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Lowering OPEX with Hybrid Solar

Nov 2013

GSMA

Mobile Energy Efficiency
Technology Partner

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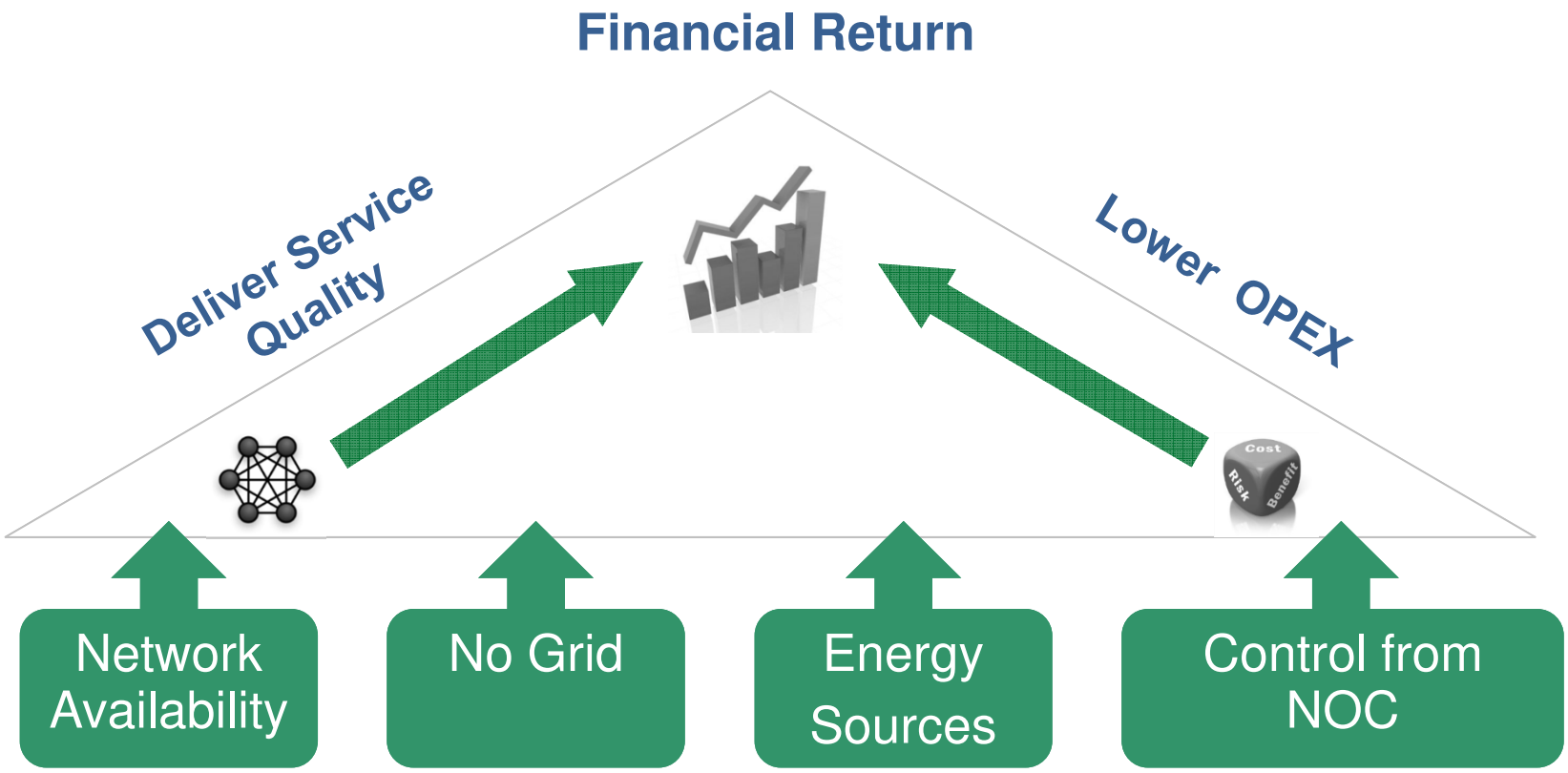
AGENDA

- PowerOasis Overview
- Best Practice in Hybrid & Hybrid Solar
- What is Possible with Successful Deployments
- Getting the Right Technology & Product Roadmap
- Conclusion

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Solving Energy Challenge Makes a Difference



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Intelligent Power Systems

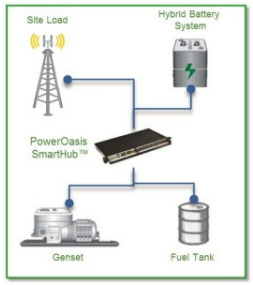


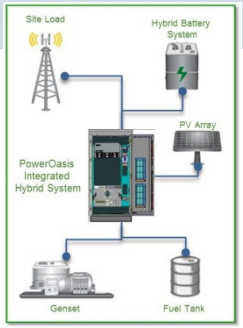
No Grid

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PowerOasis Leadership in Telecom Solutions



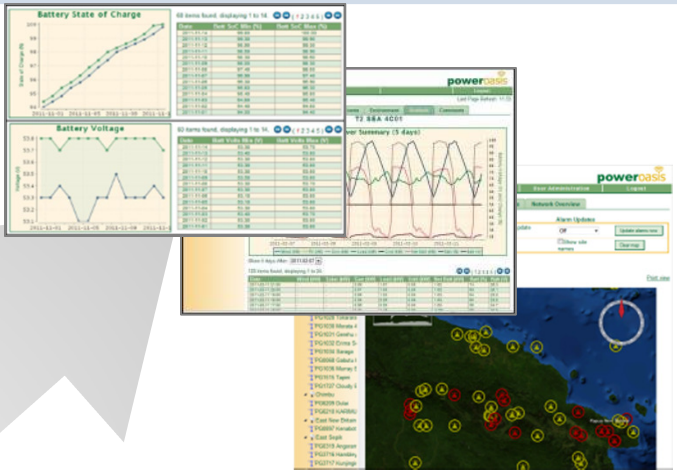




Common Hardware Platform – multiple system configurations

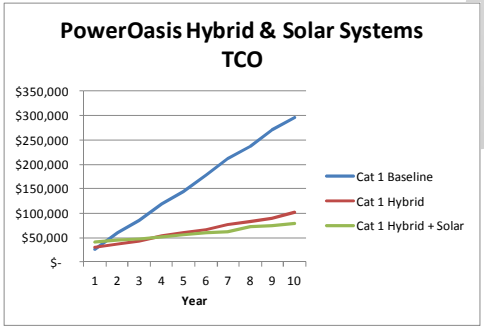
PowerOasis Manager™





NOC Management & Control

System design, modelling & Business Case ROI & TCO



Scale, Quality & Delivery at low cost

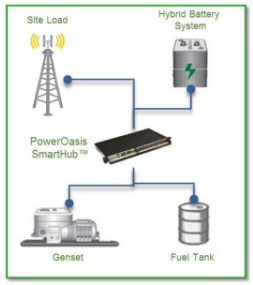




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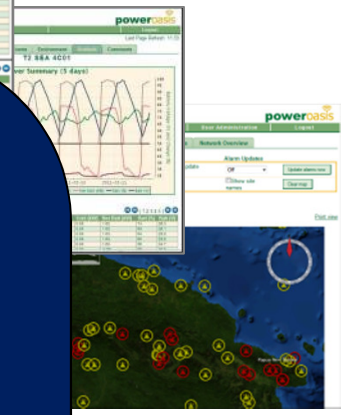
PowerOasis Leadership in Telecom Solutions









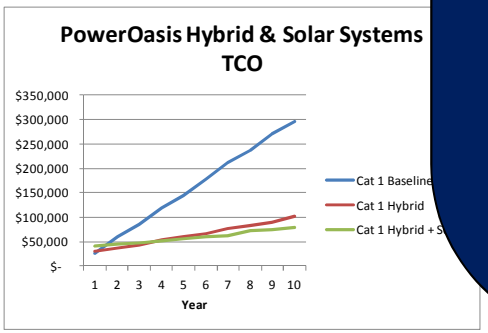


PowerOasis has over 500 Hybrid Solar Sites , in Egypt, Kenya, Morocco, Nigeria & Uganda.

3rd Generation Platform, low cost, common platform, modular expansion, easy to install

Best Performance in Fuel savings.

Power Control & Management at the NOC, stops sending people to site.





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Best Practice In Hybrid & Hybrid Solar

- PowerOasis Budget
- Business Case
- Success Criteria
- Site Layout

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PowerOasis – Site Power Analysis & Budgeting

Business Imperatives

Financial
OPEX Savings
Payback
ROI

Operational
Green Energy
Site Availability
User QoE

Site Inputs/ Requirements

Onsite Generator Spec

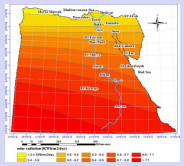
Generator Runtime

HVAC

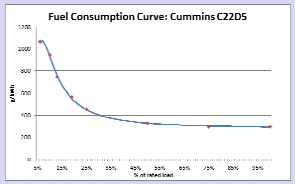
Site Autonomy

Site Load

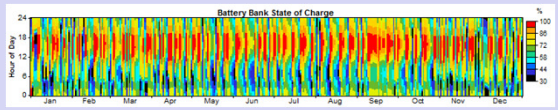
Solar Insolation Analysis



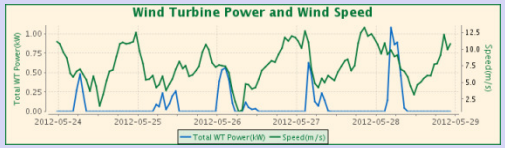
Generator Fuel Efficiency Curves



Site Power Analysis



Battery Lifecycle Modelling



Site Wind Performance

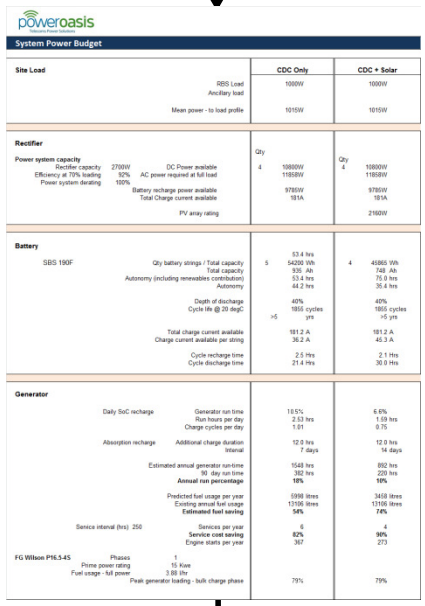
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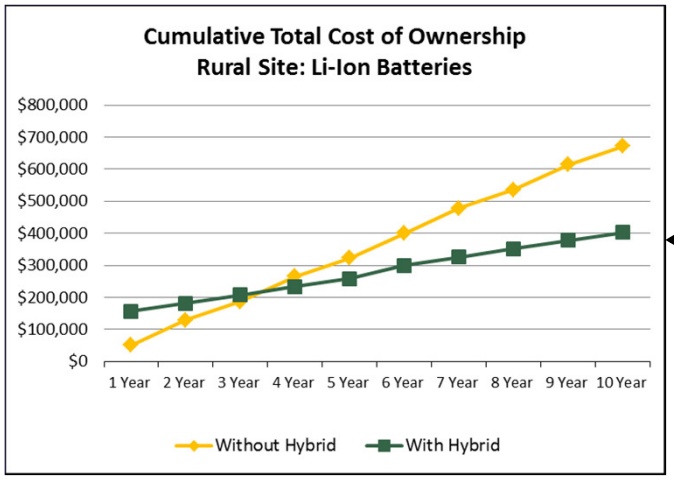
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PowerOasis – Site Power Analysis & Budgeting

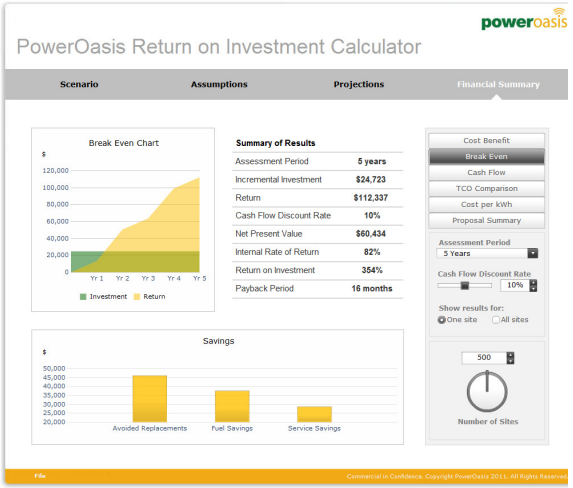
Site Power Analysis

Power Budget





Site Business Case



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System Evaluation KPI's / Success Criteria

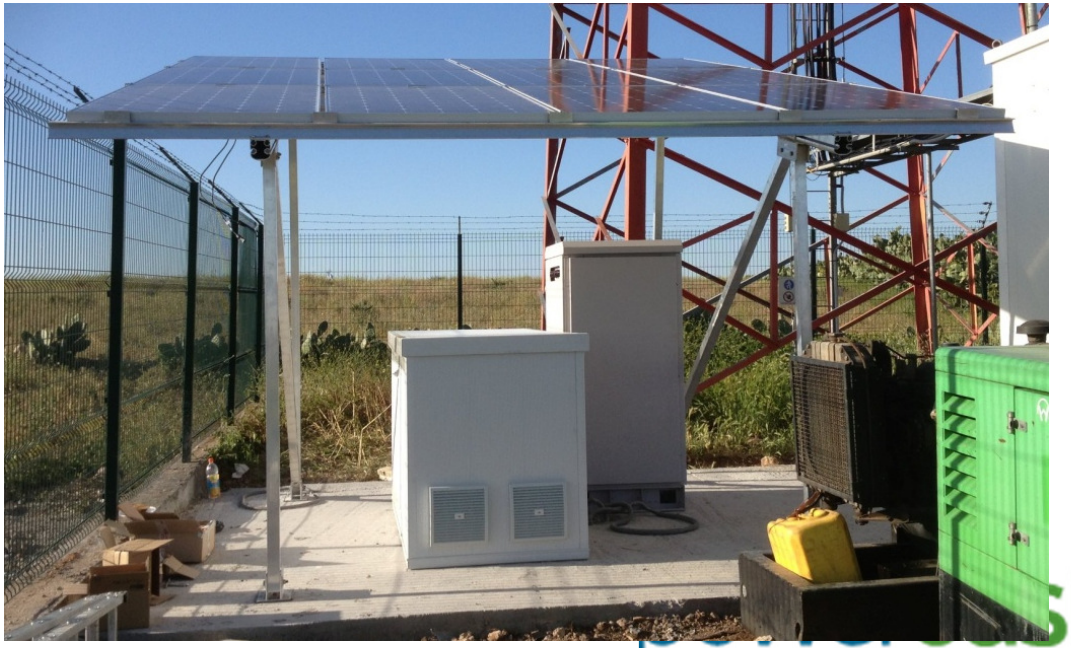
Area	KPI	Met Evaluation Criteria?
Ease of Installation and Commissioning	Simple & Cost Effective Installation	✓
Acceptance Testing	Automated Acceptance Testing	✓
Financial Benefits	Reduced Diesel Consumption	✓
	Battery Warranty Audit Reporting	✓
Operational Benefits	Start/stop Generator Remotely	✓
	Remote Configuration Management	✓
	Monitoring and Reporting	✓
Functional Compliance	SoC Cycling	✓
	Alarm Configuration & Generation	✓
	Mgnt of Comms Loss	✓
	Accuracy of Fuel Measurement	✓

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Site Layout





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What is Possible ?

- Results from Benchmarking Performance
- Generator Run time saving
- Fuel savings & elimin ate Theft
- Solar Contribution
- Optimizing performance
- Battery Temperature

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Compare Uganda Network Sites

Hybrid + Solar System at Site B (0.9kW Load)



Diesel Hybrid System at Site A (1kW Load)

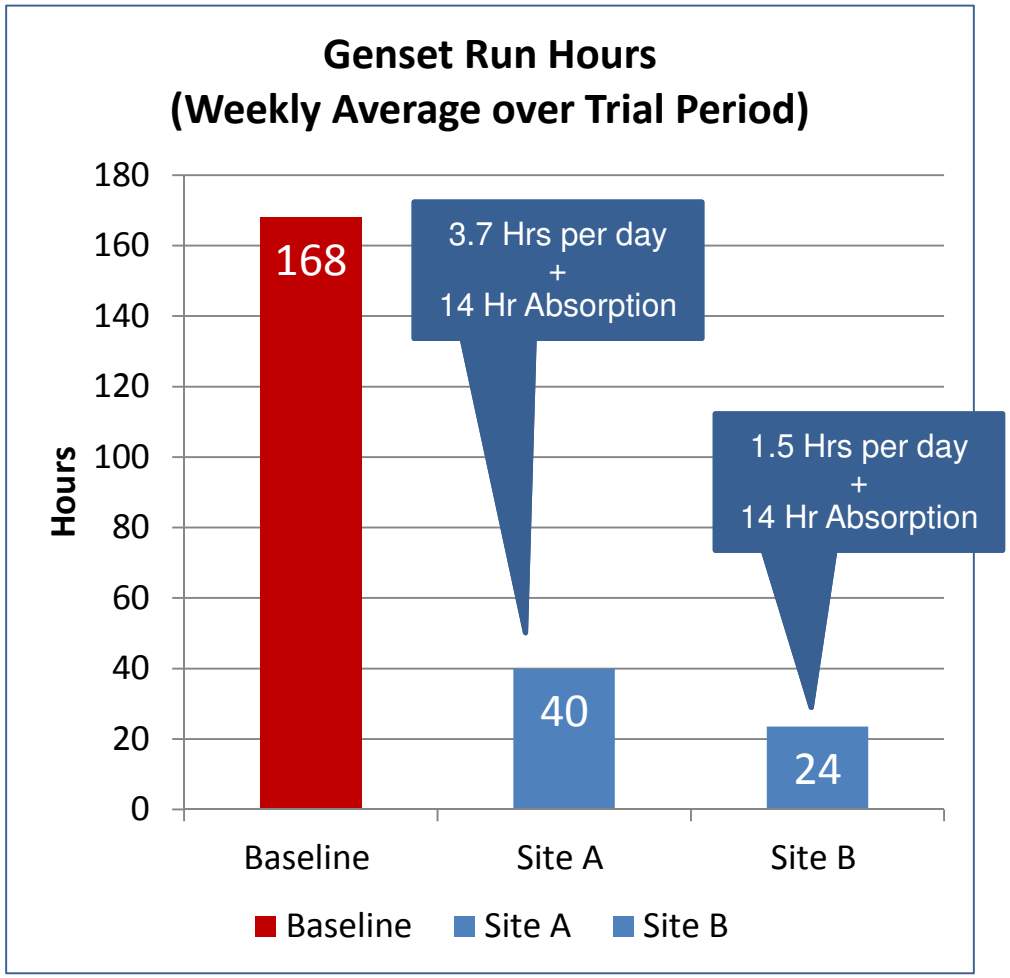


- Two PowerOasis Systems benchmarked from Uganda Network
  - Hybrid & Hybrid + Solar Configurations
  - Evaluation period; March – April 2013
- Benchmark Criteria included;
  - Ease & Quality of System Installation
  - Financial Benefits
    - Fuel Savings / Reduced Theft
    - Reduced Ops & Maintenance Costs
  - Operational Benefits
    - Remote Configuration Mgnt
    - Remote System Control Functions
    - Alarms & Events
    - Site & System Monitoring and Reporting

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Uganda Results – Generator Run Hours

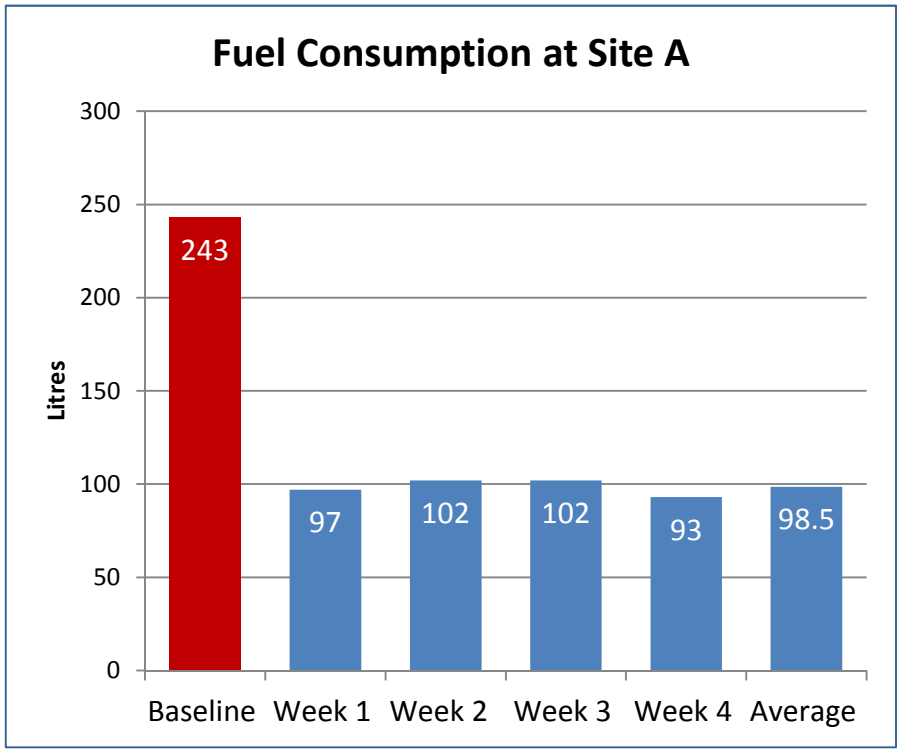


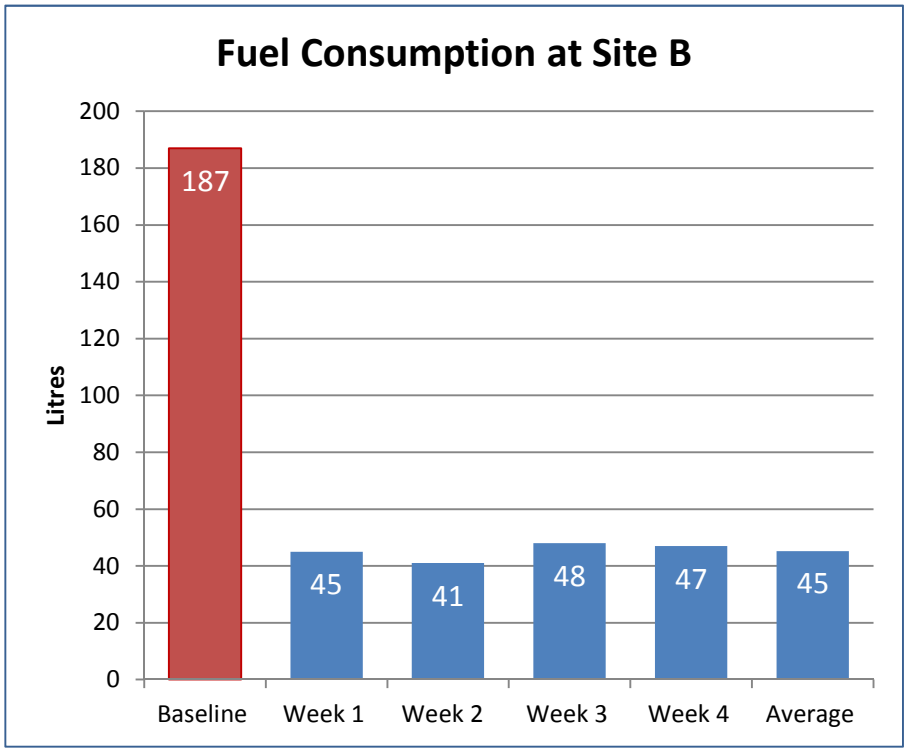
- Site Configurations;
  - 14 Hour Absorption run every 7 days
- Site A
  - 76% run time reduction
  - Asset life extension from 21 months to 86 months
- Site B
  - 86% run time reduction
  - Asset life extension from 21 months to 140 months

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Uganda Results – Fuel Savings





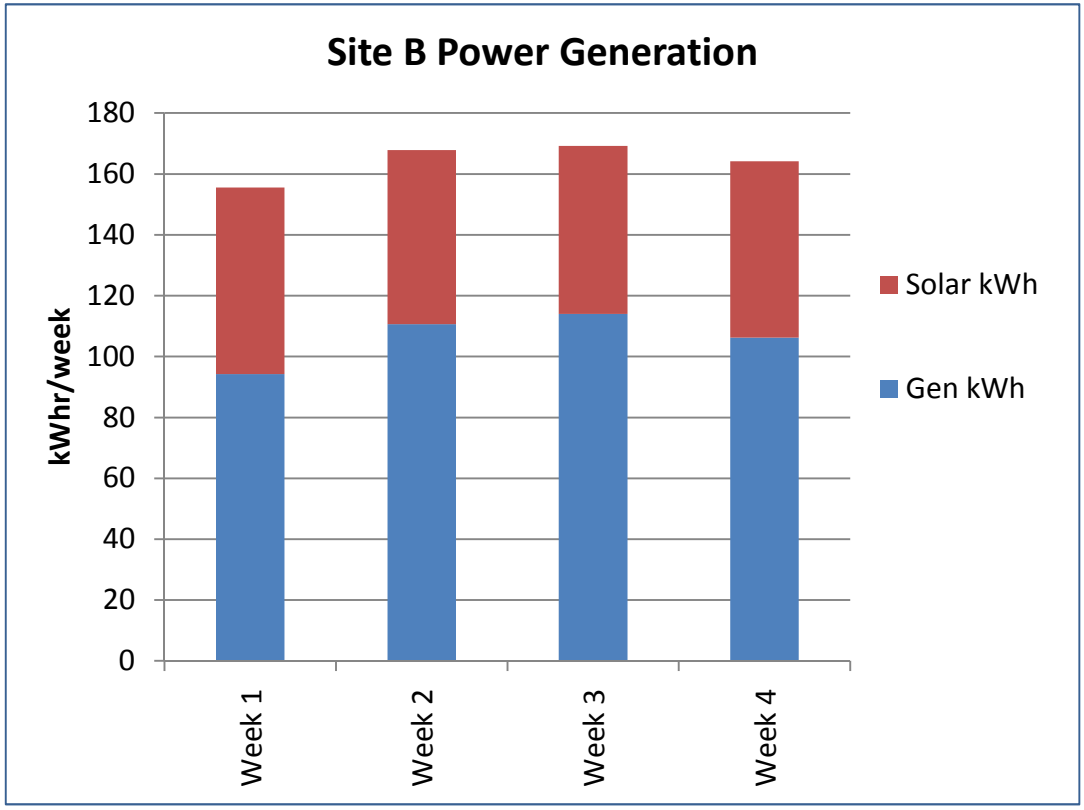
60% fuel savings at Site A

75% fuel savings at Site B

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Uganda Results – Power Production



Site B site configuration;

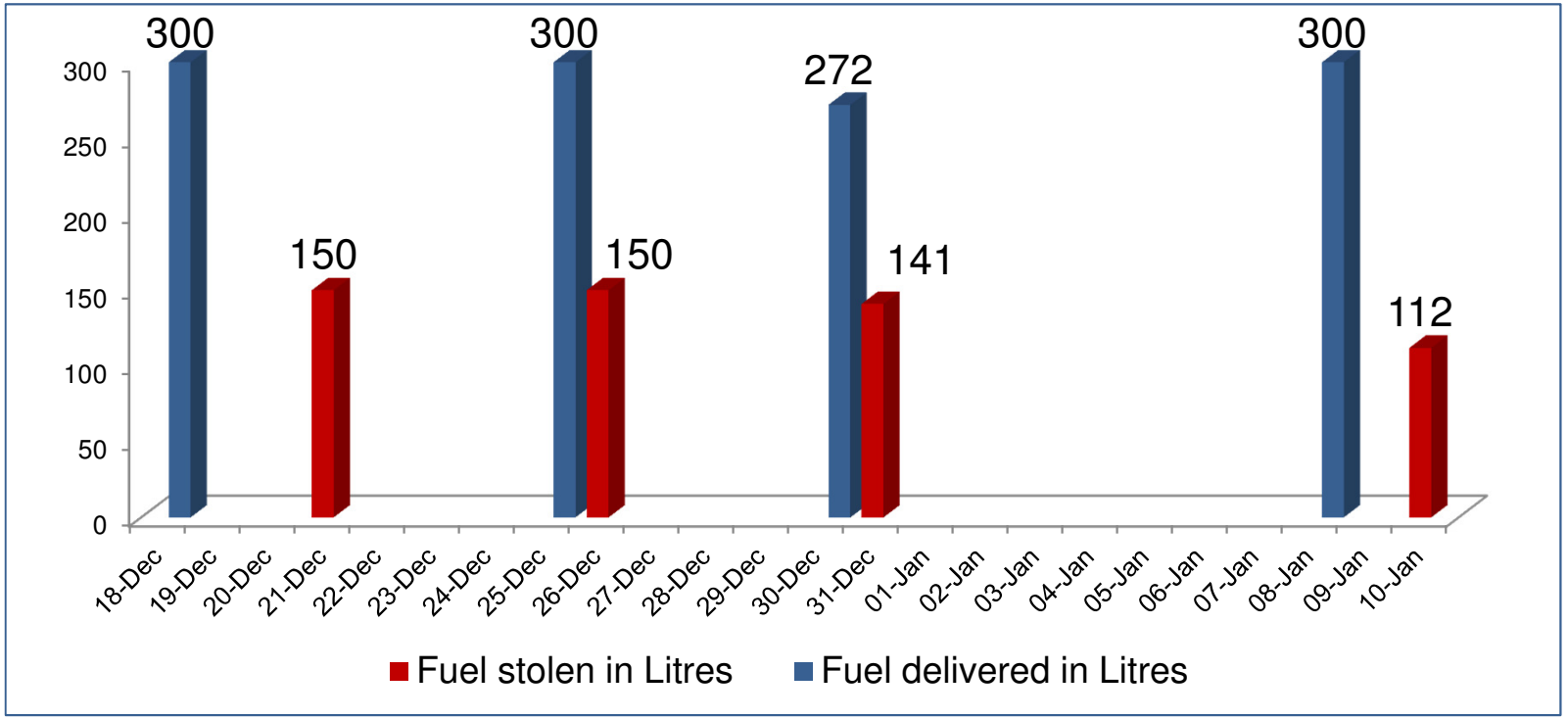
- Average site load = 0.9kW
- 2.24kW PV Array
- 12.5kVA Generator
- 570Ah Battery Bank

Solar power generated during the benchmark accounted for 37% - 40% of the total power required to run the site

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Eliminate Fuel Theft

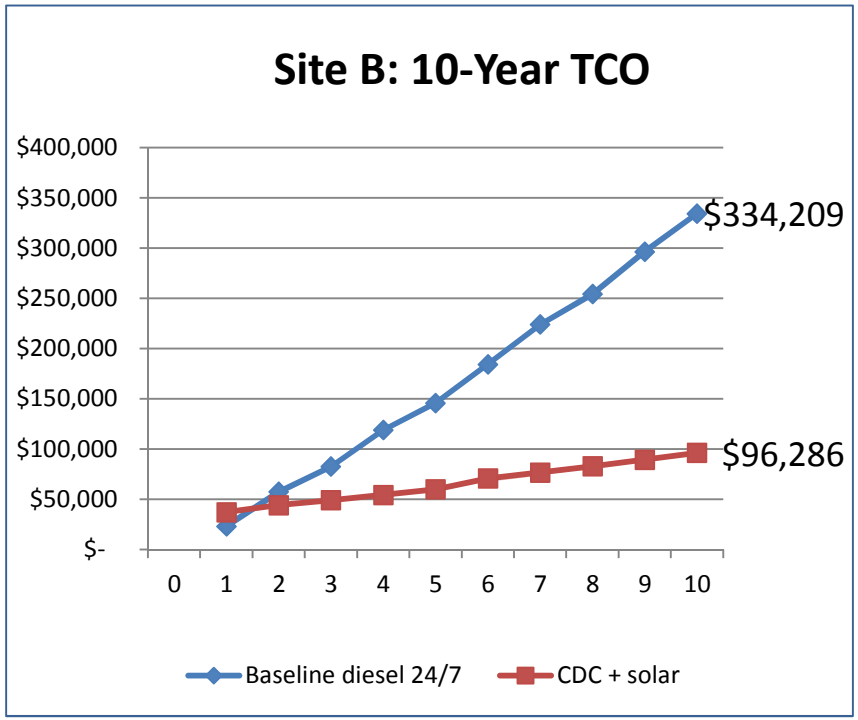


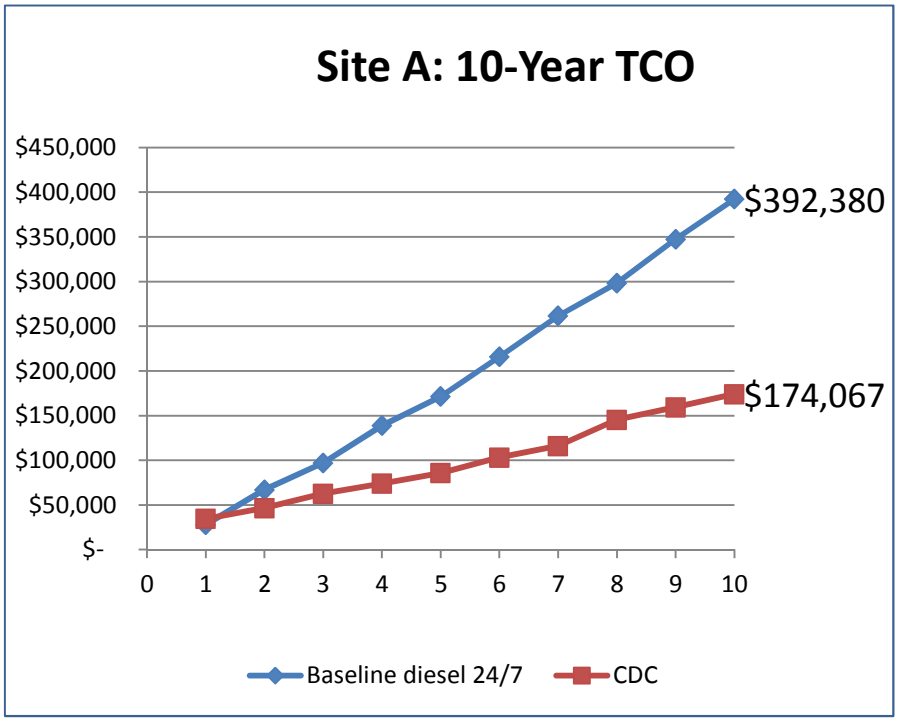
- PowerOasis system installed in monitoring mode in December
- System generated multiple fuel theft alerts during initial 3 weeks
- Customer Ops team able to identify theft sources and eradicate
- Site monitoring has been a sustainable deterrent thereafter

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Uganda Network Results





Site B:

10 year RoI% = 780%

Payback = 19 Months

Site A:

10 year RoI% = 950%

Payback = 15 Months

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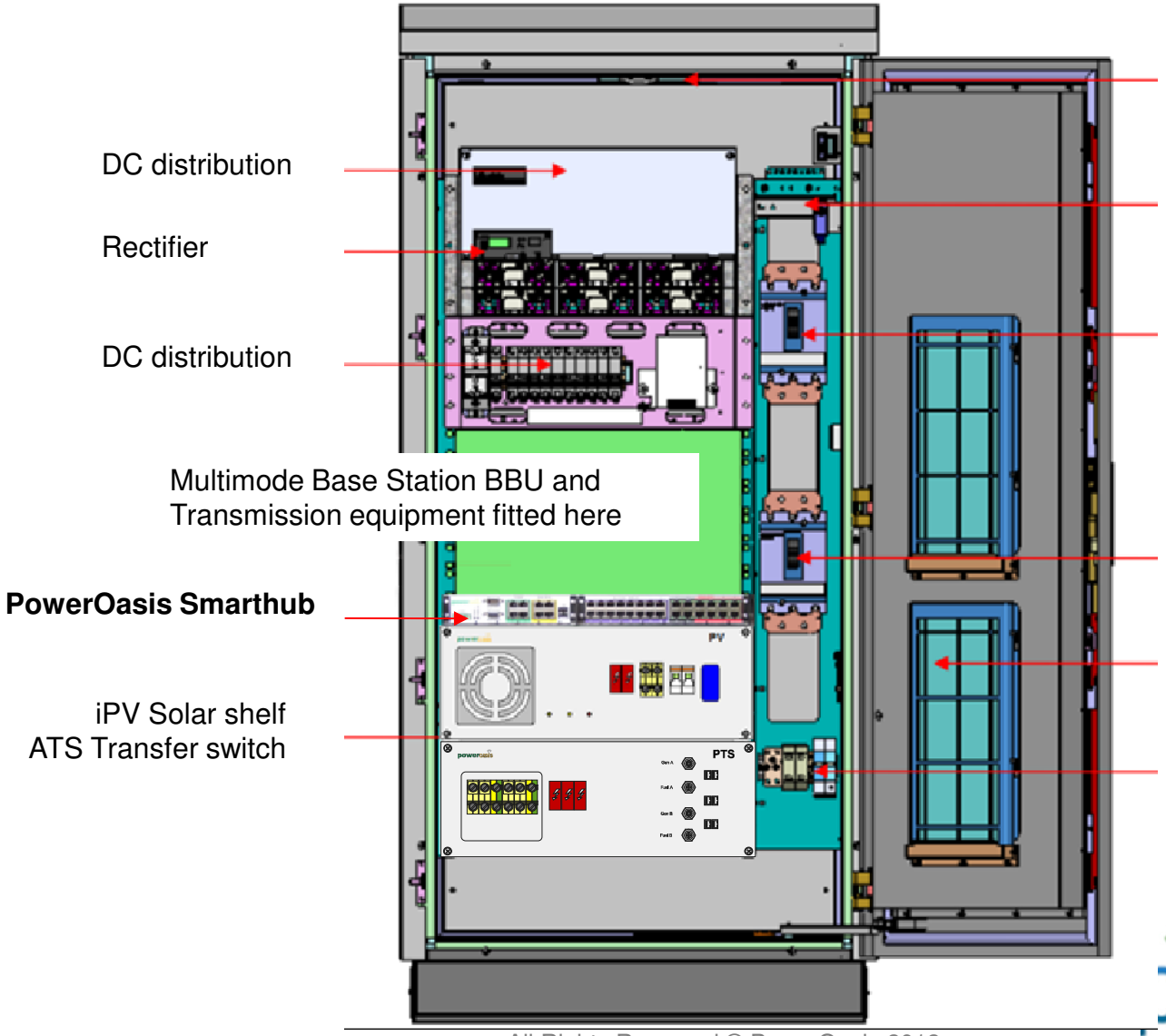
Right Technology & Product Roadmap

- Modular and Factory Tested Systems
- Remote Management & Software Control
- Reporting & Analysis

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Modular Power System



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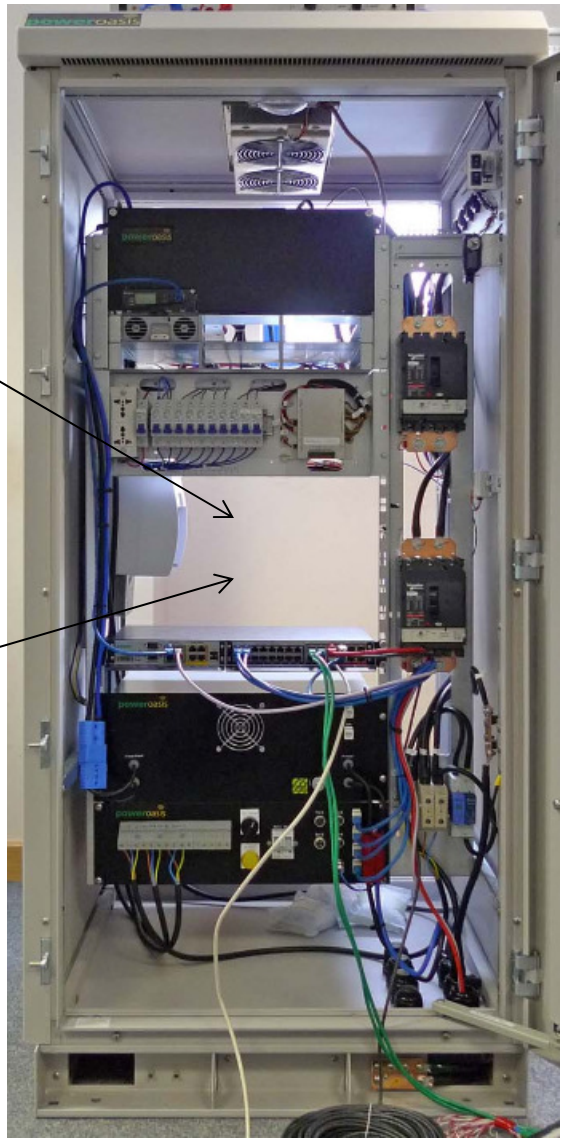
Factory Integration



BaseStation &
Transmission



ZTE



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Diesel Hybrid with Solar





BTS

Power control & rectifiers

Battery Cabinet & deep cycle batteries

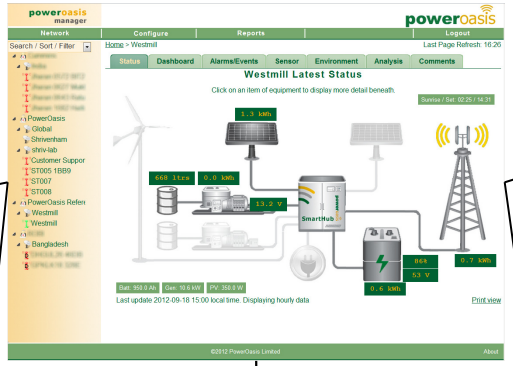
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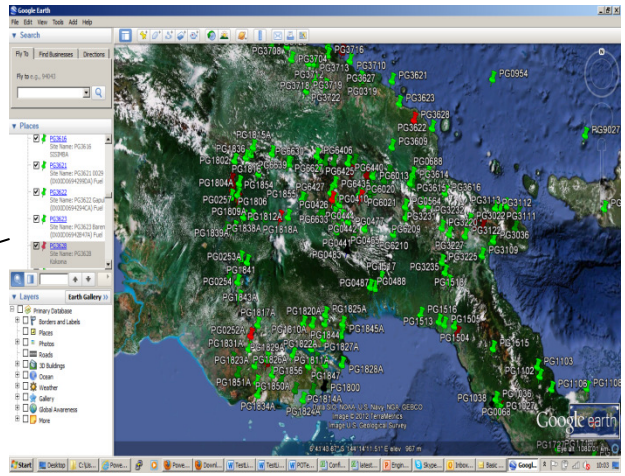
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Integrated Power Software Management Platform

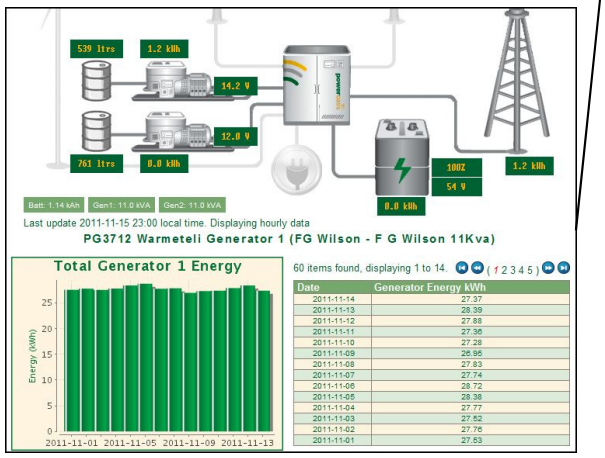


Network or site specific KPI reports





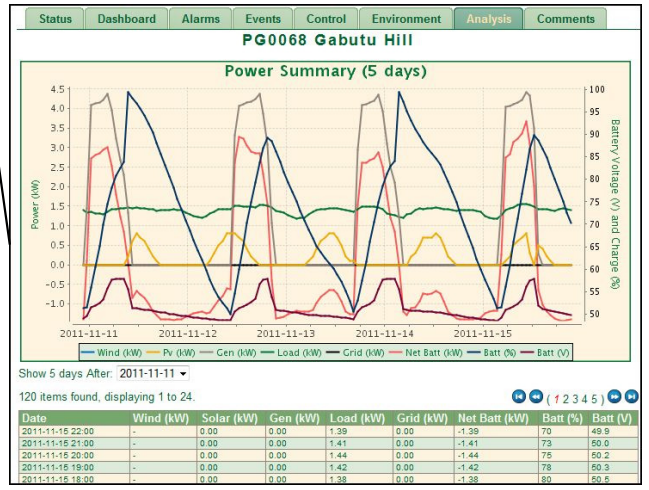
Status map of entire network



Component monitoring, drill down into each component for status reports



PowerOasis Manager



Parameter tracking in real time

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Conclusion

Let us rollout in your network and capture the benefits.

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Thank You!

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