The Challenge

off-grid and on-grid

For telecom operators and tower companies, fuel, generator and maintenance costs are often the major operational expenses for access sites. Minimizing these costs while improving network reliability will help you balance falling ARPU, attracting additional tenants (if applicable), and ensuring sufficient capital is available to keep your network one step ahead of your competition.

The Path to a Reliable Network, Rapidly Deployed with minimized fuel and power conditioning costs

Rapidly deployed and operationally efficient is achievable in off- and on-grid environments. But first we ask — what is your desired balance between capital cost and operational efficiency?

It is easy to think of a hybrid energy solution as one-size-fits-all. But if you do, you may end up with a solution designed for someone else. Emerson Network Power’s team of solutions experts listens to our operator partner’s unique needs and engineers the solution that achieves the capital/operational balance desired.

What matters most to you? Up-front capital cost? We focus on providing the most essential hybrid solution at a very competitive price. Minimizing fuel consumption? We tune your solution to ensure fuel savings is first. Protecting from surges or dirty mains/grid power? We include technologies to protect your equipment and maximize mains/grid energy use. Achieving the best ROI? We leverage smart hybrid technologies to ensure that even after installed, a site continues to improve, watching for trends and managing energy and maintenance as operating conditions change.

Whether these, power conditioning, multi-tenant support, or other factors lead your list of concerns, Emerson Network Power Hybrid Energy Solutions can help you rapidly deploy sites and achieve your operational goals.

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<tr>
<th>Challenges</th>
<th>Consequences</th>
<th>Opportunities</th>
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<tr>
<td><strong>Fuel expense is high due to:</strong></td>
<td>High operating cost</td>
<td>Strategically blend power from batteries, solar, grid/mains and other sources to achieve lowest possible energy cost</td>
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<td>n Frequent generator operation</td>
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<td>Actively manage sites to ensure proper battery health, optimal generator maintenance, clean solar panels, and tracked fuel quality and level</td>
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<td>n Theft and quality/dilution</td>
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<td>n Site accessibility</td>
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<td><strong>Deployment speed slowed by:</strong></td>
<td>Consumers choose competing carriers</td>
<td>Ensure site readiness by selecting a single coordinator for all site passive infrastructure and installation</td>
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<tr>
<td>n Passive infrastructure not in place</td>
<td>Carriers choose competing tower company</td>
<td>Tension supply chain through joint schedule and customs management</td>
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<td>n Complex supply chains</td>
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<td>n Availability of installation experts</td>
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<td><strong>Operation and maintenance costs impacted by:</strong></td>
<td>Reduced profitability</td>
<td>Engineer the hybrid site solution for the desired balance between capital and operational cost</td>
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<td>n Improper hybrid dimensioning</td>
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<td>Leverage smart hybrid technologies to minimize maintenance dispatch and achieve maximum ROI, even as operating conditions change</td>
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<td>n Lack of site visibility post-installation</td>
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<td>n Calendar-based maintenance dispatch</td>
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<td><strong>Site reliability impacted by:</strong></td>
<td>Lost revenue</td>
<td>Validate vendor focus on the technologies and skills associated with deploying and operating energy and passive infrastructure</td>
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<tr>
<td>n Improper hybrid dimensioning</td>
<td>Duplicate capital or operating expense to bring site back up</td>
<td>Keep vendor engaged in site performance post-deployment</td>
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<td>n Strong focus on active infrastructure leaves passive infrastructure unchecked</td>
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High-efficiency eSure™ Rectifiers
Reduce OpEx and CO₂ Emissions

eSure™ high-efficiency rectifiers offer superior performance and uncompromised reliability. An industry-leading 97% efficiency with a wide temperature operating range ensures that your solution will offer the best energy and fuel efficiency available in diverse operating environments. Paired together, DSP-enabled active load sharing, redundancy and hot-swappable capabilities ensure safe power is available and the network reliable.

Solar Converters (S48-3000)
Maximize Solar Efficiency

With >98% conversion efficiency, the S48-3000 is the leading solar converter in the industry. Operating in maximum power point tracking (MPPT) mode, this converter leverages DSP technology in a modular, hot-pluggable form factor to ensure high site reliability and energy use from solar sources.
With Emerson Network Power, you can achieve greater operational efficiency and rapid deployment while increasing your network’s reliability.

Emerson Network Power Smart Hybrid Ecosystem

**NetPerform™ Services**
*Reduce Operating Cost*

> Speed your network deployment through single point of contact coordination of installation. Emerson Network Power’s NetPerform™ Services team takes(824,545),(990,717) a holistic approach to the health of your network to ensure that every facet of your infrastructure is rapidly deployed and operating at maximum efficiency. By leveraging in-depth knowledge of DC power plants, batteries, generators, HVAC, UPS systems, alternative and other energy sources, we pay attention to the entire system and help keep your network reliable in even the most remote or challenging environments.

**ENEC™ Monitoring Systems**
*Reduce Operating Cost*

> ENEC™ Monitoring Systems offer customers a totally computerized supervision and control system managed and monitored 24x7 by a team of remote services infrastructure experts. By gathering and analyzing customer site performance and alarm data, we help customers increase network reliability and benefit from a continuous cycle of improvement in operational costs across the network.

**ACU+ Controllers**
*Improve Reliability, Minimize Operating Cost*

> The ACU+ for NetSure™ DC power systems enables enhanced site operation and advanced hybrid operating algorithms that balance AC mains, DC power plant, battery operation, diesel generator, site environment, and numerous other inputs. In addition, it stores a wealth of operational metrics including fuel monitoring, battery diagnostics, and more. Remote monitoring capabilities and alarms enhance network reliability well beyond solution installation by allowing for continuous improvement in energy efficiency and optimization of maintenance cycles.

**NetXtend™ Duo Enclosures**
*Optimize Site Capacity*

> NetXtend™ Duo Series of integrated enclosures are designed with dual compartment climate zones for use at wireless network access sites, backbone sites, and hub sites. These enclosures are designed with a compact footprint especially for hybrid energy solutions with mains, diesel generator, battery, renewable energy such as solar, DC power equipment, and customer equipment.

**Battery Backup Solutions**
*Maximize Site Reliability*

> Providing cost-efficient energy storage where high and deep cycle performance is required, Emerson Network Power has a full suite of available products to fit your site applications. VRLA and other technologies can be selected depending upon site conditions, to minimize operational costs and maximize site reliability.

**Additional Portfolio Offerings**

- ATS for DG/Mains and other interconnections
- Junction boxes for solar interconnections
Hybrid Diesel Solution
Emerson Network Power manages your diesel generator operation to ensure it runs with the best fuel efficiency.

High Cyclic Battery Solution
High cyclic, valve regulated lead-acid batteries achieve thousands of cycles.

Emerson Network Power’s rapidly deployed Hybrid Energy Solutions unite the industry’s best multiple energy source management technology with innovative active remote infrastructure management technology. We rapidly deploy your solution and ensure that your network runs at the best operational cost — less fuel, fewer visits, faster response — and remains as reliable as your customers demand.

Globally, no location is too dense or too remote. With Emerson, Consider it Solved.”