

The background of the slide is a sunset scene with a large, bright sun in the upper right quadrant, casting a warm orange and yellow glow across the sky. In the foreground, the silhouettes of several wind turbines are visible against the sunset. The overall color palette is dominated by warm tones of orange, yellow, and brown.

# IMERGY

POWER SYSTEMS

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The ESP5 Vanadium Redox Flow Battery

GSMA / GPM Workshop  
Dar Es Salaam, 13<sup>th</sup> August 2014

24<sup>th</sup> June 2014

# What can Vanadium Redox offer the Telecoms market?

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Vanadium Redox Energy Storage Systems offer hybrid power and CDC solutions for installations where grid power is either unreliable or not available.

It is a compelling alternative to either lead acid or Li-ion battery technologies to optimise OPEX and TCO savings



# Imergy Company Overview

**IMERGY** POWER SYSTEMS

- Privately held developer of Redox Flow Batteries and Energy Storage solutions
  - Based in Silicon Valley, Founded in 2006
  - 89 staff in USA and India
- World class, proven, executive leadership team with global experience at Fortune 500 companies
- Storage systems from 2.5kW to 10MW
- General deployment to support 2-10 hours of full load
- Commercial kW class product sales in India and Africa with over 100 years field operating experience
- Cost-down and go-to-market strategy, leveraging the partnership approach. Product quality and cost focus
- Extensive IP portfolio and know-how with 20 patents

## Offices



Fremont, California



Gurgaon, India

## Customers

MW Class:

Large Global Data Management Company

Telecom Systems Operators:



## Investors



NEA



# IMERGY

POWER SYSTEMS

## 1. Telecoms Power

There are two distinct opportunities where IMERGY's Energy Storage Platform reinforces an OPEX reduction strategy by maximising fuel reduction and optimising energy efficient systems:

- Off Grid Sites, firming power from DG, Solar and Wind Power Sources
- Weak Grid Sites, as the primary back-up power solution



# OPEX Increasing

Many new base stations, particularly in developing nations, are not be able to connect to a reliable electricity grid and rely on generator and solar power

Costs of extending the grid to power off-grid base stations can be enormous, the operator must usually pay for the grid extension

Diesel generators are the preferred off-grid power source, however...

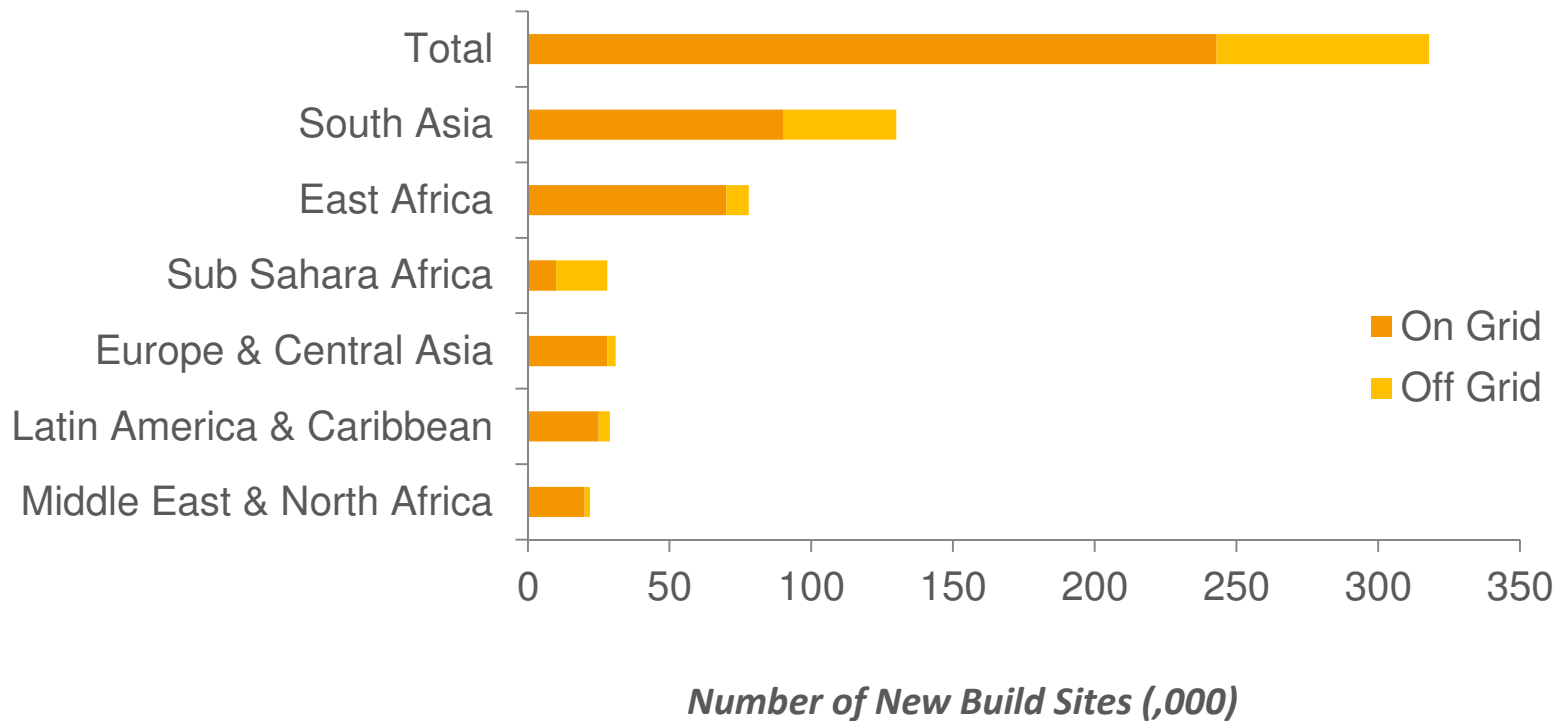
- Costly to run, ~ \$45k per year O&M for a 5kW site
- Remote maintenance is difficult and expensive
- USD diesel prices are escalating with respect to local currency
- Political uncertainty destabilising oil prices
- Many legacy off grid sites now have ROI over 10 years
- Small number of off grid sites accounts for large proportion of OPEX





# Solutions for Operators with “Off Grid” Sites

*An estimated 75,000 new off-grid sites out of a total of 300,000 sites, will be built each year in developing countries from 2013 (GSMA)*



# Countries with “Weak Grids”

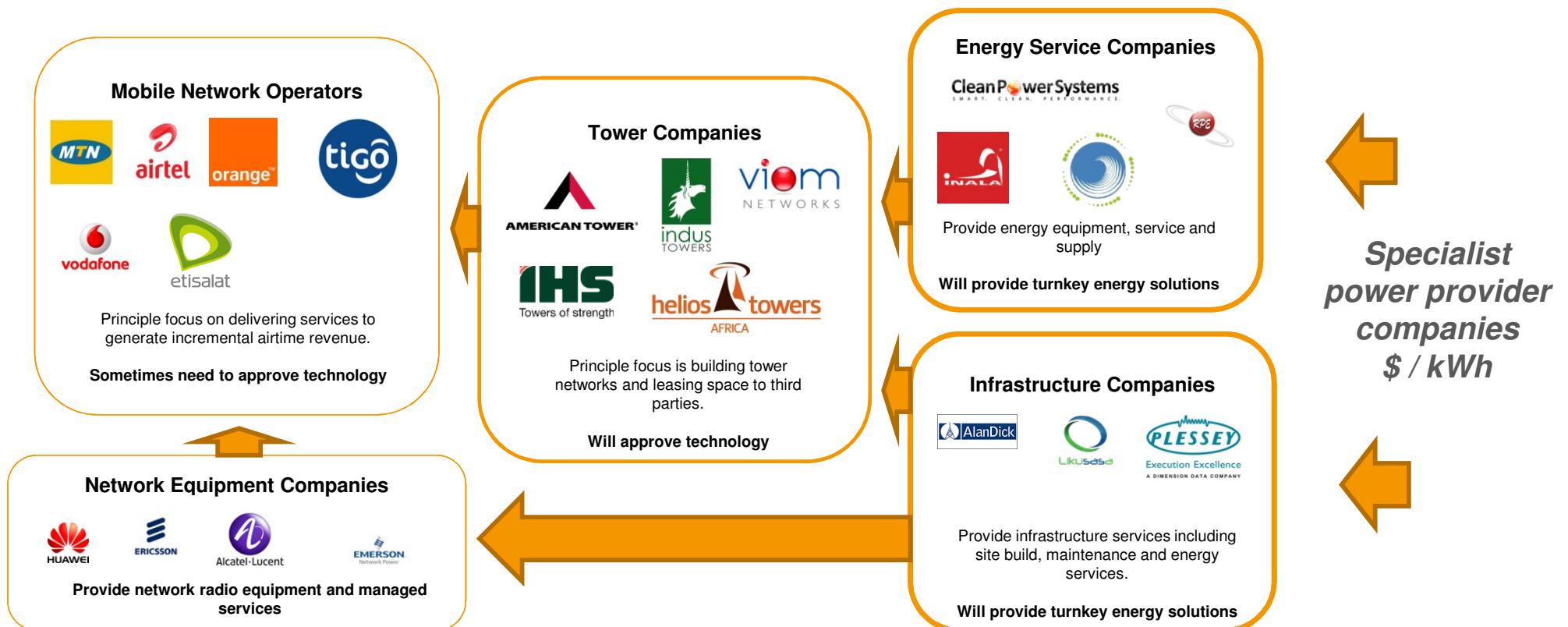
Economy	Number of electrical outages in a typical month	Duration of a typical electrical outage (hours)	Average Outage per Day (hours)	Percent of firms owning or sharing a generator	Proportion of electricity from a generator (%)
Iraq (2011)	41	41.9	18.6	80.9	41.2
Congo, Rep. (2009)	21.5	29.6	14.2	89.6	48.1
Central African Republic (2011)	29	7.2	6.8	86.1	13.4
Guinea (2006)	31.5	6.3	6.5	59.9	35.4
Nigeria (2007)	25.2	7.8	6.4	85.6	52.1
Chad (2009)	19.6	7.5	4.8	75.5	52
Congo, Dem. Rep. (2010)	20	6.7	4.4	41.6	9.4
Gambia, The (2006)	21	6.1	4.2	63.9	20.7
Afghanistan (2008)	15	8.4	4.1	71.1	50.5
Albania (2007)	33.9	3.6	4.0	81	21.5
Sierra Leone (2009)	13.7	8.8	4.0	69.7	25.5
Uganda (2006)	10.7	9.7	3.4	28.9	8.9
Burundi (2006)	10.7	9.1	3.2	41.9	10.7
Kosovo (2009)	39.1	2	2.6	88.7	15
Senegal (2007)	11.5	6.1	2.3	55.4	13.5
Pakistan (2007)	31.7	2.1	2.2	20.1	6
Bangladesh (2013)	64.5	0.9	2.2	62.9	14.2

Use energy storage technology as the primary back-up for power outages rather than diesel generators



# African Telecoms Power Infrastructure

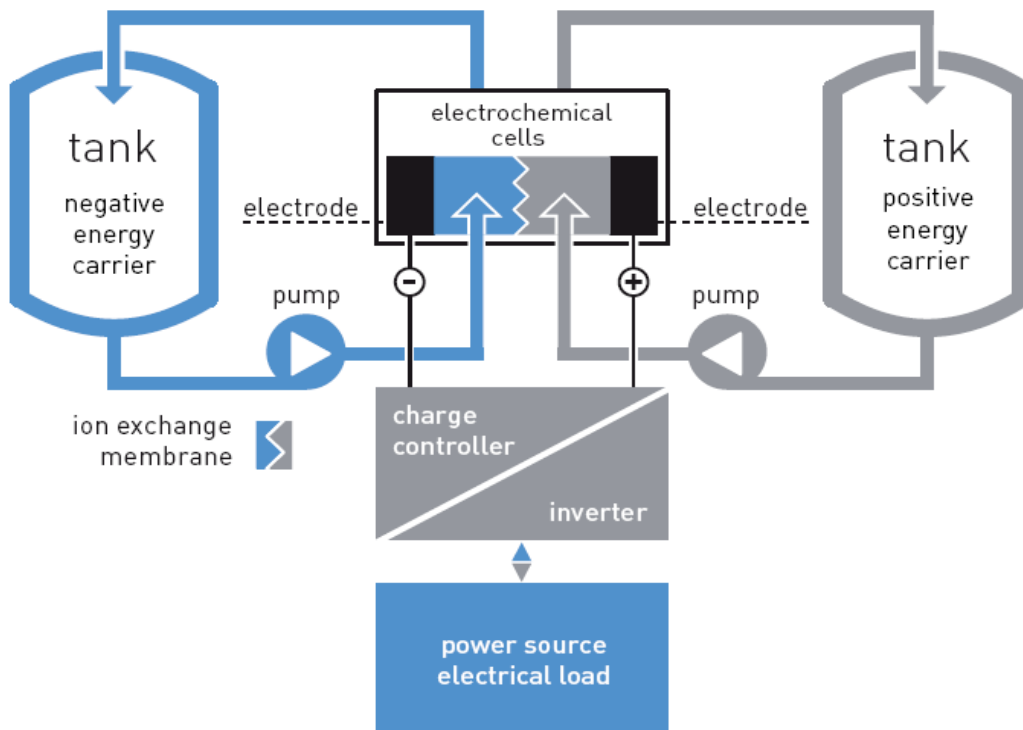
*In developing market, telecoms operators are outsourcing passive network infrastructure build and management to Tower Companies, who in turn outsource power provision to specialist companies.*



# **IMERGY** POWER SYSTEMS

## 2. Flow Battery Storage Technology

# Flow Battery Energy Storage Technology



- A Flow Battery is an energy storage device where power and energy are independent
- Power is derived from “Electrochemical Cells” or “Cell Stacks”
- Electrolyte held in separate tanks stores the Energy
- Pumps circulate electrolyte through the Cell Stacks which converts electrochemical energy into electricity. And vice versa.
- Control system manage the electrolyte circulation
- Flow battery technologies are mainly distinguished by electrolyte composition
  - Vanadium Redox
  - Fe – Cr
  - Zn - Br

# Why Vanadium? The “Miracle Metal”...

**IMERGY** POWER SYSTEMS



**Vanadium**  
*at a glance*

Symbol:	V
Name:	Vanadium
Atomic Number:	Number 23
Description:	Transition Metal
Atomic Weight:	50.94
Density (g/cm <sup>3</sup> ):	5.8
Melting Point (K):	2175
Boiling Point (K):	3682
Av. Abundance:	135ppm

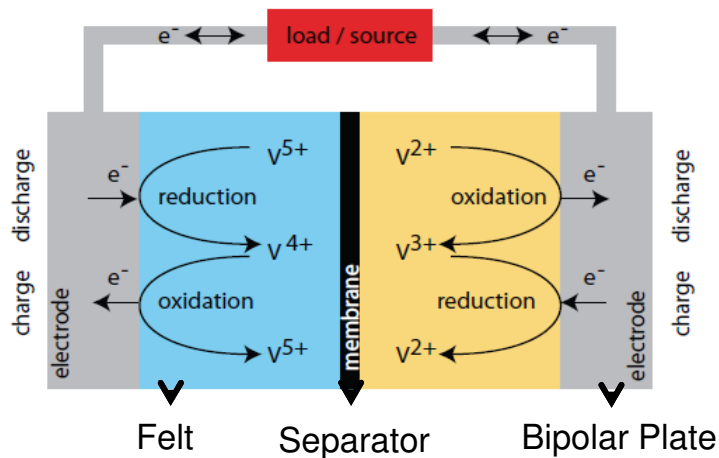
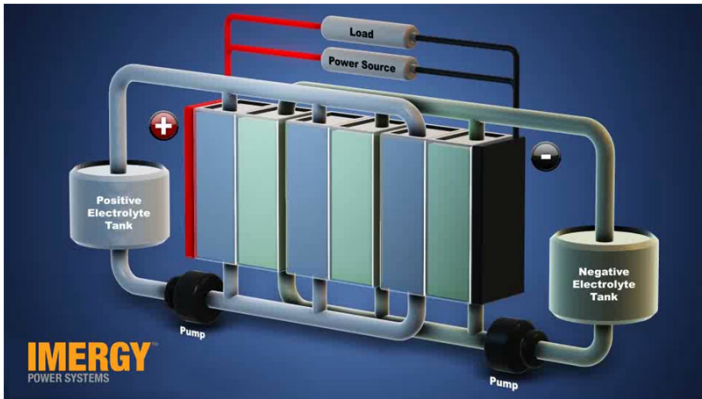
SOURCE: EduMine Element Table



- Used primarily for steel hardening
- Widely available in large quantities.
- Mined naturally as an ore. Also recovered from steelmaking slag, and coal or oil combustion exhaust ash.
- Vanadium based electrolyte
  - Does not burn, operates cold and is a **non-poisonous** fluid per UN regulations. No permitting issues.
  - Completely reusable
  - Low incremental cost for additional hours of storage
- Comes in four charge states: V<sup>+2</sup>, V<sup>+3</sup>, V<sup>+4</sup>, V<sup>+5</sup>. No cross contamination for flow batteries
- Using only Vanadium in the electrolyte has competitive advantages in terms of operating cost, system life, maintenance, and safety.

# Vanadium Redox Energy Storage Technology

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- Robust
  - Unlimited cycles: at any state of charge
  - Long system life: 10+ years
  - Operates up to 50 °C
- Scalable
  - Power & Energy decoupled
  - From minutes to 10+ hours storage
- Lowest levelised cost of energy storage
  - Electrolyte lasts over 25 years
  - Vanadium extracted from mining waste product, slag
  - Imergy ESP uses separator, not an expensive membrane
  - <\$500/kWh system cost achievable within 3 years
- Integrated
  - Self contained power electronics, remote monitoring control and energy management system
- Strong IP
  - 20 issued and allowed patents

# New kW Class ESP5 Product with Flextronics

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## IMERGY ESP-SERIES SYSTEM SPECIFICATIONS

<b>Output Power</b>	5 kW (option 2.5kW) (peak 7kW)
<b>Energy Capacity</b>	10/15/20/25/30 kWh
<b>Cycle Life</b>	Unlimited or 10 + years
<b>Discharge : Charge Ratio</b>	Up to 1 : 1
<b>Ambient Temperature Range</b>	-5°C to +50°C
<b>Charge Voltage Range</b>	54.5 VDC ±1.5 VDC
<b>Output Voltage Range</b>	49.5 VDC ±1.5 VDC
<b>Duty Cycle</b>	Continuous
<b>DC Efficiency</b>	75% (RTE)
<b>Monitoring</b>	Integrated Comm System (ICS), SMS, GPRS, USB, Optional MODBUS over TCP/IP
<b>Maintenance</b>	Preemptive via ICS – one site visit/year

### Physical Dimensions

<b>Footprint</b>	2.7 m <sup>2</sup>
<b>Dimensions (W x D x H)</b>	2.20 x 1.22 x 2.15 m
<b>Shipping Weight</b>	770 kg
<b>Total System Weight</b>	1800-3000 kg
<b>Certification</b>	IP55

**5 Year Warranty, 10 Year Extended Warranty available**

# Vanadium Redox USP 1 : Unlimited Cycle Life

## USP

- There is no impact on performance due to the number of cycles
- Life expectancy is 10+ years
- You can use the full capacity (100% DoD) with no impact on performance
- Partially charge or discharge the battery to any state of charge with no impact on performance
- There is very low maintenance

## Benefit

- You do not have to replace the battery every 2 years – unlimited cycles
- You do not have to oversize the battery capacity – use 100% of its capacity
- You do not have to charge to 100% capacity after each cycle – fast charge ideal for weak grid
- Maintenance costs are very low





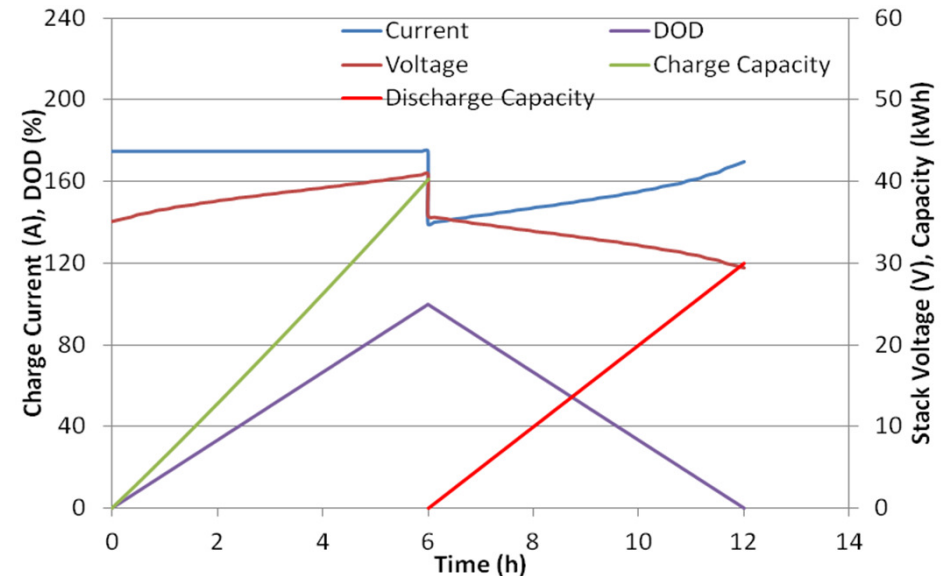
# Vanadium Redox USP 2 : Charging and Discharging

## USP

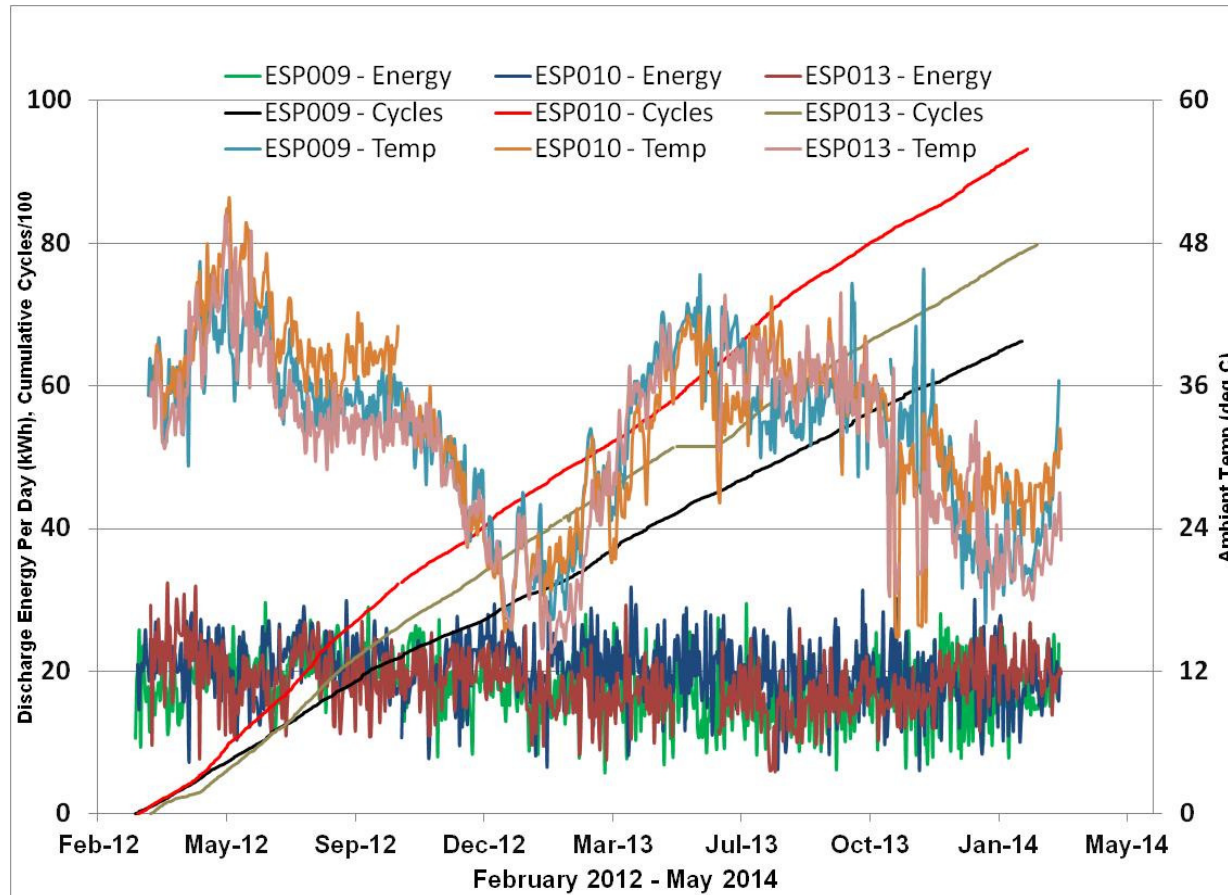
- The ESP has a straight line charge profile – no long “float” charge time
- Power and energy independent and scalable
- Operating temperature up to of 50 degrees
- Large overload capacity on both charge and discharge

## Benefit

- The fast charge profile means less generator run time
- You size the ESP to capture as much spare generator power as possible
- You can increase power and capacity as the load profile increases
- No need to cool the ESP, no parasitic power loss



# Imergy ESP: Temperature vs. Performance / Feb 2012 – May 2014



- Daily data for 2 years operation
- Over 7,000 cycles in each ESP
- Stable output (Discharge Energy per Day)
- High temperature tolerance (2 summers outdoors in Northern India)

# Vanadium Redox USP 3 : Packaged Solution

## USP

- The ESP is a fully packaged solution
- It has its own built in generator controller based on capacity (flexible setting)
- It has a built in RMS package that can either be used independently or integrated to third party RMS
- It comes with a standard warranty of 5 years, which can be extended to 10 years

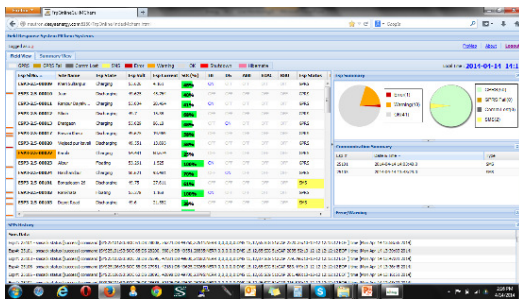
## Benefit

- No additional racks, connector or cables required
- No need for an additional hybrid battery controller – lowers equipment cost.
- Dual mode – CDC + UPS
- No need for independent battery RMS – lowers equipment cost
- No hidden cost. Known price for 5 or 10 years
- ROI under 2 years, OPEX saving and TCO is significantly better than lead acid (even TPPL)



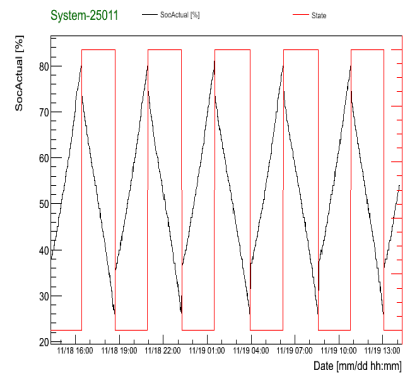
# Monitoring and Analysis

## Online Monitoring Web Page



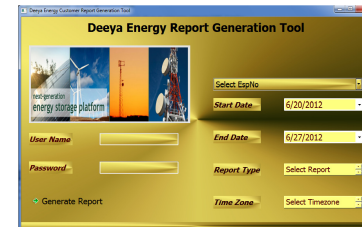
All working ESPs can be monitored through Imergy's Live monitoring Web Page which also shows current status and highlights error/warnings of systems

## Graphical Analysis Tool



Graphical Analysis tool is a tool to analyze ESP's any of the parameter for any period

## Report Generator Tool



1	ESPNO	POWER-SOURCE	STATE	SOC-START	SOC-END	START-TIME	END-TIME	CHARGE-DG	FLOAT-DG	TOTAL-DG	CHARGE-EB	FLOAT-EB	TTC
191	25010	ALLOF	DISCHARGE	85	64	5/8/2012 22:10	5/8/2012 23:10						
192	25010	EB	CHARGE	66	87	5/8/2012 23:12	5/8/2012 23:58				0:46:16		
193	25010	EB	FLOAT	89	89	5/8/2012 23:59	5/8/2012 23:59					0:00:00	
194													
195													
196	ESPNO	SITE-ID	SITE-NAME	CHARGE-CYCLES	DISCHARGE-CYCLES	START-DATE	END-DATE	TOTAL-CHARGE-DG	TOTAL-FLOAT-DG	TOTAL-DG-RUN	TOTAL-CHARGE-EB	TOTAL-FLOAT-EB	TTC
197	25010	Juan		89	87	5/2/2012 0:00	2012-5-9 00:00:00	23:30:25	00:00:00	23:31:50	41:01:35	10:29:37	51
198													

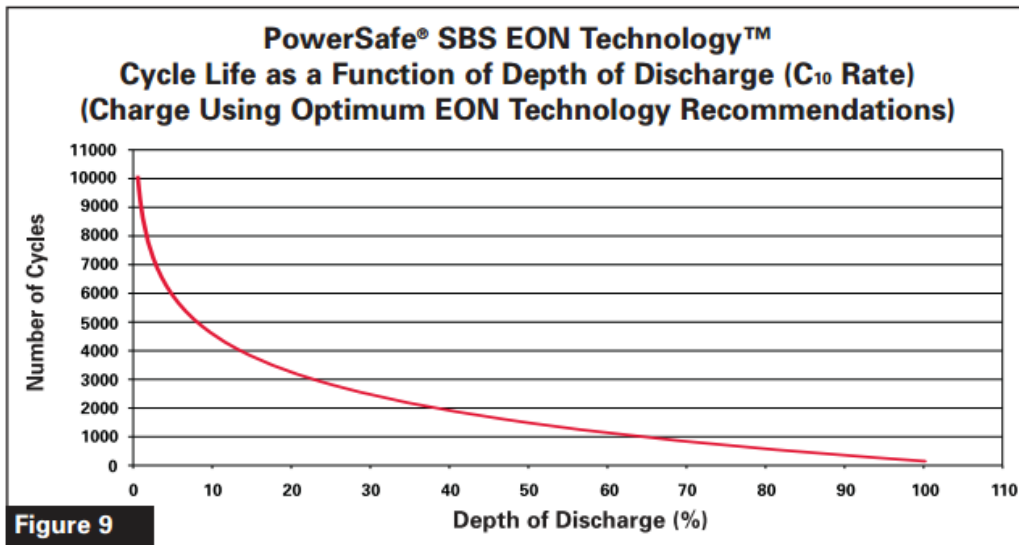
Report Generator tool generates ESPs performance report between any date interval as selected by user with selected parameters as needed to generate reports by NOC, Engineering and Customer use.

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## 3. Competitive Analysis

# Lead-Acid Battery Limitations



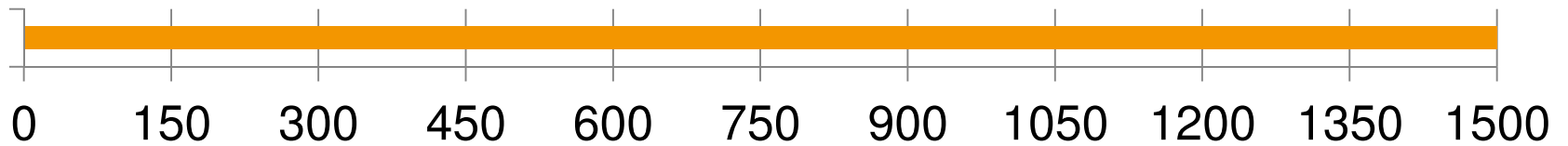
Source: Enersys PowerSafe Application Guide

## Impact of Use on Cycle Life

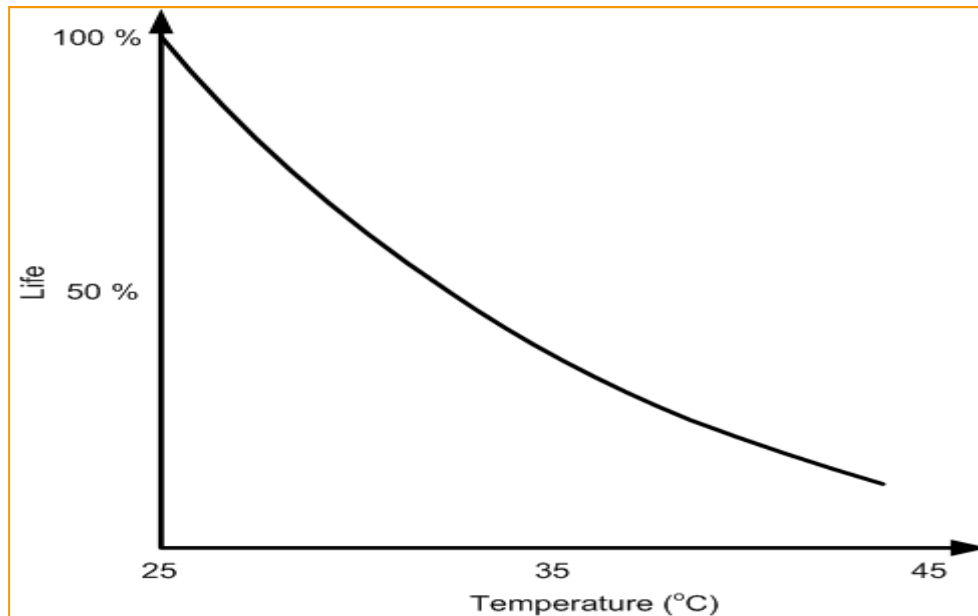
➤ 1,500 cycle life @ 50% depth of discharge

Lead-acid batteries are very sensitive to temperature effects. It can be expected that battery temperature exceeding 77°F (25°C) will decrease expected life by approximately 50% for each 18°F (10°C) increase in average temperature

Cycle Life



# Lead-Acid Battery Limitations

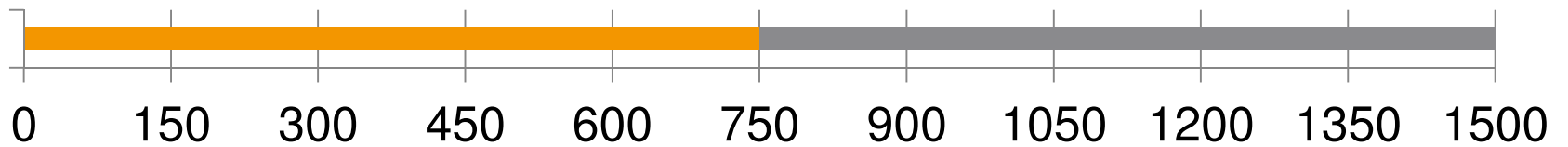


Source: Tyco Electronics product manual

## Impact of Use on Cycle Life

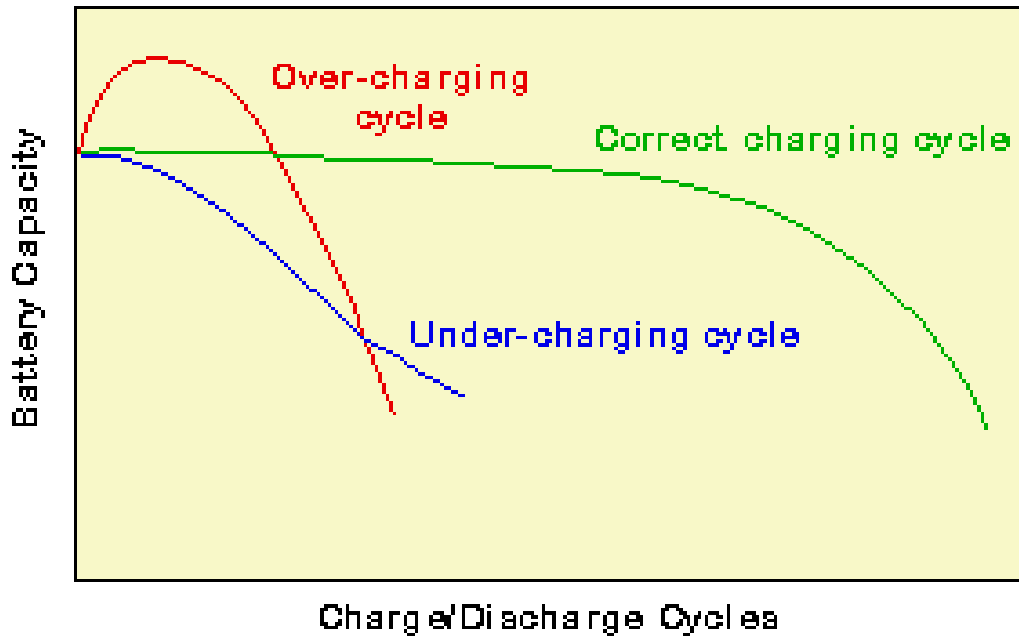
- 1,500 cycle life @ 50% depth of discharge
- 50% reduction in life at 35° C

Cycle Life





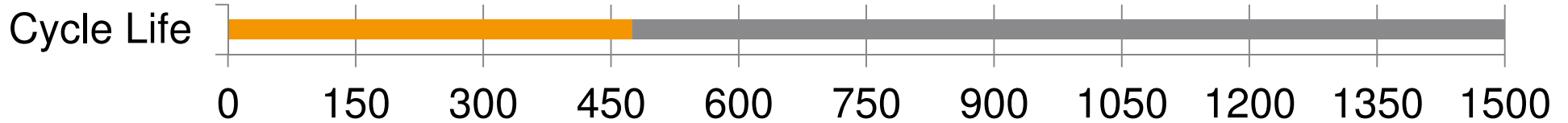
# Lead-Acid Battery Limitations



Source: Tyco Electronics Product Manual

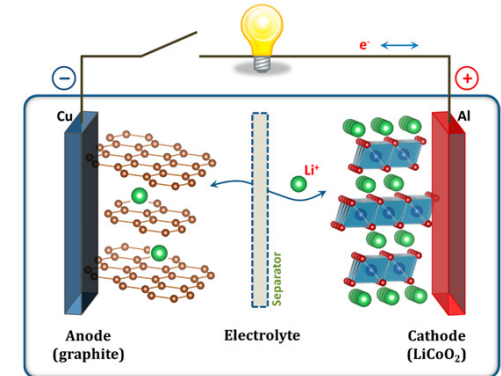
## Impact of Use on Cycle Life

- 1,500 cycle life @ 50% depth of discharge
- 50% reduction in life at 30C
- Partial state of charge/Improper Charging
  - ↳ Capacity reduction
  - ↳ Additional 37% loss @ 70% depth of discharge



# Li-ion Batteries

- High energy density and improved cycle life makes them a good choice for many small consumer applications
- The main issue with this material is **safety in large installations**, when abused it can release large amount of energy, potentially resulting in fire
- Li Ion systems are very sensitive to abuse and do not tolerate operation outside a very narrow and firm operating regime. Excursions outside this regime, typically due to BMS failures, have very quickly led to a fire situation.
- **It is imperative** to integrate a high quality Battery Management System to ensure safety. This effectively doubles the price of a Li-Ion battery system (INTELEC 2013).



Schematic illustration of the first Li-ion battery (LiCoO<sub>2</sub>/Li<sup>+</sup> electrolyte/graphite)



# Samsung-INCELL: SoC Vs. DoD

## Li-Ion Battery System Proposal

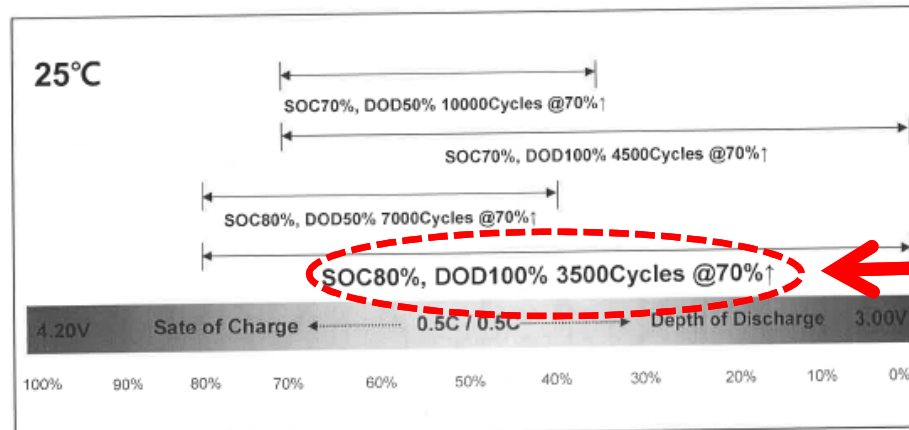
- Field Test for India Telecom Tower -

Apr. 2012

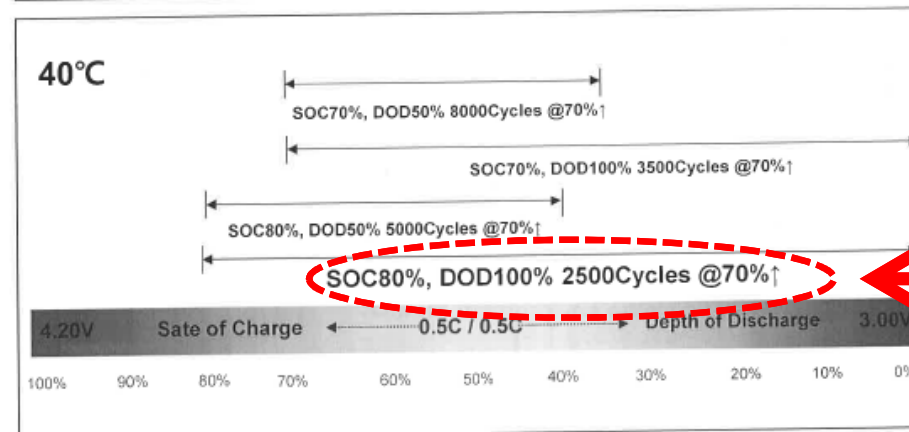


SP48-22 standard battery pack from Samsung SDI

### ■ SOC vs. DOD Cycle Life Analysis @ 25°C & 40°C



3500 Cycles



2500 Cycles

# IESP vs Other Flow Batteries

Key Attributes	Imergy Redox	Zn-Br*	VRFB Sulfuric**	Fe-Cr***
Liquid storage with no solid state issues	✓	✗	✓	✓
Cycle life	✓	✗	✓	⊖
Fast charge	✓	✗	⊖	⊖
Lifecycle cost	✓	✗	✓	⊖
High temperature (50C) operation	✓	✗	✗	⊖
Undesired side reactions: H <sub>2</sub> , O <sub>2</sub> , solid deposition, precipitation, gassing	✓	✓	✗	✗
Energy & power density	✓	✓	⊖	✗
Fully decoupled energy storage and power	✓	✗	✓	✓

\* Zn-Br: Primus, Redflow, ZBB, Premium Power

\*\* V-Sulfuric: Prudent, Gildemeister/Cellstrom, Galaxy

\*\*\* Fe-Cr: Enervault

# IMERGY

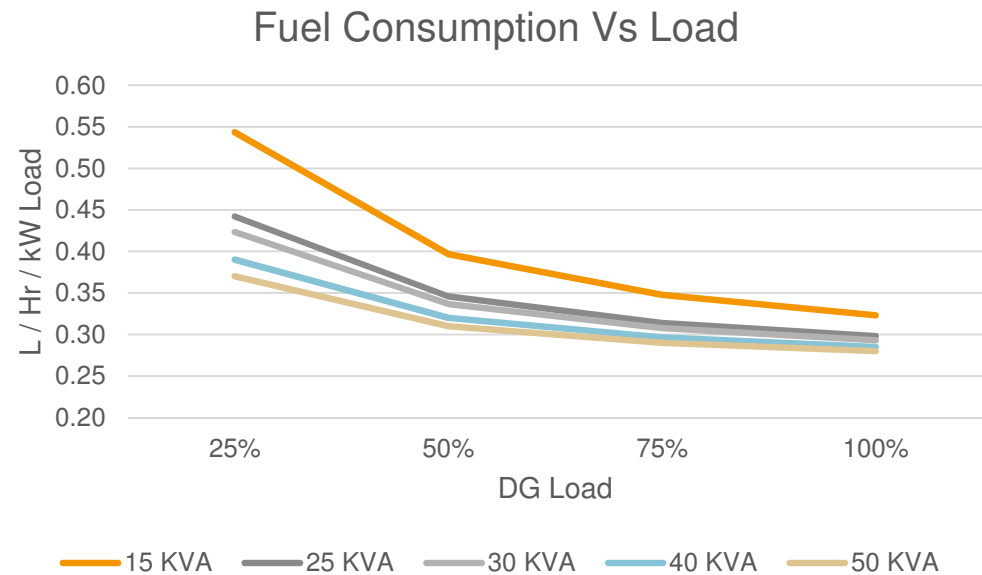
POWER SYSTEMS

## 4. Performance Results

# Fuel Consumption – Diesel Generator

**Fuel Consumption for different loads**

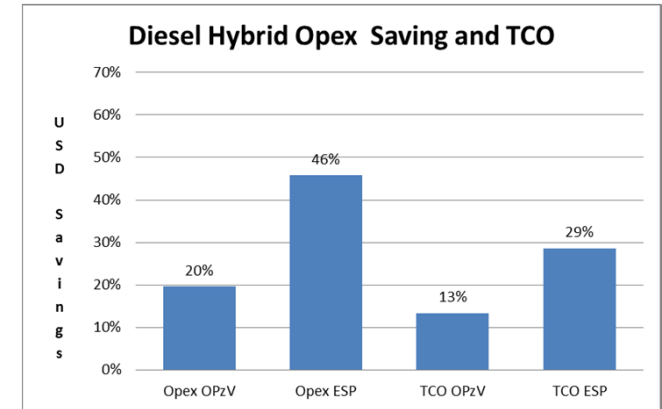
Load	0%	25%	50%	75%	100%	
15 kVA	1.1	2.04	2.98	3.91	4.85	L/Hr
		0.54	0.40	0.35	0.32	L/Hr/kW Load
25 kVA	1.2	2.76	4.33	5.89	7.45	L/Hr
		0.44	0.35	0.31	0.30	L/Hr/kW Load
30 kVA	1.3	3.18	5.05	6.93	8.80	L/Hr
		0.42	0.34	0.31	0.29	L/Hr/kW Load
40 kVA	1.4	3.90	6.40	8.90	11.40	L/Hr
		0.39	0.32	0.30	0.29	L/Hr/kW Load
50 kVA	1.5	4.63	7.75	10.88	14.00	L/Hr
		0.37	0.31	0.29	0.28	L/Hr/kW Load



There are a number of sites that do not run dummy loads. The fuel consumption saving outweighs the decrease in asset life caused by coking

# Off Grid performance comparison – Nigeria

Off Grid Site solution Diesel and Battery	Dual Generator	Deep Cycle OPzV Solution	Deep Cycle ESP5 Solution
<b>Principle of operation</b>	Two Diesel Generators run 24 / 7 alternating every 12 hours @ approx 25% load, which is very inefficient, so dummy loads are often added to reduce carbon build up and damage.	Generators charges OPzV battery and provides power to the site for part of the day, thus running at around 85% load. Generator turns off when battery fully charged. OPzV can only be discharged to 50% DoD, and has cycle life of around 1500 cycles. Cooling required to maintain 25 degrees environment.	Generator fast charges ESP and provides power to the site for part of the day, thus running at around 85% load. Generator turns off when ESP is fully charged. ESP can be fully discharged and has unlimited cycle life. No battery cooling required therefore lower average site loading
Average Site Loading, kW	4	5	4
Generator Power (kW)	12	12	12
Spare Generator Power for Charging	8	7	8
Available Battery Energy Capacity @ 48V (Ah)	0	600	625
Charge time per cycle, h	N/A	12	5.00
Discharge time per cycle, h	N/A	5.76	7.5
Charge time : Discharge time ratio	N/A	208%	67%
Daily run time of diesel (hours)	24	16.22	9.60
Number of cycles per day	n/a	1.35	1.92
US\$ cost per liter of diesel	1	1	1
Average fuel consumption per site (litres/h)	2	2.64	3.2
Annual diesel consumption per site per (litres)	17,520	15,626	11,213
Fuel Delivery costs per site/ annum	1500	1014	600
<b>Total Cost of diesel per annum US\$</b>	<b>\$19,020</b>	<b>\$16,639</b>	<b>\$11,813</b>
O&M costs per annum on DG and batteries	\$10,512	\$7,103	\$4,205
<b>Total Annual OPEX Cost</b>	<b>\$29,532</b>	<b>\$23,742</b>	<b>\$16,018</b>
<b>Total percentage Annual OPEX saving</b>		<b>20%</b>	<b>46%</b>
Generator life in years before replacement	2.57	3.80	6.42
CAPEX replacement cost Diesel engine US\$	\$12,000	\$12,000	\$12,000
Battery or stack life to replacement	5	3.0	14.3
Initial Battery Hybrid System Cost	\$1,000	\$10,000	\$21,000
Replacement Cost		\$5,000	\$3,500
Battery Replacement cost (amortised)	\$1,000	\$0	\$0
<b>TCO INCLUDING initial CAPEX</b>	<b>\$104,612</b>	<b>\$90,697</b>	<b>\$74,659</b>
<b>TCO percentage savings</b>		<b>13%</b>	<b>29%</b>



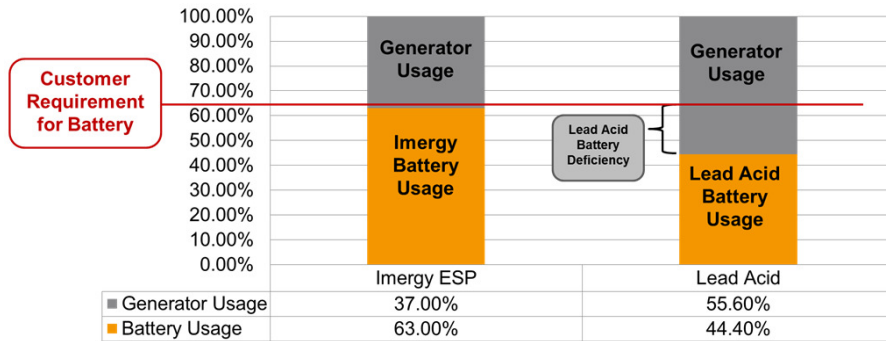
Input Parameters		
Site Load	4	kW
Generator Rating	15	KVA
Fuel Consumption @33% Load	2	l/hr
Fuel Consumption @66% load	2.64	l/hr
Fuel Consumption @90% load	3.2	l/hr
OPzV Capacity	1200	Ah
ESP Capacity	30000	kWh
ESP Efficiency	75%	%
TCO	3	Years
Cost OPzV Hybrid	10000	USD
Replacement Cost OPzV	5000	USD
Cost ESP Hybrid	21000	USD
Replacement Cost ESP	3500	USD
OPzV Charge Time	12	Hours
OPzV DoD	50%	%
Fuel	1	USD
OPzV Life	1500	Cycles
ESP Life	10000	Cycles



# Case Studies

## African: Diesel + Storage

- Off-grid telecom site reliant on diesel gensets
- Imergy ESP replaced lead acid hybrid system
- Average ambient temperature of 35C – 48C
- Diesel genset cycle operated at peak load for maximum efficiency
- 63% reduction in diesel generator use compared to 44% reduction from VRLA



## India: Weak Grid Sites

- Three Indian telecom sites originally installed with valve-regulated lead acid (VRLA) batteries & diesel gensets
- Imergy ESP acted as backup power source in event of grid-outage, genset charges battery and supports telecom tower
- Average ambient temperature 28C – 35C
- Real-world fuel savings between 41% and 94%
- Payback period <2 years

Site	Grid Availability	Monthly Fuel Pre-ESP	Monthly Fuel Post-ESP	Monthly Fuel Savings (Litres)	Monthly Fuel Savings (%)	Annual Fuel Savings (\$)
1	5.8 hr/day	926 L	547 L	379 L	41%	\$6,822
2	16.0 hr/day	552 L	128 L	424 L	77%	\$7,632
3	19.4 hr/day	495 L	29 L	466 L	94%	\$8,388

# Uninterruptible Power Supply for Data Centers

**IMERGY** POWER SYSTEMS



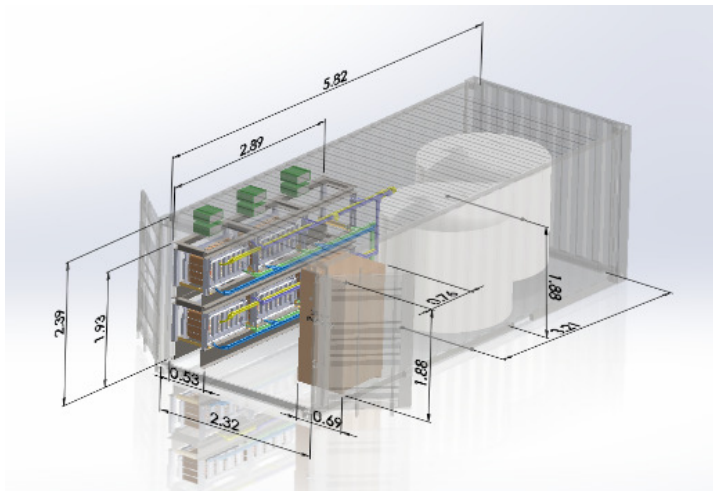
**“Data centers could turn microgrid markets upside down”**

*- Navigant Research*

## A must-have for mission-critical operations

- Battery storage helps protect against service interruptions that result from brownouts or power failures
- Technology is a critical asset for data centers, hospitals and other facilities that cannot tolerate service outages
- Battery storage offer additional operational benefits
  - Drive energy savings
  - Free up square footage
  - Potential to environmental hazards
- Several industrial giants have already focused on the data center power storage market, including ABB and General Electric

# ESP30 Containerized Module & Specifications

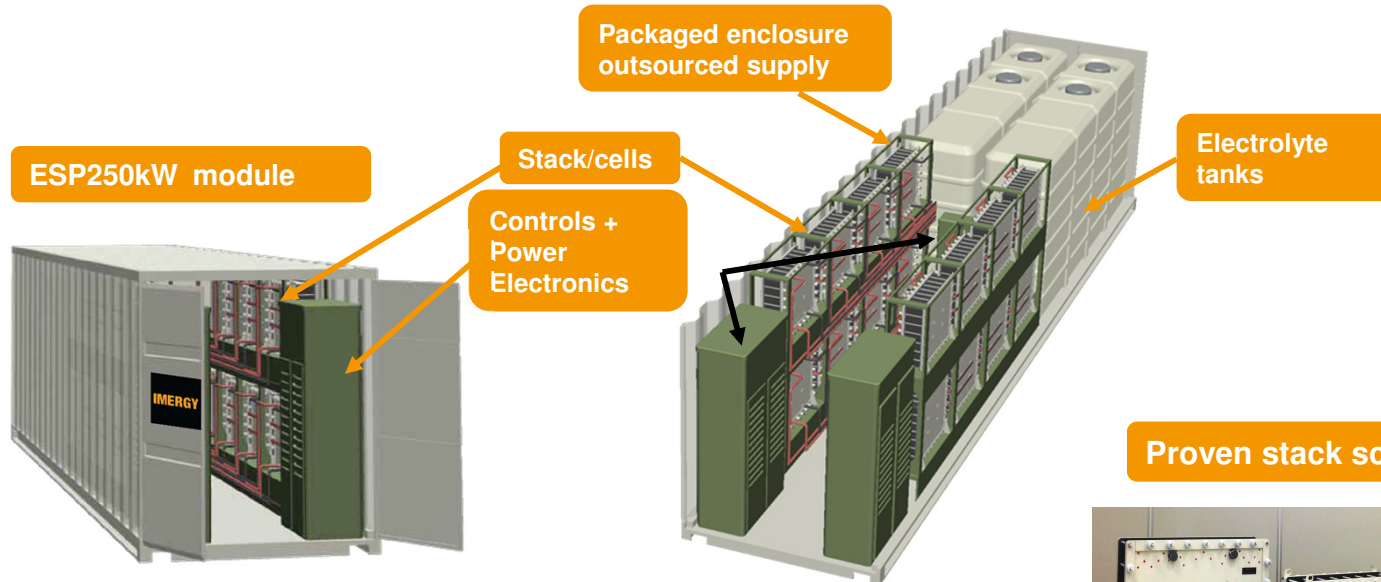


Parameter	Rating	Comments
Power rating output	DC kW AC kW: 380 to 480V 50/60Hz	40 30 Excludes pulse capability Excludes pulse capability
Response time AC	-100% to 100% output	<50ms Communication latency effects excluded
Apparent Power	kVA	PF +/-0.7 to +/-1 Selectable
Weight	kg	16,725 Includes electrolyte
Dimensions	H x W x L (m)	2.8 x 2.2 x 5.8 Container
Cycles		100,000 No limit. Based on life only
DC DC efficiency		75% Measured at constant current over 20% duty cycle
Storage duration		1 to 6 hours A function of electrolyte tank selection
Charge power maximum	kW AC	40 Adjustable
Discharge power maximum	kW AC	30 Excludes pulse capability
Capacity range		0 to 100% No life impacts
Communications interface		Modbus/TCPIP Multiple including CANBUS in multiple strings
Ambient operating conditions		-20 to 55 Celsius Conditioned space not required AC derated based on PCS and transformer
Altitude		2000m
Cooling		Air cooled
Relative humidity		0-95%
Availability figure		99.16% Single module EAR and FOR data available on request
Self discharge	%/day	0.010% In accordance with O&M procedures at a % of module first cost
Stack replacement		10 years
Noise level dBa 1 meter		<70dBa
Warranty	standard extended	5 years 10 years
Start up from Battery support mode to grid connected		< 45 seconds
Transition between Grid and islanded modes		<100ms
<b>General:</b>		
The system is designed with intent to comply with the following standards:	IEE1547, IEEE519, UL1741, CE	System will be certified by April 2015
Containerized electrolyte containers	Determined by HOURS of storage	

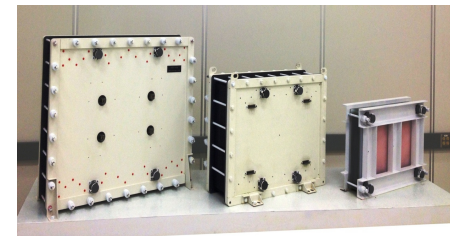
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# The Future: Imergy's Technology is Modular and Scalable and Includes Power Electronics and Software as a Solution

**IMERGY** POWER SYSTEMS



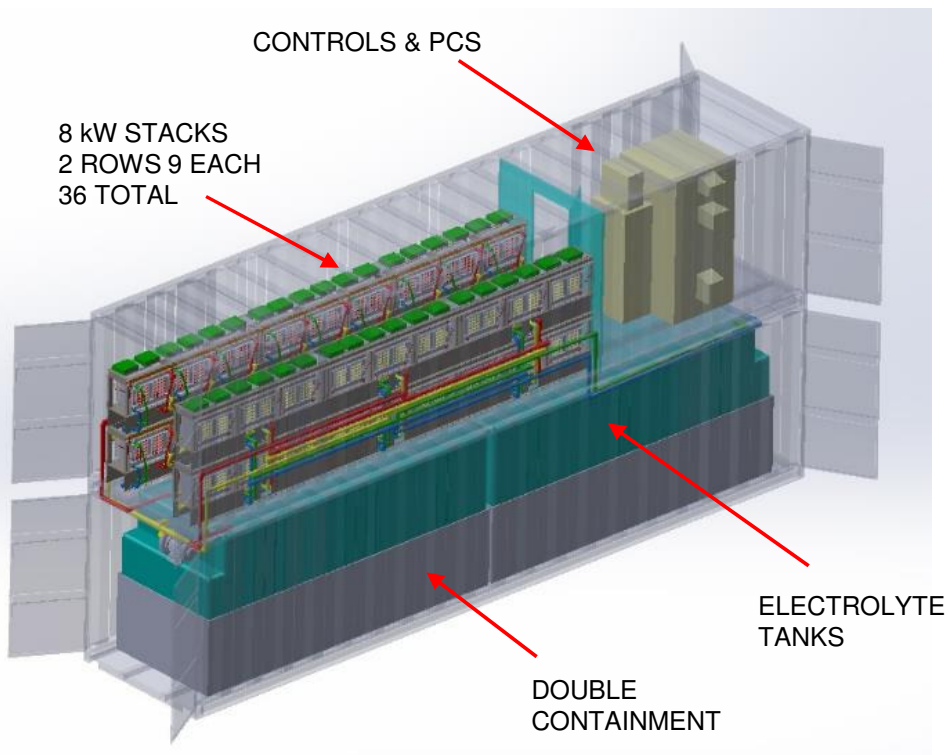
**Proven stack scaling**



**Lowest LCOE for large-scale applications requiring long discharge time, fast charging, and long cycle life**

# ESP250 Containerized Module & Specifications

**IMERGY** POWER SYSTEMS



Parameter		Rating	Comments
Power rating output	DC kW AC kW: 380 to 480V 50/60Hz	290 250	Excludes pulse capability Excludes pulse capability
Response time AC	-100% to 100% output	<50ms	Communication latency effects excluded
Apparent Power	kVA	PF +-0.7 to +-1	Selectable
Weight	kg	13,720	Excludes electrolyte
Dimensions	H x W x L (m)	2.8 X 2.1 X 11.2	Container
Cycles		100,000	No limit. Based on life only
DC DC efficiency		75%	Measured at constant current over 20% duty cycle
Storage duration		1 to 8 hours	A function of electrolyte tank selection
Charge power maximum	kW AC	290	Adjustable
Discharge power maximum	kW AC	250	Excludes pulse capability
Capacity range		0 to 100%	No life impacts
Communications interface		Modbus/TCPIP	Multiple including CANBUS in multiple strings
Ambient operating conditions		-20 to 55 Celsius	Conditioned space not required
Altitude		2000m	AC derated based on PCS and transformer
Cooling		Air cooled	
Relative humidity		0-95%	
Availability figure		99.16%	Single module EAR and FOR data available on request
Self discharge	%/day	0.010%	
Stack replacement		10 years	In accordance with O&M procedures at a % of module first cost
Noise level dBa 1 meter		<70dBa	
Warranty	standard extended	5 years 10 years	
Start up from Battery support mode to grid connected		< 45 seconds	
Transition between Grid and islanded modes		<100ms	
<b>General:</b>			
The system is designed with intent to comply with the following standards:		IEE1547, IEEE519, UL1741, CE	System will certified by April 2015
Containerized electrolyte containers		Determined by HOURS of storage	

## USP 4 : Warranty, Financing and Pricing

### USP

- The ESP has a standard 5 year performance warranty that can be extended to 10 years
- IMERGY can offer split Capex / Opex financing solutions where the electrolyte element is leased on a 5 year monthly payment basis
- Typical cost of 1 x 5kW / 30kWh complete system is \$750/kWh (48VDC)
- Typical cost of a 1 x 30kW / 200kWh complete system is \$650/kWh (240VAC, 3 Phase, Microgrid)
- Typical cost of a 1 x 250kW / 1MWh complete system is \$500/kWh (480VAC, 3 Phase, load shifting, peak shaving, wind firming)



**IMERGY** POWER SYSTEMS

Thank you