

PHOTON ENERGY CONTROL

Photon Energy ONE

Bucharest 2019

WHO WE ARE



We develop, build, own and operate PV power plants worldwide

Founded
2008



Headquartered in
Amsterdam



100+
Employees



Active in
10+ countries



Shares traded
in PL and CZ



Own portfolio
39.2 MWp



60+ MWp
PV plants installed



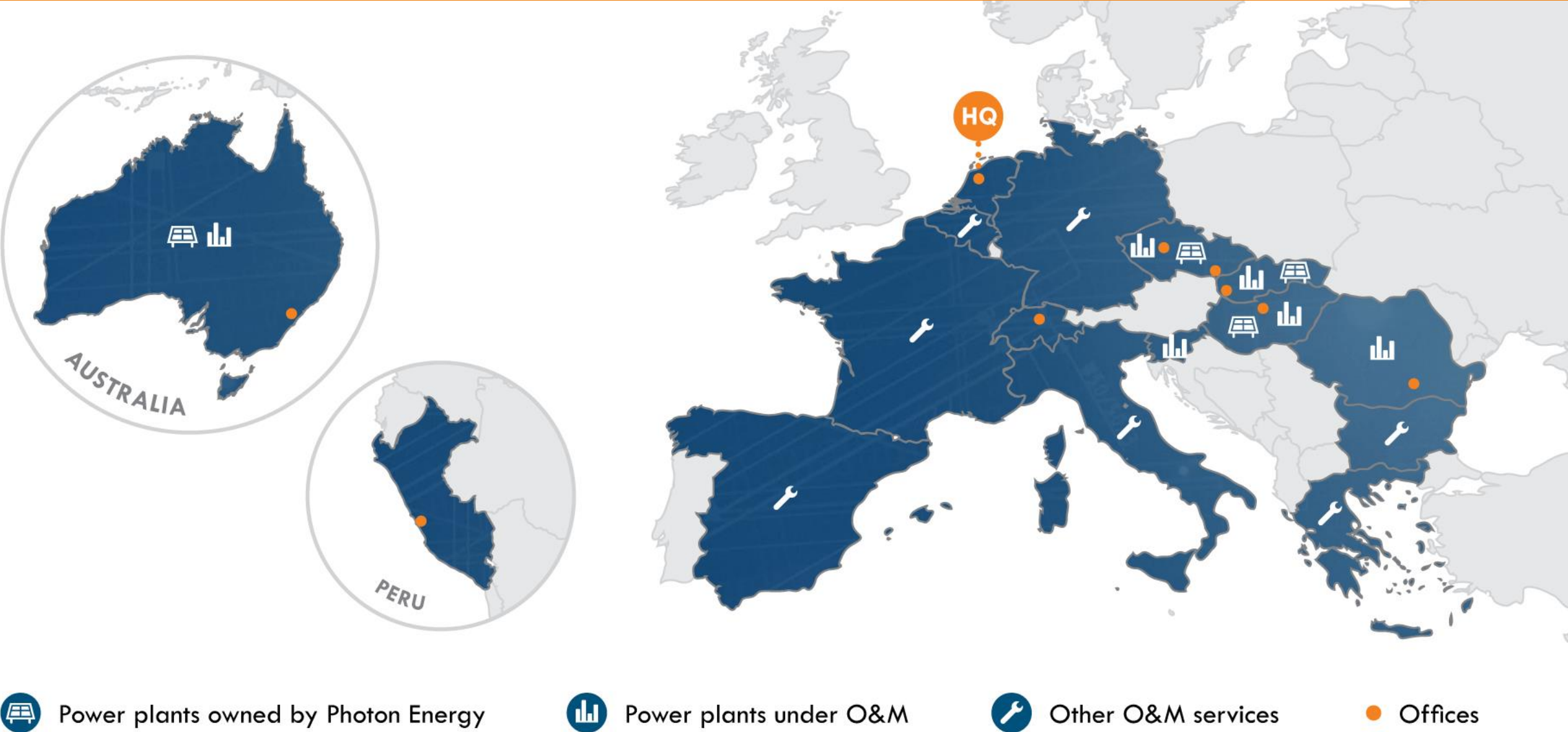
28.5 GWh
produced in 2018



O&M services
260+ MWp



GLOBAL PRESENCE



OUR KEY MARKETS

CZECH REPUBLIC

EPC

30.4 MW_p

O&M

127.8 MW_p

Own portfolio

15.0 MW_p



SLOVAKIA

EPC

13.6 MW_p

O&M

15.9 MW_p

Own portfolio

10.4 MW_p



HUNGARY

EPC

13.6 MW_p

O&M

33.0 MW_p

Own portfolio

13.6 MW_p



AUSTRALIA

EPC

1.4 MW_p

O&M

1.4 MW_p

Own portfolio

0.1 MW_p



INTRODUCTION

- What is Photon Energy ONE?
 - ✓ Full package solution
 - ✓ Everything monitoring deserves
- Why Photon Energy ONE?
 - ✓ Save costs
 - ✓ Increase efficiency of PV plant
- For whom?
 - ✓ Industry-scale owners, operators, technicians and investors
- Smart and automated
 - ✓ Complex solution that includes data backup and backup communications



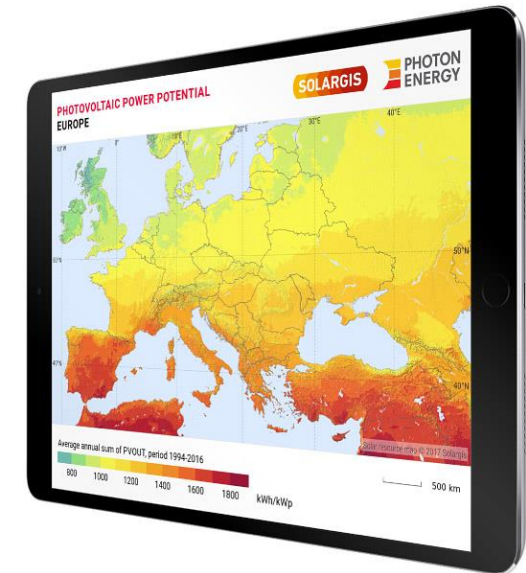
HARDWARE – SWITCHBOARD



SOFTWARE – PECOM



SERVICES – FORECASTING



SWITCHBOARD

I/O module

Router

Circuit breaker

PLC – brain

UPS

+ cameras, electrometers, etc.



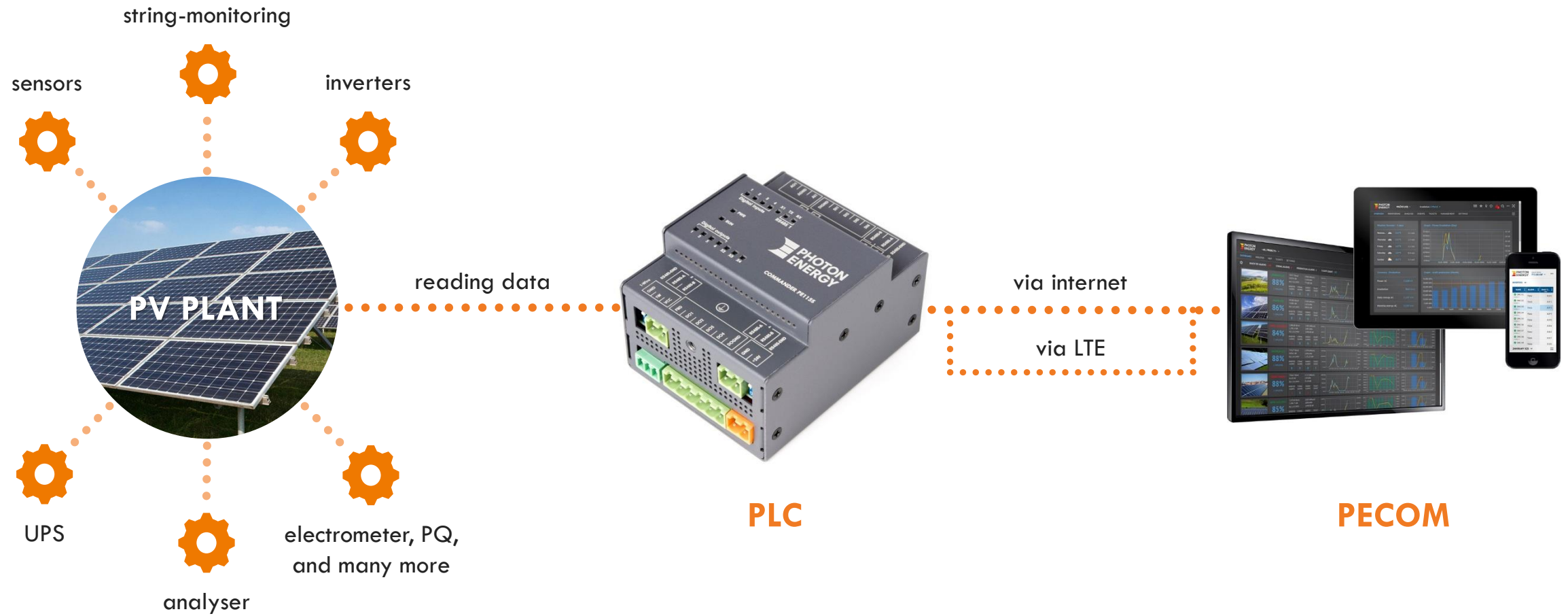
SWITCHBOARD

PLC PE115S

- Developed by Photon Energy
- Programmable for all industry sectors
- Compatible with different devices and technologies
- Connects up to 150 inverters
- Fully modular open platform
- Four digital and two analog inputs
- 1 GB of RAM and 8 GB internal memory



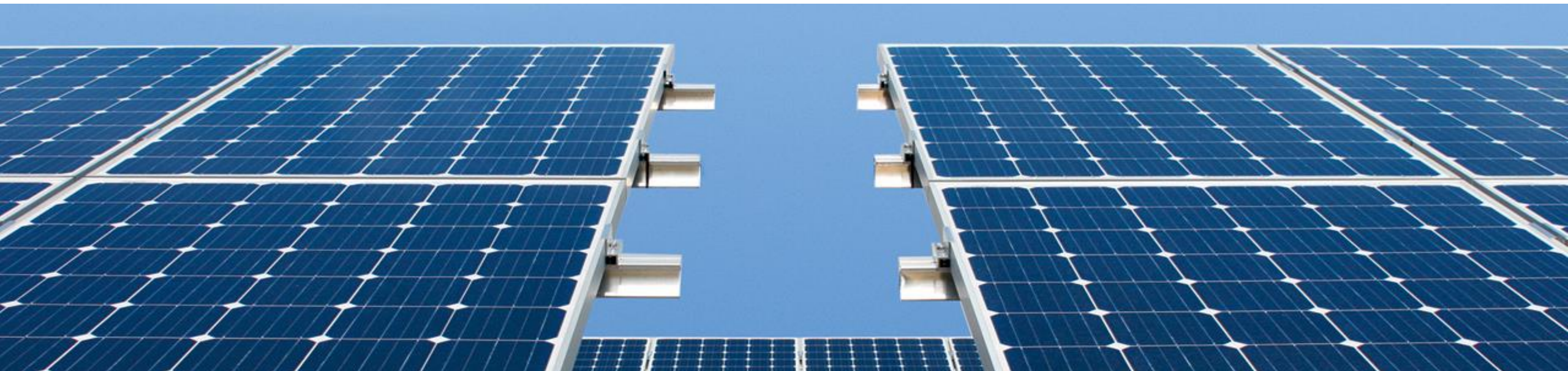
PVP COMMUNICATION & PLC



MONITORING SYSTEM PECOM

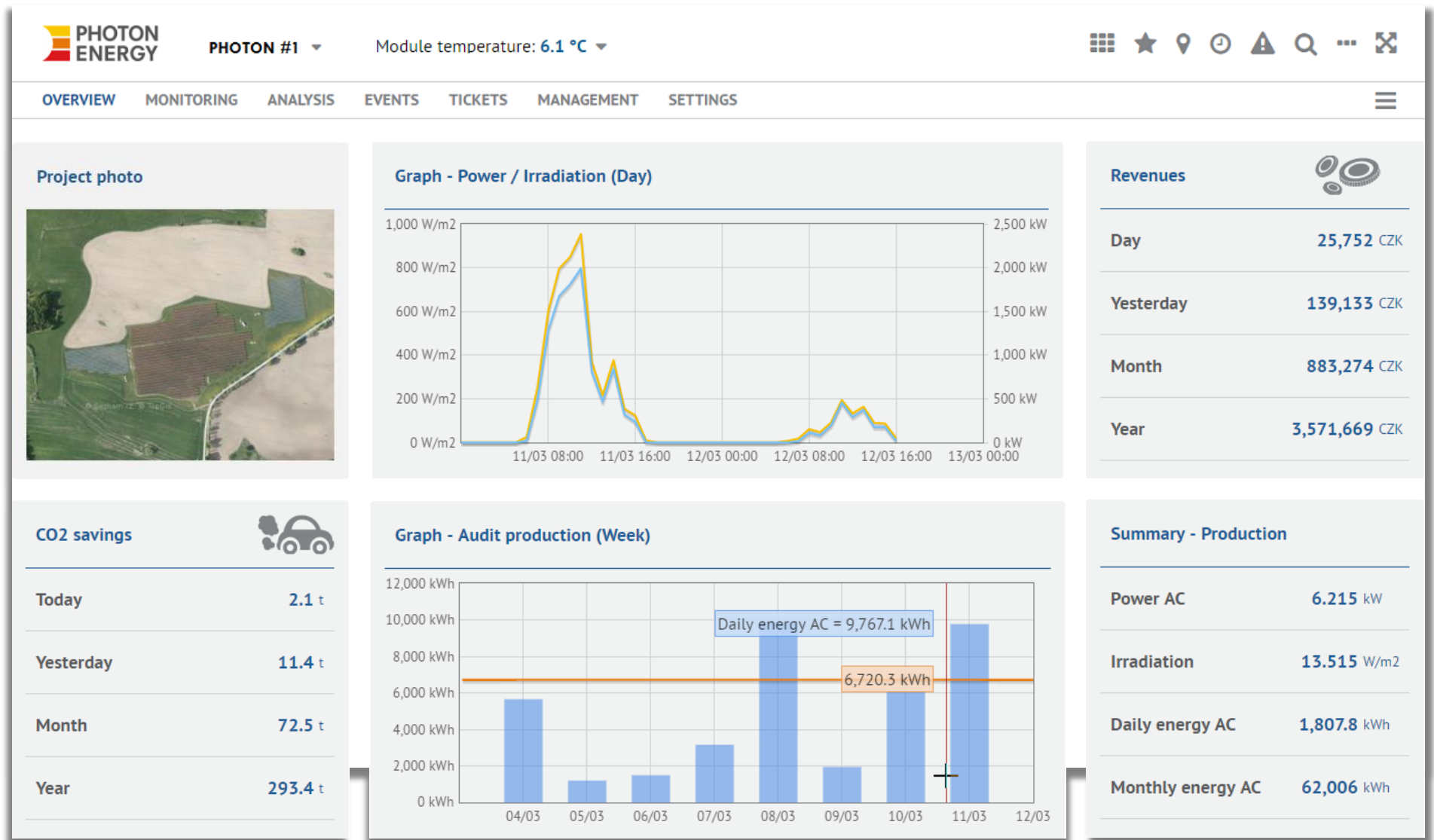
PECOM – OPERATOR'S WORKFLOW

- 365/7 Control room
- Trained team of operators
- Focus on prevention of failures and losses by immediate detection of malfunctions
- Ongoing improvement and innovation of monitoring system and processes




MONITORING SYSTEM PECOM









OVERVIEW








MONITORING SYSTEM PECOM

MONITORING

**PHOTON #2** ▾ Module temperature: 6.1 °C ▾




OVERVIEW **MONITORING** ANALYSIS EVENTS TICKETS MANAGEMENT SETTINGS 









PVP BLOCKS INVERTERS SENSORS  21/4/2018  17:00 ▾ ▶▶


DEVICE	POWER AC kW	NOMINAL AC kW	DAILY ENERGY kWh	DAILY ENERGY... %	ALARM
✖ WR 50 PLC 2	0.000	22.050	114.41	-4.000	True
✔ WR 51 PLC 1	6.785	21.600	110.47	2.000	False
✔ WR 52 PLC 1	6.734	22.050	106.65	-12.000	False
✔ WR 53 PLC 1	7.140	21.600	115.76	-2.000	False
✔ WR 54 PLC 1	7.256	21.600	117.12	-1.000	False
✔ WR 55 PLC 1	7.446	21.600	119.48	1.000	False
✔ WR 56 PLC 1	7.156	21.600	115.63	-2.000	False
✔ WR 57 PLC 2	6.595	21.600	103.88	-4.000	False
✔ WR 58 PLC 2	6.694	22.050	108.61	-2.000	False
✔ WR 59 PLC 2	6.535	21.600	107.03	-1.000	False
✔ WR 60 PLC 2	7.055	21.600	116.52	-1.000	False
✔ WR 61 PLC 1	7.401	21.600	121.27	3.000	False
✔ WR 62 PLC 1	7.437	21.600	121.94	3.000	False
✔ WR 63 PLC 1	7.400	21.600	121.77	3.000	False
✔ WR 64 PLC 1	7.141	21.600	114.81	-3.000	False
✔ WR 65 PLC 1	7.371	21.600	120.83	2.000	False
✔ WR 66 PLC 1	7.358	21.600	121.01	2.000	False
✔ WR 67 PLC 2	7.434	21.600	121.82	3.000	False




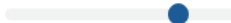
MONITORING SYSTEM PECOM



MONITORING

**PHOTON #2** ▾ Module temperature: 6.1 °C ▾



OVERVIEW **MONITORING** ANALYSIS EVENTS TICKETS MANAGEMENT SETTINGS 

PVP BLOCKS INVERTERS **SENSORS**  21/4/2018  17:15 ▾ ▶▶

DEVICE	POWER AC kW	NOMINAL AC kW	DAILY ENERGY kWh	DAILY ENERGY... %	ALARM
✖ WR 50 PLC 2 	 0.000	22.050	114.41	-5.000	False
✔ WR 51 PLC 1	6.785	21.600	110.47	2.000	False
✔ WR 52 PLC 1	6.734	22.050	106.65	-12.000	False
✔ WR 53 PLC 1	7.140	21.600	115.76	-2.000	False
✔ WR 54 PLC 1	7.256	21.600	117.12	-1.000	False
✔ WR 55 PLC 1	7.446	21.600	119.48	1.000	False
✔ WR 56 PLC 1	7.156	21.600	115.63	-2.000	False
✔ WR 57 PLC 2	6.595	21.600	103.88	-4.000	False
✔ WR 58 PLC 2	6.694	22.050	108.61	-2.000	False
✔ WR 59 PLC 2	6.535	21.600	107.03	-1.000	False
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✔ WR 65 PLC 1	7.371	21.600	120.83	2.000	False
✔ WR 66 PLC 1	7.358	21.600	121.01	2.000	False
✔ WR 67 PLC 2	7.434	21.600	121.82	3.000	False

ACTIVE VARIABLES

DETAILS

[MAIN](#)
[ADVANCED](#)
[ACTIONS](#)
[HISTORY](#)
[ATTACHMENTS](#)

Ticket #014317 Close

☒ WR 50 - Power AC ⚠ ✕

Other variables: 6 CSV

+ display selected variables

View graph
Find variables
View data

*Title	Inverter fault	Subtitle	Other alarms
*Technician	Kadleček Jan	Detection	0h 0h
*SLA	SLA2	Arrive	0h 0h
Starting	21/4/2018 17:04 ↕	Reaction	72h 0h
Deadline	24/4/2018 17:04 ↕	Production	Affected
Status	5. Validation 100%	Availability	

Contact
Description

B *I* U ~~S~~

- ☰ ☱ ☲ ☳ ☴ ☵ ☶ ☷

🔗

Fall of inverter 50 with broken fuse on current 3.
Power of inverter has been renewed.























LIMITS

TICKETING

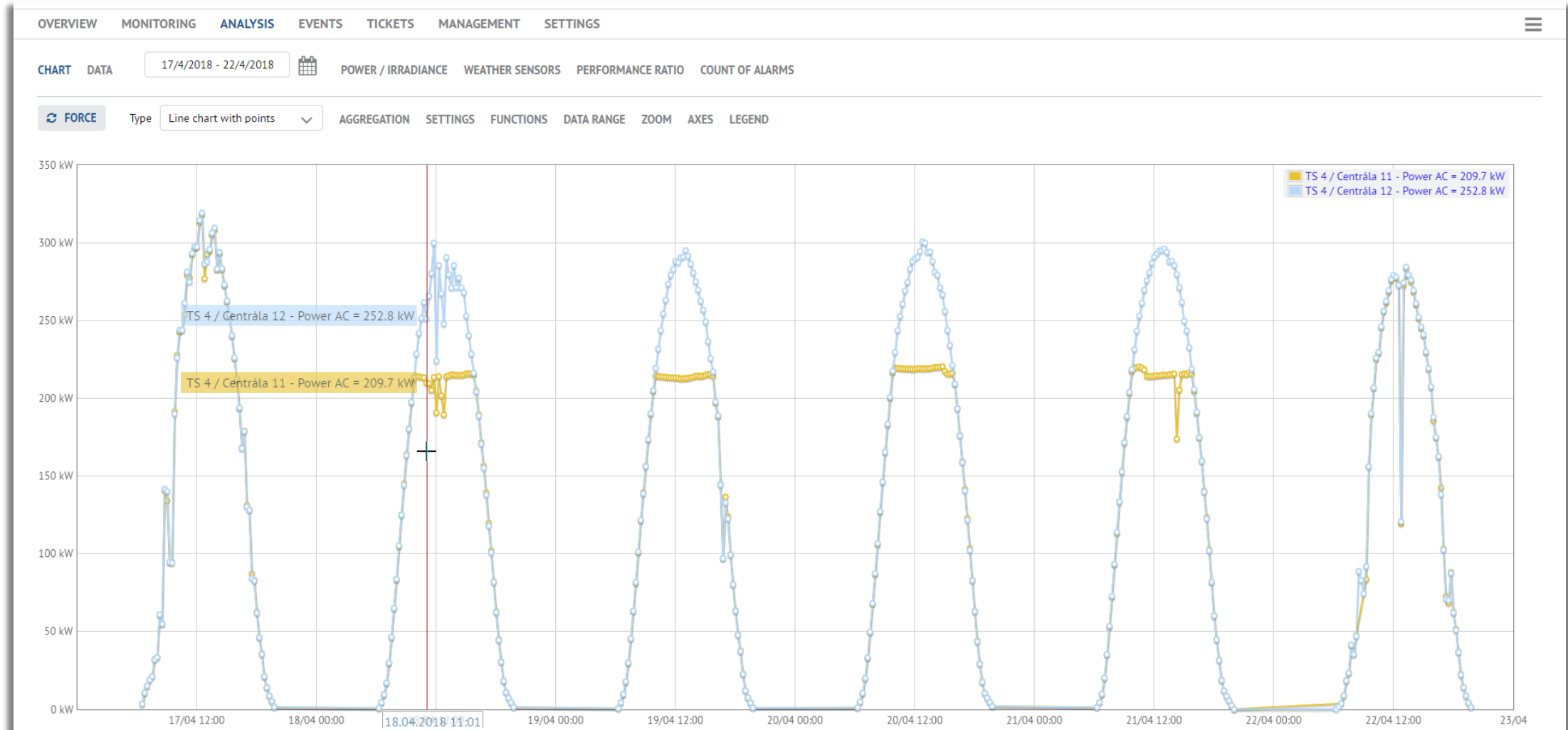
TICKETS TICKET ACTIONS PROJECT ACTIONS HELPDESK STATISTICS

+ New ticket

Sync. tickets

TICKET ID	STATUS	BEGINNING	TITLE	DEVICE	VARIABLES	
#0014317	5. Validation	21/4/2018 17:04	Inverter fault	WR 50	Power AC	 Edit 
#0013922	8. Finished ticket	27/3/2018 12:57	Preventive maintenance			 Edit 
#0013348	8. Finished ticket	18/2/2018 12:02	VN outage/ PV out of order	WR 03, WR 04, WR 06, WR 07, WR 39, WR 42, WR 44, WR 45, WR 46, WR 47, WR 49, WR 51, WR 65, WR 68	Power AC	 Edit 
#0013120	8. Finished ticket	2/2/2018 10:12	VN outage/ PV out of order	PVP	Communication alarm, Power Alarm	 Edit 
#0013033	8. Finished ticket	22/1/2018 14:45	Inspection			 Edit 
#0012965	8. Finished ticket	19/1/2018 10:30	VN outage/ PV out of order	PVP	Communication alarm, Power Alarm	 Edit 
#0012779	8. Finished ticket	4/1/2018 11:24	VN outage/ PV out of order	PVP	Communication alarm, Power Alarm	 Edit 
#0012770	8. Finished ticket	3/1/2018 15:45	VN outage/ PV out of order	PVP	Communication alarm, Power Alarm	 Edit 
#0012640	8. Finished ticket	21/12/2017 11:47	Preventive maintenance			 Edit 
#0012627	8. Finished ticket	20/12/2017 13:24	String fault	WR 57, WR 64, WR 68	Daily Energy deviation	 Edit 
#0012560	8. Finished ticket	14/12/2017 08:06	Preventive maintenance			 Edit 

ANALYSIS



MONITORING SYSTEM PECOM

MANAGEMENT

CONNECTION

DEVICE	ADDRESS	PRIVATE IP ADDRESS	LOGIN	PASSWORD
WebBox 1	182.199.88.91.43:9234	192.199.99.91	login	password
WebBox 2	182.199.88.91.43:9229	192.199.99.92	login	password
WebBox 3	182.199.88.91.43:9289	192.199.99.93	login	password
WebBox 4	182.199.88.91.43:9271	192.199.99.94	login	password
Solaron 1	https://192.199.99.91		xy	1234
Solaron 2	https://192.199.99.95		xx	1234
Solaron 3	https://192.199.99.98		xxx	1234
Cameras	http://184.43.80	192.164-xxxxxx557	xxxxxx	mxyy34
EZS	185.236.161.43:81	192.199.99.08	1133	1395
PLC1 (SMA, PQ) 22	185.236.161.43:12348	192.199.99.02		
PLC1 (SMA, PQ) 12345	185.xxx:12346	192.199.99.61	xyy	3389
PLC2 (Solaron) 22	185.236.161.43:12347	192.199.99.11		
PLC2 (Solaron) 12345	185.236.161.43:12345	192.199.99.35		
Mikrotik (winbox)	182.199.88.91.43:9211	192.199.99.88	login3	6789

ENTRIES

ID	NAME OF TECHNICIAN	ENTRY TIME	EXIT TIME	TIME	TICKET ID
2286	Kamil Koneček	13/2/2018 11:04	13/2/2018 14:30	3h 26min	#0013100
2325	Kamil Koneček	20/2/2018 09:18	20/2/2018 13:33	4h 15min	#0013369

DATASHEETS

NAME	FILE
Solar Module AIDE	11 AIDE Solar AD250M6-Ab.pdf 205.84KB
Inverter SMA	13 SMA SMC8000TL.pdf 458.25KB

PROTOCOLS



















NAME	FILE
Energy Yield	PVSYST Fyshwick.pdf 9.08KB 20/6/2016 19:46
IMS Plan	PEA-1209-001 Site Specific O&M IMS plan Fyshwick.docx 613.56KB 20/6/2016 19:46
Site Layout	03 DC string layout.pdf 355.40KB 28/2/2017 09:48
Preventive Maintenance Report	20170502_Fyshwick_Preventive_maintenance_report.pdf 49.45KB 3/5/2017 11:56

MANAGEMENT

STOCK

GROUP	NAME	EAN	DATE	COUNT	STATUS	USER	TICKET
Fuses	Fuse 160A		12/3/2018	1	New	Ferdinand Stefancsik	#0013433
Fuses	Fuse 16A		16/3/2018	1	New	Ferdinand Stefancsik	#0013557
Fuses	Fuse 160A		24/3/2018	1	New	Ferdinand Stefancsik	#0013888
Fuses	Fuse 16A		24/3/2018	1	New	Ferdinand Stefancsik	#0013888
Fuses	Fuse 16A		24/3/2018	1	New	Ferdinand Stefancsik	#0013859

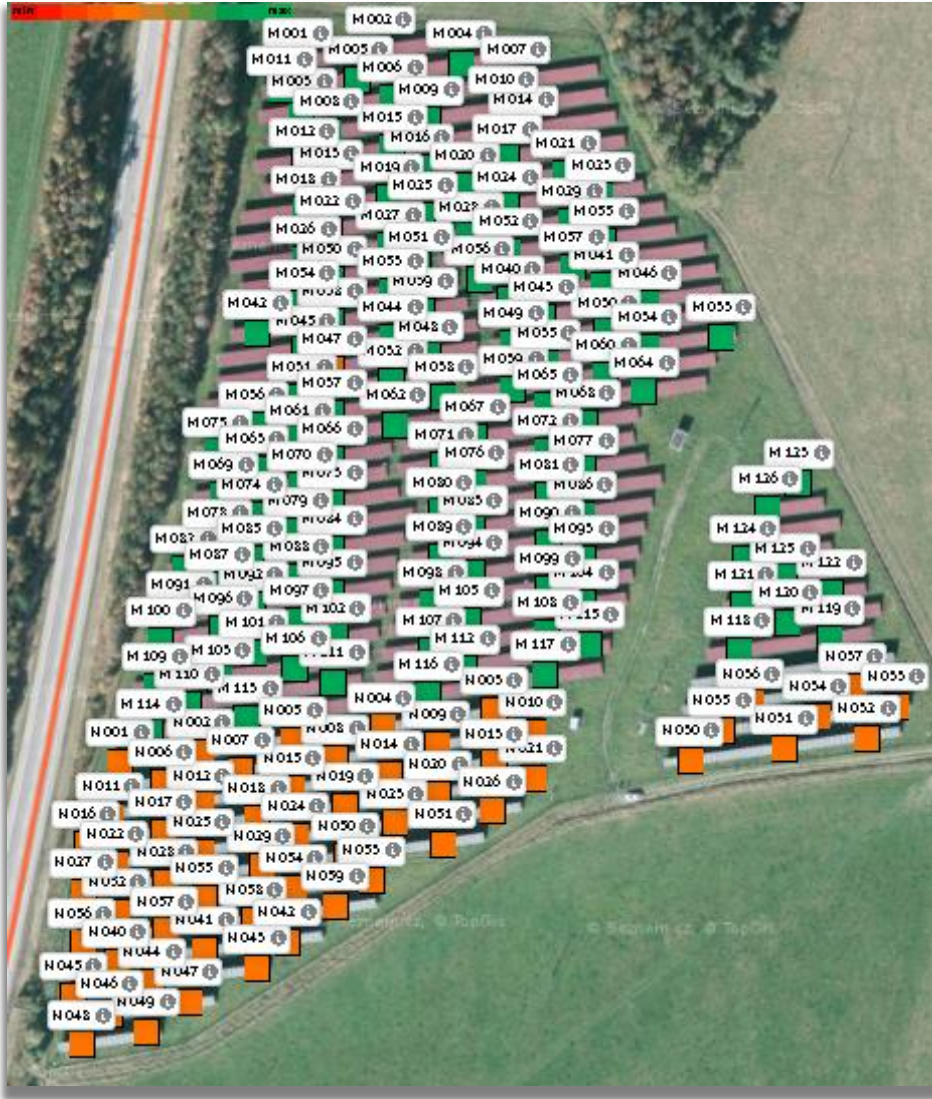
MOVEMENT IN STOCK

PROJECT NAME	GROUP	NAME	EAN	NEW	REFURBISHED	DAMAGED	COUNT	
PHOTON #1	Panels ver1	BSC40Wp	Solar 1	0			6760 min: 0 (0)	  Edit  Delete
PHOTON #1	Panels ver1	CEEG 185 Wp Module	Solferino	10			10 min: 20 (20)	  Edit  Delete
PHOTON #1	Panels ver1	KANEKA 100W Module	Solar 3	40			40 min: 0 (0)	  Edit  Delete
PHOTON #1	Panels ver1	KANEKA 105 W Module	Solar 3	16			16 min: 0 (0)	  Edit  Delete
PHOTON #1	Panels ver1	Sunwell WDACC0870	Solar 2	0			880 min: 0 (0)	  Edit  Delete
PHOTON #1	Panels ver1	Sunwell WDACC0871	Solar 2	0			393 min: 0 (0)	  Edit  Delete

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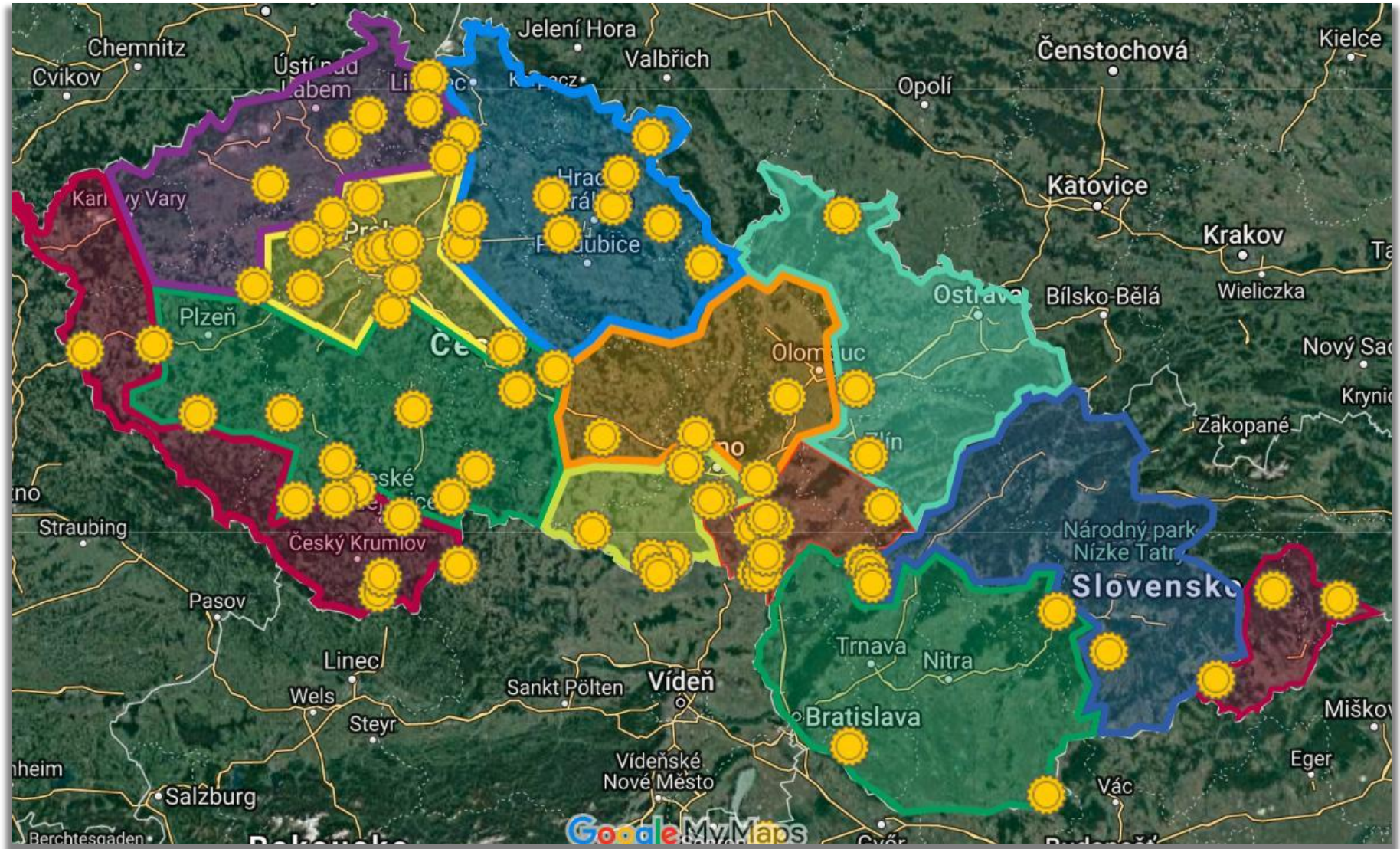


INTERACTIVE MAPS



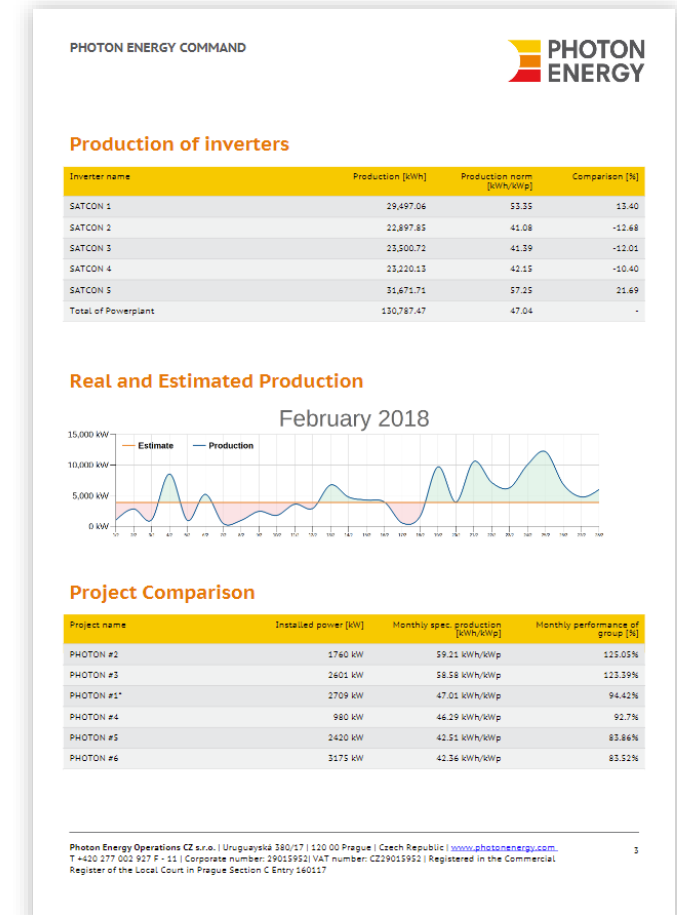
MONITORING SYSTEM PECOM

INTERACTIVE MAPS



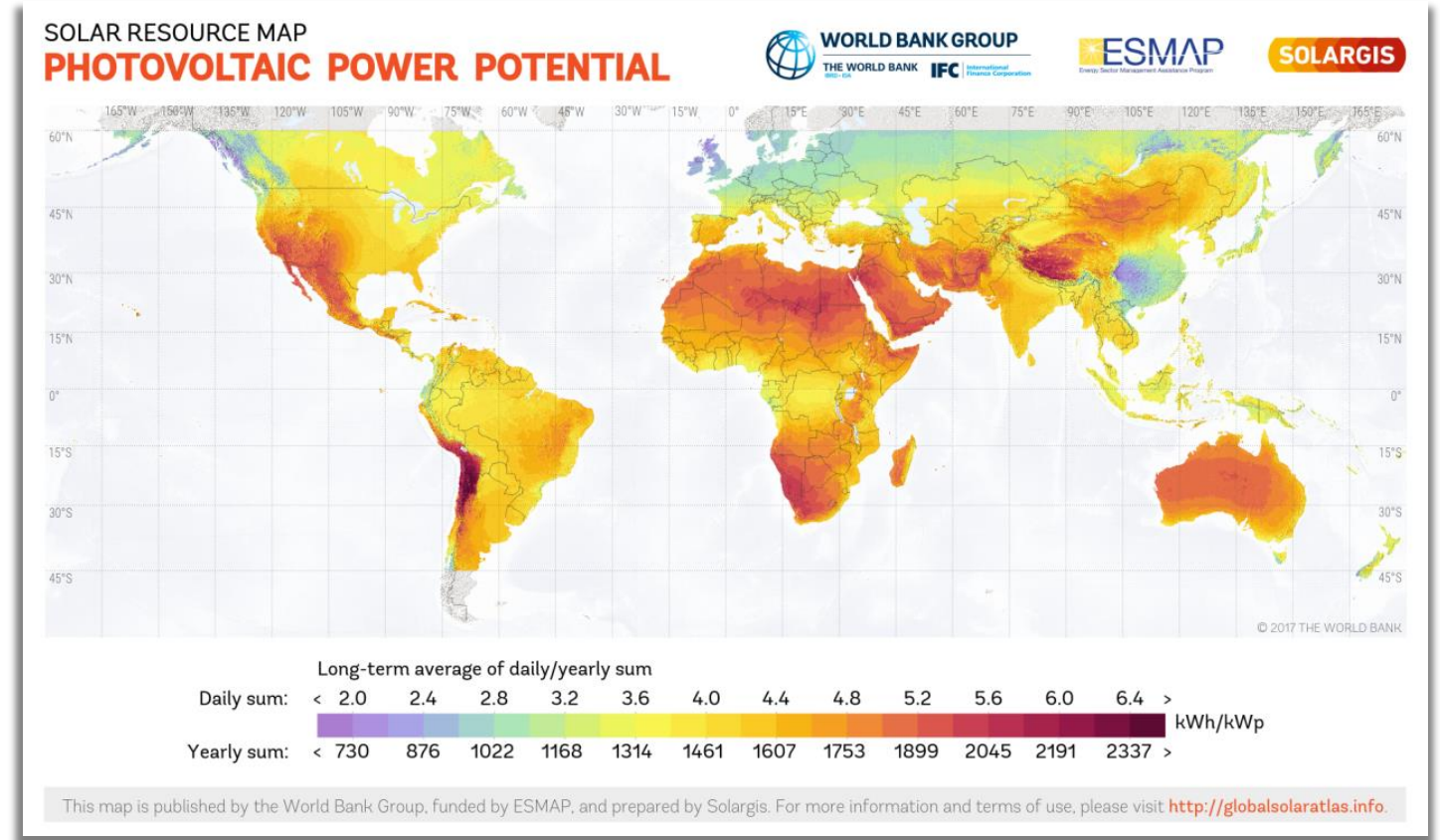
REPORTING

- Regular reports for the given period
- Option of individual reports generation
- Detailed overview not only for banks
- Statement and status of the faults at PVP during period of time
- Financial overview

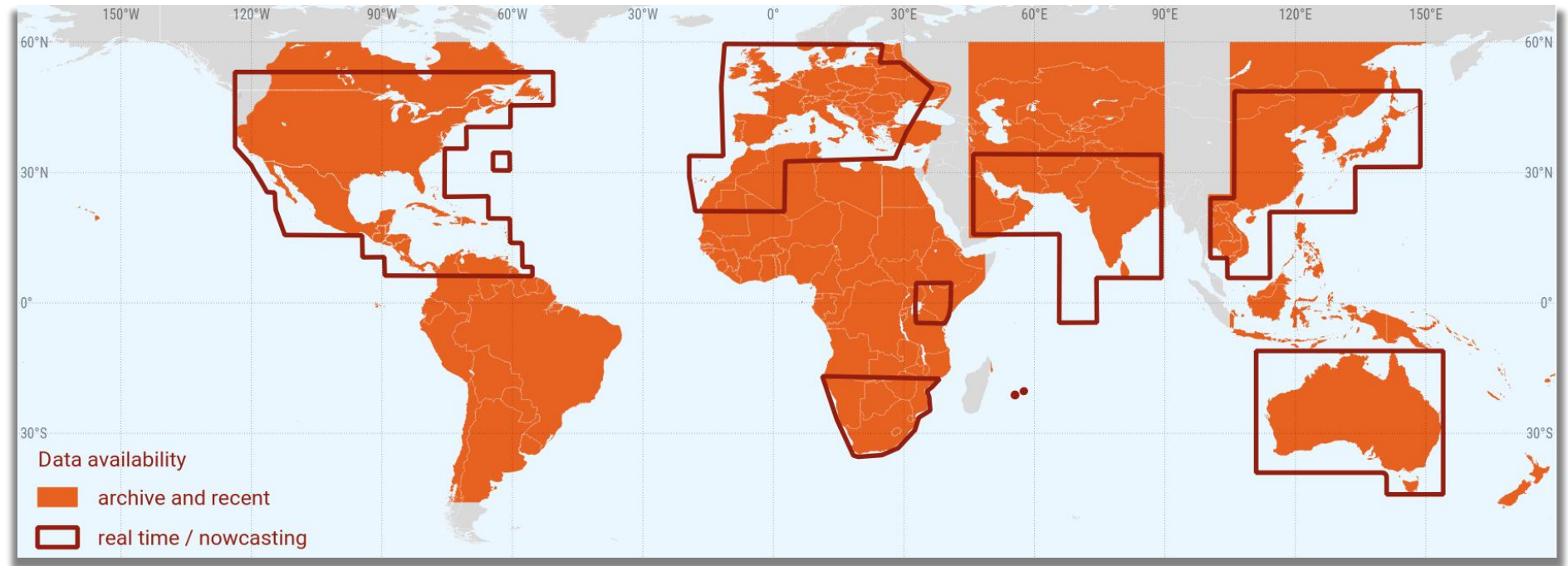


FORECASTING

- Solutions available for all solar energy assessment needs: from prospecting to effective operation
- Maximize the value of solar power you own to operate
- Control and forecast energy production in hourly or 15 minutes increments
- Improve certainty of load forecasts



FORECASTING



- Benefits
- Full administration support
- Customer's participation not necessary
- Intraday trading

REFERENCES

CONTROL AND MONITORING SERVICES

Almásfüzitő, Hungary

5.5 MWp, 2019



Cassaude, France

1 MWp, 2019



Tiszaúcskő, Hungary

5.5 MWp, 2018



Zdice, Czech Republic

1.5 MWp, 2010



CONTACT



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EXPERTS FOR
THE SOLAR AGE.

