KEY FEATURES

» Unique hybrid technology, compatible with solar power, genset, wind power
» Radical reduction in wireless infrastructure OPEX
» Increase in site reliability
» Innovative modular architecture for high availability (redundancy) and reduced maintenance
» Single controller for management of all aspects of energy generation and storage, as well as load management
» Rapid return on investment
» Flexibility to meet evolving network needs

APPLICATIONS

Off-grid and intermittent grid Wireless sites
As Communications Service Providers continue to expand their network coverage into rural and remote areas lacking access to reliable electrical grid power, our ecoPx hybrid solutions are there to provide the reliable power you need, without the need for frequent fuel delivery or service visits.

Broadband and Fixed line
It’s not just remote wireless sites which can benefit from ecoPx. ecoPx solutions can equally be applied to fixed line and grid-connected applications to help reduce the soaring cost of energy which arises from powering today’s ‘always on’ world.

The Smart Grid
With our off-grid and grid-connected hybrid solutions, optimized cost of ownership, network design/build and sophisticated data acquisition expertise, you’re ready for the migration to distributed generation and smart grid energy for your telecom network.

TURN TO A TELECOM POWER EXPERT FOR A RELIABLE SOLUTION

Environmentally-sound power solutions, combining renewable energy sources with back-up batteries, enable Communications Service Providers to lower costs by reducing reliance on diesel generators. The ecoPx solution manages network site power from end-to-end: from energy generation to energy storage, load surveillance and remotemanagement. ecoPx offers unmatched OPEX, security and reliability benefits.

AEG POWER SOLUTIONS
TECHNICAL HIGHLIGHTS

AEG PS’ eco\textsuperscript{px} hybrid power solution delivers a world of benefits for your network:

- Use any combination of diesel, solar and wind power sources
- A single controller (ACMi1000e) manages the power solution end-to-end, seamlessly selecting the appropriate source for best OPEX
- Photo-voltaic arrays: MPPT-enabled solar converters (PVi1600HD) maximize solar energy production and protect your PV investment
- Generator: Intelligent management reduces fuel consumption by 50% or more in generator/battery hybrid configurations by operating the generator for short periods at optimum load to charge the batteries. The results include reduced fuel consumption, less frequent servicing and prolonged generator lifetime - all of which help further reduce OPEX
- Wind turbine: operating with winds from a ‘whisper’ to stormforce without shutting down, and with class leading energy yield to reduce OPEX
- Grid connected (mains): as a primary source or as back-up
- Batteries: charge rate optimized according to discharge history to maintain the battery in peak condition and prolong its life by up to 25%. Battery chemistry/technology agnostic
- Flexibility: the systems designed to be upgradable to meet future expansion.

INTEGRATED TECHNOLOGY

AEG PS’ eco\textsuperscript{px} solution has been developed with the benefit of more than six decades of telecom expertise:

- First fully integrated true hybrid system
- Flexible, modular solution architecture
- State-of-the-art, high efficiency, power conversion technology
- High temperature rated components to avoid the need for special cooling
- Single, powerful controller to simplify the system
- Software-implemented algorithms for flexibility and future needs
- Advanced control command logic and system functionalities
- Complete data management and data logging
- Complete remote communication options

INTEGRATED TECHNOLOGY

AEG PS’ solutions are specifically designed for use in hybrid telecom systems – in autonomous, remote off-grid systems and grid-connected configurations. Our specialists will optimize the sizing of each power source to provide the best balance of system (BOS) equipment for each site. AEG PS offer a complete solution for all your needs; consulting, system design, products, installation and maintenance.
### Power Output

<table>
<thead>
<tr>
<th>Maximum configuration</th>
<th>eco\textsuperscript{px} 4801</th>
<th>eco\textsuperscript{px} 1122</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 x PVi1600HD converters</td>
<td>8 x PVi1600HD converters</td>
<td></td>
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</tbody>
</table>

| Maximum Power (N+1) | 4800W | 11200W |

### Photo-Voltaic Mode

#### Input Specification
- **Nominal voltage**: 255 VDC
- **Voltage Range**: Full power between 230 to 420 VDC / 170 to 420 VDC with power derating
- **Maximum input current**: 8A per PV string

#### Output Specification
- **Nominal voltage**: 48 VDC
- **Voltage Range**: 42 to 57 VDC
- **Full power (N+1)**: 4800W / 11200W
- **Maximum output current**: 90A / 210A
- **Efficiency**: 93% typical at 50% load

### Generator Mode

#### Input Specification
- **Nominal voltage**: 230 VAC
- **Voltage Range**: Full power between 207 to 253 VAC / 180 to 280 VAC with power de-rating
- **Frequency**: 45 to 66Hz
- **Power factor**: 0.99 typical from 50% load

#### Output Specification
- **Nominal voltage**: 48 VDC
- **Voltage Range**: 42 to 57 VDC
- **Full power (N+1)**: 4800W / 11200W
- **Maximum output current**: 90A / 210A
- **Efficiency**: 91% typical

### Protection

- **PV string surge protection device type II**: YES
- **AC input surge protection device type II**: YES
- **Number of DC input PV string insulation switches**: 4 / 8
- **AC input protection MCB**: YES
- **Input voltage protection**: PVi 1600HD module - shutdown, in PV mode, with automatic restart when voltage is within operating range
- **Soft start**: YES
- **Output power & current limiting**: YES
- **Input voltage protection**: PVi 1600HD module - programmable protection with automatic re-start, latched after the second fault
- **Hot pluggable converters**: YES
- **Thermal protection**: Automatic power de-rating and excessive temperature shutdown, with pre-shutdown alarm
- **Battery deep discharge protection**: YES

### System Management

- **Controller**: ACM1000e
- **Real time clock**: YES
- **Hybrid power source management**: YES
- **Genset operation optimisation**: YES
- **Control & monitoring of converters**: Via CAN Bus
- **Battery Management**: Advanced battery management algorithm, charging modes, temperature compensation, battery tests, current limitation and deep discharge protection.
- **Load management**: YES
- **Alarm detection and management**: YES
**ecopx** 4801
<table>
<thead>
<tr>
<th></th>
<th>eco™ 1122</th>
</tr>
</thead>
</table>

**COMMUNICATION**

<table>
<thead>
<tr>
<th>Local interface</th>
<th>Back-lit, graphical LCD and joystick, USB connector and two LED's (Power and Fault)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Remote communication</td>
<td>4 off volt-free relay contacts, GSM modem (optional) and TCP/IP and SNMP server (optional)</td>
</tr>
<tr>
<td>Communications protocol</td>
<td>AEG PS proprietary protocol on RS232, ModBus, Modern Management with auto-dial feature, TCP/IP connectivity (with NCS options): SNMP/Web/Telnet</td>
</tr>
</tbody>
</table>

**MECHANICAL**

| Outdoor cabinet dimensions (H x W x D) | 1600mm x 800mm x 800mm |
| Indoor cabinet dimensions (H x W x D) | 1700mm x 600mm x 600mm |

<table>
<thead>
<tr>
<th>Available space for other equipment</th>
<th>8U of free space for additional equipment (Telecom Equipment, Inverters, etc) Details on request</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indoor cabinet - IP20, Outdoor cabinet - IP55</td>
<td></td>
</tr>
</tbody>
</table>

**ENVIRONMENTAL**

| IP Rating | Indoor cabinet - IP20, Outdoor cabinet - IP55 |
| Cooling | Forced air, front to back with automatic speed control |
| Operating Temperature | -20°C to +70°C |
| Storage Temperature | -50°C to +85°C |
| Humidity | 5% to 95% Non-condensing |
| RoHS | 2002/95/EC |
| Altitude | up to 2500m without de-rating |

**REGULATORY STANDARDS**

| Safety | International - EN60950-1, North America - UL/CSA 60950-1 pending |
| Safety Approvals | CE (UL/CSA pending) |
| Electro-Magnetic Compatibility (EMC) | ENS50022, Class B |
| Emissions, Conducted | ENS50022, Class B |
| Emissions, Radiated | ENS50022, Class B |

For further information please refer to:
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