The New Energy Management Solutions from

Solar-Log™

Safe for the future with us today

Solare Datensysteme GmbH

CEO
Dr. Frank Schlichting, Brigitte Beck
Owner
BKW Group, www.bkw.ch
Headquarters
72351 Geislingen-Binsdorf – Germany
Product and market experience
> 12 years

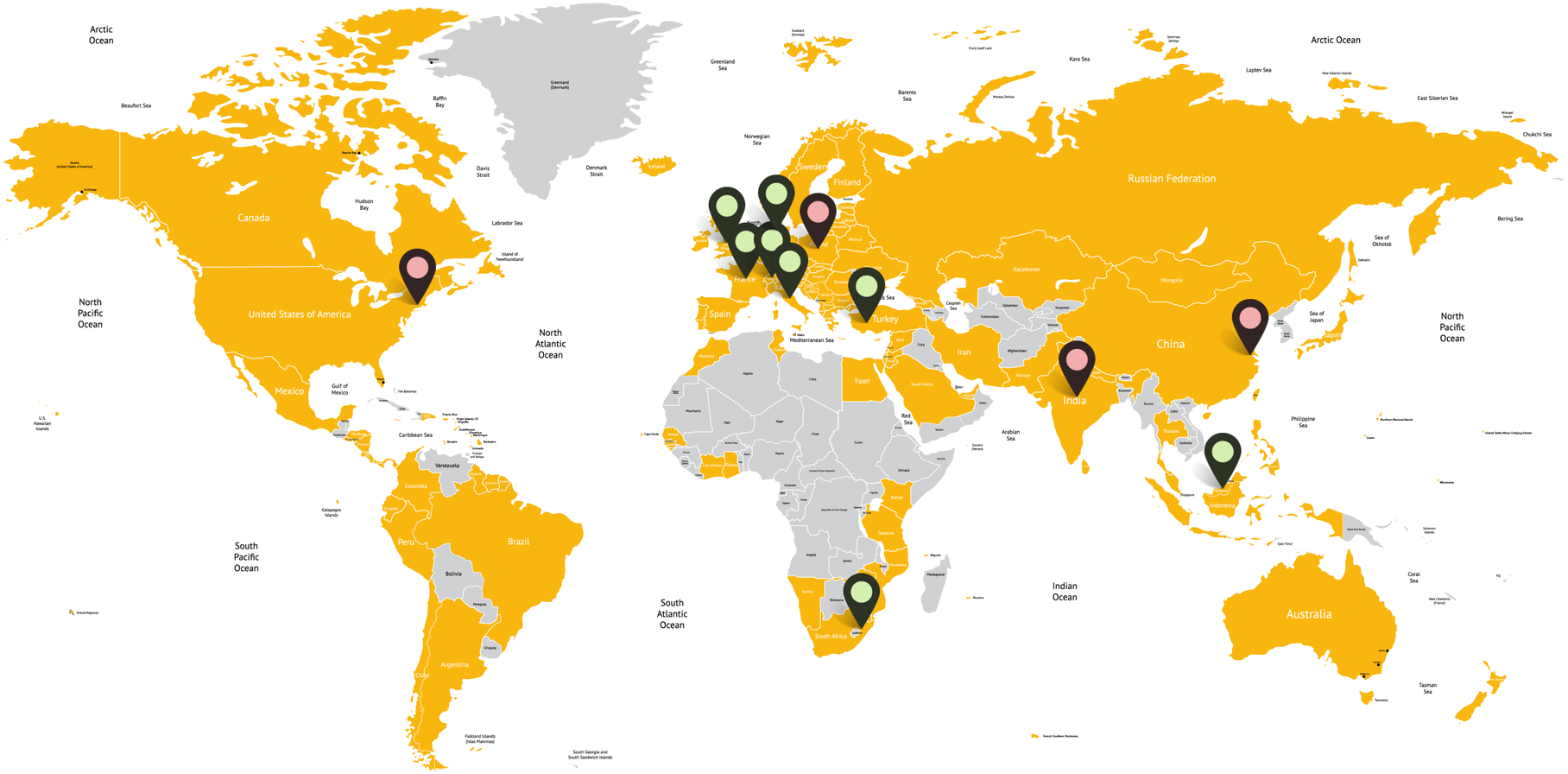
BKW Energie AG

International energy and infrastructure company

Founded 1909 in Bern, Switzerland

> 6000 employees worldwide

Delivering energy for ~1 billion people



Distributors/Direct Customers

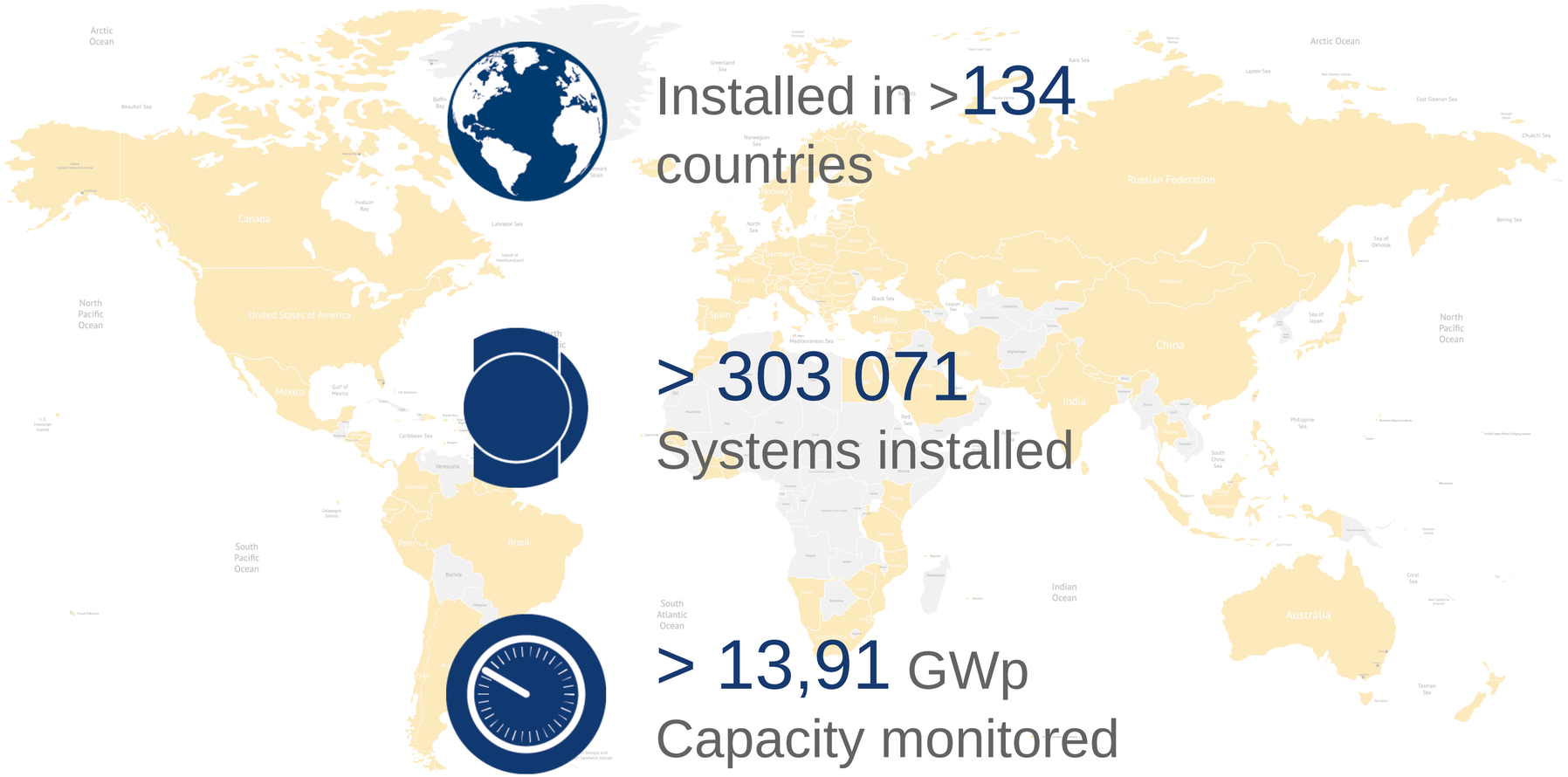
> 40 countries (installed > 134 countries)

Sales Offices

China, India, USA and Poland

Service Partners

Switzerland, Italy, France, UK, Southern Africa, Malaysia, Turkey, Denmark



Installed in >134 countries

> 303 071
Systems installed

> 13,91 GWp
Capacity monitored

Solar-Log™

References

Residential

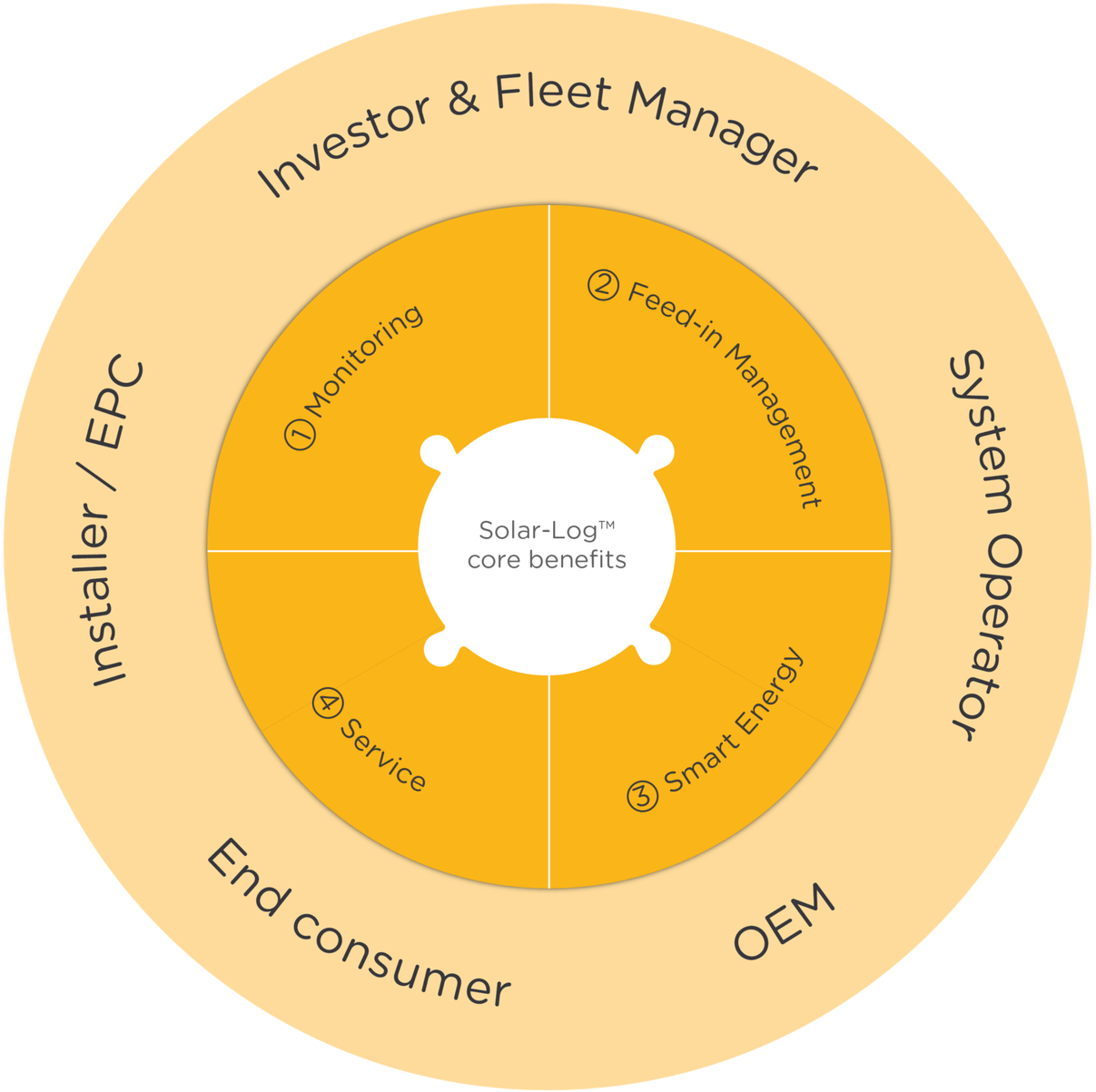
Commercial

Industrial

South Africa, Cape Town – 9,48 kWp

Poland – 340 kWp

Italy, Verona (VW plant) – 2950 kWp


Investor & Fleet Manager
System Operator
OEM
End consumer
Installer / EPC
① Monitoring
② Feed-in Management
③ Smart Energy
④ Service
Solar-Log™
core benefits

Solar-Log™ Monitoring

Basics of PV Monitoring

PV Monitoring with Solar-Log™

All relevant components of a PV system are monitored and controlled

- Inverter Monitoring
- MPP Tracker Monitoring
- String Monitoring
- Battery Storage Monitoring
- Feed-In Management
  Grid Control
- Direct Power Marketing
- Smart Energy; Optimization of
  Self Consumption

Visualization

Maintenance

Reporting

Solar-Log™

Solar-Log™
Feed-In Management

Possibilities – Applications

Grid Stability

Network operators are responsible for keeping the net balanced (voltage and frequence)

Electricity network can not store energy

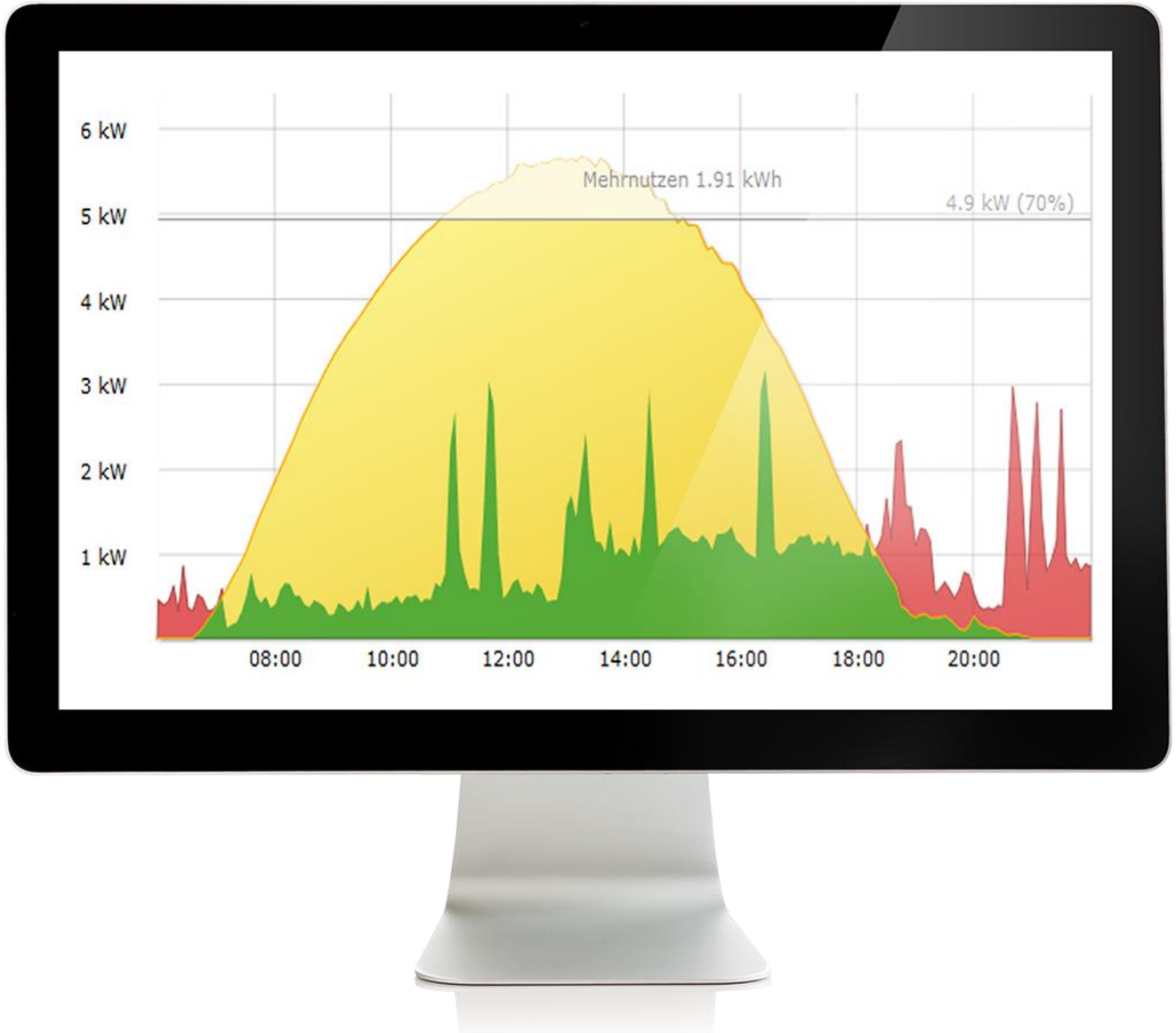
Production and consumption both have and are always to be balanced

Application Example

Germany, PV plant size 7 MWp, remote controlled

Application Example

Germany, PV plant size 7 kWp, 70% regulation with self consumption



Application Example

Jamaica, PV plant size 5,76 kWp, 0% feed-in

Daily Overview
20-03-15
WR
CM
Yield
Cons.
Udc
Uac
kWp
Inv-T
Values
Balance
24h
9 kW
8 kW
7 kW
6 kW
5 kW
4 kW
3 kW
2 kW
1 kW
08:00
10:00
12:00
14:00
16:00
18:00
Current
Feed-in Power Pac 1.77 kW
Generator Power Pdc 1.81 kW
Inverter Efficiency η 98 %
Status MPP, Power, Heating
Error
Self-consumption rate 36.35 %
Degree of self-sufficiency 80.4 %
Day
Yield 56.30 kWh
Specific Yield 5.44 kWh/kWp
Actual Value 107.23 %
CO2 emissions avoided in total 11.39 t

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Smart Energy

Possibilities – Applications

Optimization of self consumption

Reduction of energy costs

- Feed-In tariffs, tax incentives and subsidies are being eliminated or reduced.
- Power from the grid is more expensive than PV power in many countries - procurement costs are higher than production costs.
- Energy needs can only be reduced to a certain extent.
- Energy prices continue to rise.

+ The Return on Investment increases with higher self consumption.
+ "Environmental protection" and sustainability

How to increase self-consumption?

Residential homes

- Heat pumps
- Air-conditioning systems
- Refrigerators and freezers
- Ventilation
- Electric cars

Small and medium-sized businesses

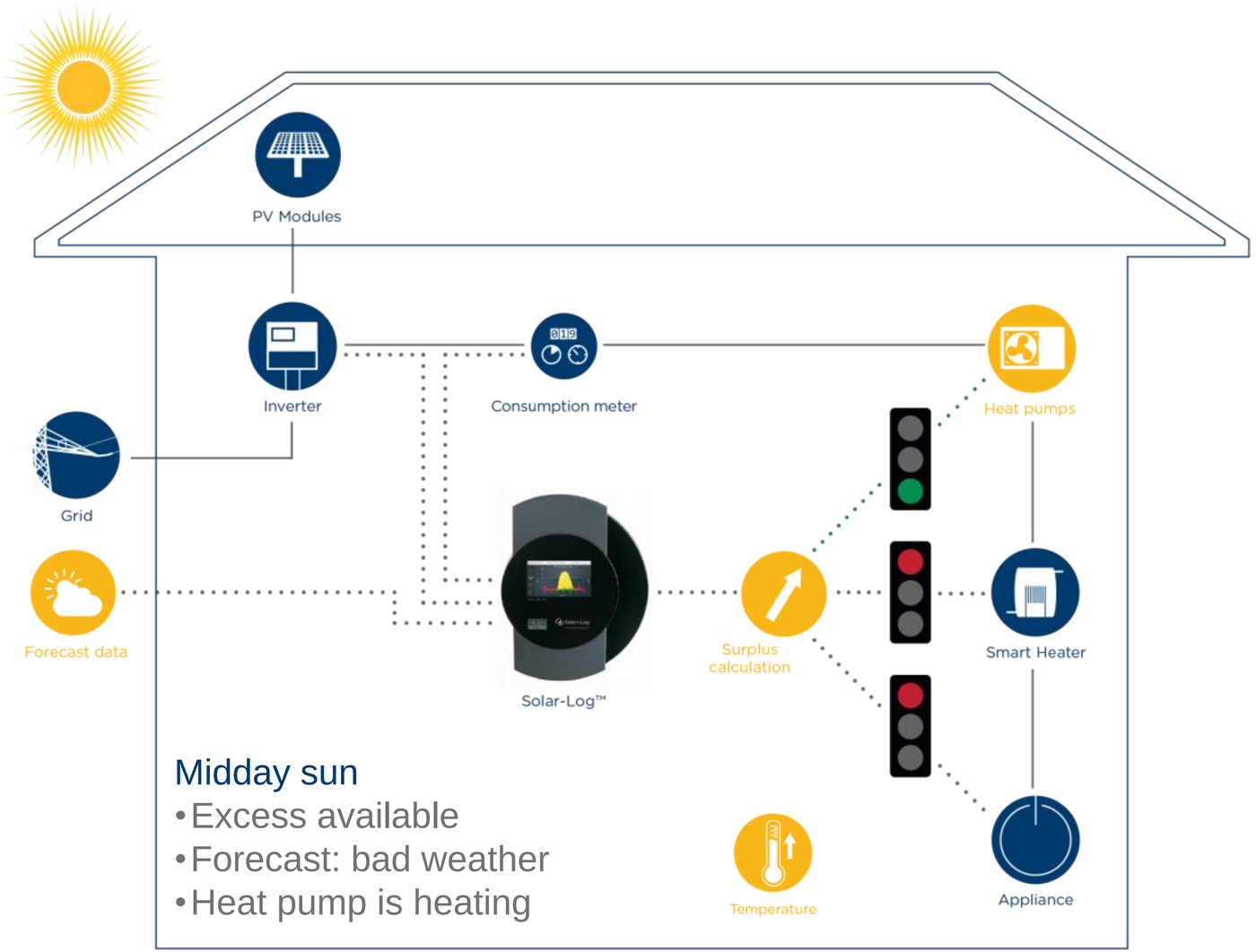
- Flexible production processes
- Furnaces
- Refrigeration
- Drying processes

Agriculture

- Pumps
- Mills and grinders
- Ventilation

Smart Energy Control

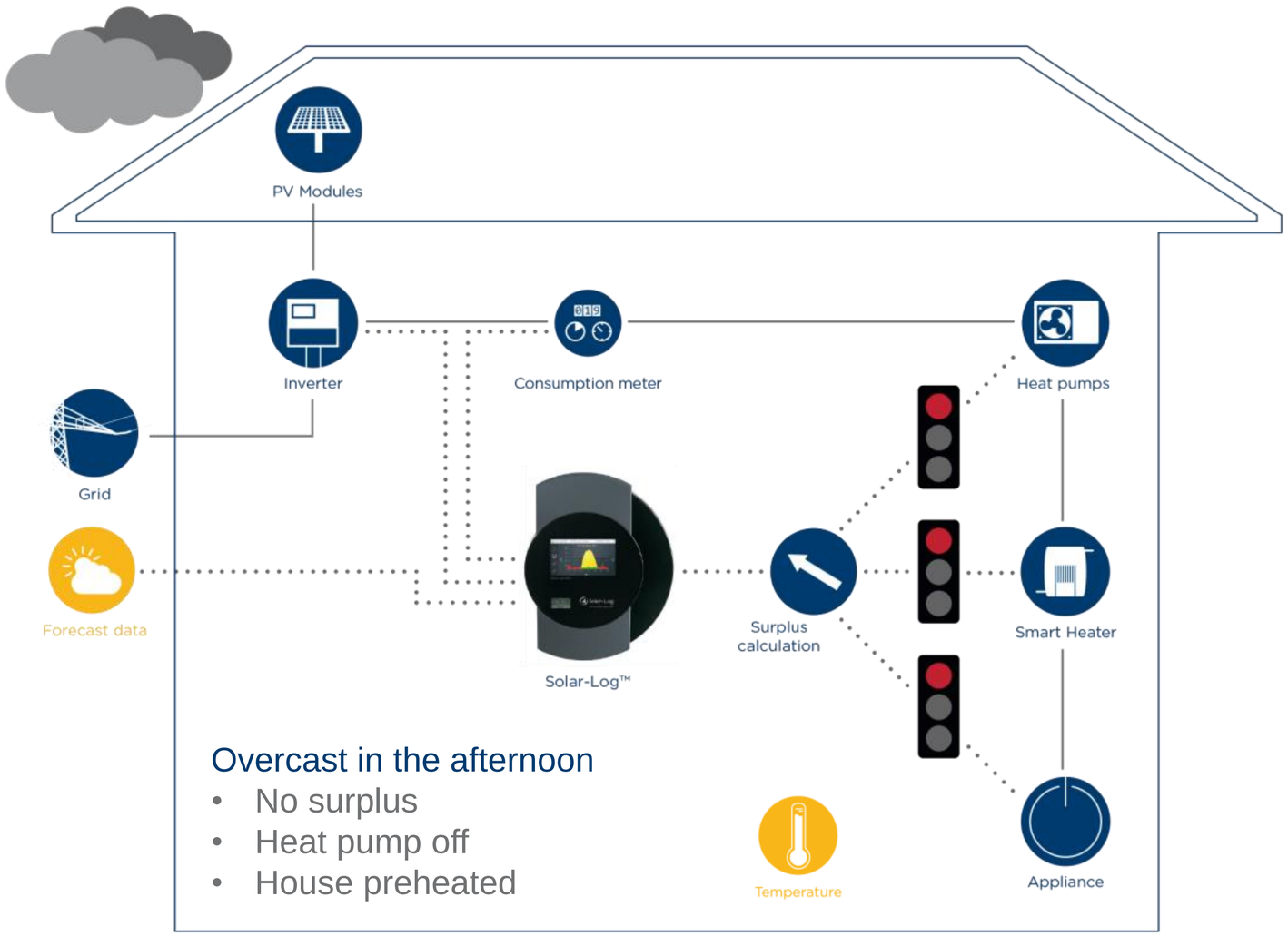
Intelligent forward-looking with Solar-Log™



Midday sun
- Excess available
- Forecast: bad weather
- Heat pump is heating

Smart Energy Control

Intelligent forward-looking with Solar-Log™



Overcast in the afternoon

- No surplus
- Heat pump off
- House preheated

Solution Partner

CTA, E·G·O, Fronius, Hoval, ID Energy, Ingenieurbüro, KEBA, KYOCERA, LG Chem, Lufft, meteoblue, MYPV, Phono Solar, Q CELLS, RainWise Inc., RESU, SAE IT-systems, STIEBEL ELTRON, solarfox, sonnen, VARTA Storage, WAGO, Weidmüller

Inverter manufacturer

ABB, Bonfiglioli, Danfoss, Europa-Solar AG, GOODWE, invt, OMNIK, REFUsol, SiEL, SOLUTRONIC, TRANNERGY, zeversolar, ADVANCED ENERGY, CARLO GAVAZZI, DELTA, Fonrich, Growatt, KACO, OMRON, Reverberi Enetec, SIEMENS, SSE, Vaillant, AEG POWER SOLUTIONS, CEHE, EATON, Fronius, GTEC, KLNE, pairan, salicru EQUINOX, SMA, steca, Valenia, ALBATECH, CHINT POWER, EEI, GE, HELIOS SYSTEMS, KOSTAL, PCM, SAMIL POWER, solaredge, SUNGROW, VISION UPS SYSTEMS, alpha, CMS Group, EFFEKTA, GEFRAN, HUAWEI, MASTERVOLT, PLATINUM, SANTERNO, socomec, SUN TENSION, VOLTWERK, AROS, conergy, ELTEK, GESOLAR, HYUNDAI, MITSUBISHI ELECTRIC, power-one, Schneider Electric, SolarMax, sunways, WINAICO, ASTRONERGY, CONVERTEAM, evoco energy, GINLONG, IDS, MOTECH, PrimeVOLT, SCHÜCO, SOLAX, Sustainable Energy Technologies, YASKAWA, ATEN, CyberPower, enfinity, GMDE, Ingeteam, OELMAIER TECHNOLOGY, SHINDENGEN, SOLECTRIA RENEWABLES, TBEA, zentralsolar deutschland

Strategic Partners

SolarPower Europe, ErtragsRetter, SOLARSCHMIEDE, solarzentrum stuttgart, SOLAR ALLIANZ, Solar Cluster Baden-Württemberg

Solar-Log™

Battery Storage Systems

Fronius KYOCERA Q CELLS Phono® Solar sonnen VARTA Storage

Heat Pumps

CTA Klima Kälte Wärme

Hoval

iDM ENERGIE SYSTEME
DIE ENERGIEFAMILIE

meteoblue
weather close to you

STIEBEL ELTRON
Technik zum Wohlfühlen

EV Charging Stations

KEBA®

Automation by innovation.

Air Conditioner

Hybrid System

CHP

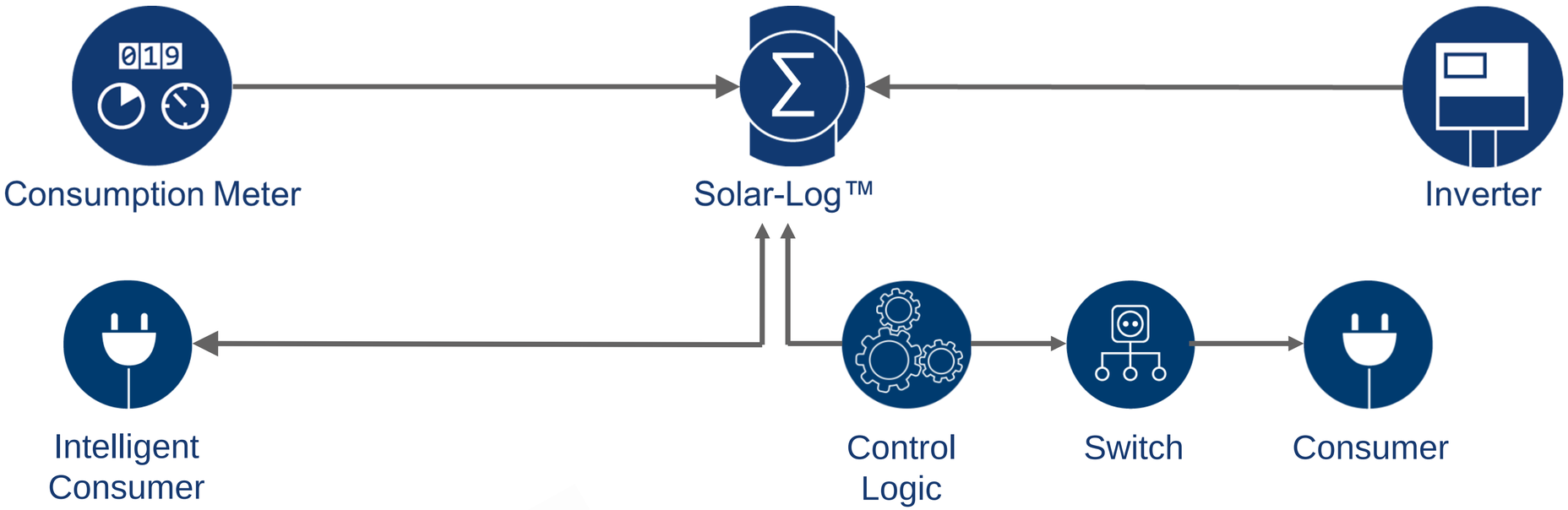
Pool Pump

Power Management Box

Heating Rod

Smart Energy Functionality

Intelligent vs. controlling consumers



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Direct Power Marketing

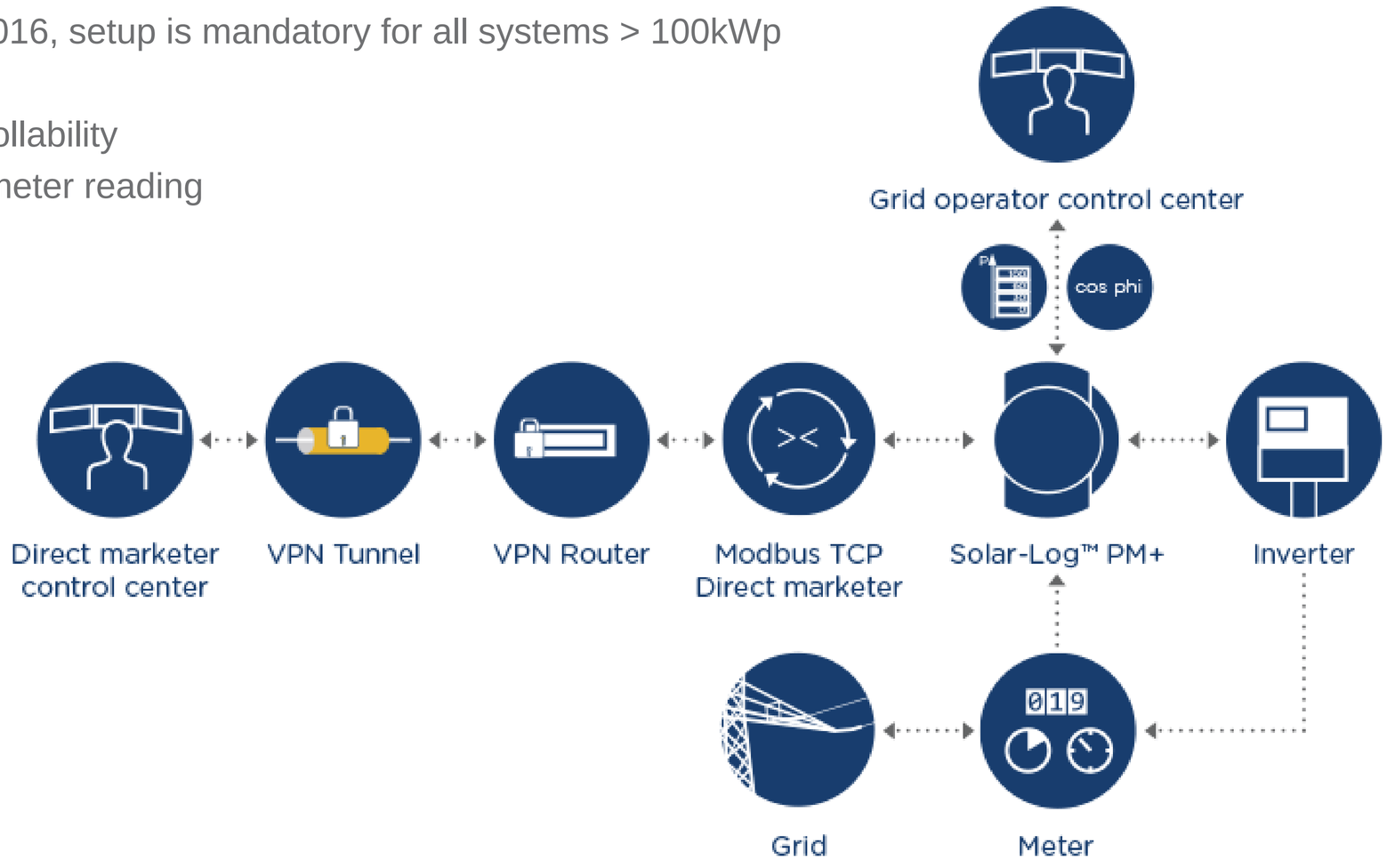
Possibilities – Applications

Direct Power Marketing

§20 EEG 2017 (German Renewable Energy Law)

Since January 2016, setup is mandatory for all systems > 100kWp

- Remote controllability
- Remote parameter reading

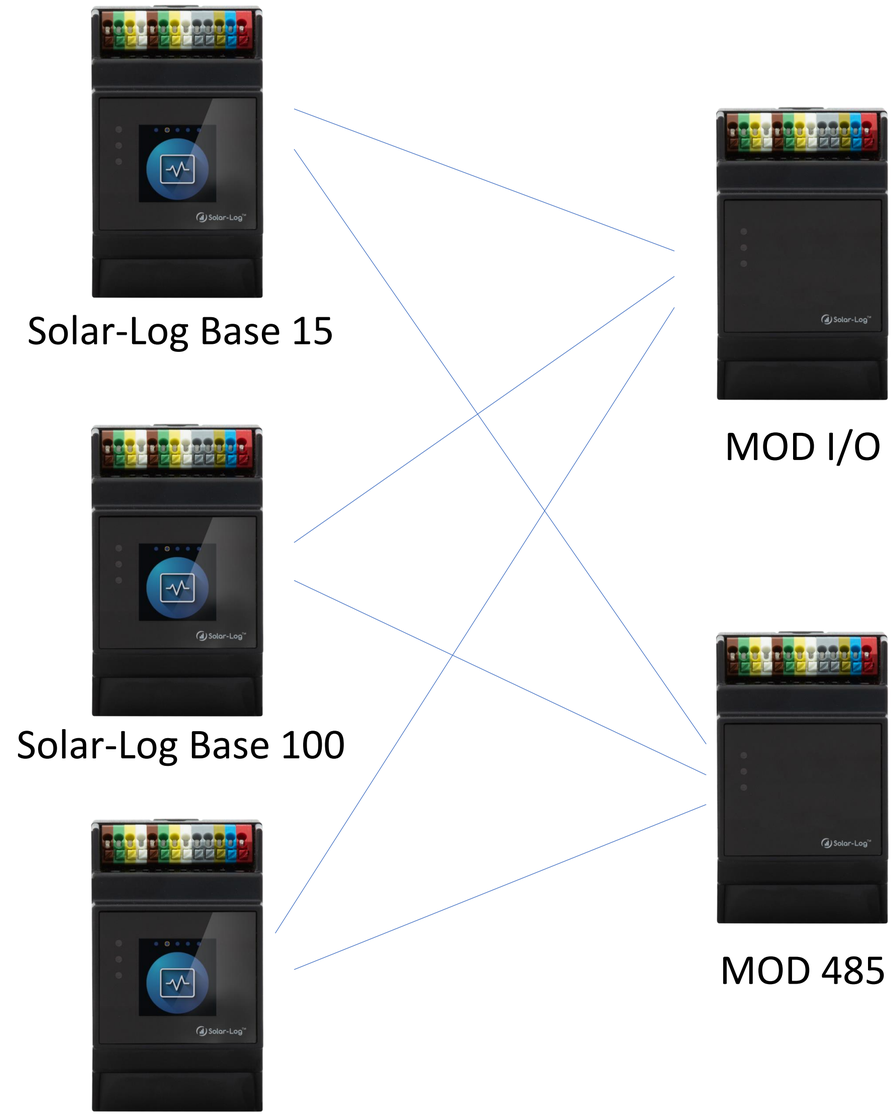


Solar-Log™ Hardware

Possibilities – Applications

www.solar-log.com

Solar-Log™



- Constructible and connectable individually
- Requirements and specific functions combinable

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Solar-Log WEB Enerest™

Solar-Log

ENGLISH FAQ SUPPORT Tamevo

Administration Welcome to the Solar-Log Admin web-Portal experience!

USERS | USER GROUP | PLANT | FLEET | ROLES

PLANT PROPERTIES

EDIT DELETE CLOSE

BASIC INFORMATION

GROUP NAME	PLANT SIZE	PLANT STATUS	COMMERCIAL	OPERATING DATE	S-L INSTALLATION	DATE YIELD MAIL	RECIPENT	ADD. RECIPENT
Dusseldorf	132,45 kWp		28.08.2018	28.08.2018	28.08.2018		t.amevo@solar-log.com	j.cham@solar-log.com r.loehr@solar-log.com

NOTE:

Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Aenean commodo ligula eget dolor. Aenean massa. Cum sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus quis, sem. Nulla consequat

COMPONENTS

Component List | Inverters | Sensor | Meter

Battery | PM | DPM | Module

ALARMING & NOTIFICATION

Recepient | Device Notification | Power | I/O

PM / DPM | Smart Energy

CONTACTS / FINANCE / DOCUMENT

Contacts | Finance | Documents

PLANTS

BINSDORF :	135kWh	13456845
DÜSSELDORF :	45kWh	774625735
STUTTGART :	35kWh	856943812

ASSIGNED USER

MEMBERS NAME : [4]	ROLES :
Sebastian Großkreiz	Administrator
Dirk Mayer	Installer

ASSIGNED USER GROUPS

GROUP 01	[2]
GROUP 05	[8]
GROUP 07	[5]

HIDE

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Administration Welcome to the Solar-Log Admin web-Portal experience!

USERS | USER GROUP | PLANT | FLEET | ROLES

New Plant

NAME	SIZE	DATA SOURCE	FIRMWRE	SERIAL NO.	LAST DATA TRANSFER	CONFIG. STATUS	FLEET	USERS	USER GROUP	STATUS	
Plant 01	135 kW	Solar-Log 2000	FW 4.1.1	3024362	12D 3h 23min	100%		[5]			View
Plant 02	135 kW	Solar-Log 200	FW 4.0.0	3024362	12D 3h 23min	100%		[0]			View
Plant 03	135 kW	Solar-Log 1000 PM+	FW 4.1.1	3024362	12D 3h 23min	90%		[5]			View
Plant 04	135 kW	Solar-Log 2000	FW 4.1.1	3024362	12D 3h 23min	50%		[5]			View
Plant 06	135 kW	Solar-Log 200	FW 3.1.1	3024362	12D 3h 23min	70%		[5]			View
Plant 07	135 kW	Solar-Log 1000 PM+	FW 4.1.1	3024362	12D 3h 23min	40%		[0]			View
Plant 08	135 kW	Solar-Log 2000	FW 4.1.1	3024362	12D 3h 23min	20%		[5]			View
Plant 09	135 kW	Solar-Log 500	FW 3.6.0-94	3024362	12D 3h 23min	10%		[5]			View
Plant 10	135 kW	Solar-Log 2000	FW 3.6.0-94	3024362	12D 3h 23min	100%		[0]			View
Plant 11	135 kW	Solar-Log 200 PM+	FW 4.1.1	3024362	12D 3h 23min	80%		[5]			View
Plant 12	135 kW	Solar-Log 500	FW 4.1.1	3024362	12D 3h 23min	80%		[5]			View
Plant 13	135 kW	Solar-Log 2000 PM+	FW 4.1.1	3024362	12D 3h 23min	40%		[5]			View
Plant 14	135 kW	Solar-Log 1000	FW 4.1.1	3024362	12D 3h 23min	90%		[5]			View
Plant 15	135 kW	Solar-Log 500 PM+	FW 3.6.0-94	3024362	12D 3h 23min	100%		[0]			View
Plant 16	135 kW	Solar-Log 2000	FW 4.1.1	3024362	12D 3h 23min	100%		[5]			View

HIDE

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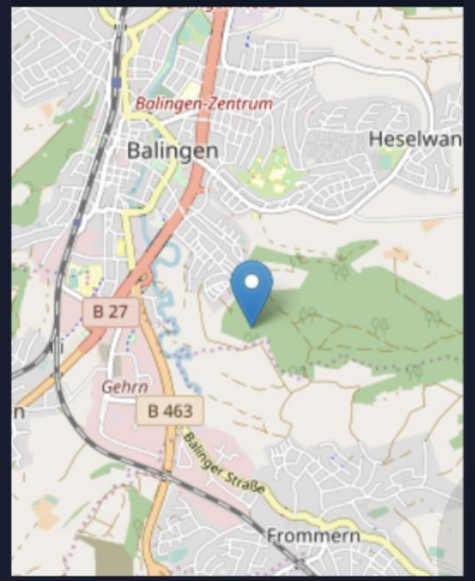
Portfolio / Fleet Alpha / Plant Alpha

PLANT ALPHA

TYPE	REPORTED ON		START	END	COMPONENT	ERROR DETAIL
	21.02.2017	12:45	11:45		Inverter 1	Deviation 36%
	08.08.2016	10:45	10:32	10:45	Solar-Log	PM reduction to 0%
	03.04.2016	17:58	17:54	17:54	Inverter 1	Communication Error Component 1
	09.11.2015	12:25	11:11		Solar-Log	No Data for 2 hours
	21.02.2017	12:45	11:45	12:45	Inverter 1	Deviation 28%
	08.08.2016	10:45	10:32	10:45	Solar-Log	PM reduction to 1%
	03.04.2016	17:58	17:54		Inverter 1	No Data for 45min

DAY



MONTH CHART

YEAR CHART

MINI DISPLAY

INFORMATION TO DEVICES AND CONFIGURATION

PLANT INFORMATION

Plant Name
Installed Power: 13.3 kWp
Solar-Log 1200
S/N: 2113848
Data Transfer: http
Setup Date: 15.12.2012

INTERFACE ASIGNMENT

RS485A: 3xSMA
RS 485B: Sensor
Ethernet: Utlity Meter

CURRENT PLANT INFORMATION

Feed in power PAC: 912 W
Last Data Transfer: 13.03.2019, 11:45 Uhr

Status
RS485A: 3x MPP
RS485B: Running
Ethernet: Idle

PRODUCTION OVERVIEW

Today:
Yield: 3,31 kWh
Specific Yield: 0,25 kWh / kWp
Yesterday:
Yield: 9,77 kWh
Specific Yield: 0,73 kWh / kWp
Month:
Yield: 325,54 kWh
Year :
Yield: 1,73 kWh

WEATHER INFORMATION

624 20.11.2018

TUESDAY							THURSDAY
5° 0°	12° 4° 5-8	12° 4° 8-11	12° 3° 11-14	12° 4° 14-17	17° 6° 17-20	17° 6° 20-23	16° 6°

PLANT HISTORY

DATE	TIME	COMPONENT	ERROR TYPE	ERROR DETAIL
21.01.2019	11:45 - 12:45	Inverter 1		Deviation -28%
08.08.2018	10:32 - 10:45	Solar-Log		PM reduction to 0%
09.11.2017	17:54 - 17:58	Inverter 1		No Data for 45 min

HIDE

PLANT ALPHA POWER MANAGEMENT

25.11.2016 Reported 13:35h Affected Component #Name WR #MPP Tracker

Power Management Control-Value: 30% from 12:30 till 14:00

ADDITIONAL DATA

This plant #NamePlant has been shut down or limited by remote control on

DD.MM.YYYY

Start time HH:MinMin

End time HH:MinMin or "still active"

Remote control by #PM or #DPM

Control limit #30%...

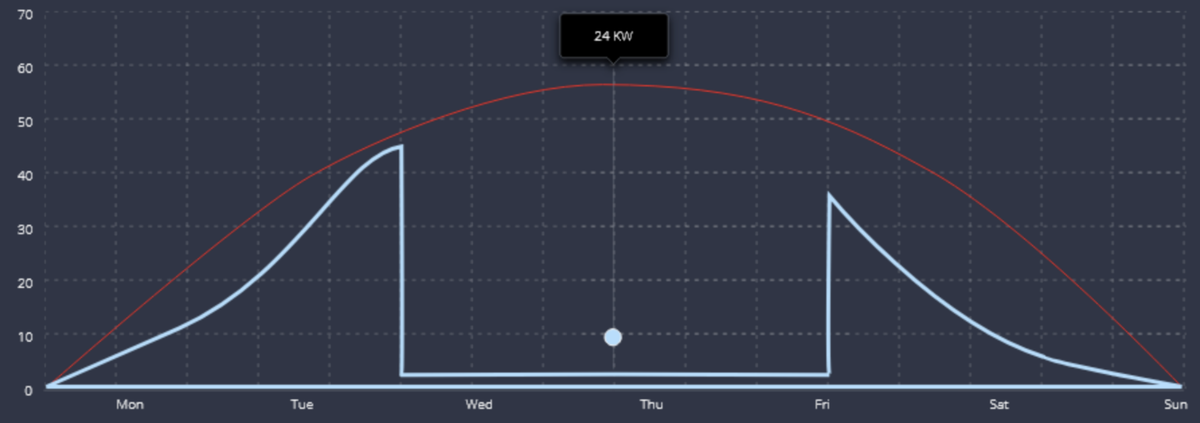
CLEAR ERROR ERROR HANDLING

CONFIGURATION POWER MANAGEMENT

Maximum apparent power	#MaxAppPower
Active Power	
Type:	#PMActive Type
Interface assignments:	#InterfaceActivePower
Reactive Power	
Type:	#PMReactiveType
Interface assignments	#InterfaceReactivePower
Profile	#ProfileName
IO Box Interface	#InterfacePMProfile
Configuration Direct Power Marketing Provider	#DPM_Provider

DATA TRANSFER CHART

The Graph should include PAC Line Sensor (if available), alternative Prognosis Data



STATUS AND ERROR CODE LIST

DATE	TILL	CODE	DEVICE
25.01.2018	15.02.2018	code	Device
14.08.2018	16.09.2018	code	Device
10.03.2018	19.04.2018	code	Device

MINI DISPLAY

STATUS AND ERROR CODE LIST

DATE	FROM	TILL	PERCENTAGE	CONTROL CHANNEL
25.11.2018	12:15	13:15	30%	PM
22.11.2018	11:45	12:15	100%	PM
05.10.2018	10:55	11:30	60%	DPM

ENERGY EXCHANGE CHART

For plant that are using direct power marketing 29.11.2018

POWER MANAGEMENT HISTORY

DATE	TIME	ERROR TYPE	ERROR DETAIL
21.01.2019	11:45 - 12:45		Deviation -28%
08.08.2018	10:32 - 10:45		No Data for 25min
09.11.2017	17:54 - 17:58		No Data for 45min

HIDE

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Portfolio / Fleet Alpha / Plant Alpha / Error detail view

PLANT ALPHA DEVIATION

25.11.2016 Reported 13:35h Affected Component #Name WR #MPP Tracker

Deviation Error Period: from 12:30 - Still active

ADDITIONAL DATA

Solar-Log WEB Enerest has detected a deviation on 1/16/19 at 15:00 at mock Plant max 1st

Component with deviation:	#NameWRdev MPP Tracker
Actual yield:	0,50 kW/kWp
Deviation:	32%
Reference component:	#NameWRref#MPPTracker
Target yield:	0,30 kW/kWp

CLEAR ERROR ERROR HANDLING

MONITORING PARAMETERS

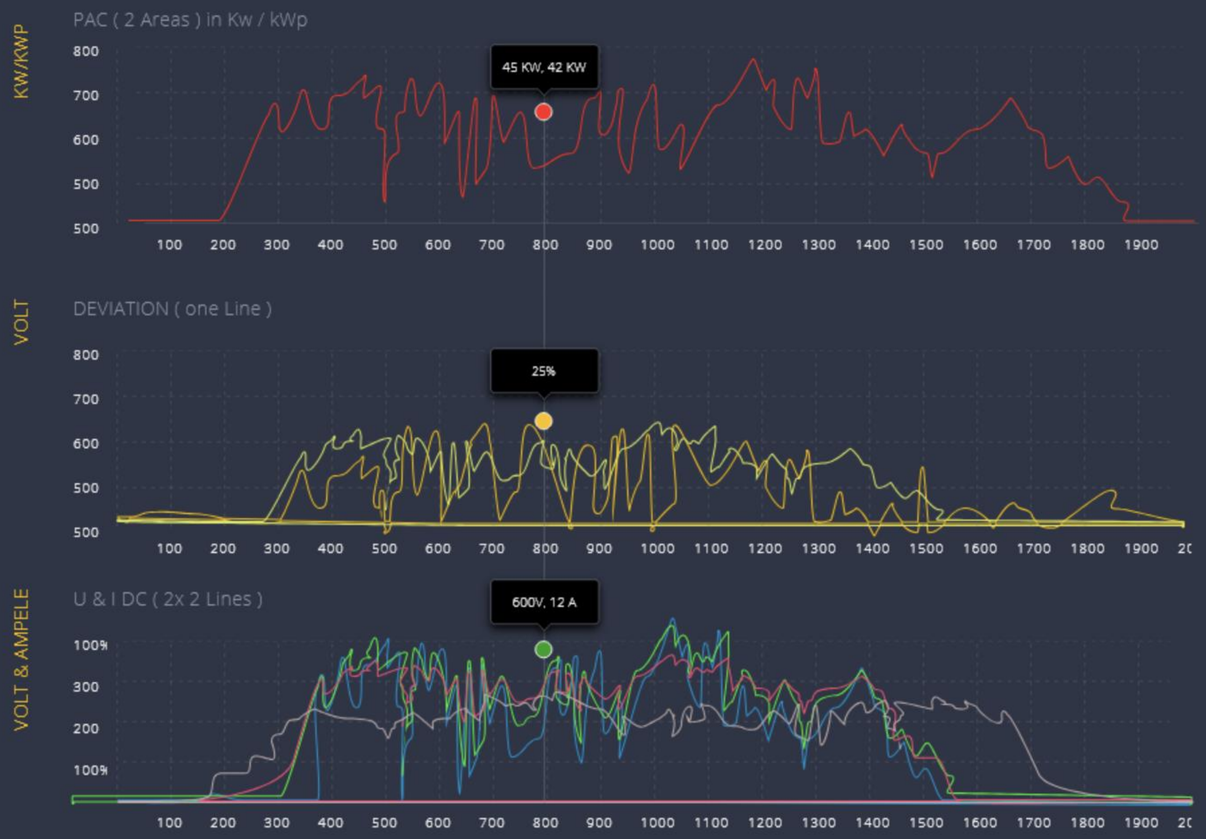
Monitoring begin:	10:00
Monitoring end:	13:00
min. generation:	20%
min. deviation:	20%
min. error duration:	30Min
max. messages sent per day:	3
Snow coverage:	on
Send Email to:	adresse@server.com

CONFIGURATION

TO BE DEFINED ...

MINI DISPLAY

VARIOUS CHART (COMBINED CHART)



WEATHER INFORMATION

TUESDAY	624 20.11.2018						THURSDAY
5° 0°	12° 4° 5-8	12° 4° 8-11	12° 3° 11-14	12° 4° 14-17	17° 6° 17-20	17° 6° 20-23	16° 6°

COMPONENT HISTORY

DATE	TIME	ERROR TYPE	ERROR DETAIL
21.01.2019	11:45 - 12:45		Deviation -28%
08.08.2018	10:32 - 10:45		No Data for 25min
09.11.2017	17:54 - 17:58		No Data for 45min

HIDE

Solar-Log™ ENGLISH FAQ SUPPORT Tamevo

Task list /

QUICK FILTERS: Today Tomorrow Next Week From: 28. 08. 2018 Till: 04. 09. 2018 Plant name or Serial number

TO DO [6]

Plant name
SN: 58684252
Due to 28.08.2018 11:00 pm | 2 | 3 / 3

Plant name
SN: 58684252
Due to 28.08.2018 11:00 pm | 4 | 0 / 4

Plant name
SN: 58684252
Due to 03.09.2018 8:40 pm | 1 | 1 / 1

Plant name
SN: 58684252
Due to 28.08.2018 10:10 pm | 3 | 3 / 9

Plant name
SN: 58684252
Due to 01.09.2018 15:18 pm. | 5 | 8 / 8

IN PROGRESS [5]

Plant name
SN: 58684252
Due to 28.08.2018 8:46 pm. | 2 | 3 / 3

Plant name
SN: 58684252
Due to 01.09.2018 10:05 pm | 4 | 5 / 5

Plant name
SN: 58684252
Due to 28.08.2018 10:42 pm. | 6 | 2 / 9

Plant name
SN: 58684252
Due to 28.08.2018 1:00 pm | 3 | 2 / 2

Plant name
SN: 58684252
Due to 28.08.2018 9:05 pm | 5 | 4 / 5

DONE [4]

Plant name
SN: 58684252
Due to 03.09.2018 8:55 pm | 3 | 3 / 3

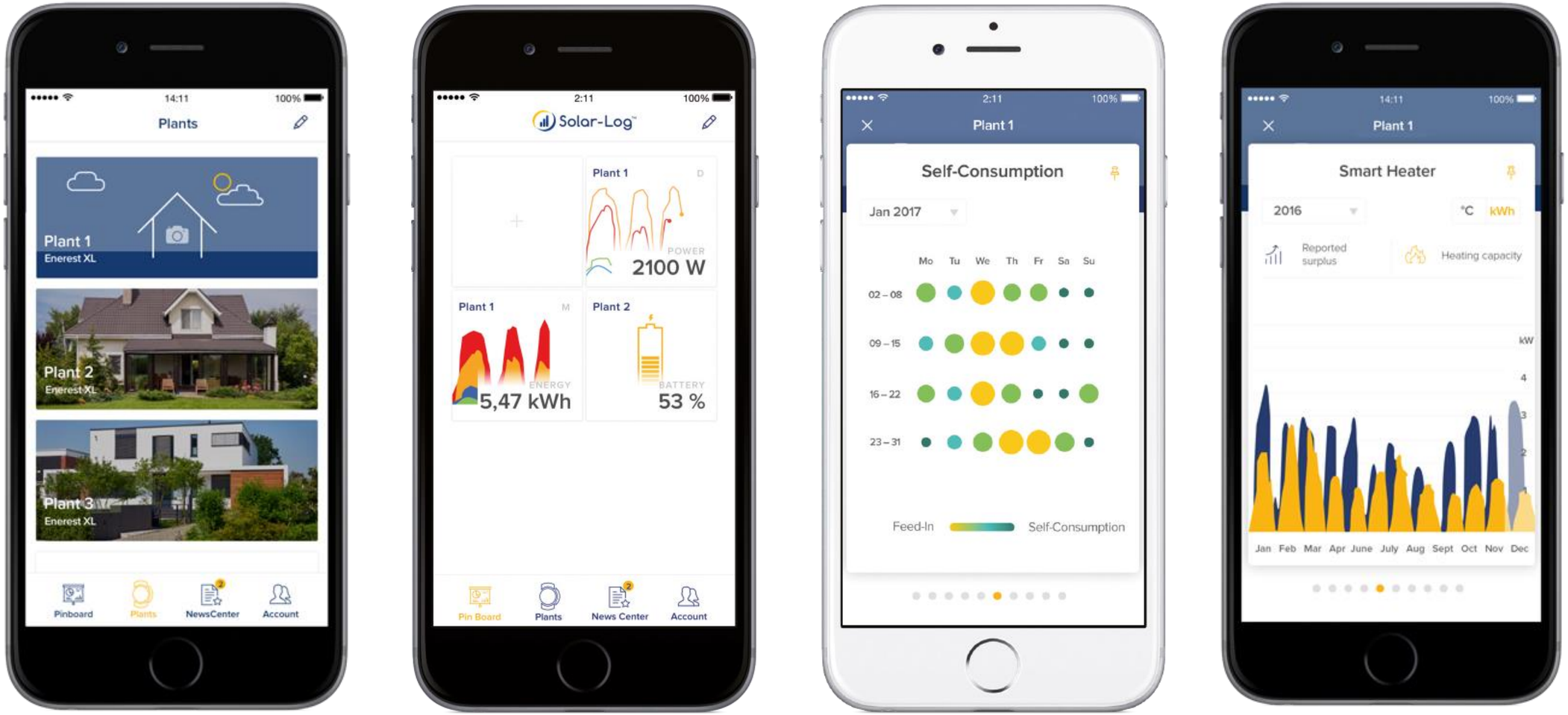
Plant name
SN: 58684252
Due to 01.09.2018 9:00 pm | 1 | 2 / 9

Plant name
SN: 58684252
Due to 01.09.2018 9:42 pm | 3 | 8 / 8

Plant name
SN: 58684252
Due to 03.09.2018 9:40 pm | 4 | 1 / 4

HIDE

Solar-Log WEB Enerest™ App

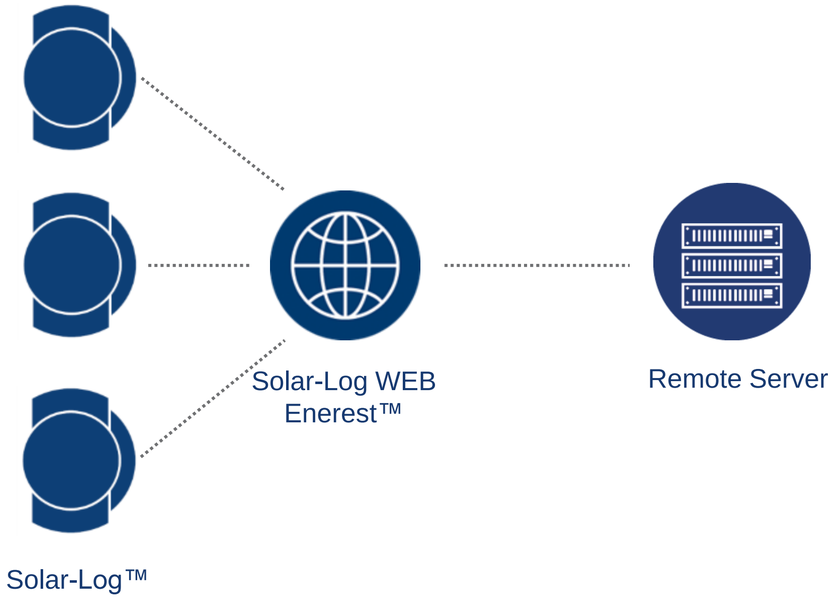


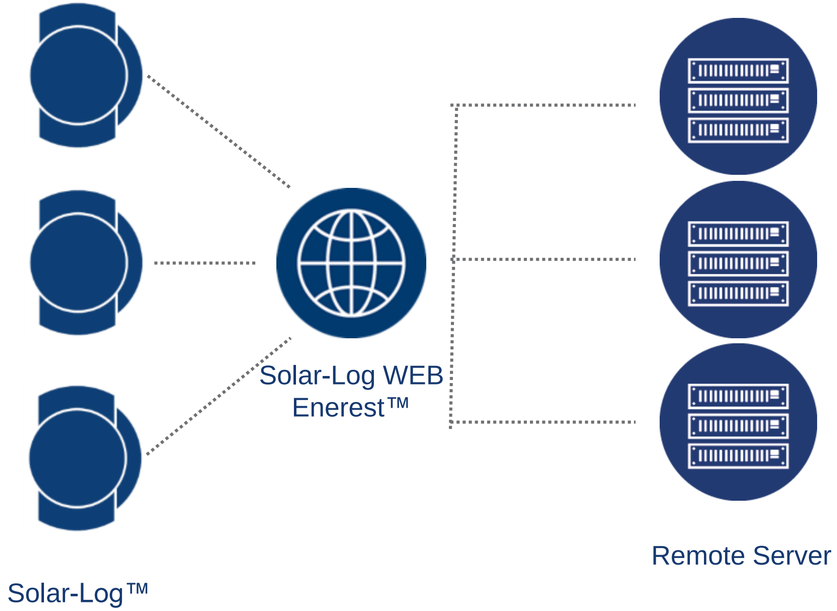
The new app for the Solar-Log WEB Enerest™ portal

left: Pinboard view right: self consumption

API

Data Interface





Solar-Log™ WEB-4U

Professional Service for PV Monitoring

WEB-4U

Our Services – Your Advantages

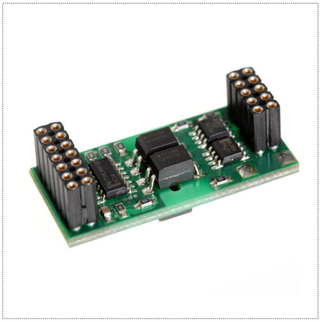
Do you lack time and personnel to closely monitor and keep track of all of the messages from every PV plant of your customers every day?

Then please make use of the Solar-Log™ WEB-4U service to take advantage of our years of experience and competence.

Solar-Log™ Accessories

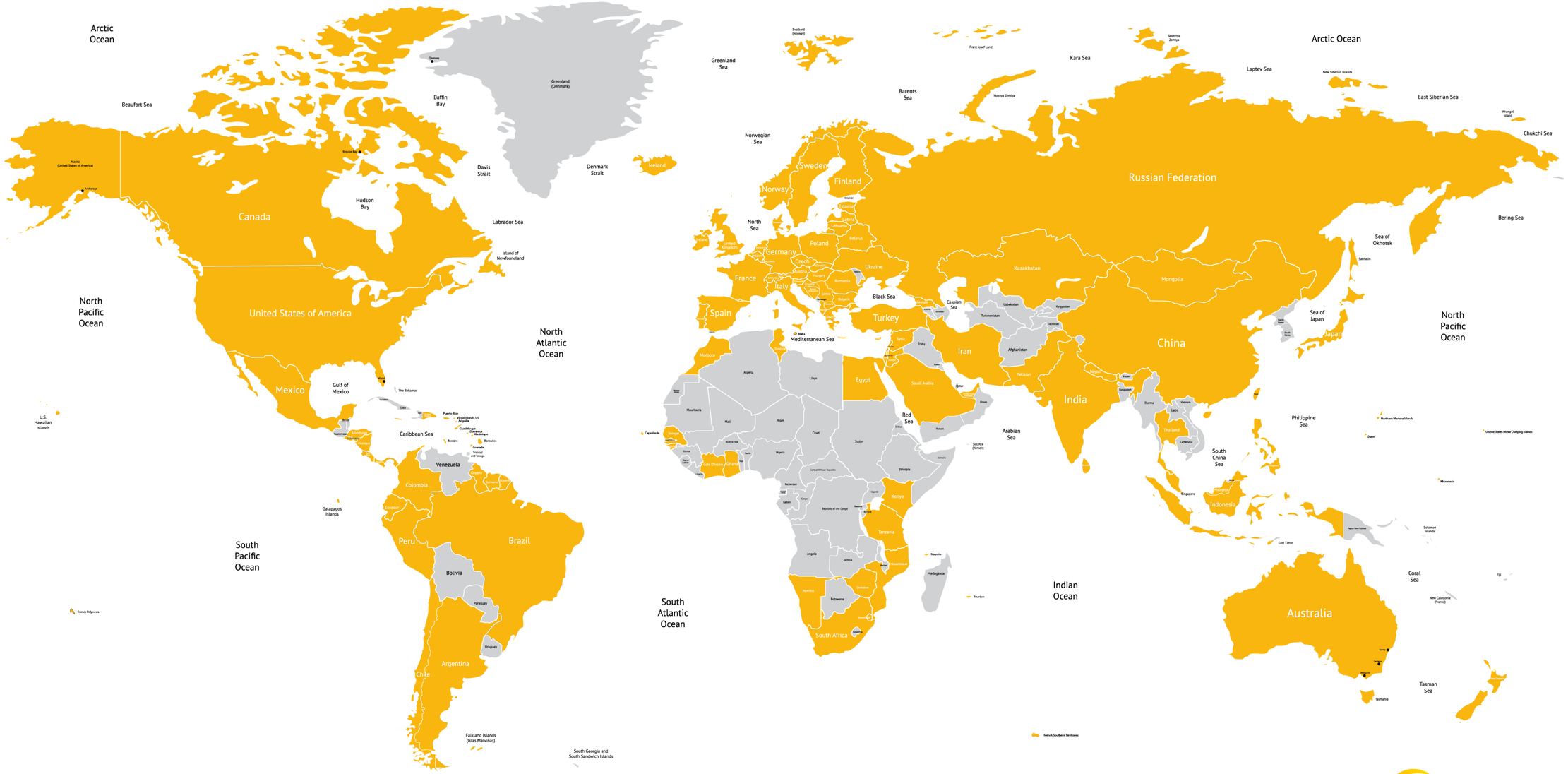
Monitoring solutions from a single source

Reliable accessories for system completion



Solar-Log™ References

Solar-Log™ References – in the field in over 134 countries



Solar-Log™ References – in the field in over 134 countries

Argentina, Buenos Aires – 39 kWp

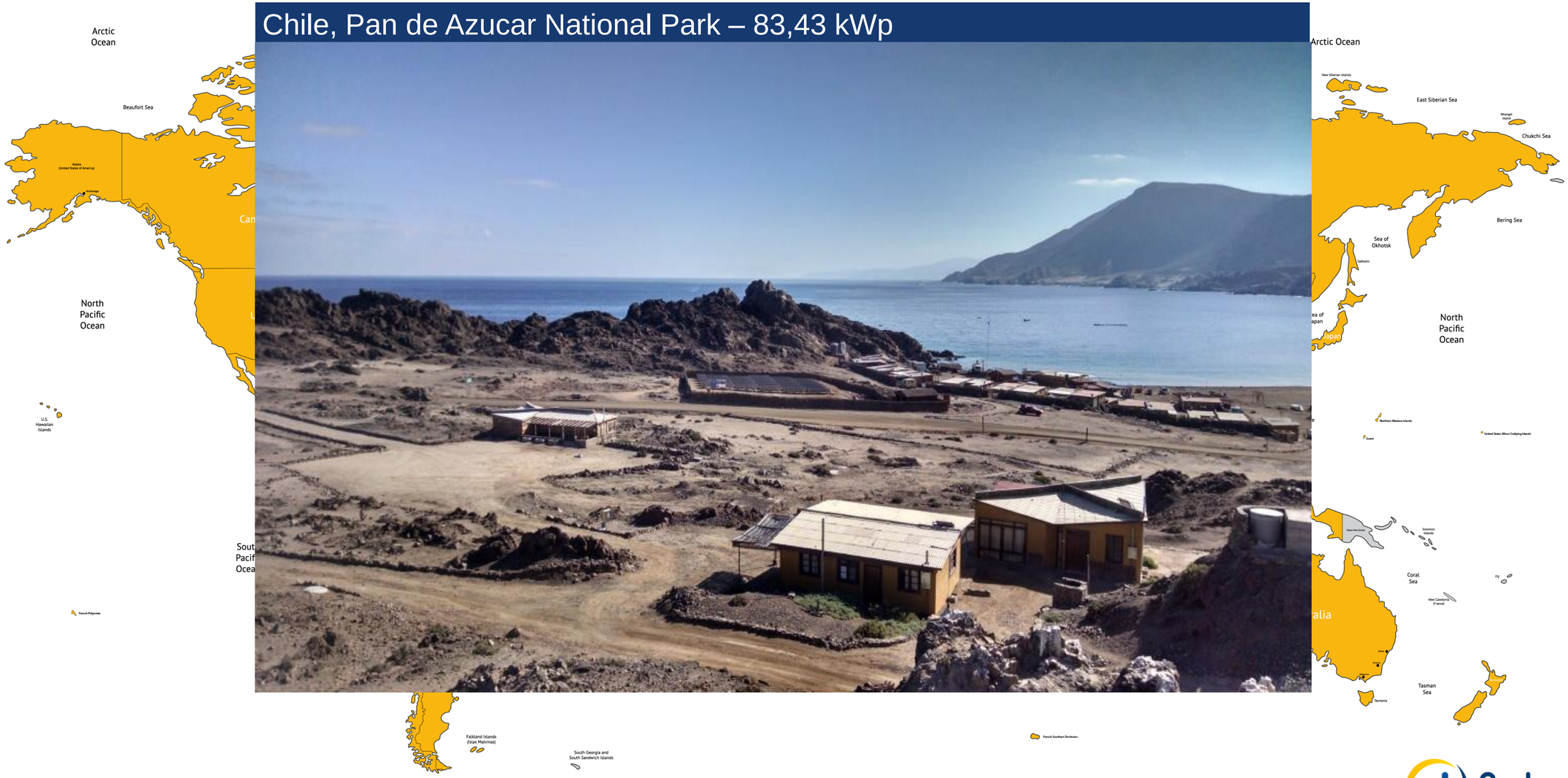
Solar-Log™ References – in the field in over 134 countries

Costa Rica, Quepos, Cloud House – 5,50 kWp

Solar-Log™ References – in the field in over 134 countries

Solar-Log™ References – in the field in over 134 countries

Solar-Log™ References – in the field in over 134 countries

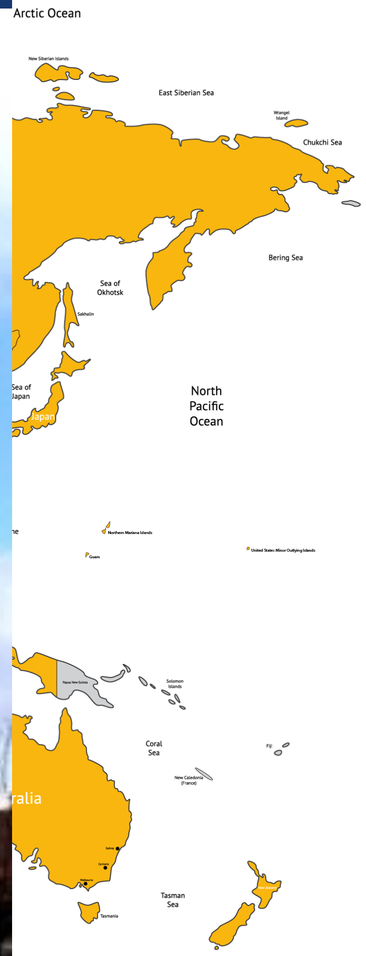


Solar-Log™ References – in the field in over 134 countries

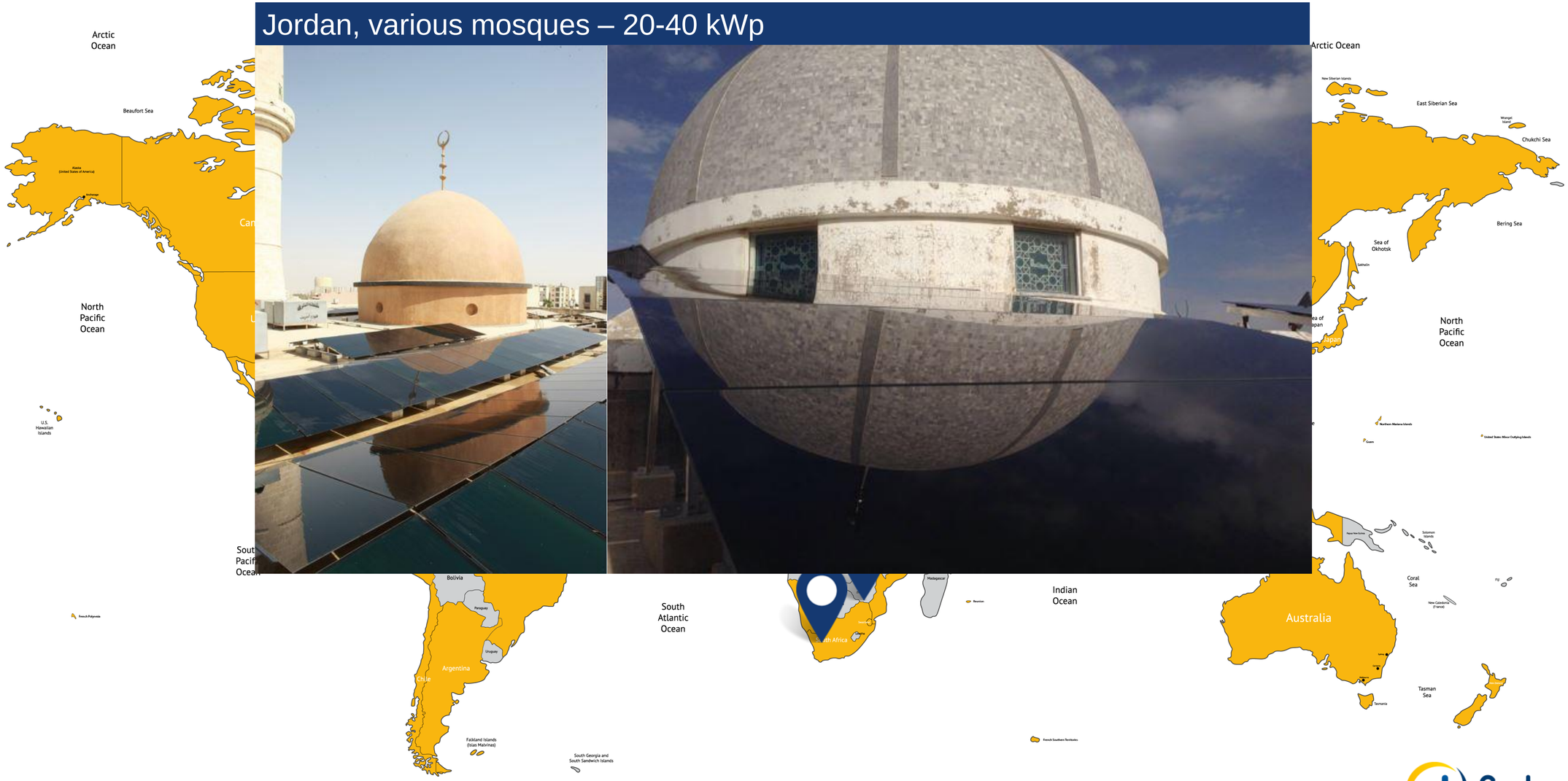
Spain, Barcelona – 21,06 kWp

Solar-Log™ References – in the field in over 134 countries

France, Chruch in Manspach– 30 kWp



Solar-Log™ References – in the field in over 134 countries



Solar-Log™ References – in the field in over 134 countries

Solar-Log™ References – in the field in over 134 countries

South Africa, Roodepoort – 1005,31 kWp

Thank you very much

for your attention!