Modular, decentralized storage system topologies for the rural electrification
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SMA Solar Technology
SMA is a true growth story – more than 60 % p.a. sales increase in last five years

> Founded in 1981
> Sales 2012 EUR 1.5 billion and shares in exports of 56.3 %
> More than 5,000\(^1\) employees
> More than 25 GW of inverter output sold worldwide
> Represented in 21 countries* all over the globe
> Best efficiency worldwide (99 %)

> SMA was again customers’ first choice in 2012

\(^1\) Plus temporary seasonal employees
* plus SMA Railway Technology Brazil
SMA serves all market segments worldwide

All PV applications
- On-grid
- Off-grid
- Backup

All performance ranges
- Residential
  - < 2 kW
- Residential
  - 2 kW to 30 kW
- Commercial
  - 30 kW to 500 kW
- Industrial
  - To > 1 MW

All module types
- Crystalline modules
- Thin film
- Concentrator modules

> Every market segment has different product requirements
Best coverage with more than 1300 sales and service professionals worldwide

> SMA is and will be present locally in all relevant PV-markets
SMA modular, decentralized solutions
Basic principle of battery supply
Off-Grid system with solar power
Off-Grid system with solar power

\[ P_{PV} > P_{Load} \]
Off-Grid system with solar and generator power
Off-Grid system with solar and genset

\[ P_{PV} < P_{Load} \]
Three Phase Off-Grid system with solar and genset power
Three Phase Off-Grid system with solar and genset power

SMA Solar Technology AG
Off-Grid system in 100 kW range
Multi Cluster System up to 36 Sunny Island Power lines connection
Multi Cluster System up to 36 Sunny Island Communication lines connection
In a Multicluster System is all inclusive

> Up to 300 kW

> Integrated circuit breaker for all SI

> Integrated generator contactor!

> Integrated load shedding contactor!

> Integrated main connection for PV

> 5 years warranty

> Single Point of operation – Behaviour as a single Inverter

All communication cable included!
Customized system topologies
Use of more Multiclusters for different Sub-Mini-Grids
Use of different type of Batteries

- Lead Acid Battery
- Lithium Ion Battery
Bad-Grids
Higher PV penetration by AC/DC coupling
Case studies

Picture: Off-Grid Building in Niestetal/Germany „SMA Solar Academy“
Isle of Eigg / Scotland

This system integrates multiple renewable power sources

> Hydro (110 kW)
> Wind (24 kW)
> Solar (32 kWp)

- Distributed, medium voltage grid
- Modular AC coupled system
Schematic for Isle of Eigg
One of the World's largest modular off-grid solar system in Mozambique

159 Battery Inverters (Sunny Island)
120 PV Inverters (Sunny Mini Central)

Source: SMA Blog
Bamyan Renewable Energy Programme in Afghanistan

50 PV Inverters / 1MWp (Sunny Tripower)
114 Battery Inverters (Sunny Island)
750 kVA Genset

Source: SMA Blog
Tokelau – The first country with 100% renewable Energy

Source: SMA Blog
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