

# Solar Hybrid Systems in China



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- What SMA do?
- The German Solar Energy Program of the Sino-German Financial Cooperation
- Overview about the successful realization of PV/Hybrid Systems





# SMA - heart and brain of every solar power system

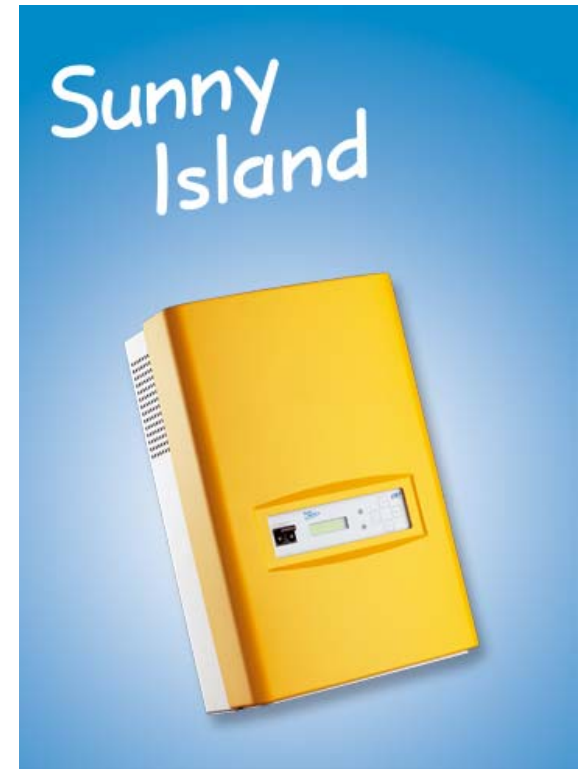


- Founded 1981
- Headquartered in Niestetal, Germany
- Total turnover 200 million EUR
- 1,200 employees
- Worldwide presence:
  - SMA America
  - SMA China
  - SMA France
  - SMA Spain
  - SMA Italia

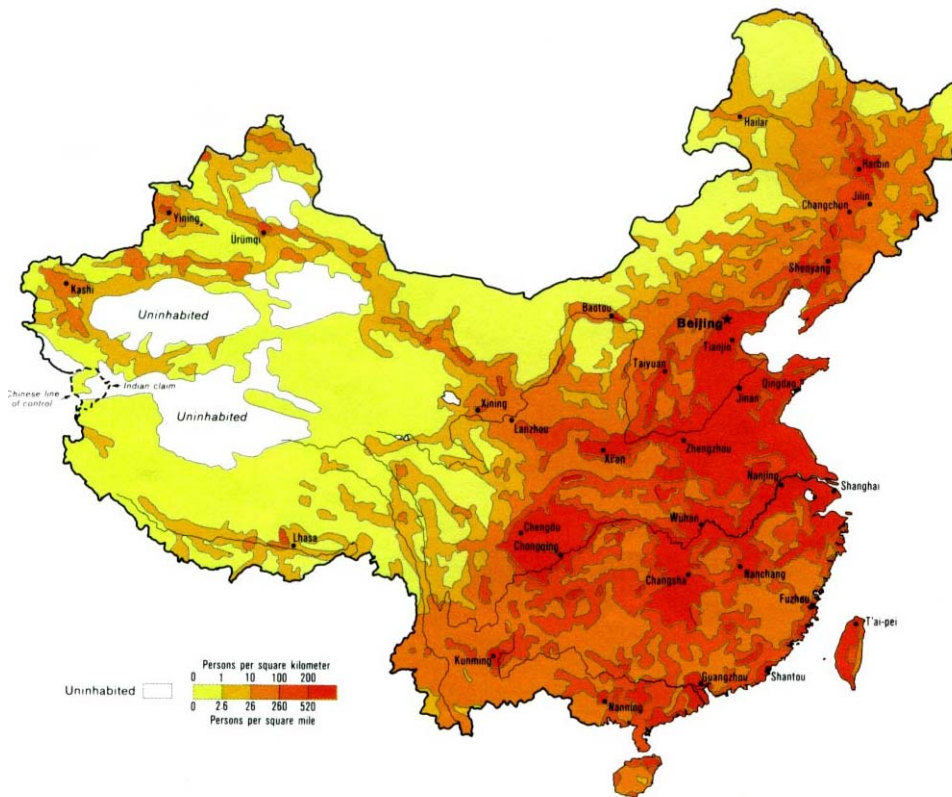


## Grid feeding of photovoltaic plants

## Island grids



# The Sino-German “Solar Energy Program”



Population Distribution in China

- Improvement of quality of live in remote areas of West China provinces (Yunnan, Xinjiang, Qinghai, Gansu)
- Electrification of remote villages by PV/Hybrid Energy Systems
- Use of productive applications
- Ability and willingness of inhabitants to pay electricity tariffs
- Inhabitants contribute to the program by participating in installation and maintenance works
- Sustainable Operation by provincial Service Companies



# Objective of the “Solar Energy Program” in China



Province	Yunnan	Xinjiang	Qinghai	Gansu
Households	1859	2335	3213	847
Villages	52	35	65	26
Total PV Power [kWp]	337	426	450	126





## 1. Financing Agencies

- Germany: KfW (German Bank of Reconstruction)
- China: Ministry of Finance and Provincial Bureaus of Finance

## 2. International Consulting Teams

- Beijing Jikedian RE Development Center
- Project Consult GmbH

## 3. Project Executing Agencies

- Service companies in each Province



# Participants in the Program

## 4. Goods and Services provided by

- System integrator:
  - Shell Solar GmbH and Schott Solar
  - German and Chinese sub-suppliers
- Provincial grid construction companies
- Provincial companies for civil works

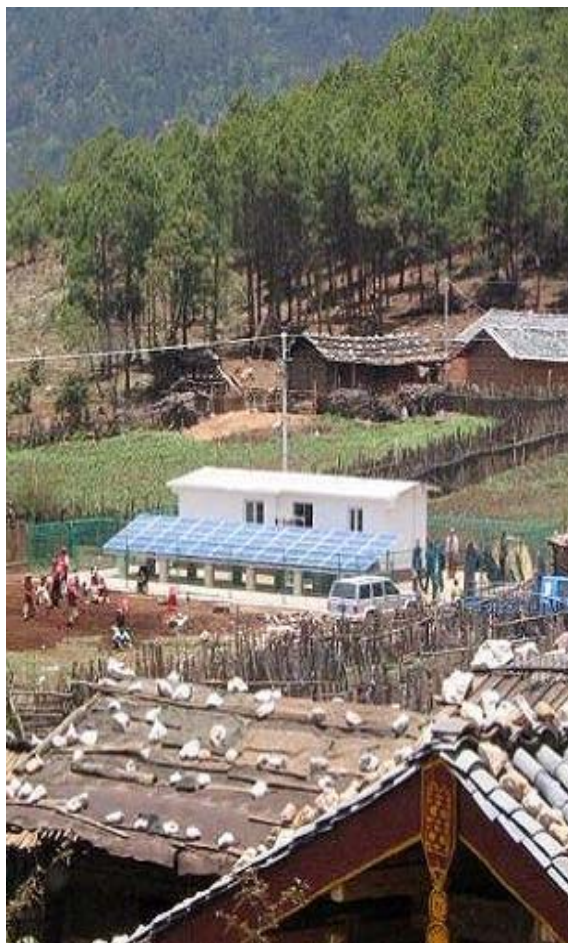
## 5. Local Institutions and Participants

- Prefecture and country governments
- Village committees
- Villagers

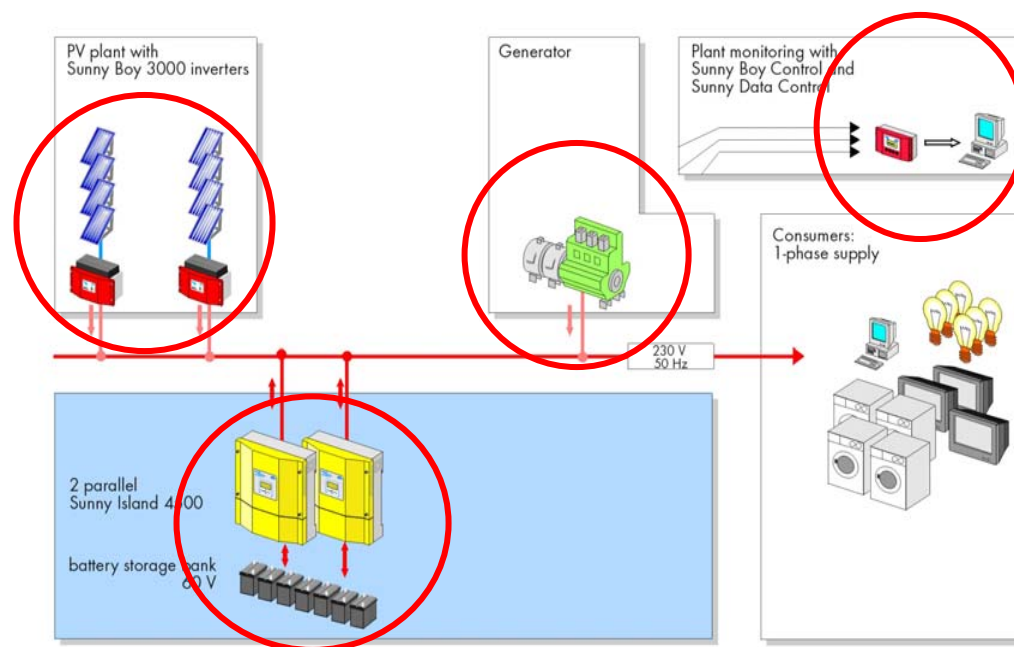




# Technical Realization PV Village electrification systems in China



- Off-Grid Inverter: 9 – 40,5 kW
- Photovoltaic: 4,5 – 18 kWp
- Battery: 72 – 190 kWh
- Generator: 10 – 30 kW



## ■ Classroom training for local installers



Photos: Schott Solar



- On the site training for local installers
- Preparation of documents for technical installation



Photos: SMA Technologie AG





# Reference Installation on site



Photos: Schott Solar





# PV Hybrid System in Yunnan Province



Photos: Gtz bureau China





# PV Hybrid System in Xinjiang Province



# PV Hybrid System in Gansu Province





# PV Hybrid System in Qinghai Province





# Villagers in Xinjiang Province



# Sales of prepaid cards





## Tasks of the Provincial Service Companies

### 1. Continuous support of customers:

- Permanently observing the development of electricity consumption in each village
- Immediate reaction in case of unexpected situation
- Regularly collect fees and adjust tariffs if needed

### 2. Guarantee sufficient income to ensure payment of:

- – Running costs (e.g. staff, infrastructure)
- – Re-investment costs (e.g. battery, electronics)



# Film “Energy supply in remote regions” on DVD

- Sustainable and flexible system concept for the future based on standard useable modular components



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