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In partnership with the Netherlands

GREEN POWER FOR MOBILE TELECOMS

OUTSOURCING POWER NEEDS TO AN ESCO

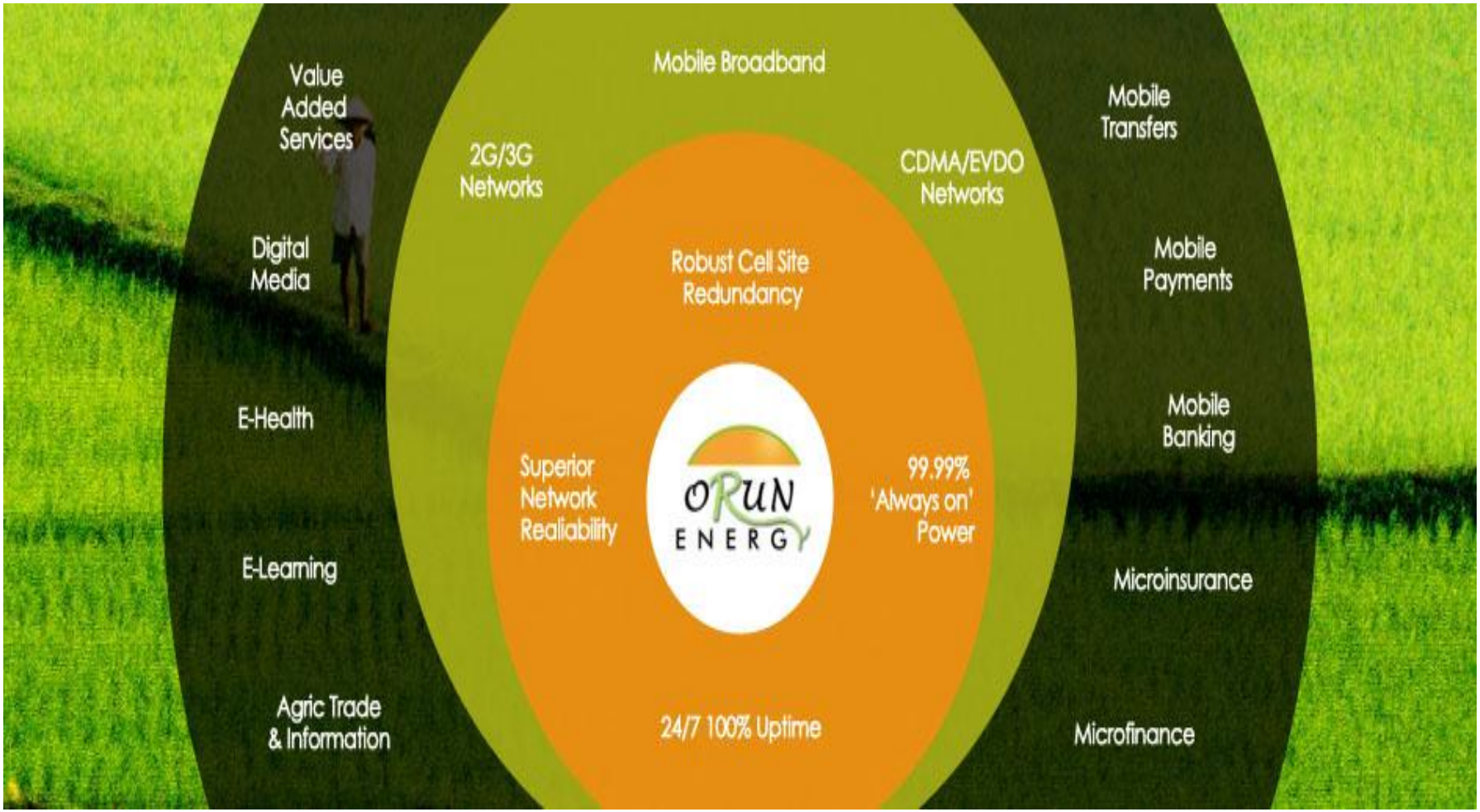
IS NIGERIA READY FOR THE OPEX MODEL?

January 30th 2013

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The Telecom Ecosystem



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Orun Energy – Key Milestones

•Incorporated in 2005

•Won “Celtel” Nigeria international alternative energy RFP supervised by KPMG in 2006

•Conducted successful test with Kasapa (CDMA) telecom operator in Ghana in 2008

•Signed India Partnership Agreement with HBL Power Systems India Ltd in 2011

•Successful one year live trial (single outdoor site and three operator indoor site) with Bharti Airtel in Rajasthan from Dec 2012 – Dec 2013

•Conducted successful 3 month live trial (single indoor site and two operator indoor site) with Viom Networks in Uttar Pradesh in 2012

•Orun Energy has entered into contract with Viom Networks in India to roll out 500 HPS in 3 states in India using the opex model.

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Nigeria Telecom Sector Dynamics

- *Highly Competitive Telecom sector*
- *ARPUs trending lower - $3.00 by 2014*
- *QOS is and will be a major challenge*
- *Telcos slow adoption of power outsourcing/co-location*
- *Grid Power Infrastructure remains challenging*
- *Consolidation in the CDMA Sector*
- *Mobile Number Portability a Game Changer?*

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The Energy Challenge in Nigeria Telecoms

- *Total spend on diesel in 2011 in excess of $400 million*
- *Industry cost per kw/hr between $3.8 - $4.8*
- *High rate of theft and vandalism of power equipment*
- *30% of Cell Site Outage due to genset failure*
- *Low ROI in grid power connection capex*
- *Diesel price remains high: $1.00 - $1.20 per litre*
- *Dual genset approach is highly inefficient*

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What is an Esco?

An ESCO, or Energy Service Company, is a business that develops, installs, and arranges financing for projects designed to improve the energy efficiency and maintenance costs for facilities over a seven to twenty year time period.

Typically, an Esco offers the following services:

•develop, design, and arrange financing for energy efficiency projects;
•install and maintain the energy efficient equipment involved;
•measure, monitor, and verify the project's energy savings; and
•assume the technical operational and financial risk of the project

ESCO projects are comprehensive, which means that the ESCO employs a wide array of cost-effective measures to achieve energy savings. These measures often include the following: high efficiency power, high efficiency heating and air conditioning, and centralized energy management systems.

Key Features of an Esco?

Know-How
Engineers, architects, consultants, innovation ...

Technology
Suppliers, construction, operation & maintenance ...

Energy
Gas, fuel oil, solar, woodchips ...

Money
Equity capital, banks, TPF, subsidies ...

Legislation
Laws, procurement, technical rules ...

Energy Service Company (ESCo)

Supply (MWh) or Savings (NWh) incl. function, performance + price guarantees



Mobile Operator or Towerco

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Esco Financing Mechanisms

Equity - equity investment can take the form of an ESCO issuing additional shares in the company's common ownership. The issuance of shares gives the investor a right to any proceeds that may result from a distribution of dividends to the owners

Subordinated Debt or Mezaninne Finance - is capital that sits between senior debt and equity and has features of both kinds of financing. Subordination refers to the order or priority of repayments

Project Finance – most commonly non-recourse loans, which are secured by the project assets and paid entirely from project cash flow, rather than from the general assets or creditworthiness of the project sponsors, a decision in part supported by financial modeling.

Partial Risk Guarantees - provide collateral from external partners for part of the debt of projects. Guarantees thus can address the credit risk barrier common in many EE market segments and make local FIs more comfortable with the risk.

Carbon Finance - Carbon refers to the purchase of project-based greenhouse gas emission reductions. Carbon finance provides additional revenues to the project.

Market and Legal Barriers to Esco EE Financing

High pre-investment development and transaction costs partially due to small size and no of projects

• Information failure on the side of customers: lack of customer awareness and a very high perceived risk of new more efficient technologies by both users and financiers

• Information failure on the side of lending institutions: general lack of EE finance experience lack of dedicated time and resources to develop EE capacity

• Lack of visibility and scale of EE finance: EE projects often represent a relatively small niche business for major banks;

• High perceived end-user credit risks;

• Long marketing cycles associated with selling EE and scarcity of investment ready projects;

Energy savings as revenue is foregone by financiers: cash flows from saving energy are not (yet) conventional revenues in what is still an asset-based culture in financing.

The Opex Model in Telecoms Power

The telecom industry is currently evolving models to outsource the power generation for telecom sites.

It helps the Operator or Towerco to reduce dependency on diesel generators without having to invest the capital for renewable energy solutions.

Since power generation and maintenance is not the core competency for the Operator or Towerco outsourcing the power generation will help to get rid of the challenges associated with power.

The concept of an Energy Service Company (ESCO) has been introduced to the telecoms industry to facilitate the outsourcing model.

Different Outsourcing opex models include the following:

- Operating lease or monthly flat fee outsourcing model.
- Power Purchase Agreement (PPA) model.
- OPEX saving recovery or Energy Savings Agreement (ESA) model

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Responsibility Matrix: Capex/Opex Comparison

Activity	CAPEX model	OPEX model
Equipment purchase	Operator	ESCO
Additional land acquisition (If required)	Operator	ESCO
Rollout of equipment & project management	Operator	ESCO
Risk related to rollout	Operator	ESCO
Site maintenance & operation	Operator	ESCO
Re-fuelling of DG and risk related to fuel price hike	Operator	ESCO
Assurance of site up-time	Operator	ESCO
Site monitoring and Security	Operator	ESCO
Remote alarm and performance data collection	Operator	ESCO
Risk of theft and vandalism	Operator	ESCO
Payout to 3rd Party	NA	Operator

Key Success Factors for Escos in Telecom Networks

A Partnership Mindset

Thorough Evaluation of Esco Technology

Continuous Technical Innovation

A Thorough Test Regime and Test Analysis

Robust Remote Monitoring & ERP Tools

Transparency in Reporting

A Willingness to Compromise

Commitment to Project Governance and Communication

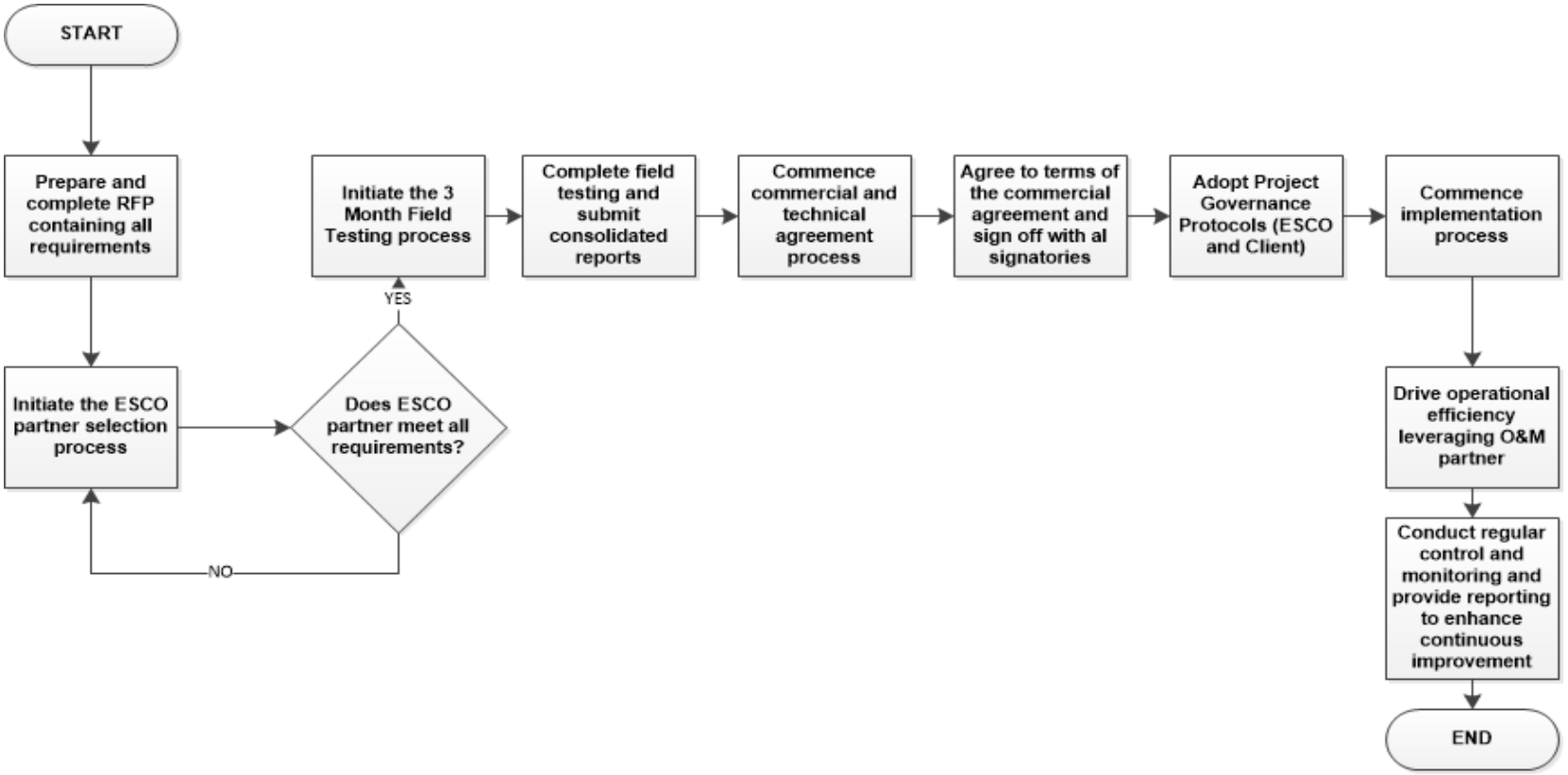
Business Model Innovation

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Process Flow for the Opex Model

Below are the steps an operator or Towerco should follow to outsource power:



The Ideal Opex Pricing Model

The ideal opex pricing model combines the features of the 3 outsourcing models

TELECOM LOADS	PRICE PER KW/HR MINIMUM	PRICE KW/HR ON LOAD:GRID	PRICE KW/HR ON LOAD:OFF GRID
0.8 - 1.5KW 1OD	$0.75	$0.95	$1.20
1.6 – 2.5 KW 2OD	$0.65	$0.85	$1.10
4.0 – 6.0KW 3OD	$0.45	$0.70	$0.90

	Grid Availability in Hrs/Day - Cost per Kwh (Average/day)						
	0	1	2	3	4	5	6
(Kw)	USD/Kwh	USD/Kwh	USD/Kwh	USD/Kwh	USD/Kwh	USD/Kwh	USD/Kwh
<1.1	1.19	1.15	1.11	1.07	1.03	0.99	0.95

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Dimensioning the Risks

Credit Risk

Payment Risk

Technical Risk

Operational Risk

Performance Risks

Financial Risk

Currency Risk

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Benefits to Operators & Towercos:Opex Model

Financial

- Eliminate the capex burden
- Predictable opex savings between 45% - 65%
- Immediate payback for New Build sites

Depreciation on Esco Books
Eliminate Replacement Costs
Carbon credit arrangements

Technical

- Increased Uptime to 99.99%
- Lower generator runtime
- Lower Air-Conditioner runtime

Benefit from New Technologies
Risk of Obsolescence
Modularity of Components

Operational - 24/7Monitoring

- Fuel levels
- Battery Charge/ discharge
- Generator Runtime
- Shelter Temperature

Enhanced Transparency
Improved Reporting
Project Governance

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The Role of Regulators,Govt and NGOS: The India Example

The Telecoms Regulator of India (TRAI)

•The Regulator has built consensus amongst all players in the telecoms sector on the need to convert to Clean Energy

•Mandated the Industry to convert 50% of all rural sites and 30% of urban sites by 2015 and 70% of urban sites and 100% of rural sites by 2017.

The Reserve Bank of India

•The RBI has designated Telecom Towers infrastructure status

•This allows telecom tower companies to borrow funds at 4% interest rate over 10 years

Bureau of Energy Efficiency

The BEE is responsible for regulating the Esco business in India and acts as a lobby agency for bringing issues to the attention of Govt

GreenPeace India

Greenpeace has acted as an effective lobby group to convince the industry to move away from diesel consumption. It sponsored the research paper ‘Enabling Clean Talking” showing how the industry would benefit financially if it adopted clean energy solutions

Orun Energy: Integrated Energy Efficiency Approach

Thermal Management

- Closed Loop air conditioning
- Thermal Controller
- Ceramic Paint
- Insulation
- Free Cooling

Hybrid Power

- Advanced BMS
- Deep cycle Lithium Batteries
- AC generator
- Fast Battery Charger

Fuel & Oil Management

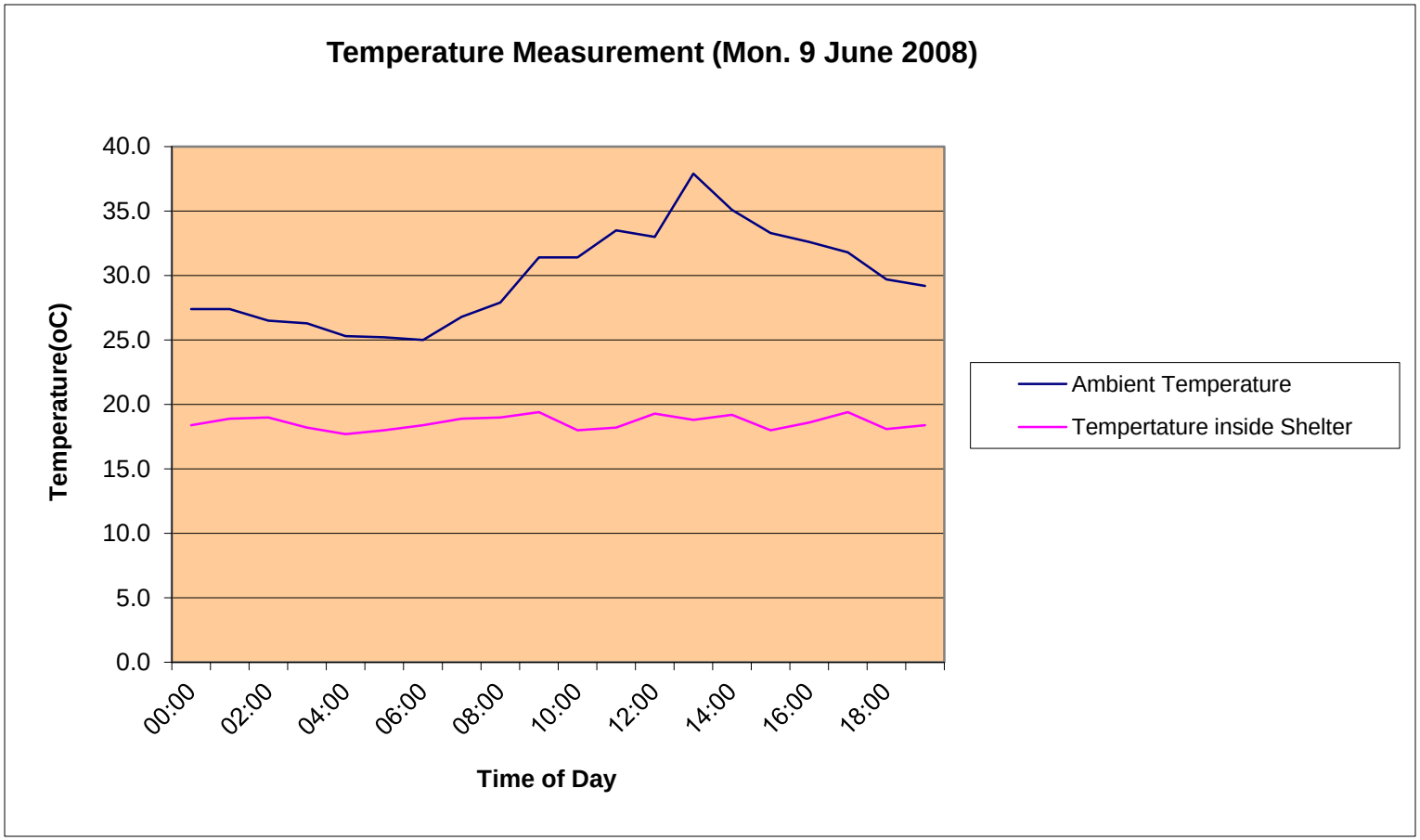
- Continuous filtered oil infusion into generator engine
- Extended oil sump allowing for 2 service intervals yearly

Orun solutions are applicable to both retrofit and new build single operator and co location sites

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Orun Energy: Shelter Temperature at Ghana Test Site



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Orun Energy: Value Proposition

Life Cycle Cost

- 88% plus saving in diesel cost at $1.10per litre
- 45% savings in 8 Year Total Cost of Ownership

Reliability

- Increased Uptime to 99.99%
- Lower generator runtime
- Lower Air-Conditioner runtime

24/7Monitoring

- Fuel levels
- Battery Charge/ Discharge Cycles
- Generator Runtime
- Shelter Temperature

Modularity

- Separate power enclosures for multiple combinations of indoor & outdoor solutions
- Battery bank config for easy upgrade with increase in tenancy/ equip power draw
- Additional Shelters easily added for increased demand for indoor space

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Q & A

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