



Implementation of solar PV on Fernando de Noronha, Brazil

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WIRSOL



Gefördert durch:



aufgrund eines Beschlusses
des Deutschen Bundestages



Introduction

Bastian Telg

- 10 Years in project development and project coordination
- Since 2009 in the area of PV power plants (Phoenix Solar)
- In 2012 Entrepreneur in Brazilian solar business
- In 2013/2014 project coordination of Fernando de Noronha and Cidade Azul / Tubarao (both Wirsol Solar).

Wirsol Solar do Brasil S.A.

- Founded in 2012
- Strong consortium with WEG
- 2 projects realized in Brazil with a total of 3,4 MWp

Fernando de Noronha

- 350km offshore from Brazilian coast
- 17 km² is the size of the main island
- 2.800 inhabitants
- UNESCO World Heritage



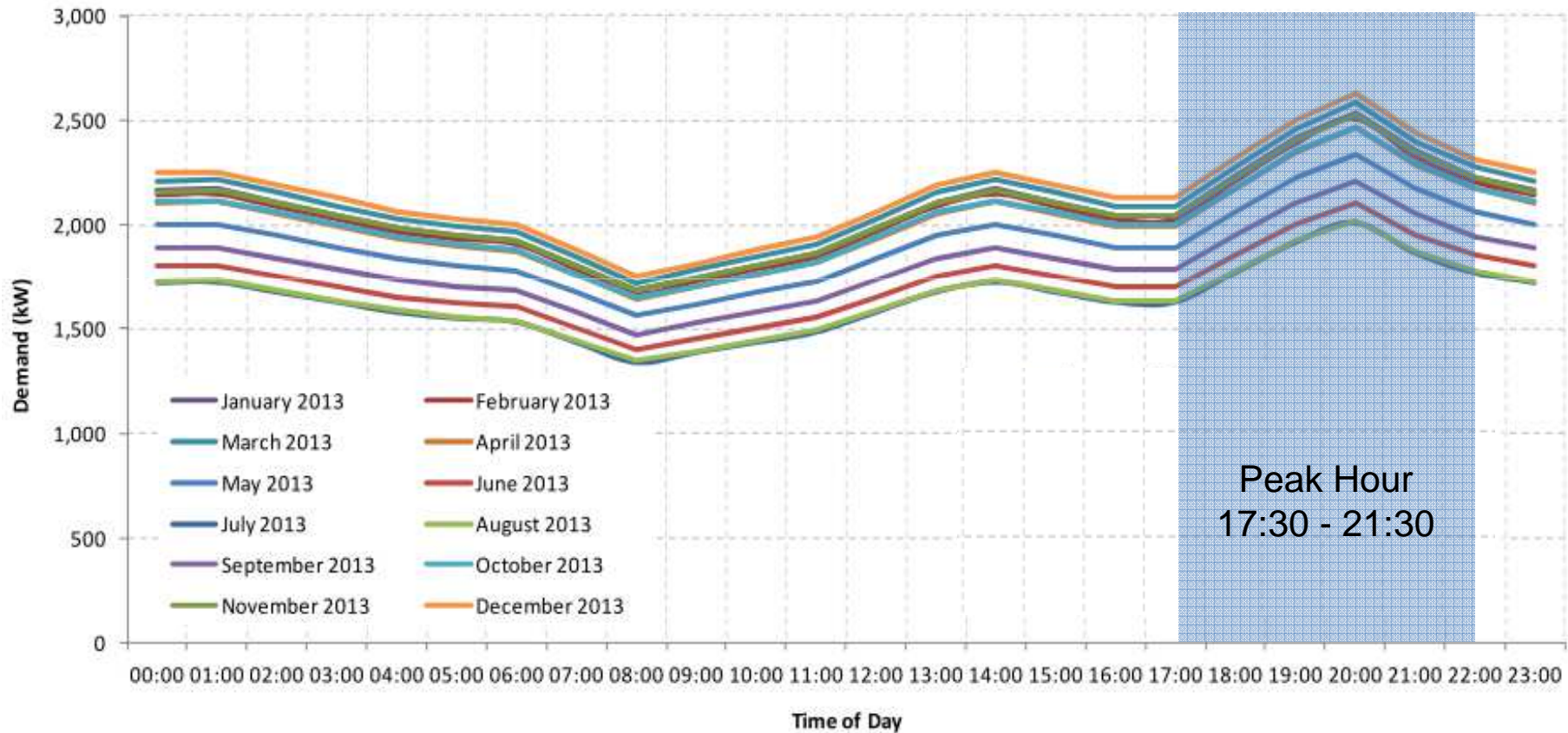


Situation on Fernando de Noronha

- **Energy generation in 2013**
 - 2 Generators operate on the island
 - 1.600.000 kWh p.a.
 - 10,000 liters of Diesel per day
 - 50t CO₂ per capita p.a.
- **PV implementation of 400kWp**
 - Generation of 5% of energy demand
 - Fuel compensation of 200.000 l p.a.



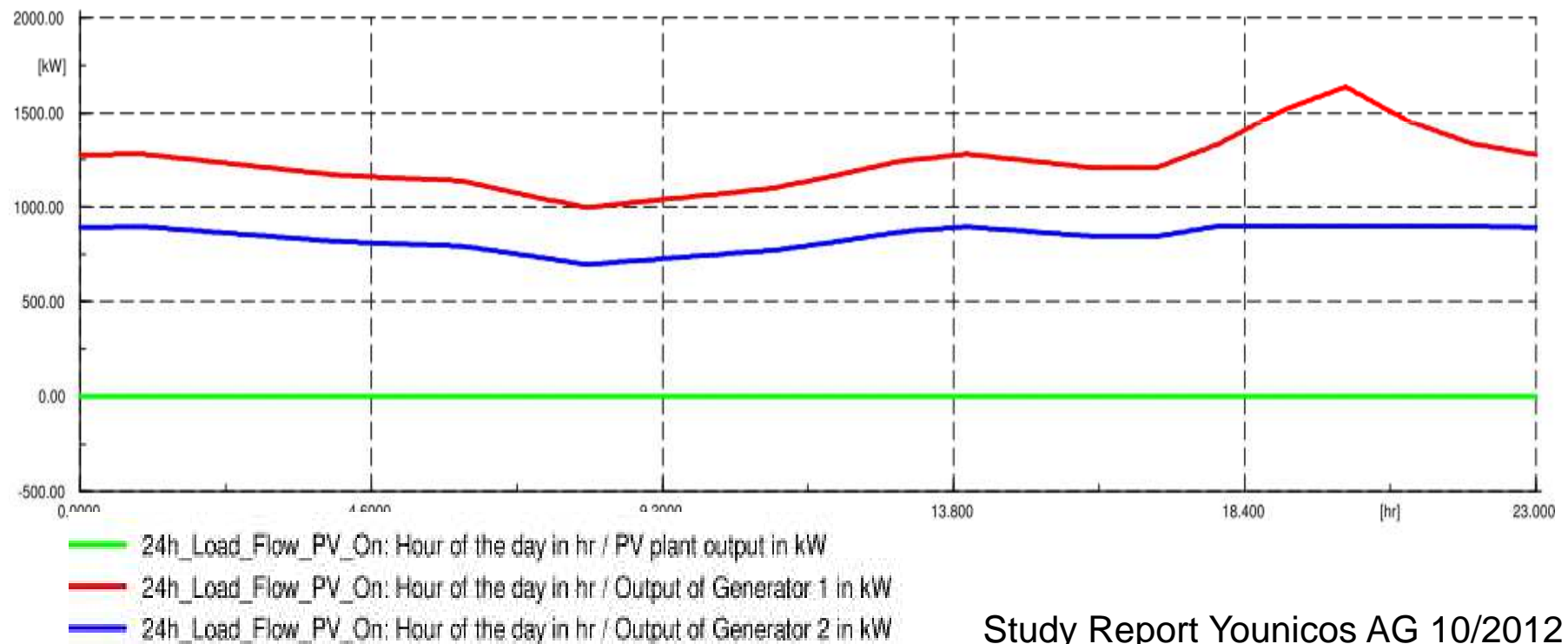
24 Hour Load Profile Fernando de Noronha





Effect of PV Plant on Generator Output

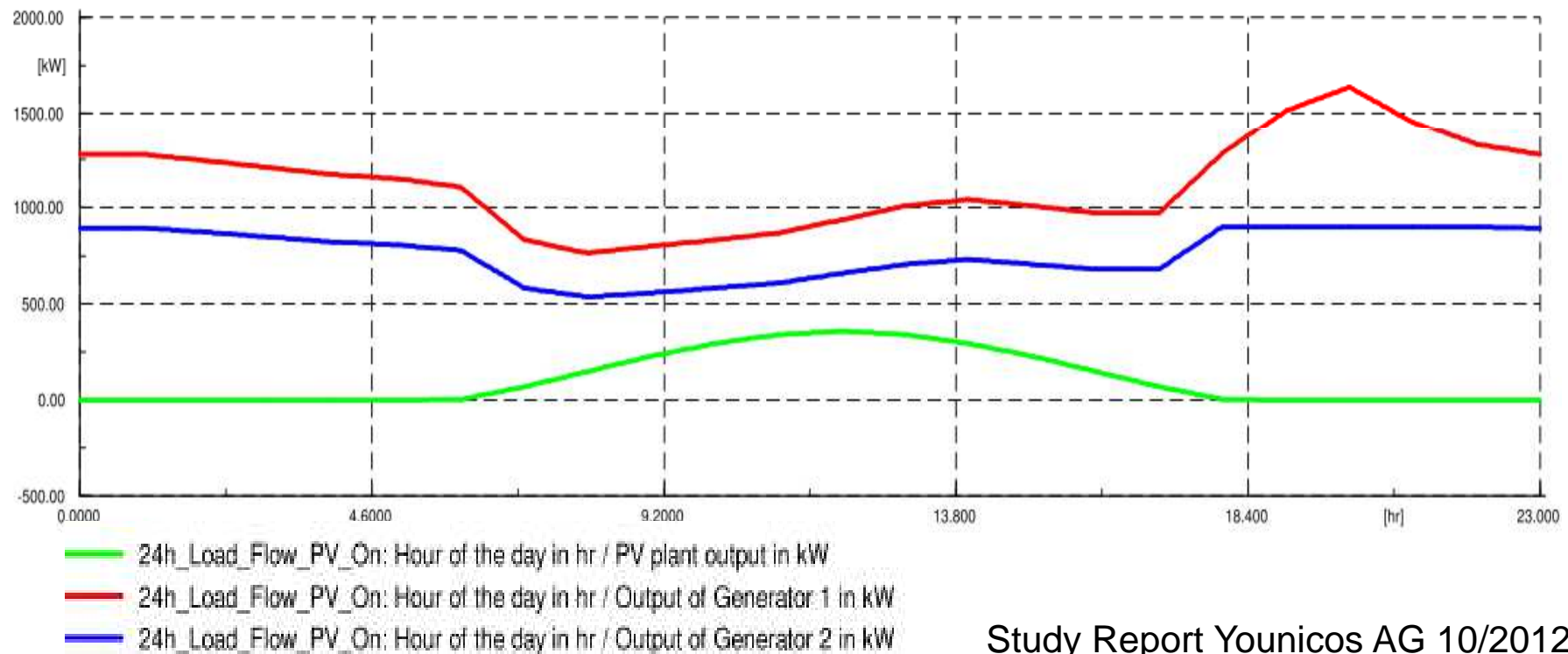
Generator Output (kW) for an average day in November 2013
– PV plant disconnected





Effect of PV Plant on Generator Output

Generator Output (kW) for an average day in November 2013
– PV plant in service

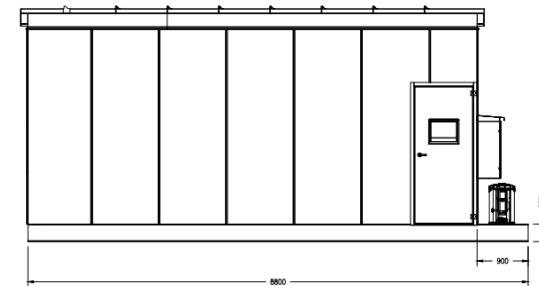
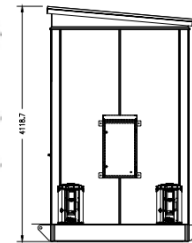
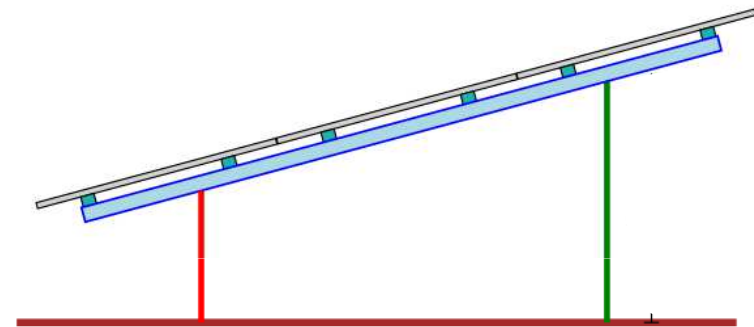
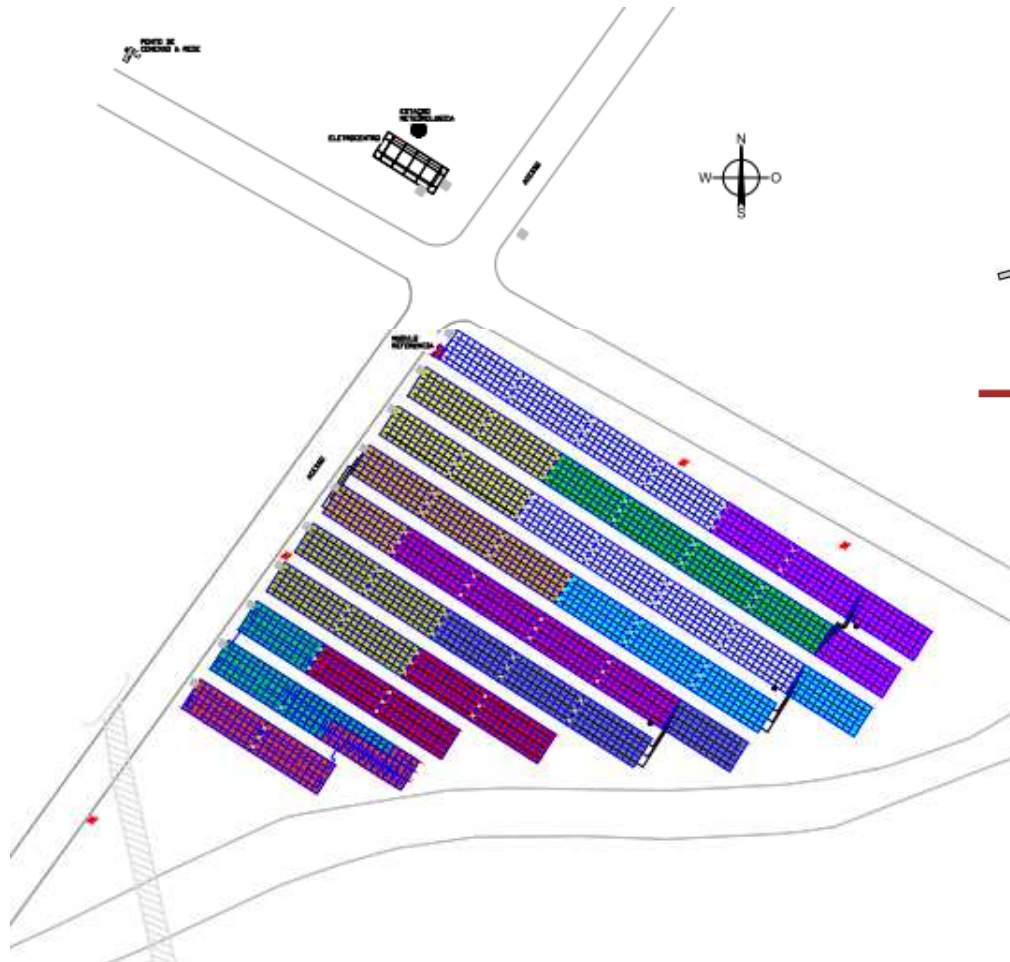


PV Power Plant on Fernando de Noronha

| | |
|--------------|-------------------|
| Power | 402 kWp |
| Project type | EPC |
| Inverters | 13 x Trio-27.6-TL |
| Modules | YL245P |
| Investor | CELPE |
| Construction | Dec 13 – May 14 |



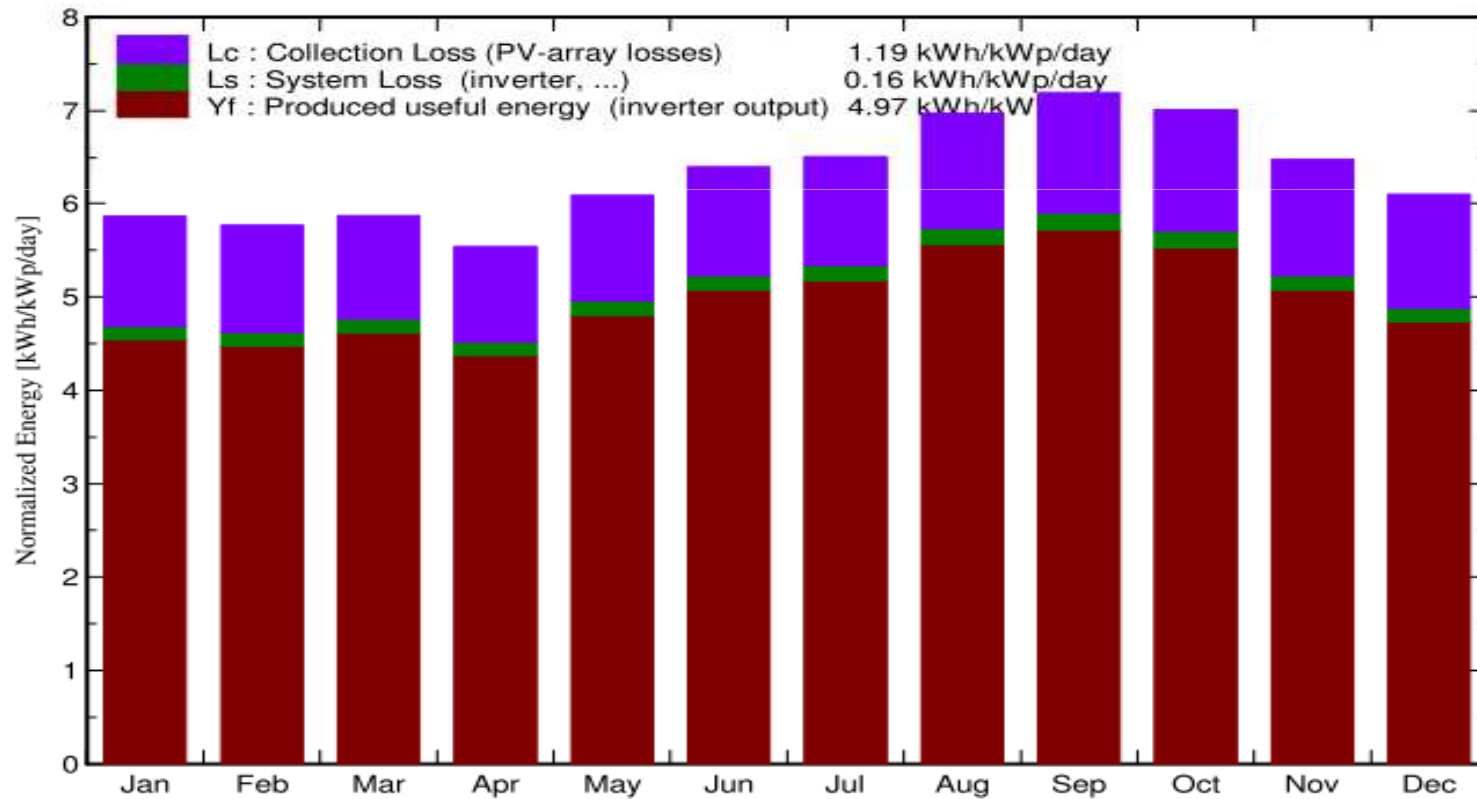
The Concept of the PV Power Plant





PV Syst: Specific Prod. >1.800 kWh/kWp p.a.

Normalized productions (per installed kWp): Nominal power 403 kWp



Bastian Telg
Solar Consultant

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Challenges

- Totally different working culture / problem solving
- Low or no mobile phone / internet connectivity
- Logistics: No priority when unloading ships
- Limited access to resources / tools / materials
- Extended reaction time in case of problems



Lessons learned / Advice

- Understand how things work on the island
- Ensure Know-how-transfer
- Be aware of difficult infrastructure
- Let the equipment arrive in advance
- Be able to make changes / be creative
- Make friends on the island





PV in Brazil – The Opportunities

| Legal Basis | Segment | Situation / Chances |
|----------------------|----------------------------|--|
| ACR-Market | Energy Auctions >30 MWp | -High barriers for participation -Projects are not “ready to build” |
| ACL-Market | IPP / PPAs <30 MWp | -KWh-prices are quite low -Grid usage at a low price |
| Mini- / Microgeração | Net Metering <1 MWp | -Know how is needed -Further tax incentives |
| Luz Para Todos | Off Grid | -1 million people not connected -small and distant installations |



Thank You!

Dipl. Ing. Bastian Telg
solar@telg.de

Content: Wirsol Solar AG
Fotos: Christian Maier

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