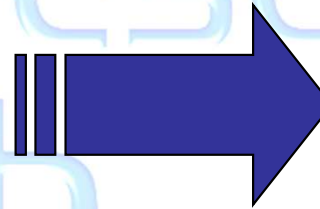




Die Energie an Ihrer Seite.
The energy by your side.

Our services

- engineering planning
- project controlling
- site management
- construction
- operation & maintenance
- TÜV evaluation



On-grid Solar plants

- rooftop and free area
- Storage solutions
- e-mobility integration

Off-grid solutions
with storage systems

Integrated energy

About us

Harry Rauch

State-certified management expert – commercial informatics
Certified engineer for electrical engineering

CEO



Executive partner

Acquisition, project controlling, engineering planning, site management

DGS specialist photovoltaics
DGS specialist off-grid solutions
TÜV Rheinland PV evaluator

Silvio Hauenschild

Certified engineer for electrical engineering
Thematic priority
Renewable Energy

Procurator

Partner



project controlling, engineering planning, site management, IT

Specialization:
Off-grid solutions
Integrated energy

About us

Energieschmiede – Rauch:

Founded April 2007

Owner: Harry Rauch

ESR GmbH

Founded as SGN Projekt GmbH 2009

Energieschmiede – Rauch

Rebranding to ESR GmbH 2013

CEO : Harry Rauch

Registered office:

04668 Grimma near Leipzig

Neuer Weg 12 & Weinbergstr.21

Country:

Germany / Saxony

Fon office:

+49(0)170 - 9622673

Website:

<https://www.esr-se.de>

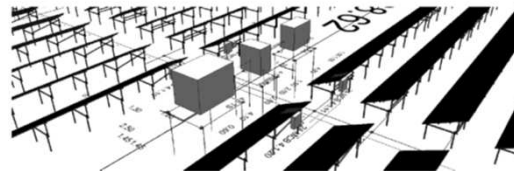
Email:

info@esr-se.de

CEO Harry Rauch



*Evaluator
photovoltaic plant
TÜV Rheinland“*



qualifications in the renewable energy / solar:

- 1994 Certified electrical technician engineer for energy and process automation
- 1998 Solar Energy consultant for photovoltaic systems
- 2005 Certified business economist for Computer Science in Economics
- 2005 self-sufficient energy supply for pressure measurement point in the Berlin Water Supply Network
- 2007 foundation Company „Energieschmiede“ (a second job)
- 2007 DGS photovoltaic specialist
- 2008/2009 initiate, public invitation to tender for largest pv plant „Berliner Wasserbetriebe“ Berlin Water Supply Waterworks Berlin Tegel
- 2010 foundation Company SGN Project GmbH to realize large pv plant outside from Berlin Water Supply in own responsibility

Qualification in Renewable Energy / Solar:

- 2011 lecturer DGS Solar School for large pv - plant
- 2013 TÜV Rheinland authority for photovoltaic as Evaluator
- 2013 change the Name from SGN Projekt GmbH to ESR GmbH Energieschmiede Rauch to expansion in Hybridplant PV + Wind + Electrical Energy Storage
- has been working internationally since then with more then 790 MWp

Photovoltaik · Solarthermie · Wärmepumpe

2008 Germany Berlin Water Supply „Berliner Wasserbetriebe“ rooftop pv plant 192 kWp



activity / responsibility:

- arrange project document to decision from board of directors
- initiate, public invitation to tender
- project management
- construction site management
- check quality and quantity to verify invoice from the subcontractors
- the whole monitoring system

2009 Germany Berlin Water Supply „Berliner Wasserbetriebe“ free area plant 364 kWp



Realität und Plan stimmen überein. Der Projektleiter der Berliner Wasserbetriebe, Harry Rauch (2.v.l.), und der Projektleiter der Solar Gruppe Nord, Dirk Gnausch (2.v.r.), die die Anlage nach den Plänen der Wasserbetriebe montieren, bei einer Beratung vor Ort. Im Hintergrund die neue, zum Teil fertiggestellte Photovoltaikanlage am Tag der Aufnahme Anfang Juni.

Foto: Herrn



activity / responsibility:

- arrange project document to decision from board of directors
- initiate, public invitation to tender
- project management
- construction site management
- check quality and quantity to verify invoice from the subcontractors
- the whole monitoring system

2010 Germany - Stedten chicken farm rooftop pv - plan 870 kWp



activity / responsibility:

- detail planning
- project management
- construction site management
- monitoring system
- check energy production

2010 Germany - Trebsen cowshed rooftop pv –plant 860 kWp



activity / responsibility:

- detail planning
- project management
- construction site management
- monitoring system
- check energy production

2010 Germany - Bremen dump free area pv – plant 860 kWp



activity / responsibility:

- detail planning
- project management
- construction site management
- monitoring system
- check energy production

2010 Germany – Glauchau rooftop pv - plant 2.417 kWp



schmiede

activity / responsibility:

- detail planning
- project management
- construction site management
- monitoring system
- check energy production

2010 Germany – Radeberg rooftop pv – plant 857 kWp



eschmiede

activity / responsibility:

- detail planning
- project management
- construction site management
- monitoring system
- check energy production

hermie wärtepumpe

2010 Germany – Sonnefeld rooftop pv – plant 2.383 kWp



activity / responsibility:

- detail planning
- project management
- construction site management
- monitoring system
- check energy production

2011 Germany - Ferropolis rooftop pv -plant 21



activity / responsibility:

- detail planning
- project management
- construction site management
- monitoring system
- check energy production

2012 Germany - Werdau free area pv - plant 1.330 kWp



activity / responsibility:

- detail planning
- project management
- construction site management
- monitoring system
- check energy production

2012 Germany - Sömmerda free area pv - plant 1.300 kWp



activity / responsibility:

- detail planning
- project management
- construction site management
- monitoring system
- check energy production

2012 Germany - Umpferstedt free area pv - plant 1.000 kWp



eschmiede

activity / responsibility:

- detail planning
- project management
- construction site management
- monitoring system
- check energy production

2012 Germany - Demmin rooftop pv - plant 1.542 kWp



activity / responsibility:

- detail planning
- project management
- construction site management
- monitoring system
- check energy production

2013 Germany - Demmin free area pv -plant 1.401kWp



activity / responsibility:

- detail planning
- project management
- construction site management
- monitoring system
- check energy production

2013 Germany - Röllfeld Freifläche 2.445 kWp



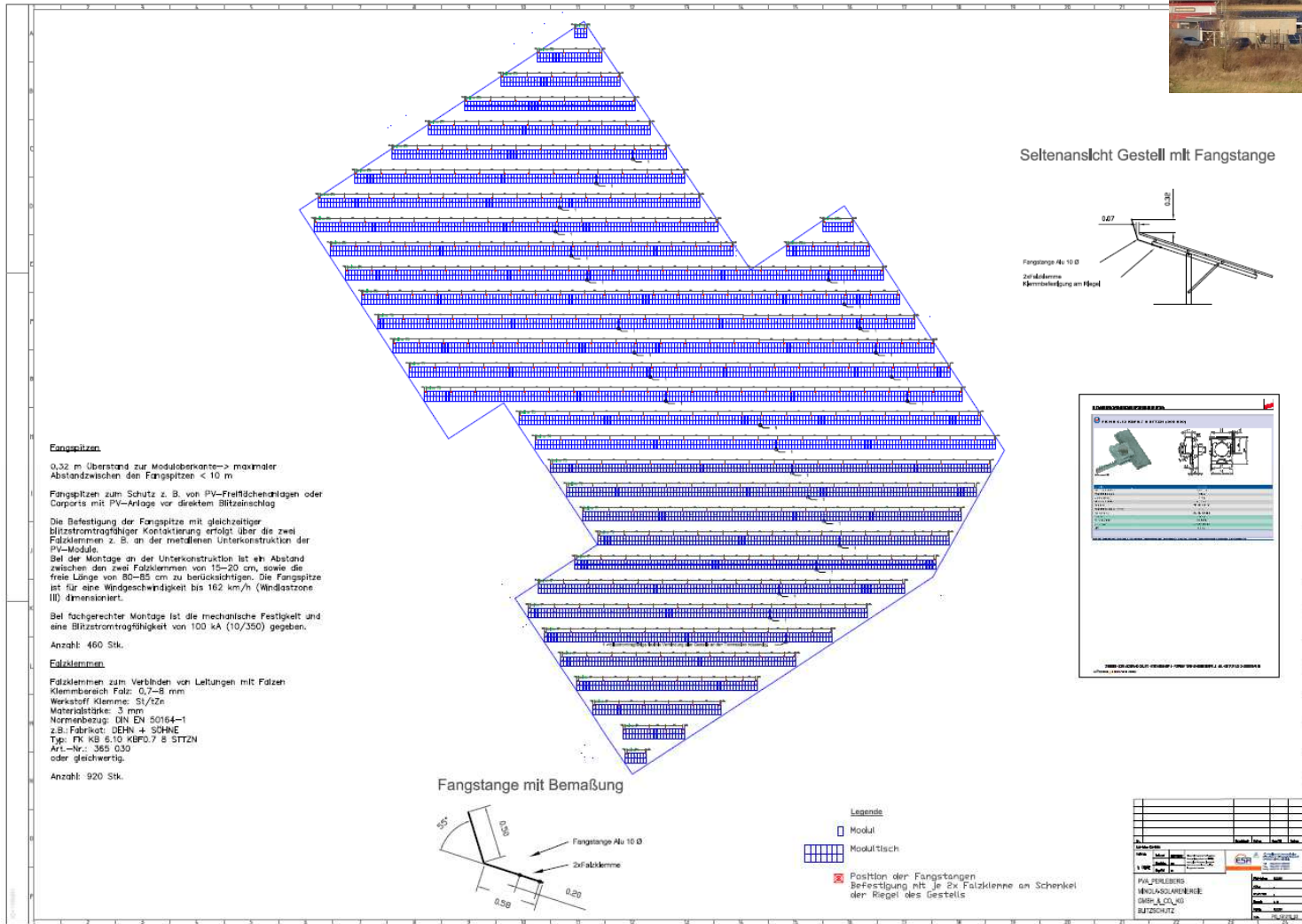
miede

activity / responsibility:

- detail planning

Wärmepumpe

2014 Germany - Perleberg free area plant 1.680 kWp



niede



activity / responsibility:

- detail planning
- project management
- construction site management
- monitoring system
- check energy production

2014 Turkey – Elbistan Feasibility Study QuaideAzam free area plant 500 MWp

activity / responsibility:

- Forecast
- 800,5 GWh/a
- 1.601 kWh/kWp
- 650 ha
- 2 year building time

Die Energie an Ihrer Seite.
The energy by your side.

+

Feasibility study

Output forecast

Turkey 500 MWp Photovoltaic system
Elbistan

Report PV-2014-9961-025

Version 1.0 – 27th May 2014

Figure 4: TGT substructure drawing with ballast [2MW Elbistan]

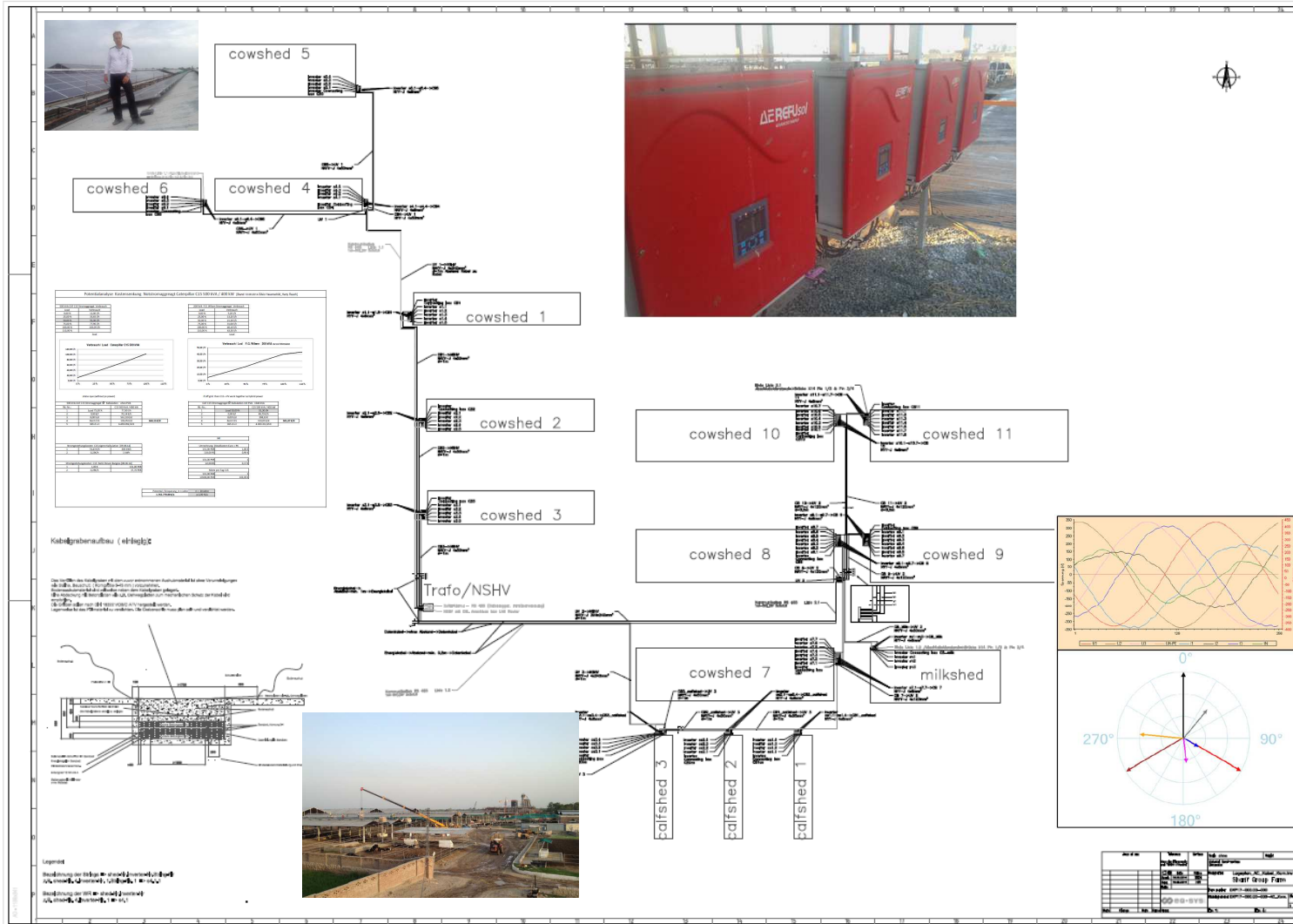


Figure 3: Representative PV surface Elbistan



EPC from China
ESR no responsibility
in all other steps!

2015 Turkey – Elbistan Dairy Farm rooftop plant 1.692 kWp



activity / responsibility:

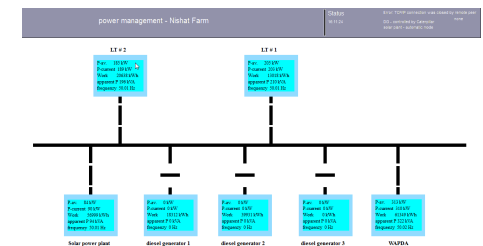
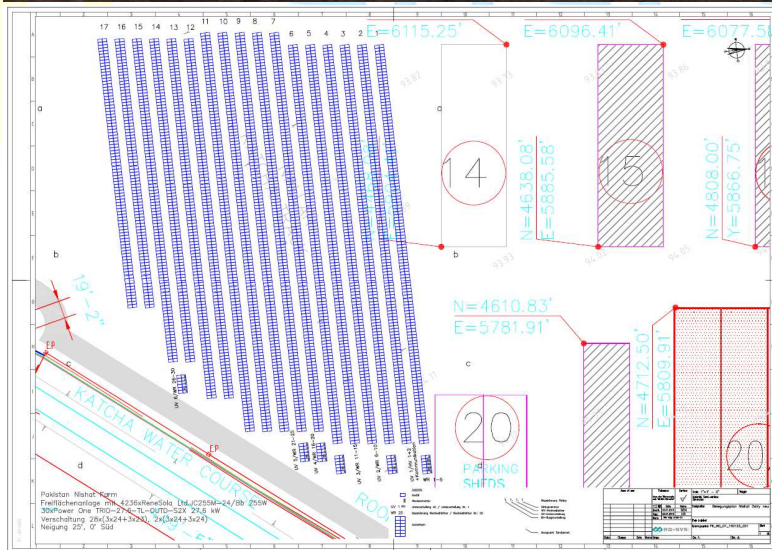
- detail planning
- project/construction site management
- monitoring system
- check energy production
- analysis the custom current grid network
- cost potenzial analysis decrease DG + PV Hybrid plant

2015 Turkey – Elbistan Dairy Priv. Ltd. free area plant 1.080 kWp



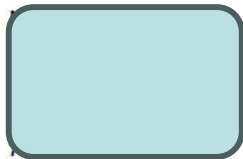
activity / responsibility:

- detail planning
- project/construction site management
- monitoring system
- check energy production
- analysis the
- custom current grid network
- realize PV + DG Hybrid plant



2016 Turkey – Elbistan Mills Ltd. rooftop plant 1.495 kWp

ESR GmbH, Weinbergstr. 21, D-04668 Grimma




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 CEO Harry Rauch
 Weinbergstr.21
 D- 04668 Grimma
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 +49 170 313 26 73
 Web:
 www.energieschmiede-rauch.de
 Email:
 harry.rauch@energieschmiede-rauch.de
 Amtsgericht Leipzig
 HRB.27416
 USt-ID:
 DE 270164885
 Bank:
 Sparkasse Muldental
 IBAN: DE58860502001041042139
 BIC: SOLADES1GRM



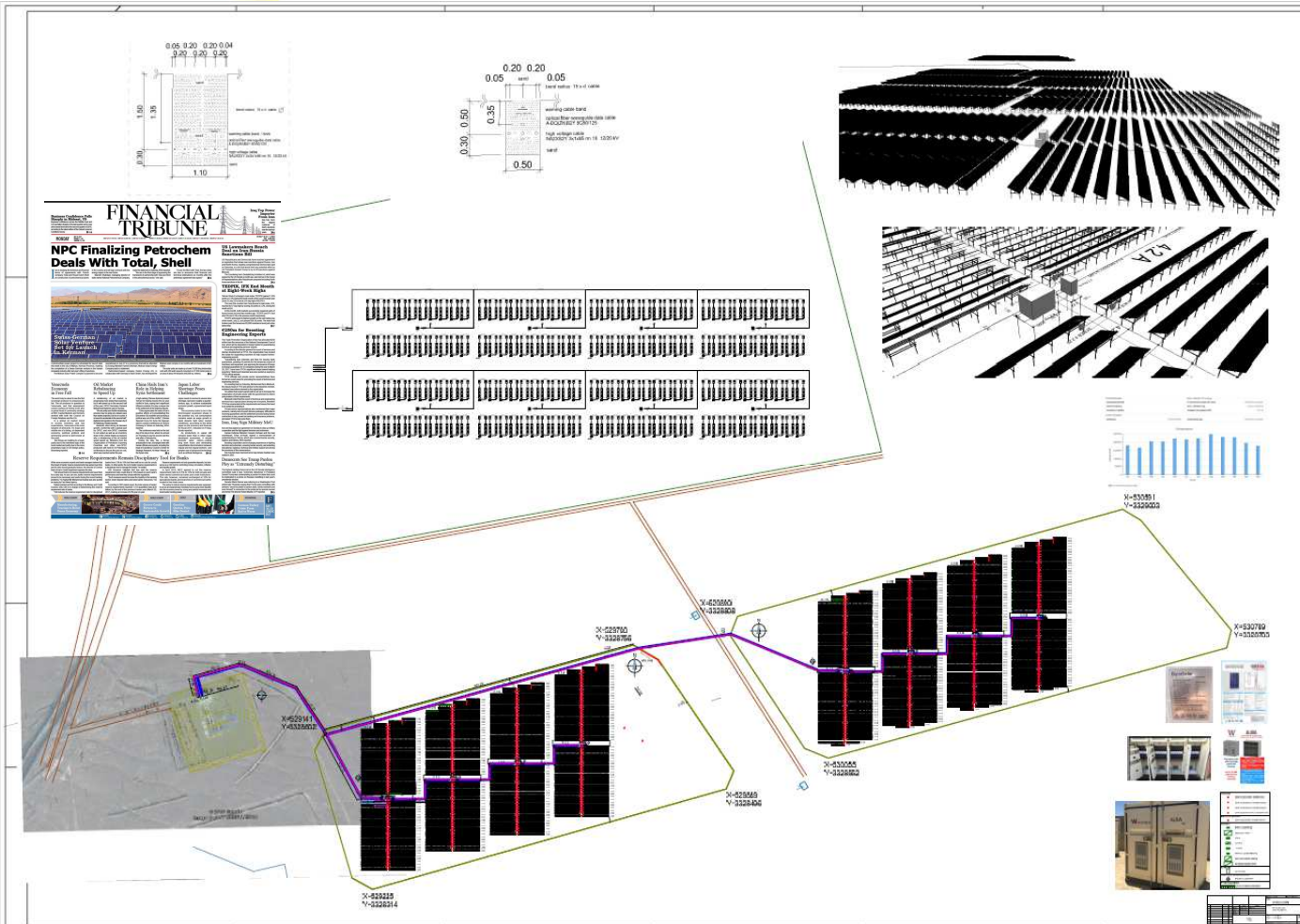
activity / responsibility:

- check the whole pv plant according to
 DIN EN 62446-1
 DIN VDE 0100-712
- write TÜV report



technical TÜV standards
 authority audit certificate
 power construction project
 Pakistan Nishat Apparel Unit 2
 roof top pv plant
 1.495 kWp

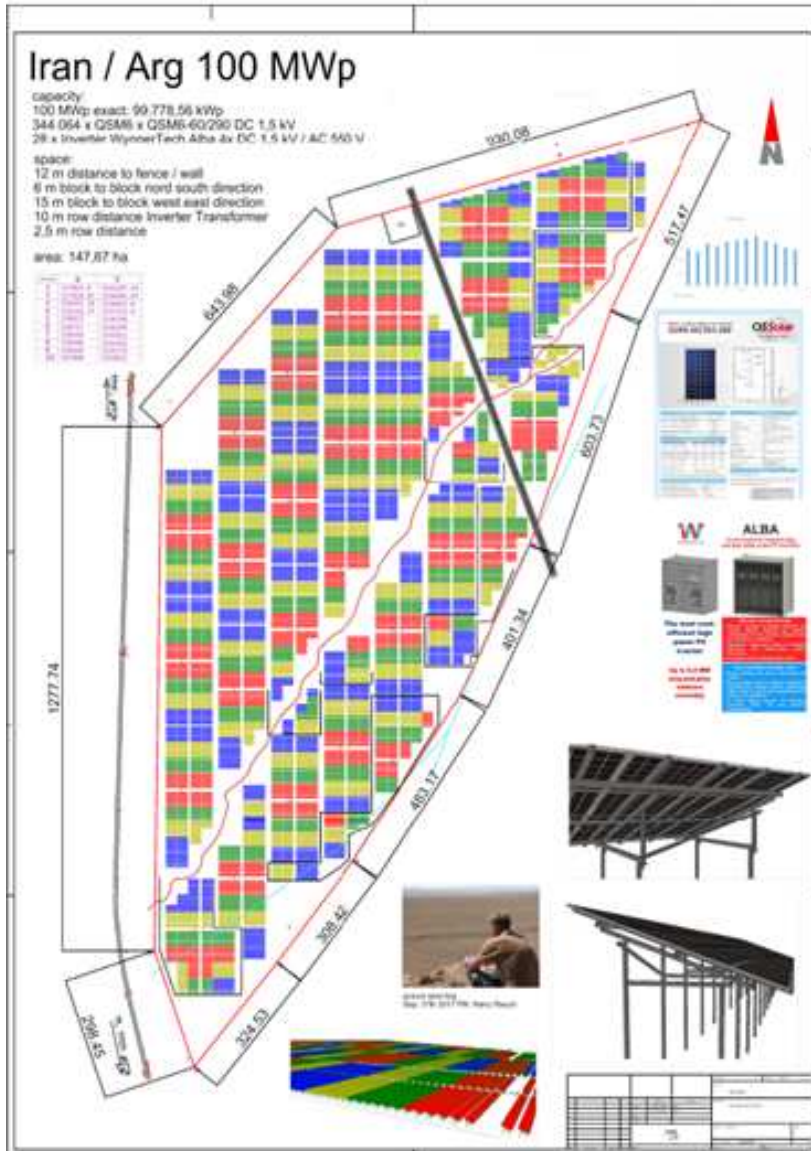
2017 Iran - Kerman - Mahan free area plant 19.997,20 kWp



activity / responsibility:

- detail planning
- project/construction
- site management
- monitoring system
- check energy production
- analysis the
- custom current grid network

2018 Iran - Kerman - Mahan free area plant 99,779.56 kWp



miede
activity / responsibility:

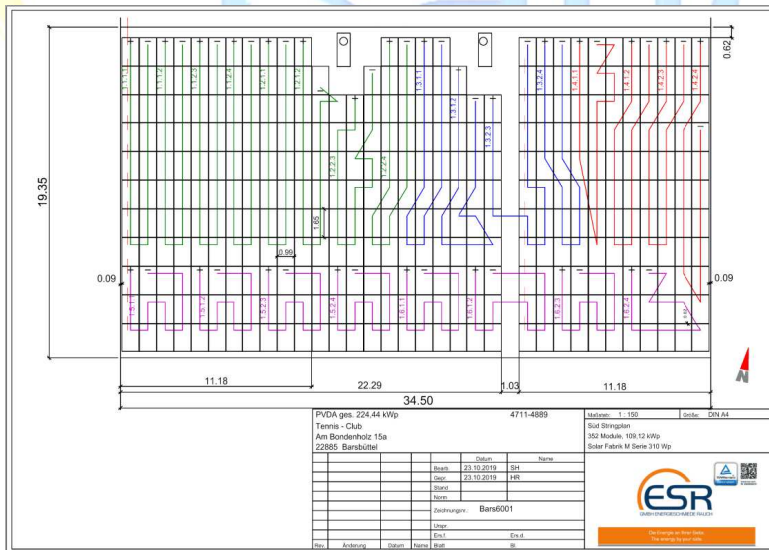
- detail planning
- project/construction site management
- the project was stopped by the USA sanction and has not been completed

2019 Germany Schleswig – Holstein, Barsbüttel roof top pv plant 224kWp



activity / responsibility:

- detail planning
- project/construction site management
- monitoring system
- check energy production
- analysis the custom current grid network

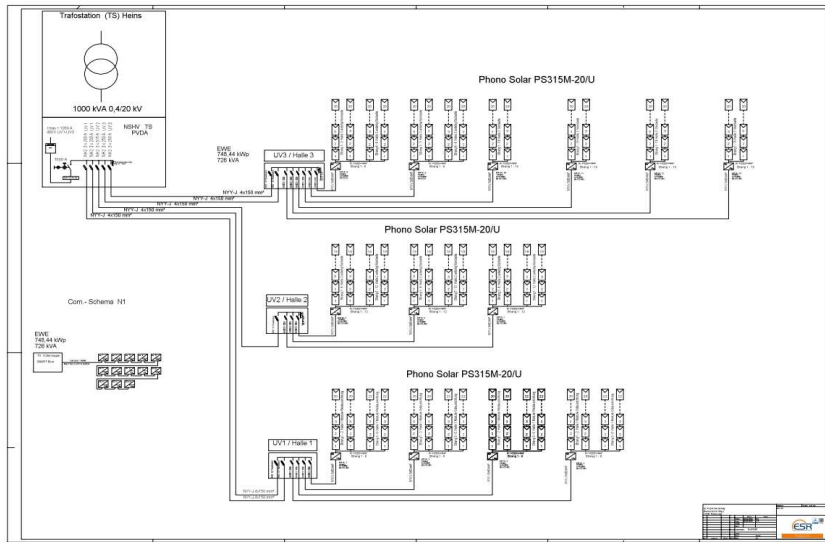


2020 Germany Niedersachsen, Nottensdorf roof top pv plant 748 kWp



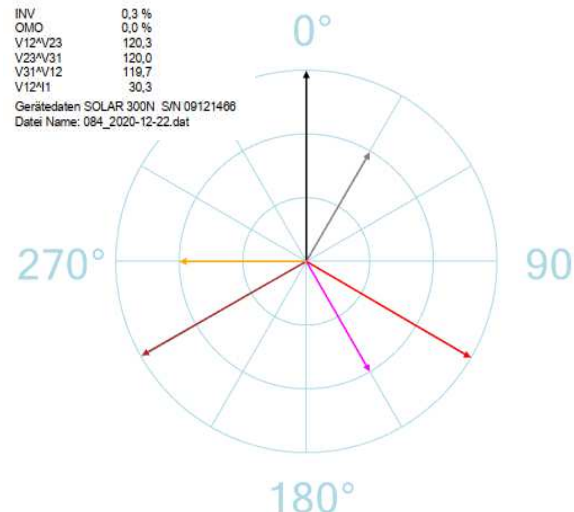
activity / responsibility:

- detail planning
- project/construction site management
- monitoring system
- check energy production
- analysis the custom current grid network



INV 0.3 %
 OMO 0.0 %
 V12^V23 120.3
 V23^V31 120.0
 V31^V12 119.7
 V12^I1 30.3

Gerätedaten SOLAR 300N S/N 09121406
 Datei Name: 084_2020-12-22.dat



| | |
|---|--|
| ESR | ITF Photovoltaikanlage (PVDA) 748,44 kWp / 720 kVA Nottensdorf Bismarckstraße Weg 2a D - 31561 Nottensdorf |
| DN EN 62449-1 VDE 0126-23-1 Gütesicher - PV (ITF) Hory Rauch / Messdurchführung Silvio Hauschild | |
| AC Netzanschluss NBNV TS Zeitpunkt am 22.12.2020 15:00 Uhr bewittert 5 Grad, Ein = 100W/m² | |
| MS-Zustellung durch EWE | |

| Phase 1 | | Phase 2 | | Phase 3 | |
|------------------|-------------------|------------------|-------------------|------------------|-------------------|
| U _{ms} | U _{0(N)} | U _{ms} | U _{0(N)} | U _{ms} | U _{0(N)} |
| 238.5 | 19.83 | 239.9 | 20.08 | 239.1 | 20.02 |
| 414.20 | 19.83 | 415.54 | 20.08 | 413.10 | 19.95 |
| Imp | PI 1 | Imp | PI 2 | Imp | PI 3 |
| 83.2 | 1.00 | 83.8 | 1.00 | 84.0 | 1.00 |
| Th _{MS} | Q _{0(N)} | Th _{MS} | Q _{0(N)} | Th _{MS} | Q _{0(N)} |
| 7.28 | 0.00 | 6.99 | 0.00 | 6.95 | -1.98 |
| Th _{MS} | q _{PI} | Th _{MS} | q _{PI} | Th _{MS} | q _{PI} |
| 2.04 | 1.00 | 1.97 | 1.00 | 1.91 | 1.00 |

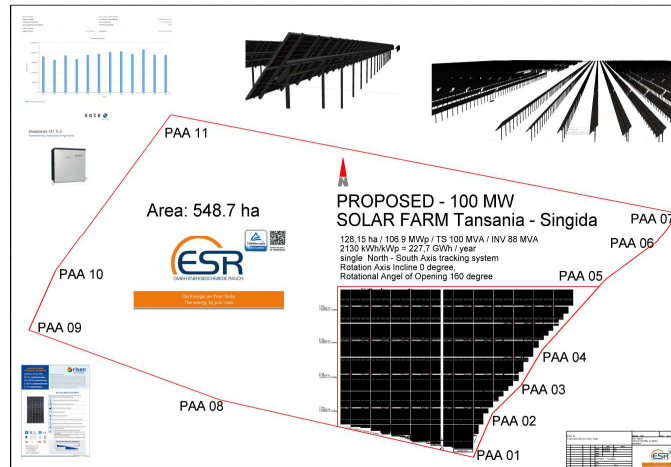
| Sum | | Pha 1(N) | | Pha 2(N) | | Pha 3(N) | | Pha 0(N) | | Pha 0(N) | |
|-----------------------|-------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|--|
| Sum U _{0(N)} | Q _{0(N)} | Pha 1(N) | Pha 2(N) | Pha 3(N) | Pha 0(N) | Pha 0(N) | Pha 0(N) | Pha 0(N) | Pha 0(N) | Pha 0(N) | |
| 58.86 | -1.86 | 58.84 | 1.00 | 1.00 | 1.00 | 1.00 | | | | 49.93 | |

Gerätedaten SOLAR 300N S/N 09121406
 Datei Name: 084_2020-12-22.dat

2020 Tanzania – Singiad Feasibility Study free area plant 106.9 MWp

+ **Feasibility study**
Output forecast

Tanzania Singida 106.9 MWp / TS 100 MVA / INV 88 MVA
Azimut 0 degree, Indination 10 degree
Photovoltaic system none tracking
128.15 ha



activity / responsibility:

- Forecast
- 181.73 GWh/a
- 1.700 kWh/kWp
- 128 ha
- 1 year building time

Report PV-2020-01

Version 1.0 – 20th Jan. 2020

Prepared on behalf of the



Weinbergstr.21
D – 04668 Grimma

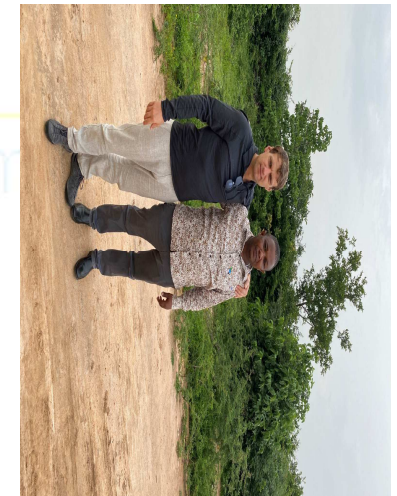
Sign:

CEO Harry Rauch
Jan. 20th 2020

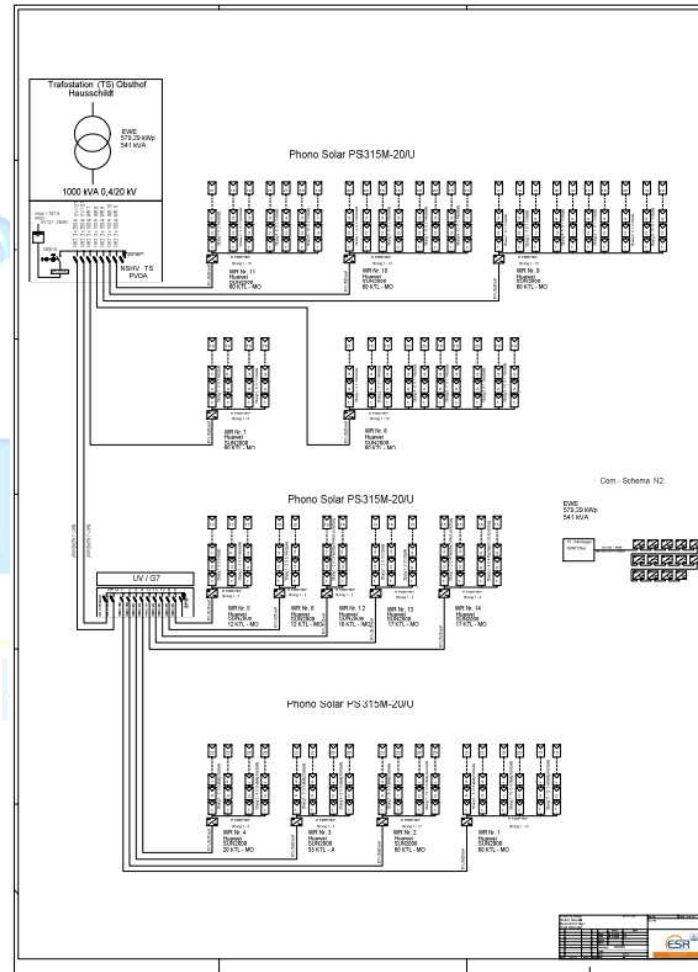


ESR GmbH
Weinbergstr. 21
D - 04668 Grimma

phone: +49 (0) 3437 94 89 581
mobile: +49 (0) 170 3132673
email: h.rauch@sun-steel.de
web: www.esr-se.de

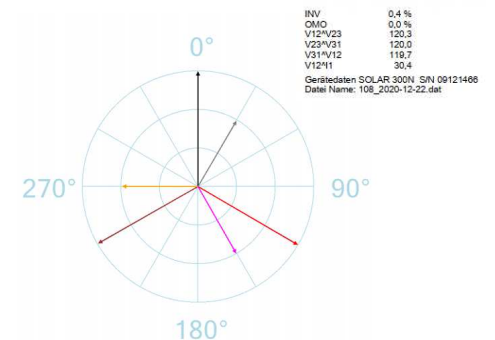


2020 Germany Niedersachsen, Nottensdorf roof top pv plant 579 kWp



activity / responsibility:

- detail planning
- project/construction site management
- monitoring system
- check energy production
- analysis the
- custom current grid network



2021 Tanzania – Zanzibar Feasibility Study free area plant 256 MWp + 20 MWh EES Battery

Proposal for a Solar Power Plant in Zanzibar

256 MWp and 20 MWh EES Photovoltaic system
around on Zanzibar Island

Proposal PV-2021-10

Version 1.0 – 14th April 2021

Prepared on behalf of the



Die Energie an Ihrer Seite.
The energy by your side.

Neuer Weg 21

D – 04668 Grimma OT Beiersdorf

ESR GmbH

Neuer Weg 12

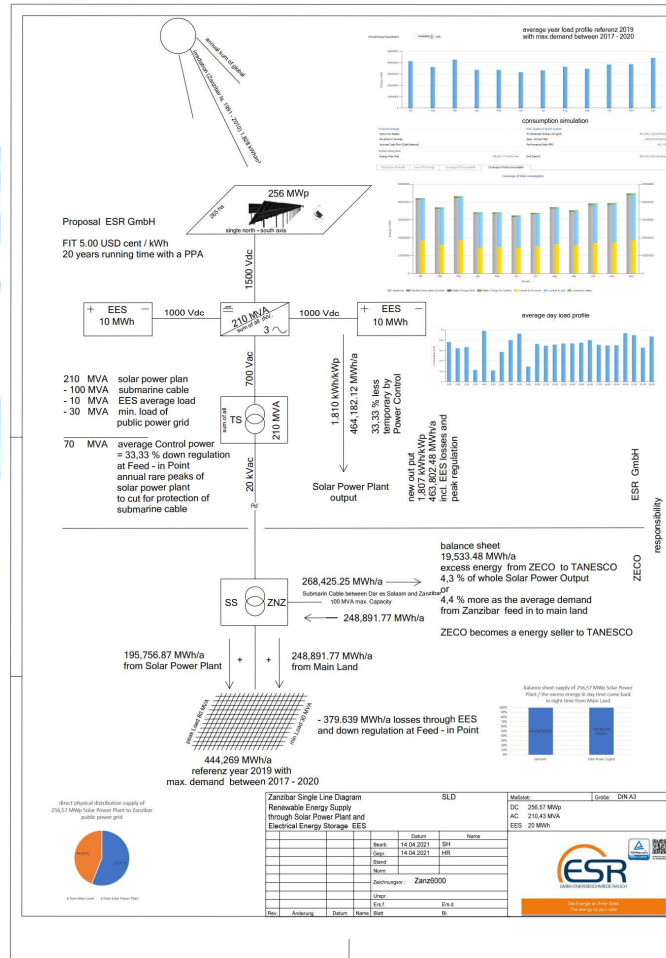
D - 04668 Grimma OT Beiersdorf

Sign:



CEO Harry Rauch
April 14th 2021

phone: +49 (0) 3437 94 89 581
mobile: +49 (0) 170 3132673
email: hr@esr-se.de
web: www.esr-se.de



activity / responsibility:

- Forecast
- 463.8 GWh/a
- 1.807 kWh/kWp
- 265 ha
- 2 years building time



2022 Tanzania – Pembe Feasibility Study free area plant frist 15,89 MWp from total 30 MWp

Proposal for a Solar Power Plant in Pemba

30.096 MWp Photovoltaic system

Proposal PV-2022-02
Version 1.0 – 13th Sep. 2022
Prepared on behalf of the



Neuer Weg 21
D – 04668 Grimma OT Beiersdorf

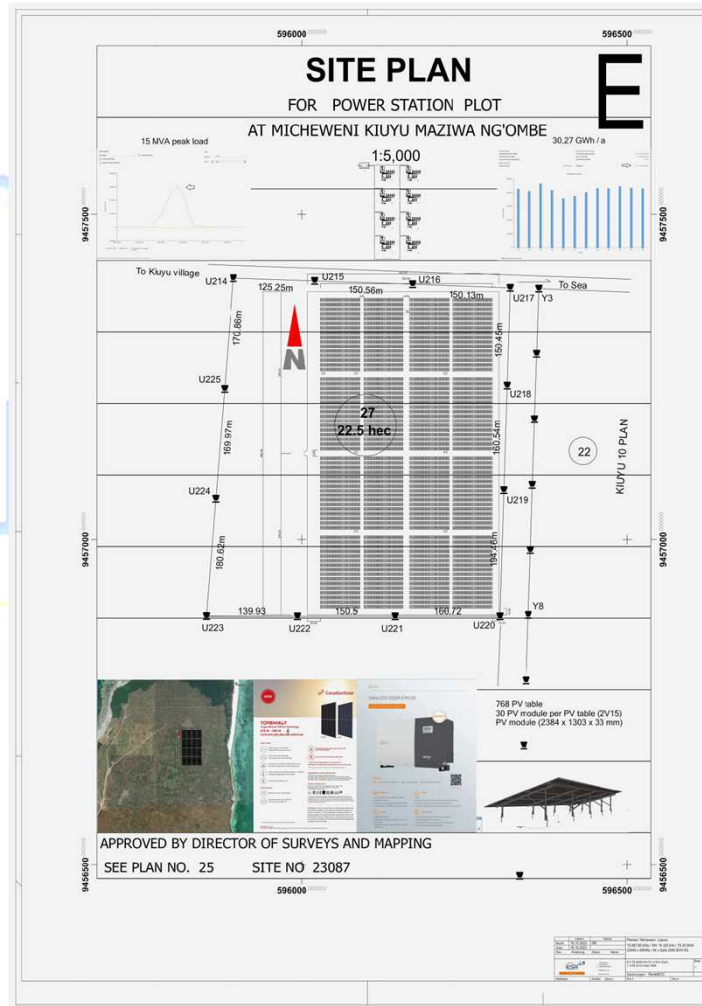
ESR GmbH
Neuer Weg 12
D - 04668 Grimma OT Beiersdorf

Sign:

CEO Harry Rauch
Sep. 13th 2022

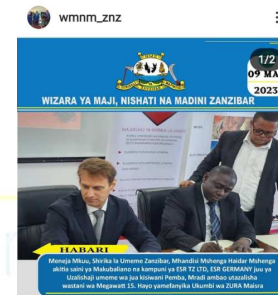
phone: +49 (0) 3437 94 89 581
mobile: +49 (0) 170 3132673
email: hr@esr-se.de
web: www.esr-se.de

Proposal ESR in Germany.



activity / responsibility:

- Forecast
- 32 GWh/a
- 1.900 kWh/kWp
- 22,5 ha
- 1 years building time





Rooftop plant Lamellar-systems company

463 kWp

Germany, Schleswig-Holstein, Ahrensburg

2022 Germany Bavaria, Oening free area plant 14,711 kWp



activity / responsibility:

- project/construction site management

Wärmepumpe

2022 Germany Bavaria, Altenschwant free area plant 10,434 kWp

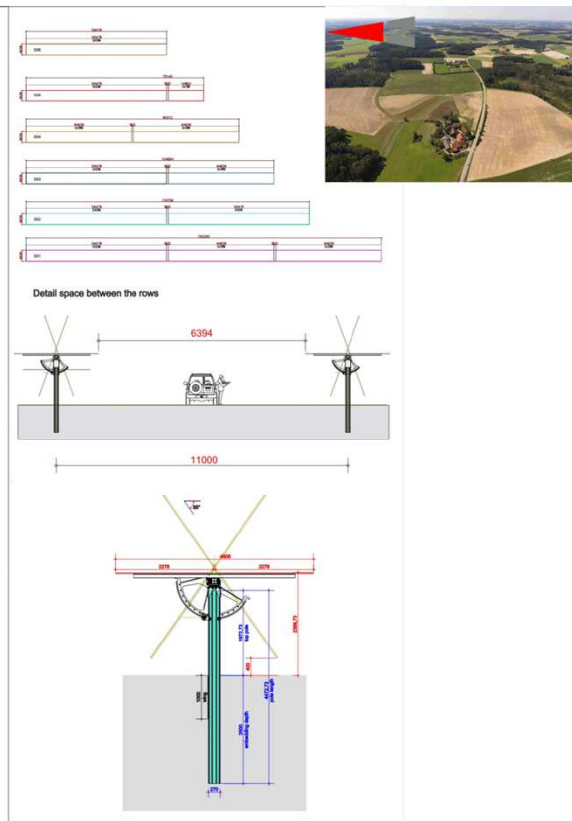


activity / responsibility:

- project/construction site management

Wärmepumpe

2023 Germany – Bayern Johanniskirchen / Oberstadl Freifläche 20.036 kWp



| | | | |
|---------|------------|-----------------|--|
| Project | ESR | Name | Oberstadl / Johanniskirchen Bayern Germany |
| Client | ESR | Project Manager | ESR |
| Start | 18.10.2023 | End | 18.10.2023 |
| Scale | 1:1000 | Author | ESR |
| Version | 1.0 | Check | ESR |
| Drawn | ESR | Reviewed | ESR |
| Project | ESR | Project | ESR |
| Project | ESR | Project | ESR |
| Project | ESR | Project | ESR |
| Project | ESR | Project | ESR |

niede

activity / responsibility:

- preliminary design

- detail planning

still in progress

- construction

will be in 2024

- opening

will be in 2025

incl. 40 MVA 33/110 kV
Substation and 9 km
Transmission Line

our reference

| lfd.-Nr.: | photovoltaic plant reference between 2007 - now ESR GmbH | | | type | power (STC) |
|-----------|--|------------------------|-----------------------------|-------------------|--------------------|
| 1 | Germany | Sachsen | Trebsen | rooftop | 680 kWp |
| 2 | Germany | Berlin | Berlin - Tegel | rooftop | 556 kWp |
| 3 | Germany | Berlin | Berlin - Tegel | free area plant | 364 kWp |
| 4 | Germany | Sachsen - Anhalt | Stedten | rooftop | 870 kWp |
| 5 | Germany | Thüringen | Sömmerda | free area plant | 1.300 kWp |
| 6 | Germany | Thüringen | Umpferstedt | free area plant | 1.000 kWp |
| 7 | Germany | Sachsen | Werdau | free area plant | 1.330 kWp |
| 8 | Germany | Mecklenburg Vorpommern | Demmin | rooftop | 1.542 kWp |
| 9 | Germany | Sachsen | Glauchau | rooftop | 2.417 kWp |
| 10 | Germany | Sachsen | Radeberg | rooftop | 857 kWp |
| 11 | Germany | Bayern | Sonnefeld | rooftop | 2.383 kWp |
| 12 | Germany | Bremen | Bremen | free area plant | 827 kWp |
| 13 | Germany | Mecklenburg Vorpommern | Burow-Weltzin | free area plant | 1.401 kWp |
| 14 | Germany | Bayern | Röllfeld | free area plant | 2.445 kWp |
| 15 | Germany | Mecklenburg Vorpommern | Perleberg | free area plant | 1.680 kWp |
| 16 | Turkey | Eastern Anatolia | Elbistan | rooftop | 1.692 kWp |
| 17 | Turkey | Eastern Anatolia | Elbistan | Feasibility Study | 500.000 kWp |
| 18 | Turkey | Eastern Anatolia | Elbistan | free area plant | 1.080 kWp |
| 19 | Turkey | Eastern Anatolia | Elbistan | rooftop | 1.495 kWp |
| 20 | Iran | Kerman | Mahan | free area plant | 20.000 kWp |
| 21 | Iran | Kerman | Arg | detailed planning | 99.779 kWp |
| 22 | Germany | Schleswig-Holstein | Barsbüttel | rooftop | 224 kWp |
| 23 | Germany | Niedersachsen | Nottensdorf N1 | rooftop | 748 kWp |
| 24 | Germany | Niedersachsen | Nottensdorf N2 | rooftop | 577 kWp |
| 25 | Germany | Schleswig-Holstein | Ahrensburg | rooftop | 463 kWp |
| 26 | Germany | Bayern | Oening | free area plant | 14.711 kWp |
| 27 | Germany | Bayern | Altenschwant | free area plant | 10.434 kWp |
| 28 | Germany | Bayern | Johanniskirchen / Oberstadl | free area plant | 20.036 kWp |
| 29 | Tanzania | Singiad | | Feasibility | 100.000 kWp |
| | Tanzania | Zanzibar | | Feasibility | 256.000 kWp |
| | Tanzania | Pemba | Micheweni progress | free area plant | 16 kWp |
| 26 | | | | | 790.892 kWp |

thank you for your attention

