Sustainable Hybrid Energy Solutions for Sri Lanka

nrg4.you GmbH, 26th March 2019
Company Structure

Holdings

Ing. el.tech. Mag.rer.nat. Wolfgang Schmittner
CEO

Landstraeg GmbH

Subsidiary
Expert Company

Wind Energy
System Partners

Sonnertraeg
Solar Energy
System Partners

Speichertraeg
Energy Storage
System Partners

System Integration
Landertraeg subsidiary in cooperation with System integration partners

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Photovoltaic

>1 GWp

fixed ground mounted

Rooftop

Single-Axis &

Dual-Axis

Tracking Systems
References in Cooperation with System Partners

Design 2019
Solar Energy Storage
Durchführer
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Solar Solutions
Sustainable Hybrid Wind Solar Energy Storage System
# System Specifications

## Wind Turbine
- Tabular steel tower 60m | 80m | 101m
- Lattice tower 130m
- Pitch system
  - integrated power supply
  - adaptive charging supercaps
  - high dynamic single blade pitch control
- Generator
  - synchronous generator
  - electrical excitation, auxiliary field generated
- Rotor blades
  - 40m
  - hybrid build GRP (CRP)
- Gear
  - planetary- and spur gearing
  - gear ratio: approx. 1:96
- Converter
  - only one converter for the complete turbine and the battery system
  - rated apparent power: Sn=2,300kVA
  - active power range: 0.88 inductive–0.88 capacitive

## PV & PV Tracking
- Highest efficiency, active single / double axis, intelligent tracking system
- Enables the optimal utilization of all the irradiation energy
- Yield increases of approx. 30% compared to standard applications
- Robust durable technology
- Monitoring and real tracking with maximum light detection technology
- Snow sensor for cleaning
- Storm sensors for horizontal security position
- Lowest service expenditure and maintenance free rotary drive
- Hot-dip galvanized steel / alloy substructure, 20 years warranty against corrosion
- Global references
- Complex Condition Monitoring and SCADA System
- Power Control Unit
- Photovoltaic modules glass-glass monocrystalline with 30 years linear power warranty (87% of peak power)
- Made in Germany

## Energy Storage
- Lithium-ion battery technology with cells from the industry leader
- Battery Management System and turnkey Solution designed and produced in Germany
- 200 kWh up to 5 MWh each System, with the highest energy density on the market
- Modular technology, maintenance free
- Fastest system respond time
- Warranty >8000 cycles
- Grid supporting features
- Island grid operation and Uninterruptible Power Supply UPS functions
- Different operation modes with intelligent Energy Management: Industry electricity bill saving, self-consumption, emergency power back-up, peak-shifting, frequency regulation, renewable integration, etc.
- Integrated in the bottom of the tower or in a separated operation building
- Alternative Energy Storage Solutions e.g. Redox-flow-battery
- Proven technology, >2 GWh installed

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Made in Germany

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**Selected References**

- Pfinztal in Germany: 2 MW wind turbine with 82 m rotor diameter combined with the largest Battery in Germany (20 MWh)

- Article in the regional Television (Baden-Württemberg, Germany): [https://www.swr.de/odysso/die-megabatterien-der-zukunft/-/id=1046894/did=18982566/nid=1046894/1gd746x/index.html](https://www.swr.de/odysso/die-megabatterien-der-zukunft/-/id=1046894/did=18982566/nid=1046894/1gd746x/index.html)


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<thead>
<tr>
<th>Wind Turbine</th>
<th>PV &amp; PV Tracking</th>
<th>Energy Storage</th>
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<tbody>
<tr>
<td>in 31 countries</td>
<td>in 64 countries</td>
<td>&gt;50 countries</td>
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<tr>
<td>&gt;1 GWp in operation</td>
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<td>local partner</td>
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<td>one of the most proven type</td>
<td>World’s market and technology leader</td>
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- Installations
- Installed power
- Service & Maintenance
- Details
- Position of the System Partner
- >1 GWp in operation
- local partner
- Project list available
- one of the most proven type
- World’s market and technology leader
Selected References Wind Turbine

>1 GW of same turbine type already in operation
most of them only with different full power converter

Wind Turbine
2 MW

Energy Storage System
20 MWh
Energy Storage System

>1 GWh

classic scale

in cooperation with system partners

in operation e.g. Germany:
Thank you!

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