



# A holistic implementation strategy for storage systems in renewable mini grids

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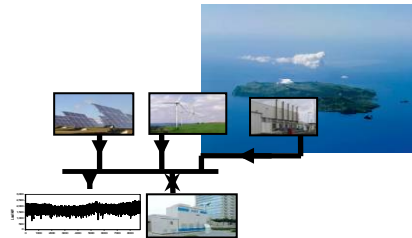
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# Company Profile - Autarsys

Expertise in storage technologies and the integration of renewable energies into isolated grids.

- Newly found company based in Berlin
- long experience through the work at Younicos AG
  - Working with NaS, Vanadium Redox Flow and Lithium Ion batteries.

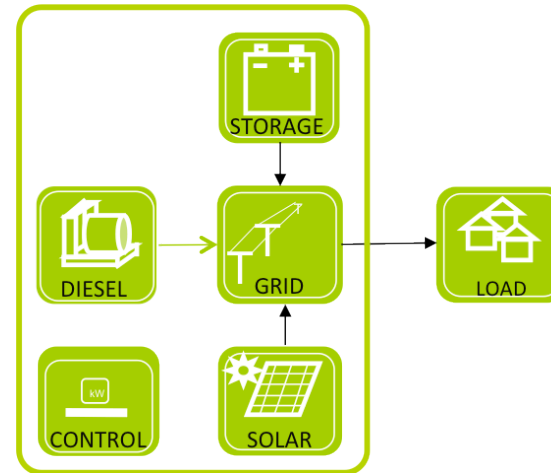


- Focusing on lithium ion-based ESS for mini-grids in the range 100-1000kW
- Project accompanying services

# ESS and its Roll in Mini-Grids

Energy Storage System:

- + DC-Batteries
- + Battery Management System
- + Inverter
- + SCADA
- + Housing



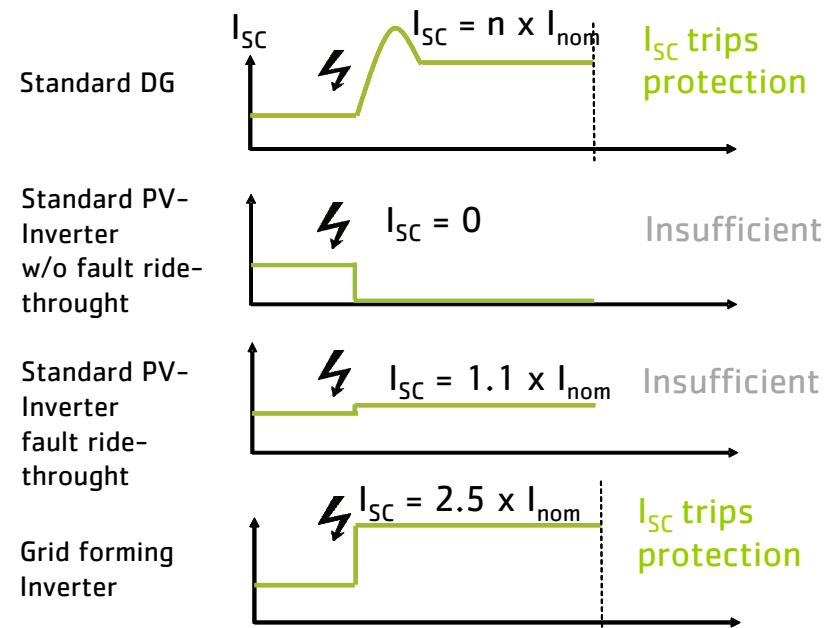
1. Energy shifting:

Short term: to compensate fluctuations

Medium Term: e.g. day-night shift

2. Provision of short-circuit power

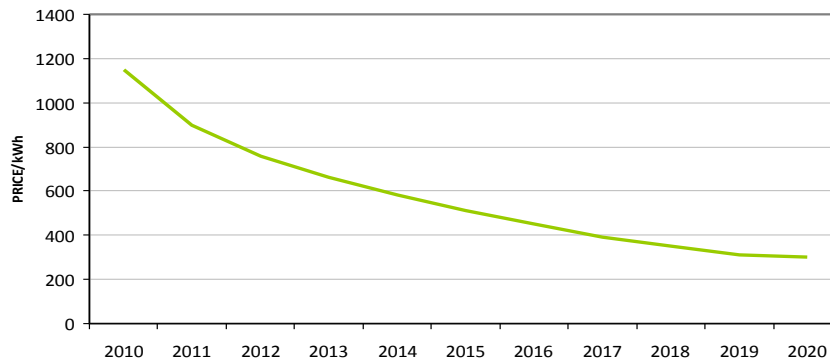
3. Controlling the frequency to keep the balance – droop control.





# Advantage of Lithium Ion Batteries

- High energy density up to 200Wh/g
- Much better lifetime due to longer cycle life (3000-7000 Cycles @ 100% DoD)
- Better efficiency (>97%)
- Early stage of development – high cost reduction potential
- Less maintenance
- Environmental friendly due to no/less heavy metals



Source: Roland Berger, Supplier Information

Price will drop to 250€/kWh within 7 years



# Our approach:

## Partner Company

Experience in project development or as EPC for grid connected RE-projects

- + Knowledge of local conditions
- + Interest in going "off-grid"

## Autarsys

Provides modular ESS, which can be adopted to the needs of the project

- + expertise on storage system and isolated grids
- + simulation studies
- + off-grid specific consultancy services



Successfully joint project implementation



# Energy Storage System



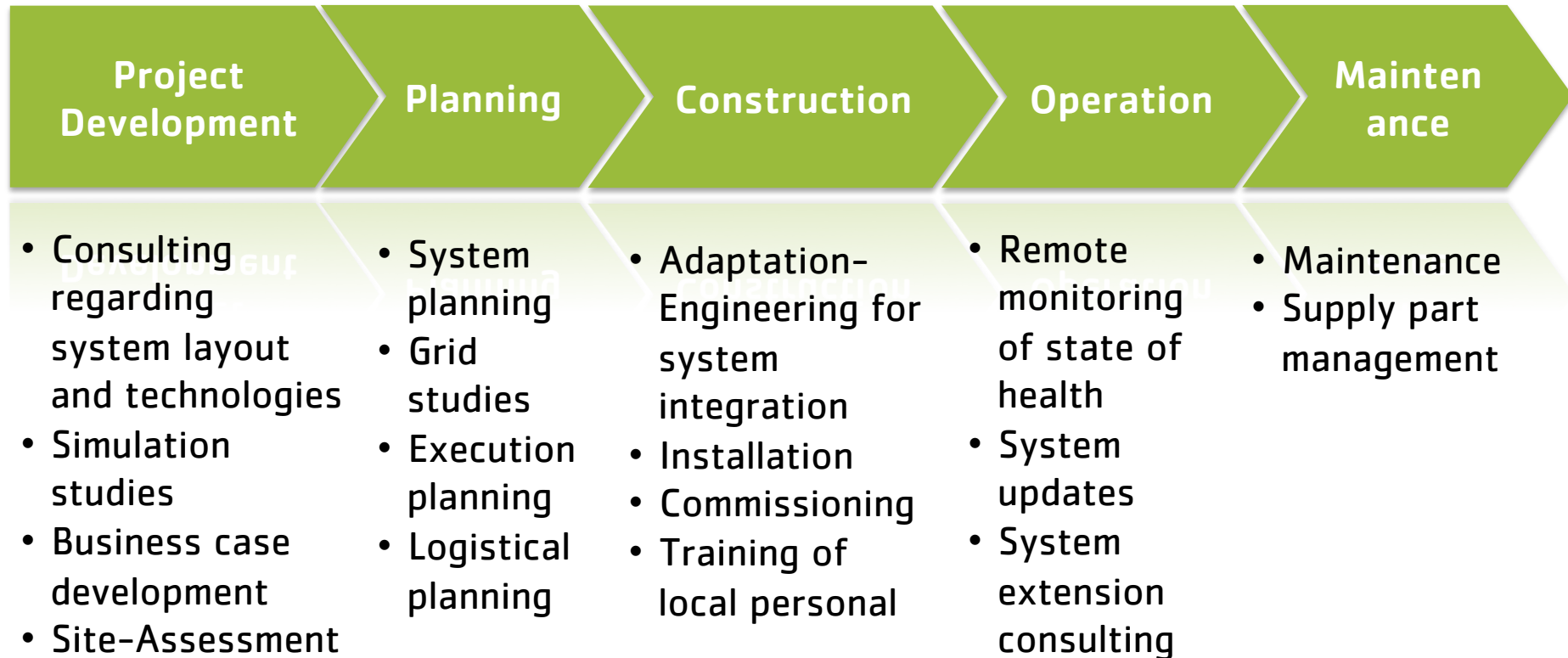
## Technical Properties

AC-Power	100 kW+ (scalable in 100 kW) up to 1MW
AC-Capacity	54kWh (scalable in 54kWh), C-Rate of 1.5
Efficiency:	Inverter: >97%, Battery: > 97%
Battery type	Lithium Manganese spinal; 4000 cycle @ 80% DoD
Performance Guaranty	15 years, backed by known battery supplier
Optional integrated	PV-Inverter; Switch-gear, trafos

## Features:

- „Plug `n play“ installation
- Power + energy scalable according to project requirements
- Hermetical sealed
- Connection + operation from the outside
- Remote monitoring
- A/C system + insulation to increase lifetime

# Our Service



autarsys



**Thank you for your attention....**

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