InterSolar 2012

“Diesel – PV Hybrid Systems without Batteries Targeting Telecom and Village Power Supply”

Saves up to 30 % on CAPEX

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Managing Director

www.elgrispower.com
Agenda

- Introduction elgris power
- Product range
- Telecom solutions
- Village electrification
- Questions

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elgris power

- Since 2004 working with power generating
- Classic power generating with a Diesel generator
- Hybrid battery chargers for Deutsche Bahn, Siemens, Voith Turbo and MTU
- Hybrid battery chargers build based on a fuel cell
- Specializing in Hybrid power solutions with a generator and a renewable energy source
elgris power is a system integrator

Solar power – Batteries – Diesel generator – Control System – Remote monitoring

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World-Wide Partner Alliances
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Products

- Complete design and build of a hybrid power solutions based on Photovoltaic, Wind generator and a Diesel generator.
- Upgrade von existing Diesel generators with Photovoltaic / Battery into a hybrid System
- (Control) electronics for Hybrid Systems
- Custom electronic design
- 24 Vdc and 48 Vdc generator sets with canopy and remote control functionality

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Remote Generator solutions RM 320

Features:

- Diesel start / stop
- Power / Fuel monitoring
- Extensive & Complex alarm capabilities
- Blackberry, iPhone and iPad support
- SLA & Historical Data reporting
- Remote site access
Hybrid system controller SPC-1000

Features:

- Diesel start / stop
- Monitoring of Solar array current / voltage / power
- Monitoring of Battery current / voltage / capacity
- Status input
- Data logging
- Remote access

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Hybrid generator controller LX-449.solar

Enables direct interface between PV – Diesel without battery

Features:

- Prime-mover start / stop
- Monitoring of Solar array current / voltage / power
- Monitoring of Battery current / voltage / capacity
- Special software to enable the advantage generator and PV control algorithm. This algorithm enables the generator to work in parallel with an PV generator without the need for batteries and an extra inverter

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Diesel – PV solutions from elgris power
100 kWp Diesel – PV solutions from elgris

<table>
<thead>
<tr>
<th></th>
<th>Classic Layout</th>
<th>elgris power layout</th>
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<tbody>
<tr>
<td>Batteries</td>
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Save up to 30 % on CAPEX !
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Telecom solutions
“Classic” system layout

- Diesel generator running 24/7
- Backup generator needed (Telecom)
- Fuel cost
- Fuel logistic cost
- Maintenance cost

Generator 1
Generator 2
Public Grid
Rectifier → Battery → Inverter → Load

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Solar insulation

Need for a battery

- Power requirement
- Solar output

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Solar power disadvantages

- Solar insulation is not constant throughout the day
- Battery needed for storage

- Diesel Generator is only as backup foreseen
- Reduced fuel consumption (5 %)
- Lower operational costs
- “Green Energy”
“elgris Hybrid” system layout

- Simplified layout, lower investment (up to > 20%)
- ROI + 25 %
- Battery bank installed
- Generator running 60%
- Reduced fuel / operational cost
- Less maintenance cost

Diagram:
- Generator
- Solar
- Battery
- Inverter
- DC load
- AC load

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Village power solutions
Village electrification

Power generating based on a classic Diesel generator.

Disadvantages:

- Generator always running
- Generator off, no power
- High Fuel / operational cost
- High maintenance cost
- No synergy effects
Synergy effects

An average family in a rural area has a power system of 200 W. From this 200 W, most of the time only <150 W is used. This is an over dimensioning of ~ 35%.

By using 1 power system the power not needed is shared and the total power requirement is up to 30% lower in practice.

This synergy effect significantly lowers the total price per kWh for a village electrification project in rural or off-grid areas.
Hybrid Village electrification

- Solar 95%
- Generator 5%
- Battery
- Family 1
- Family 2
- ...
- Family n

Power generating based on a hybrid system.

Advantages:
- 95% of the power is produced by solar
- Reduced fuel consumption
- High synergy effects; only the average power needs to be produced.
Factsheet

- **elgris power** is a system integrator specializing in hybrid power systems with a Generator.

- Remote control and measurements for hybrid systems, web-based and also for large number of sites > 100

- Focus on Telecom and Village electrification

we think global, but we are local

www.elgrispower.com
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