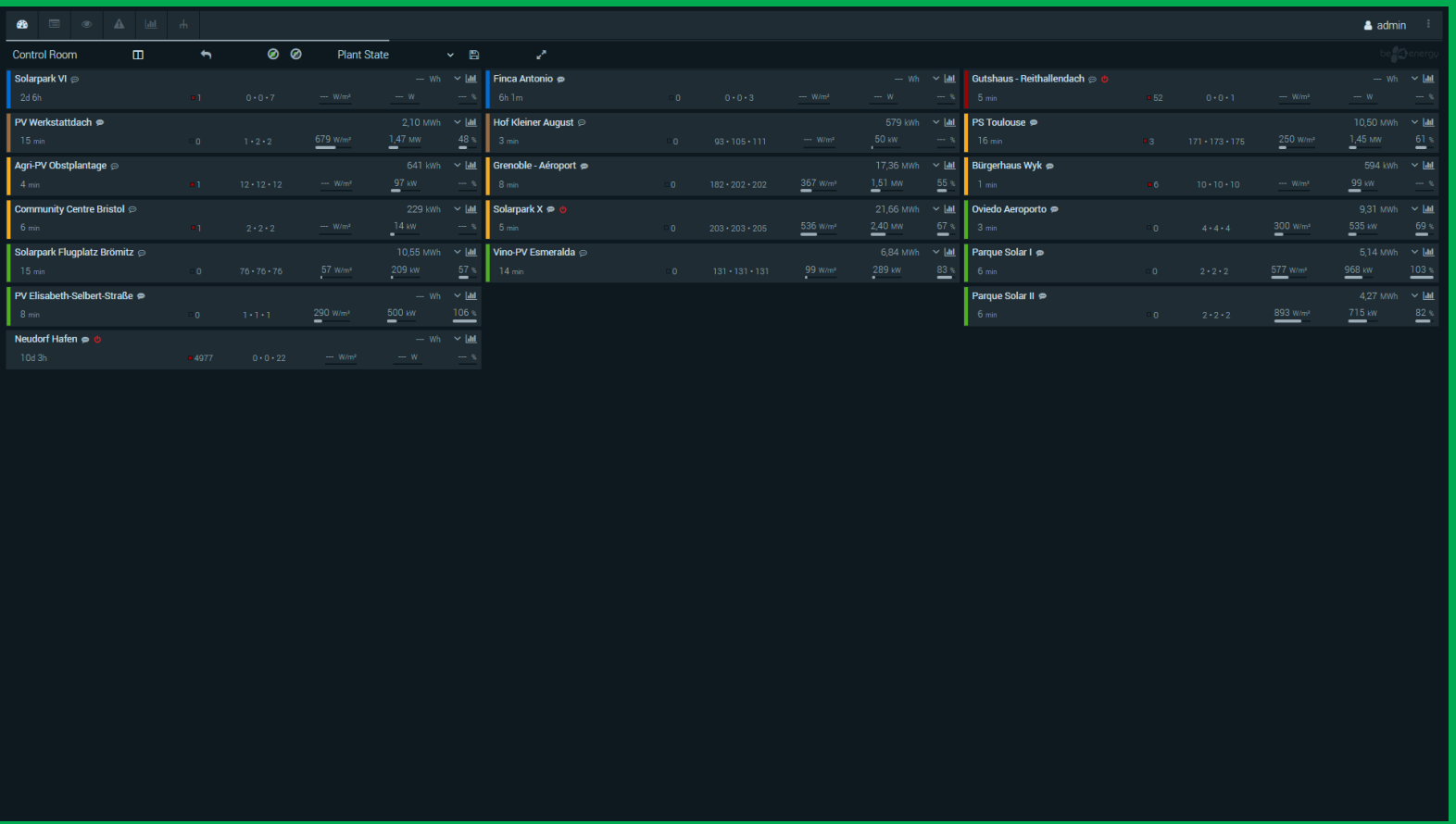
Project Overview

Zoom into a specific plant. Day, month and year time bar charts show the development of power output, yield, PR, real-time and forecast figures, and on-site weather conditions, with 100% precision and clarity. Views of past periods also available.

Alarm Management

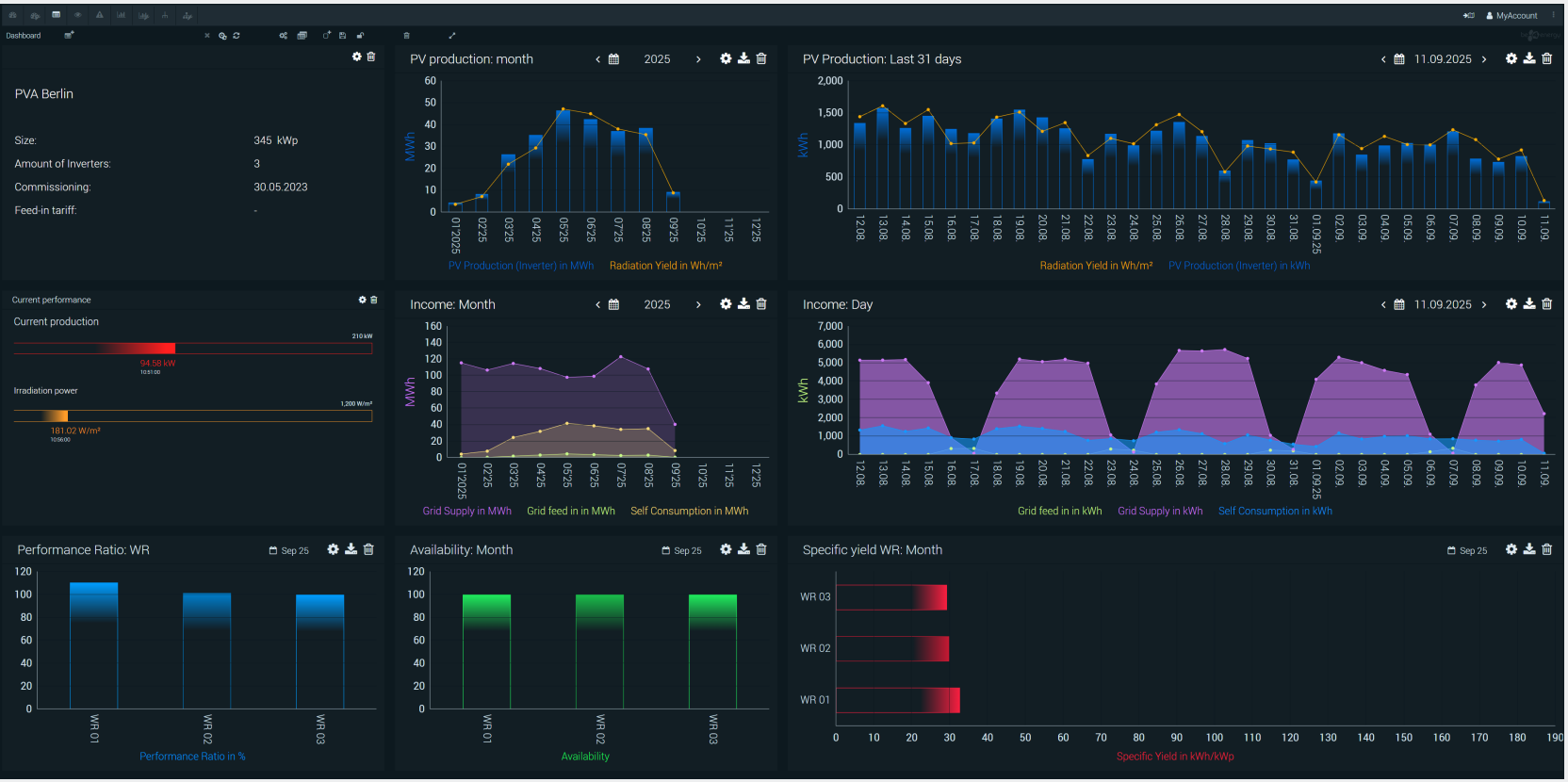
Pinpoint alerting and thorough fault analysis features that are highly adaptable to the specifics of your portfolio. With optional hookup to your own ticketing system.

Control Room



- → Concise overview of your entire asset portfolio
- → Quick sorting by plant status, nominal AC power or plant name
- → Flexible layout using drag & drop
- → Instant indication of underperformance, inverter failure, disruption of data communication, etc. via alarms
- → Plant-specific notes for sharing important information within the team
- → Fine 'zoom in' to predefined charts in the Analysis view using drop-down menus and links

KPI Dashboard



Flexible visualisation of freely selectable plant metrics (KPIs). Customisable composition of the View.

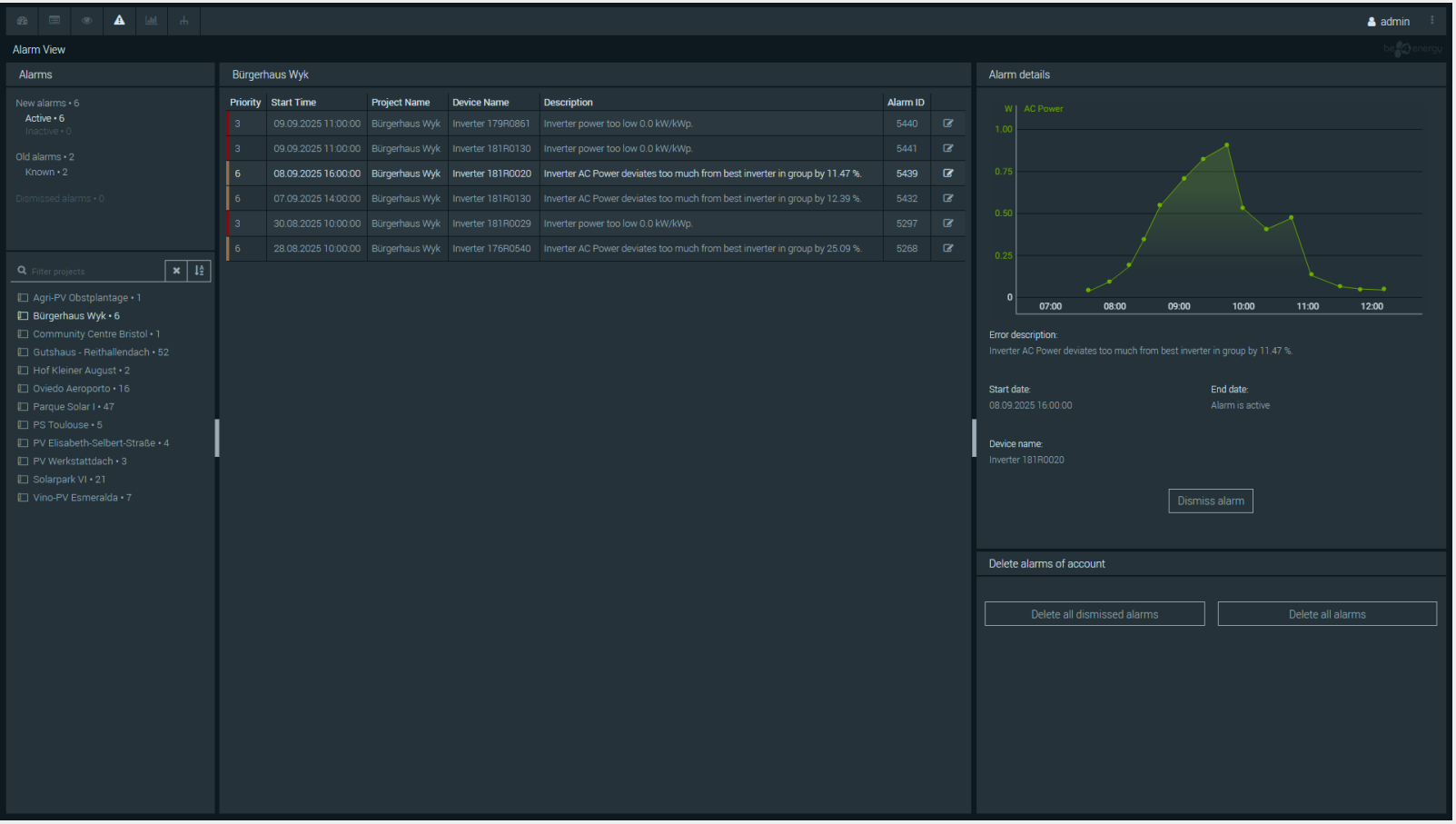
Example:

- Energy yields
- Inverter availability
- Energy import
- Energy export
- Total energy consumption
- Self-consumption
- Autarchy
- Losses due to data failure
- ...

Project Overview

- → Predefined overview of current and past states of a specific plant
- → General plant parameters: Installed DC power, geographical location, commissioning
- → Power metrics: irradiation power, produced power, performance ratio PR
- → Energy yields [kWh]: Daily, monthly and yearly values
- → Local weather conditions: ambient temperature, humidity, atmospheric pressure, wind speed
- → Actual/forecast comparison: generated AC power, PR and irradiation power
- → Convenient CSV export of all yield values

Alarm Management



- → Focussed response to alarm messages from the plant
- → Timestamp, duration and cause of the alarm
- → Detailed description of the error situation
- → Direct zoom into the chart or table of the plant's affected operations figures for precise analysis
- → Systematic processing of selected alarms
- → Possibility to enter instructions for the on-site service team
- → Detailed alarm list, either itemised by a specific plant, or across all plants of an entire asset portfolio

Actionable data always at your fingertips

Analysis

Systematically structured project data, methodically processed by **be4vision**, based on our expert knowledge, helps you make actionable decisions and perform substantiated data analyses.

Analysis View

Comprehensive display of all vital data with KPI charts and freely combinable data points for each installed device and each individual measurement or aggregated value. Configurable by time, resolution and other criteria.

Value Tables (CSV)

Standardised and freely configurable value graphs, which can also be presented in tables with a simple click. Ready for export and further processing in your own business analysis applications.

Scatter Charts (XY)

Display of critical interdependent variables in scatter plots, with a click of the mouse. For in-depth analysis of functional correlations, such as GHI irradiation and PV power output.

Inverter KPIs

Concisely displayed – for an overview of inverter status, power output, efficiency and availability. Depicted individually for specific plants, or across selected or all assets of your portfolio.

String Monitoring

Display and analysis of string currents if string level sensors are installed. Measured, for instance, in the DC inputs of string combiner boxes or the solar inverters.

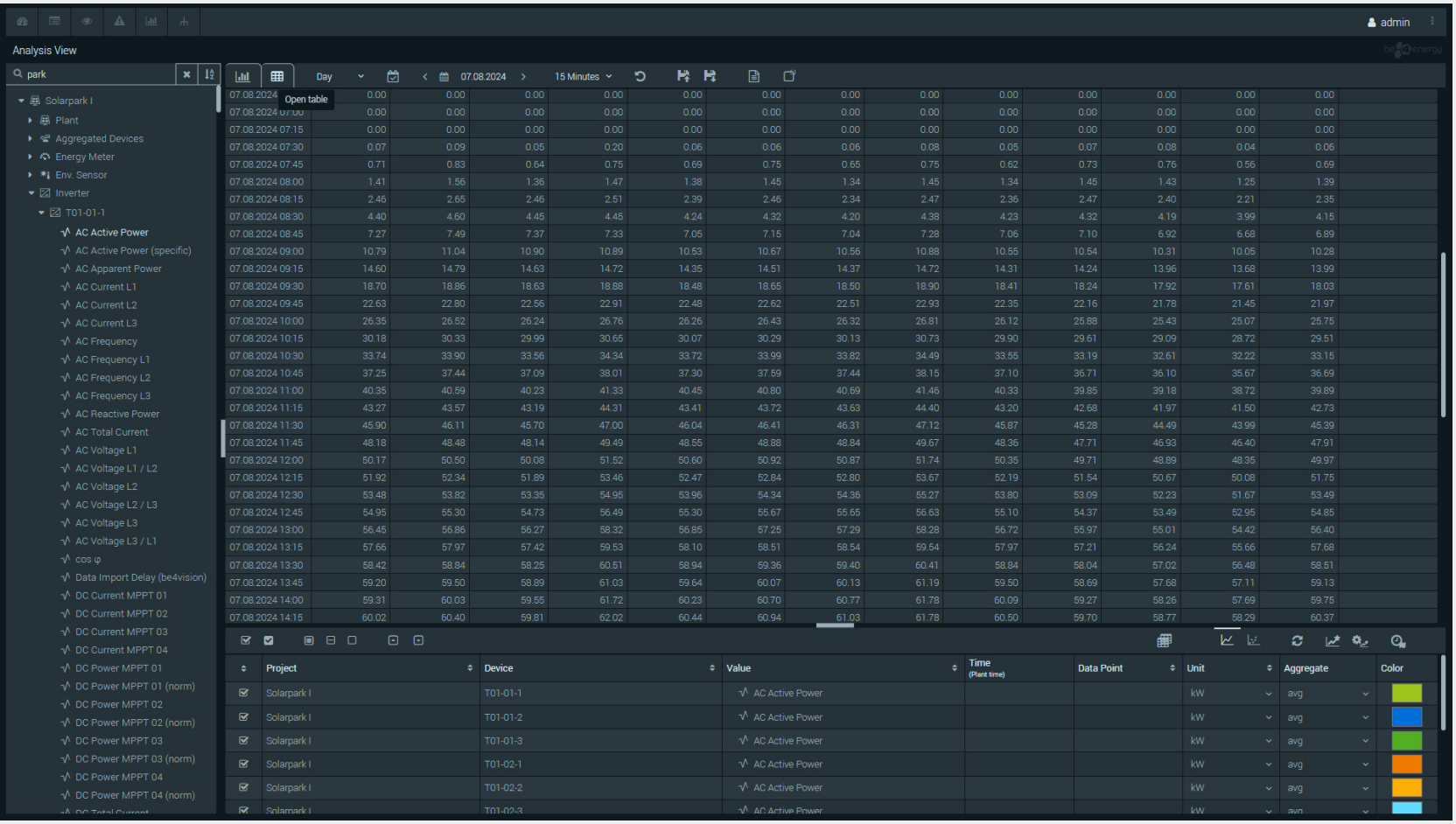
Data Extraction

Configurable export of all measured and aggregated data. Freely selectable information retrieval on demand, also available via API and FTP Push. For in-depth analyses in other applications.

Analysis View: KPI Charts

- → Freely selectable access to each individual measurement metric and aggregated value
- → Charts of hourly, daily, weekly, monthly and yearly values
- → Selectable time periods, including retroactive periods
- → Selectable data granularity, up to high 1-minute resolution
- → Flexible combination of charts, plant-specific or portfolio-wide
- → Saving of customised chart views for quick consultation
- → Convenient chart/table toggle
- → Saving of charts in image format
- → Easy data export in CSV format

Value Tables (CSV)



→ Tabular view of the selected data

→ Adjustable granularity at a data resolution of up to 1 minute

Example:

Solar Park 1:
Generated Active AC Power, individually displayed for all inverters installed in the plant

Selected settings:
Average values, 15-minute resolution

Scatter Plots (XY)

→ X-Y or scatter plot representation

→ Analysis and assessment of correlations between physical quantities

Example:

In order to evaluate the performance of a plant's reactive power control function, its generated reactive power [kvar] was displayed in a scatter plot and set against the AC active power [kW] fed into the grid for a period of one month. The plot clearly shows that reactive power is generated from a feed-in power of 275 kW onwards, and that it increases linearly with a further increase in exported active power.

Inverter KPIs

Ⓐ Energy flow Ⓑ Yearly yields Ⓒ Inverter availability Ⓓ Yields / Losses Ⓔ Inverter PR

Display in Dashboards:

Well-organised dashboards displaying the key status and performance metrics of the installed inverters. Again, freely configurable to project requirements.

Example:

→ Energy flow: total, self-consumption, import from the grid

→ Yearly energy yields [MWh]

→ PV output [kWh] on inverter level: actual/expected

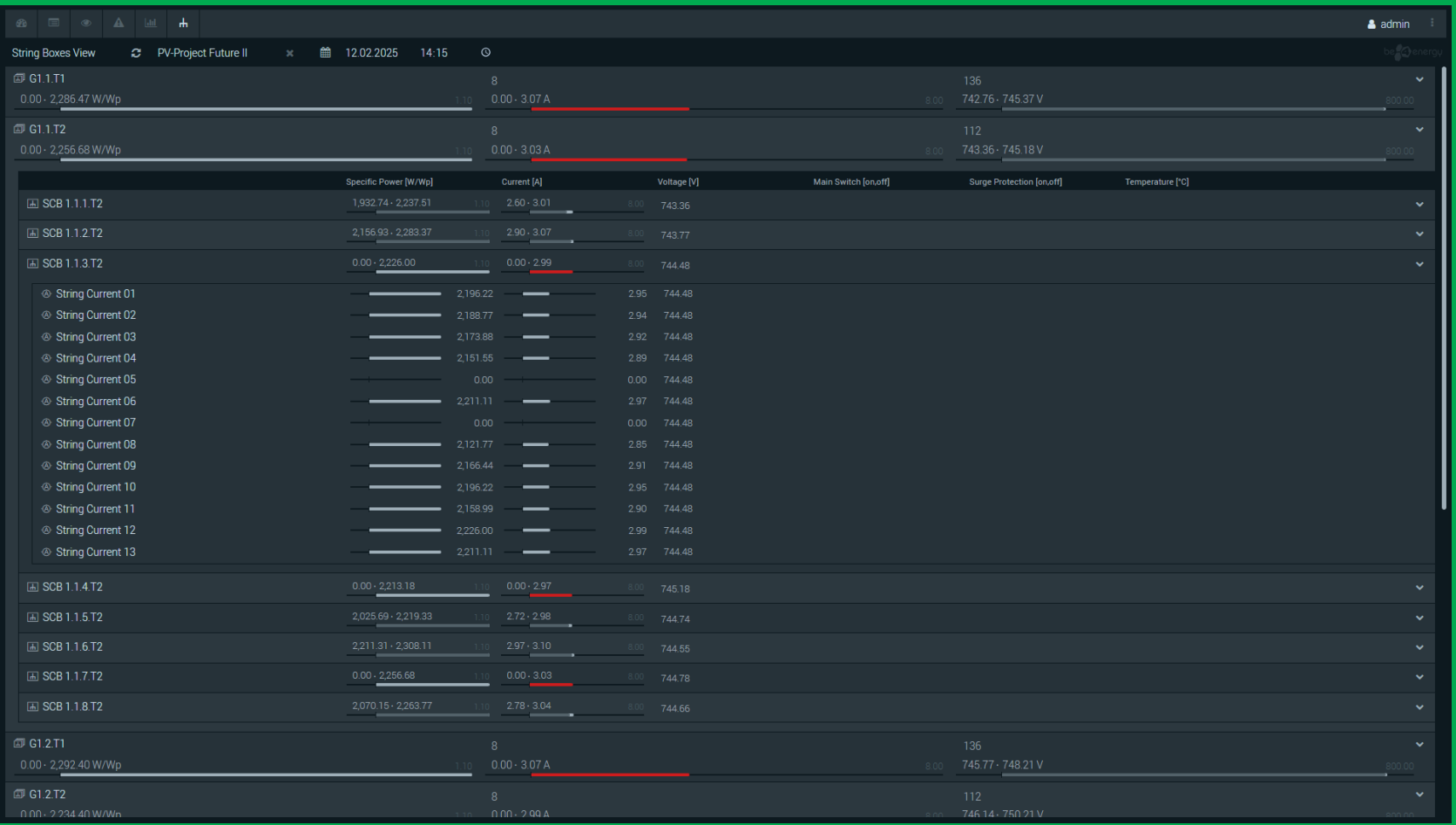
→ Individual inverter availability [%] over a month

→ Individual monthly inverter PR [%]

→ Yield losses [kWh] due to curtailment

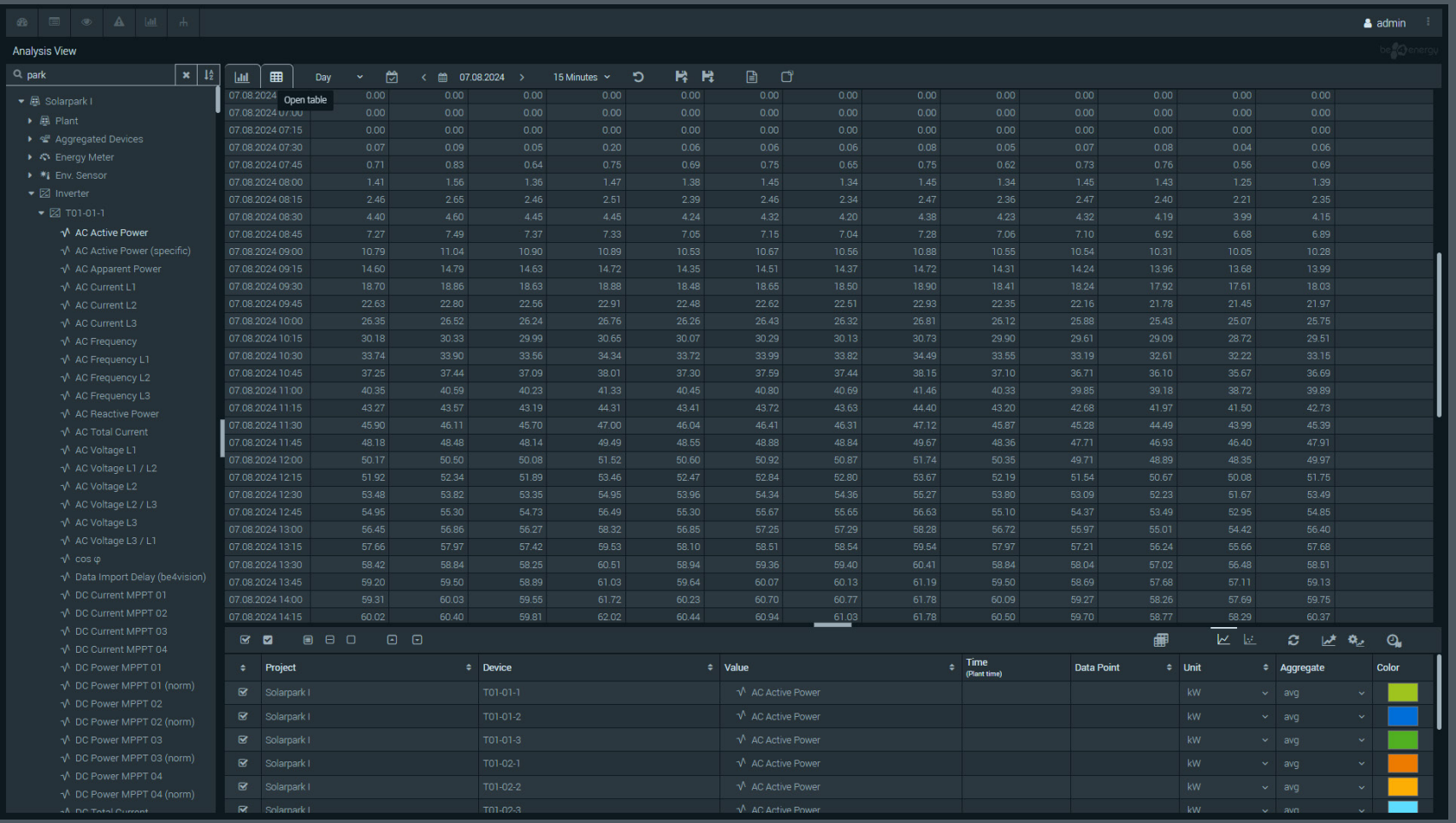
→ Easy configuration and data export of all charted values

String Monitoring



- → List of the installed combiner boxes
- → Detail display of all combiner box status metrics
- → Detail display of all string metrics: specific power, current, voltage
- → Display of the data communication status
- → Status display of overvoltage protection, ON/OFF switch and cabinet temperatures

Data Extraction



→ Easy and configurable data export via CSV

→ Automatic periodic data extraction using API or FTP Push

→ Flexible selection of the data items to be extracted

Example:

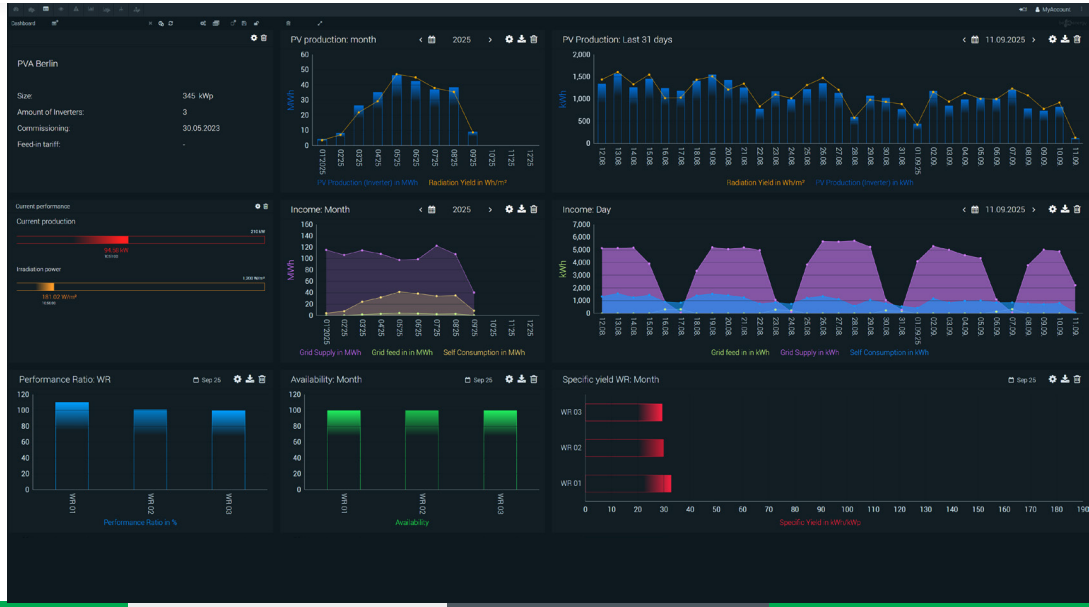
Solar Park 1:
Active AC power produced by all inverters installed on site, shown individually for each inverter output

Selected settings:
Average values, 15-minute data resolution

Efficient project implementation

Workflow

be4vision is your knowledge-based support in all phases of project implementation – from equipment and system commissioning through to regular plant maintenance and performance analysis.



Commissioning

Selective, dedicated condition monitoring and alerting set up specifically for functional checks and test runs. Use adaptable test parameters for detailed commissioning reports.

Configuration

Intuitive set-up of plant architecture, components and alarm management. Adaptable user roles and access rights to suit your case. Easy onboarding of new plants into your asset portfolio.

Alarm Management

Thorough, prompt fault analysis. From distinct alerting for specific components and plants through to wide-ranging cross-asset diagnostics in a larger portfolio.

Reporting

Automatic reporting on key metrics such as power, yield, PR, availability, KPIs, curtailment losses, power import, self-consumption, etc. Customisable report contents, dispatch and addressees.

Data Warehousing

Efficient use of third-party analysis tools thanks to flexible data import/export features and software interoperability. Bespoke data analysis by our solar expert team upon request.

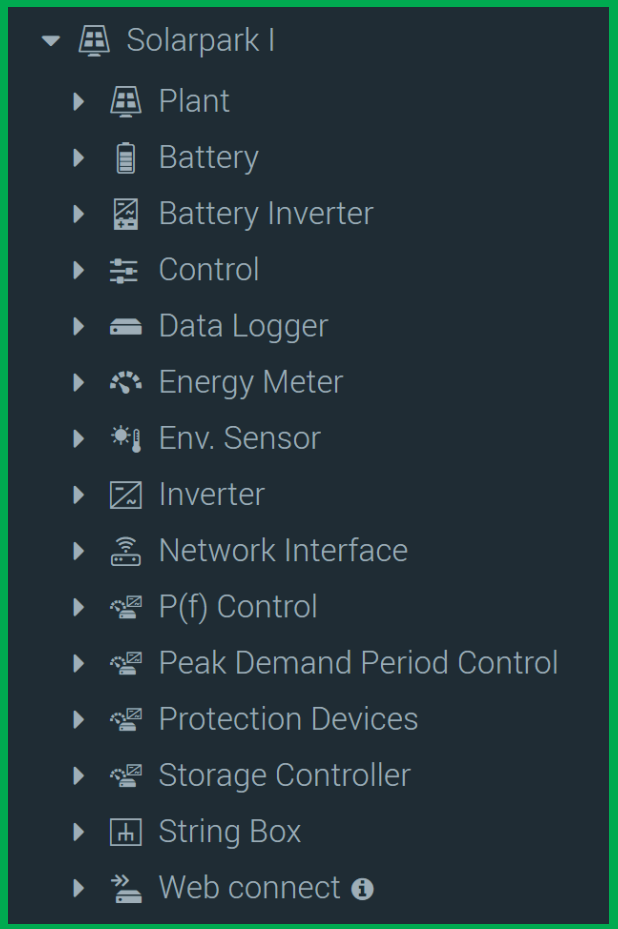
Legacy System Merge

Integration of your existing solar PV systems, including the historical data from previous monitoring systems.

Asset Maintenance

Cost-effective preventive maintenance based on seamless condition analysis for all devices. Configurable intervention reporting and integration with third-party CMMS and ticketing systems.

Commissioning



→ Immediate display of ALL plant metrics as soon as the data loggers are connected in the network (our be4unity logger or third-party devices)

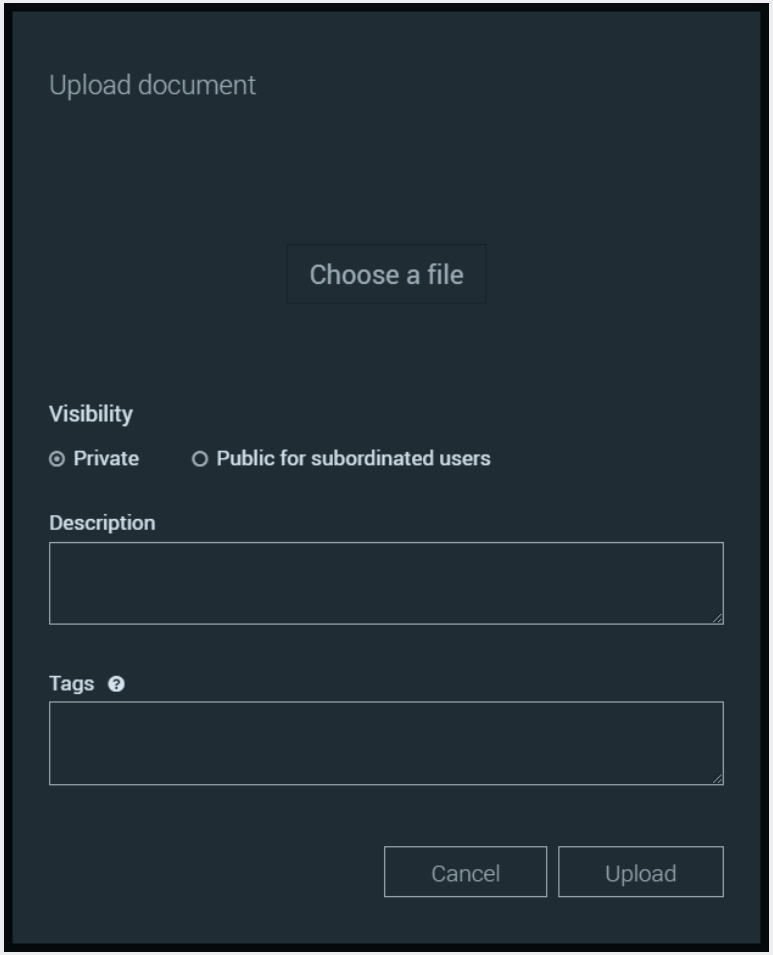
- All inverters OK?
- All measurement values within the valid range?
- Power control tests in line with the grid code?
- Circuit breakers ON or OFF?

→ Automatic data refresh and updated displays even with third-party data loggers

→ Customised alarm groups with special thresholds and instructions, specifically for the setup phase

→ Direct and focussed communication with the commissioning team on site

Configuration

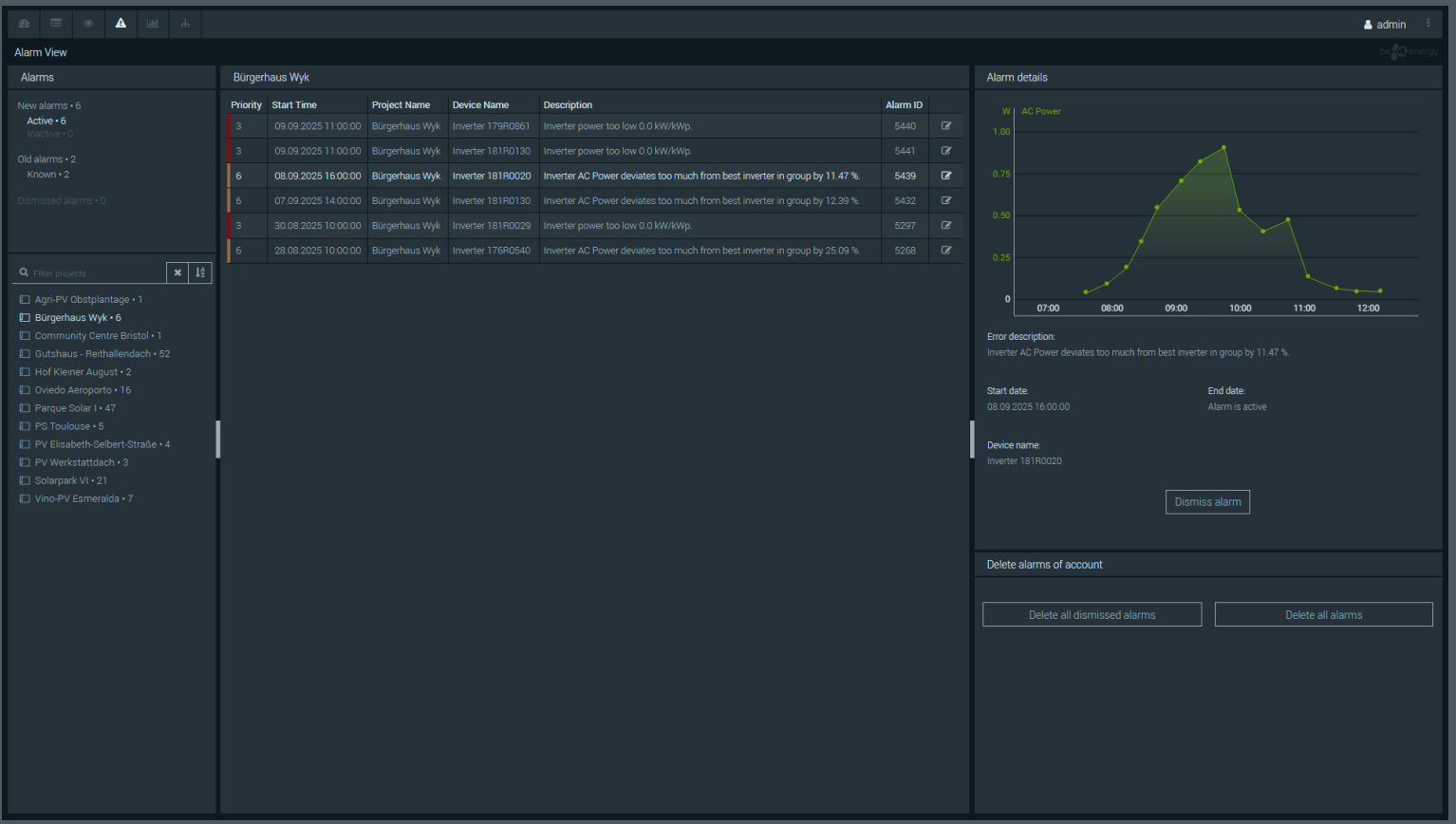


→ Convenient guided plant configuration via the user interface

→ Import/export of plant configurations for configuration cloning in larger asset portfolios

→ Configurable functions:
- User access control
- Plant architecture and installed devices
- Alarm management
- Reporting
- Characteristics of inverters, data loggers, combiner boxes, …
- Settings of the data communication portal

Alarm Management



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→ Detailed description of the error situation

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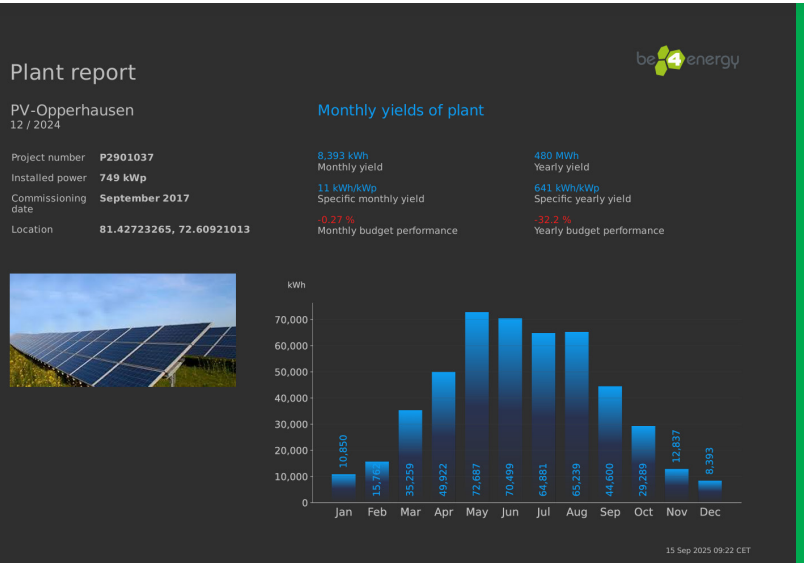
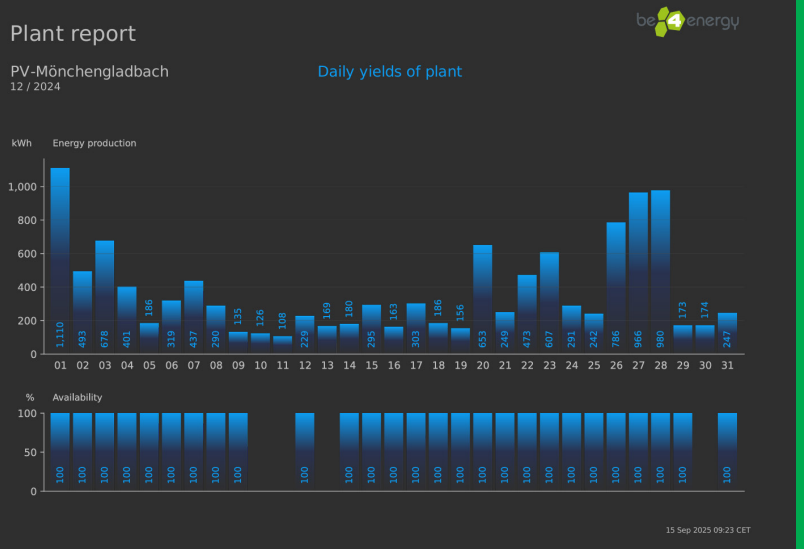
→ Systematic processing of selected alarms

→ Possibility to enter instructions for the on-site service team

→ Detailed alarm list, either itemised by a specific plant, or across all plants of an entire asset portfolio





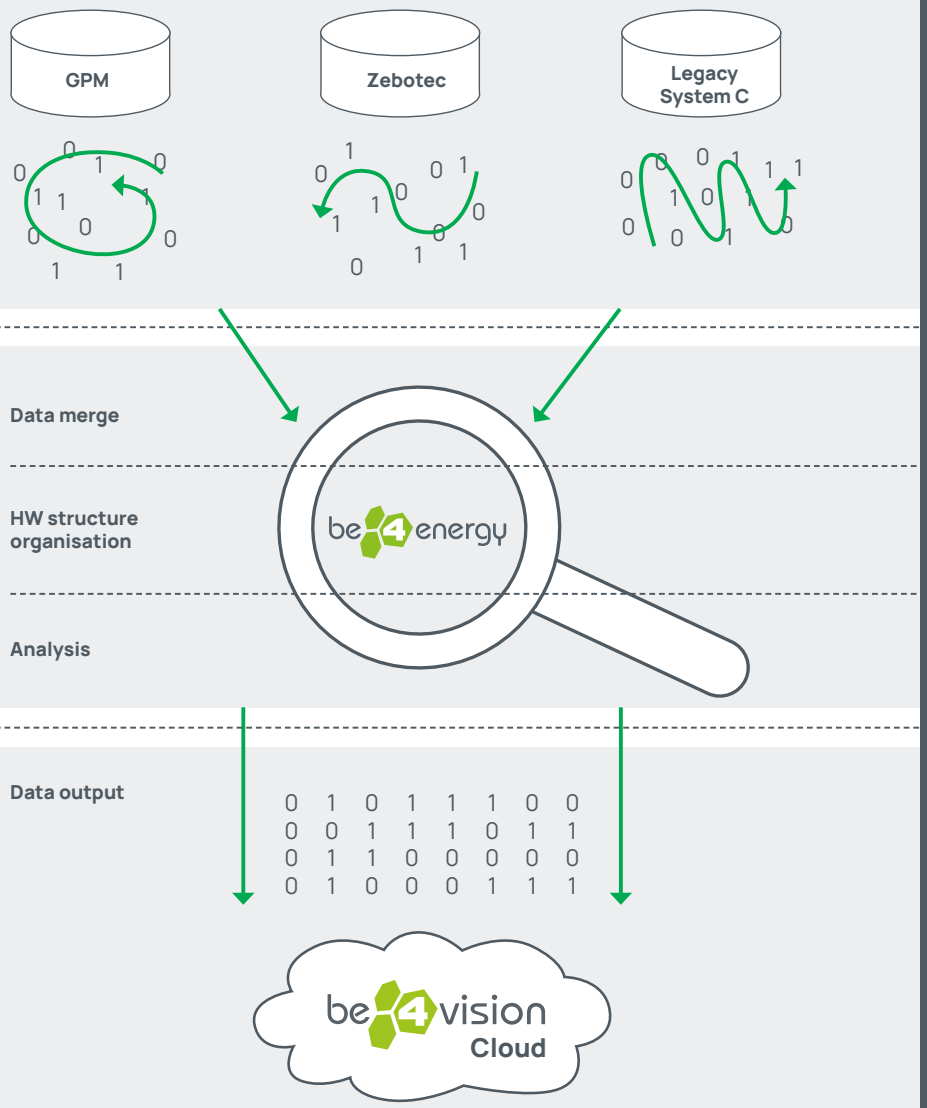
Reporting

- → Clearly structured plant reports
- → Automatic report generation at configurable intervals
- → Ad-hoc report generation for selectable time periods
- → Also applicable to past periods
- → Report dispatch to configurable e-mail addresses
- → Report contents: all vital KPIs (currently predefined)
- → Report contents: configurable (under development)

Data Warehousing

- → Long-term archiving and safe management of your data in a ‘Data Lake’
- → High data availability of > 98%
- → Permanent access to your data throughout the entire lifespan of your assets
- → Flexible access to your own data, at any time, incl. to selectable time periods in the past
- → Safe data dumps and database exports for your own analysis activities, incl. downloads of historical data
- → Secure data storage on servers stationed in the EU, fully compliant with EU data protection regulations
- → Eco-friendly data storage on renewable energy for our servers

IMPORTANT: The stored information remains your property. We securely save, manage and maintain it for you.



Legacy System Merge

- → Integration of your legacy systems, irrespective of their plant architecture
- → Import of historic plant data
- → Project-specific analysis and assessment of the legacy data
- → Incorporation of the existing hardware configuration, if possible
- → Systematic integration into the new monitoring scheme, taking into account the specifics of the project concerned
- → Our service upon request

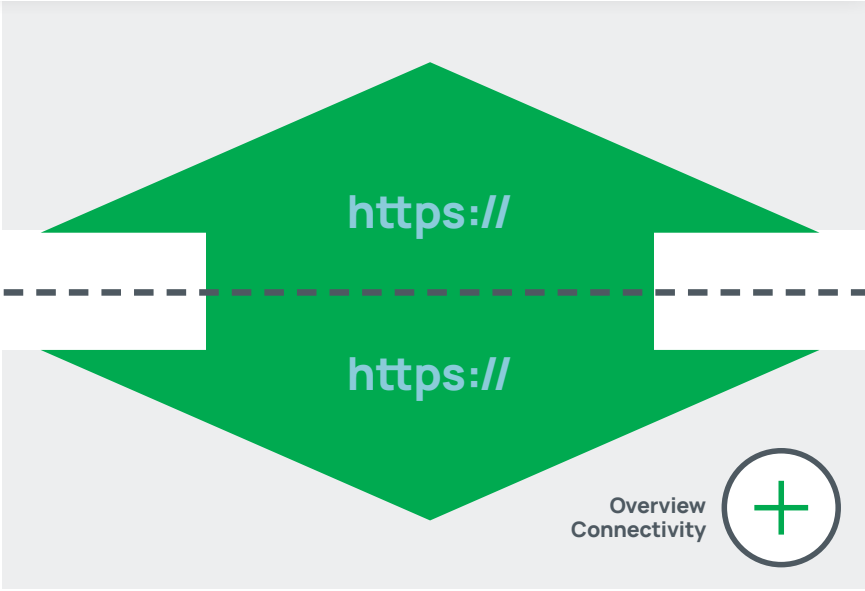
Asset Maintenance

- → Clear overview of on-site service activities, current power curtailment and device statuses indicated by dedicated symbols
- → Detail view of failed inverters
- → Prompt reaction to status issues or error messages
- → Input of work instructions to the on-site service team
- → Flexible maintenance procedures: instructions directed at a specific plant and user, or referring to several plants and directed at several different users
- → Systematic tracking of hardware statuses
- → Integration of external ticket system possible

Multi-compatible communication

Connectivity

be4vision talks to practically everyone. Regular updates by our in-house development team keep the platform's communication tools compatible with other software applications and the latest market-standard components, such as data loggers. The advantage for you – **be4vision** remains completely brand-independent in its usage.



Compatibility

be4vision works with the information collected by the installed data loggers. Not tied to any particular brand, **be4vision** connects not only with our own be4unity logger, but also with pretty much all commonly available data loggers.

→Compatibility List

Network Integration

Technical grid-code compliant connection to the power grid and commercial integration into the power trading market using our **be4market** tool – with **be4vision** you will manage and supervise both processes in a few clicks.

Remote Control

be4vision's webconnect function gives you remo-te control access to your asset's on-site equipment. You can thus intervene from a distance, and actuate ON/OFF switches, for instance.

Meteo Data

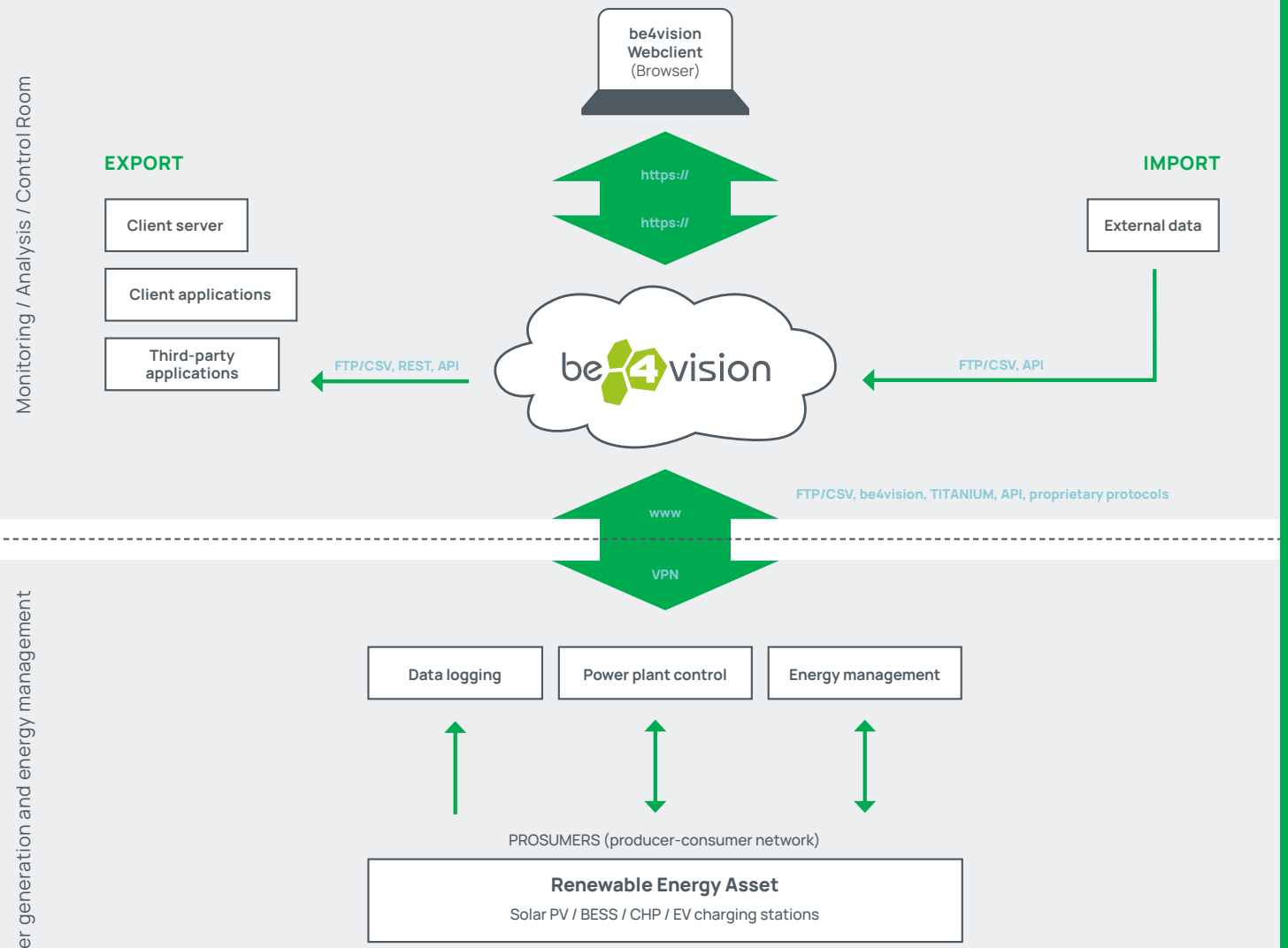
be4vision integrates meteorological data from a number of different sources. This gives you a reliable weather information base to make qualified judgements about irradiation and yield scenarios.

Data Transparency

be4vision's many export functions and transmission via FTP Push and API allow flexible sharing of plant data for further processing in external applications.

Hotline

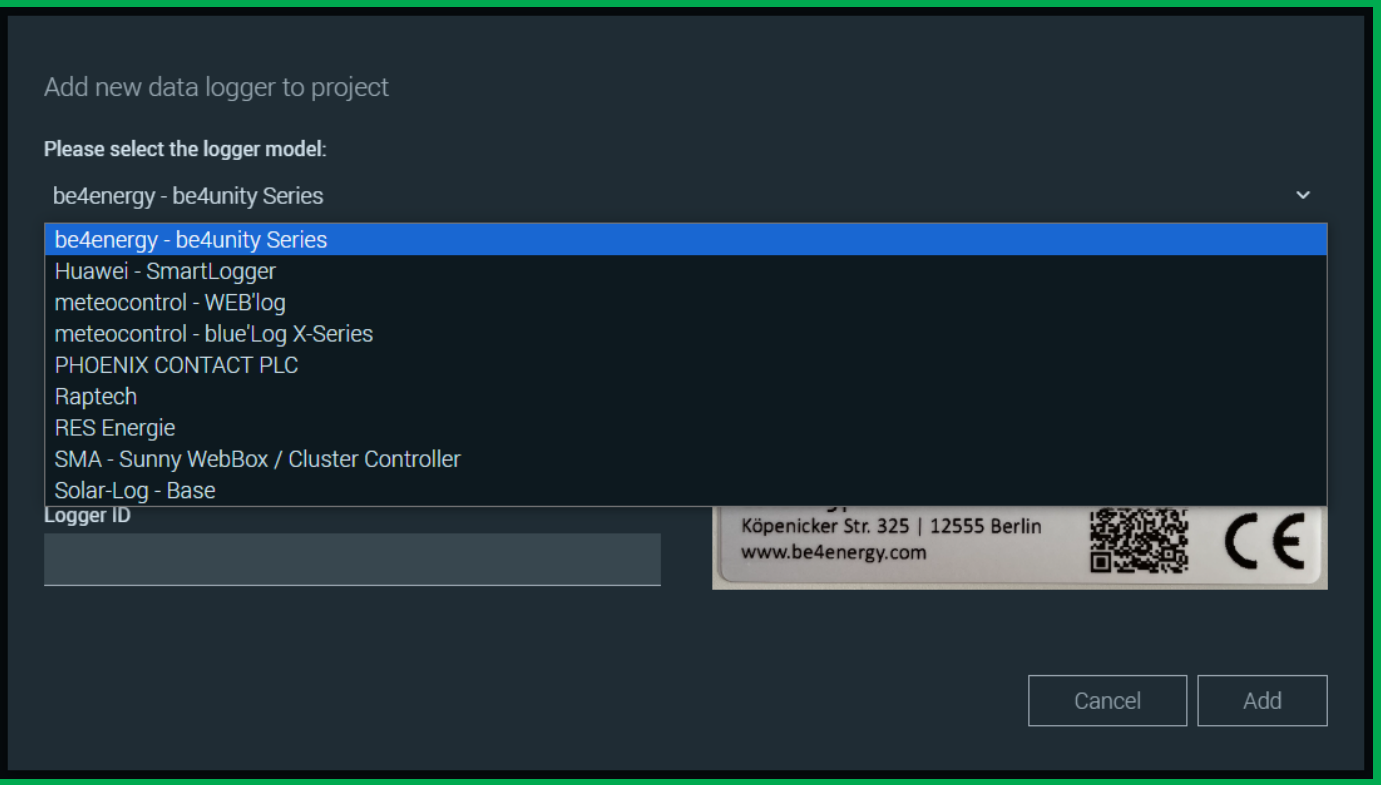
Our expert hotline team is just a call away to assist you with your work with **be4vision**. With our Premium Service package, you can take advantage of our all-round support.



Connectivity

- → Multi-compatible communication with other devices, systems and software
- → Via LTE wireless technology, Modbus RTU, Modbus TCP
- → Secure data transmission via VPN
- → Flexible data retrieval via FTP, API, CSV

Compatibility



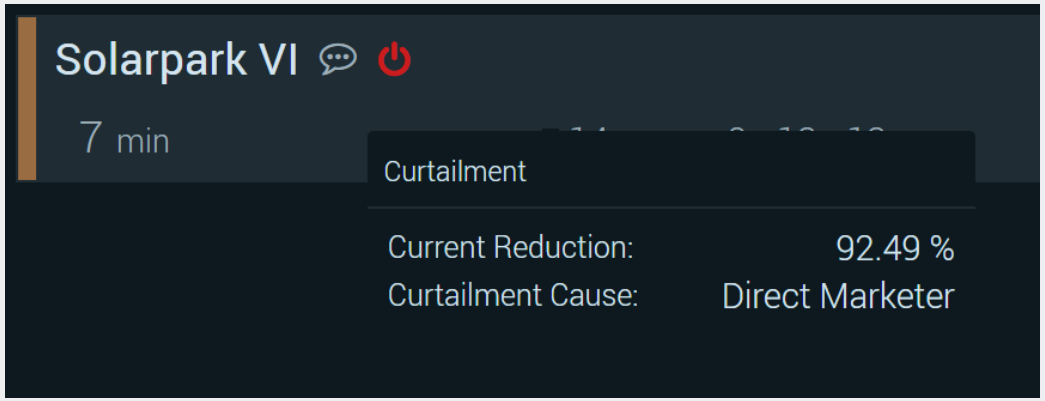
→ Reliable data acquisition using our own be4unity data logger

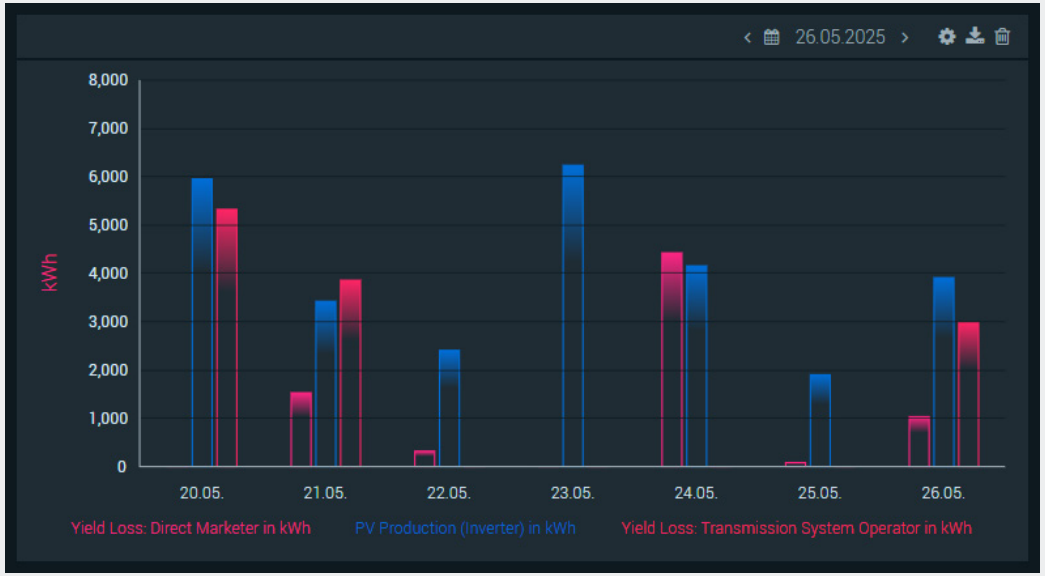
→ Equally reliable data acquisition also possible via third-party commercially available data loggers via our integrated connectivity feature

→ Integration of additional data loggers upon request

→ Compatibility List

Network Integration





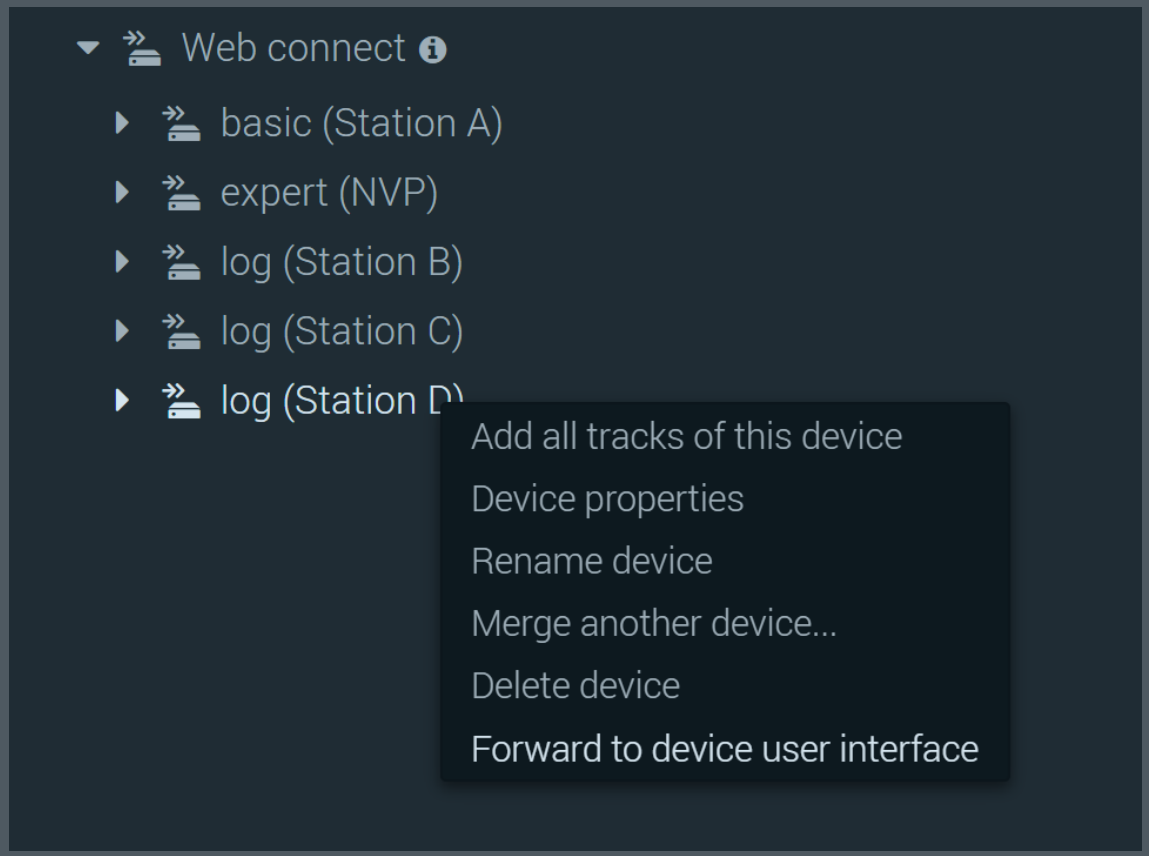
→ Detailed display of all power plant control parameters in the device browser: active power, reactive power, cos phi, …

→ Status display of all network stakeholders: grid operators and electricity traders

→ Flexible combination of all control information in customisable charts and tables – available also across several plants of a larger asset portfolio

→ Possibility to save customised charts and views for quick and repeated access

Remote Control



Webconnect

→ Dynamic information forwarding to the user interface of our be4unity data logger and to other devices installed in the plant and accessible in the local network (energy meters, alarm systems, routers, third-party loggers, network analysers, etc.)

→ For remote configuration of the plant's equipment

→ For control access to network-capable devices installed in the plant, e.g. for ON/OFF switching

YOUR ADVANTAGE
Efficient plant configuration, maintenance and control from a distance, without costly on-site interventions

Meteo Data

Project	Device	Value	Time (Plant time)	Data Point	Unit	Aggregate	Color
Solarpark I	Sat Radiation	Radiation Power (Diffuse Horizontal)			W/m²	avg	
Solarpark I	Sat Radiation	Radiation Power (Diffuse Normal)			W/m²	avg	
Solarpark I	Sat Radiation	Radiation Power (Global Horizontal)			W/m²	avg	
Solarpark I	Sat Radiation	Radiation Power 01			W/m²	avg	
Solarpark I	Sat Radiation	Temperature: Ambient			°C	avg	
Solarpark I	Sat Radiation	Wind Direction			°	avg	
Solarpark I	Sat Radiation	Wind Speed			m/s	avg	

→ Flexible integration of external meteorological data

→ For qualified weather forecasting and yield prediction for up to 3 days ahead

→ Meteo information from different data sources, such as satellites and meteorological forecasting services

YOUR ADVANTAGE

Prognostics and analysis of irradiation, performance ratio and energy yield possible even without field sensors installed on site

Data Transparency

Data loggers and plant controllers that are currently integrated by default

MANUFACTURER	MODEL
be4energy	be4unity log, be4unity basic, be4unity expert
Huawei	SmartLogger 1000/2000/3000
meteocontrol	WEB'log PRO
meteocontrol	blue'Log X-Series
SMA	Sunny WebBox, Cluster Controller, Data Manager M
skytron energy	skylog / skycontrol
Solar-Log	Solar-Log Series
zebotec	PLC
GPM	Logger/Scada API
GPM	Logger/Scada CSV

For more details, please consult our current Compatibility List:
→Compatibility List

→ Multi-compatible integration of data from virtually any data logger:
- Our own be4unity logger, or
- zebotec PLC
- SMA Sunny WebBox & Sunny Boy FTP
- Huawei FTP
- Solar-Log FTP
- meteocontrol blue'Log & WEB'log FTP
- Fronius FTP
- GPM CSV FTP
- GPM API

→ Merging producer data (power producers) and consumer data (power consumers) into a global prosumer network

→ Versatile data channels in all directions for import, export and backups

→ Live data (CSV) and aggregated data via API and FTP permanently available

→ Systematic transfer of plant or portfolio data to external systems

Hotline

- → Our experienced hotline team is at your service!
- → Different Service Level Agreements for your specific requirements
- → Our **be4vision** Premium Service Package for your all-round 24/7 support from our experts (upon request)
- → For systematic and comprehensive diagnostics and detailed performance analyses

More than just a software

SaaS

As a cloud-based SCADA platform, **be4vision** is your expert tool that comes with a wide range of useful service functions. Some are built in by default and enhanced by regular updates, while others are developed and added by our in-house expert team upon your request.

Our ‘Software as a Service’ for you:

- → A permanently available monitoring platform for you, irrespective of the employed operating system (Mac, Windows, Linux, Android...)
- → Browser-based, hence no download or installation of software required
- → Licence-based and scalable
- → No costs for you for the server infrastructure
- → All aspects of data security and reliable availability taken care of
- → Updates and evolution of the functional scope at regular intervales included
- → Implementation of customised features upon request
- → Integration of data from various different sources upon request

Your direct contact

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Stefan Galler and Milan Rompe

Text
TECDOC automation

Design and creation
REUTER × BOBETH Sustainable Branddesign

Edition: 9/2025

This product brochure was created in a resource-efficient manner using reusable bytes.