



LITHIUM ION THE GAME CHANGER



BY:

Joseph Inyang
CTO Juststandout

Thursday 9th July 2020

LITHIUM ION THE GAME CHANGER

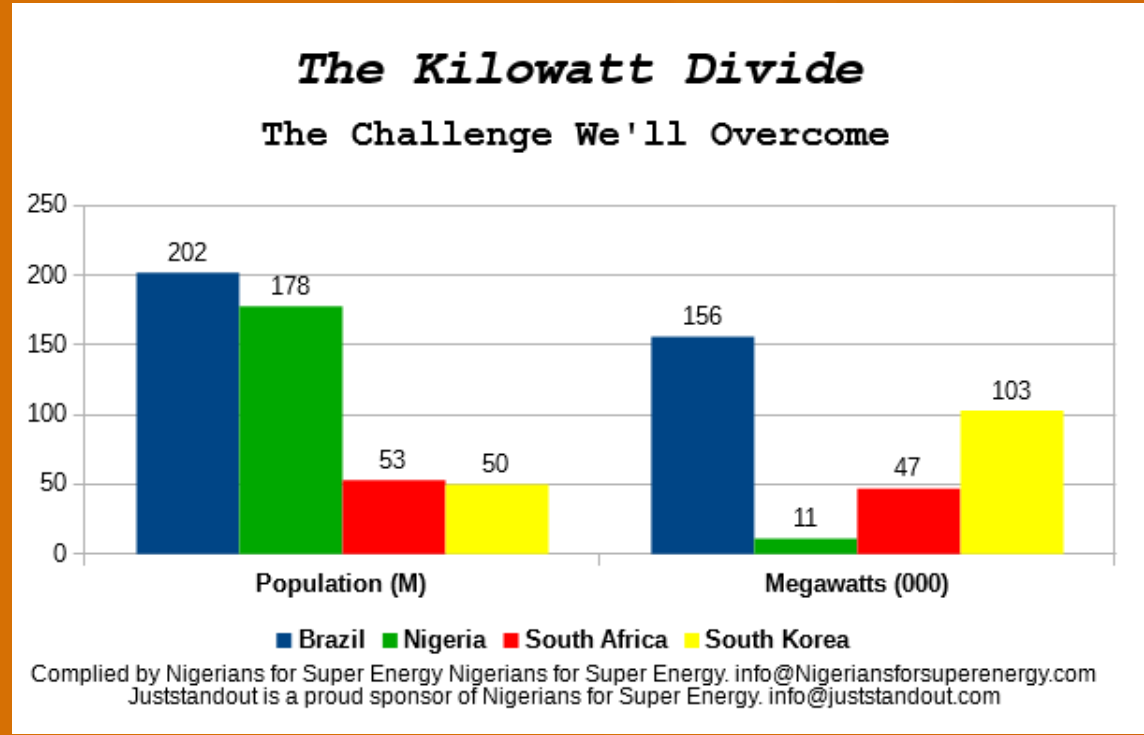


LITHIUM ION THE GAME CHANGER



- We are losing more lives due to lack of power than we are to malaria.
Most primary health care centers do not have access to reliable efficient power.

LITHIUM ION THE GAME CHANGER



LITHIUM ION THE GAME CHANGER

DSEA the Key to Overcoming the Kilowatt Divide

Decentralization

Storage

Efficiencies

Artificial
Intelligence

- Out of the 4 key drivers the most important is STORAGE. Mainly because renewable energy is not a steady supply.



LITHIUM ION THE GAME CHANGER



Key Technologies in ESS and Benefits of LiB

Rechargeable batteries which can be used for energy storage are mainly Li-ion, NaS, Lead, Nickel-Hydrogen Batteries.

	Li-ion Battery	NaS Battery	Lead acid Battery	Nickel-Hydrogen Battery
Energy Density (Wh / kg)	120	110	35	60
Energy Efficiency (%)	95	90	87	90
Life (Number of Cycle)	4000	4500	200-2000	1000
Advantages	<ul style="list-style-type: none">- High energy density- High energy efficiency- Rapid charge and discharge	<ul style="list-style-type: none">- Long life- Low price- Resourceful (Na, S)	<ul style="list-style-type: none">- Long life- Proven technology- Confirmed method of Recycling of the battery	<ul style="list-style-type: none">- Rapid charge and discharge- Resistance to overcharge and over discharge
Disadvantages	<ul style="list-style-type: none">- Danger of Organic electrolyte	<ul style="list-style-type: none">- Exothermic danger	<ul style="list-style-type: none">- Low energy density	<ul style="list-style-type: none">- High price of hydrogen storing alloy- Exothermic danger

Source: Japanese Agency for Natural Resources and Energy, 2009 & NEC's research

LITHIUM ION THE GAME CHANGER



PYLONTECH



LITHIUM ION THE GAME CHANGER



WHO WE ARE

Your dream of future energy is our Heart-oriented motivation, Force awakens.

We, Pylontech, as a dedicated BSS (battery storage system) provider, by consolidating our expertise in electrochemistry, power electronics and system integration,

- have been providing reliable and affordable ESS battery products and solutions to the global market,
- and been significantly contributing to a 5-years increasing rate by double, enabling our market position as one of the top suppliers of lithium battery storage world widely.

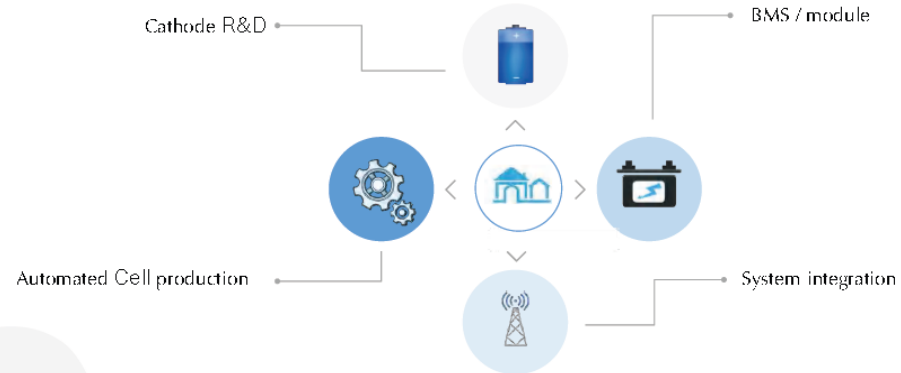


LITHIUM ION THE GAME CHANGER

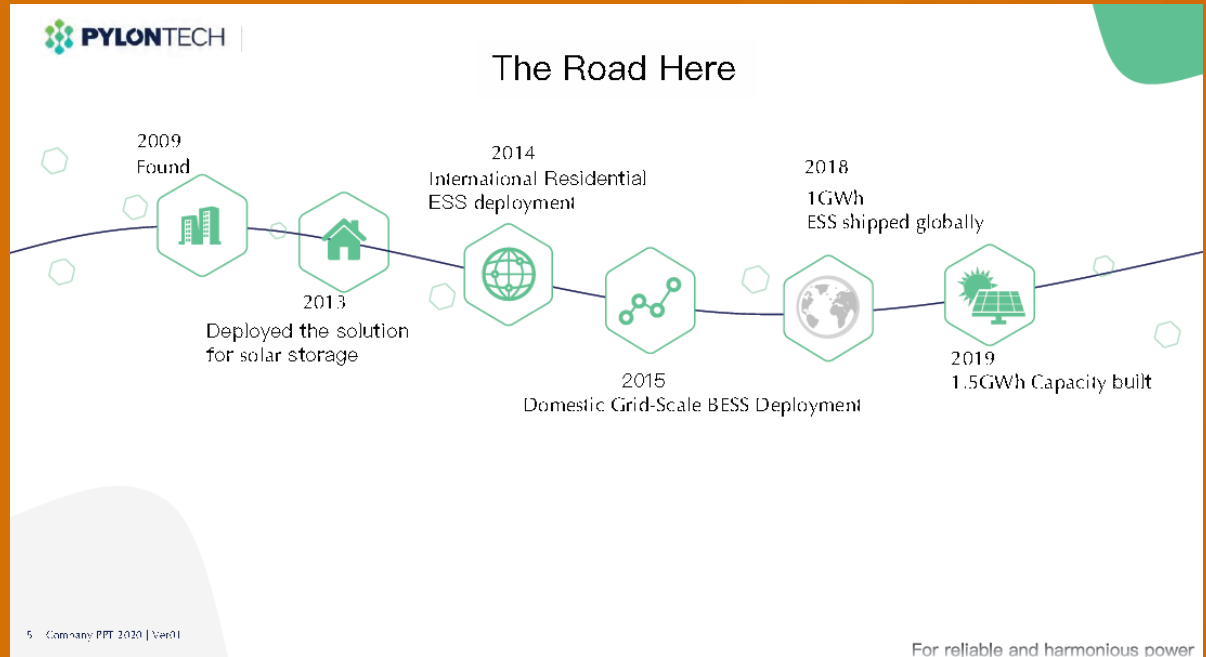


ESS SOLUTION

Vertically integrated the whole industrial chain of Lithium-Iron Phosphate Battery
Only FOCUS on Energy Storage Business
With more than 2.0 GWh serving 120,000+ users. Globally



LITHIUM ION THE GAME CHANGER



LITHIUM ION THE GAME CHANGER



MARKETSINSIDER WATCHLIST

MARKETS STOCKS INDICES COMMODITIES CRYPTOCURRENCIES CURRENCIES ETFS NEWS BI PRIME

TUV Rheinland Issues Pylontech with World's First Certificates for the Latest German Energy Storage Standards

PRESS RELEASE PR Newswire
© Dec. 21, 2017, 02:45 AM [SHARE](#)

SHANGHAI, Dec. 21, 2017 /PRNewswire/ -- On December 15, TUV Rheinland issued the first 2Pfg 2511 & VDE-AR-E 2510-50 certificates for the PowerCube-H1-48 product series developed by Pylon Technologies Co., Ltd. ("Pylontech") of Shanghai. The certificate presentation ceremony was attended by representatives from both companies, including Mr. Lutz Frankholz (Managing Director, TUV Rheinland Shanghai), Mr. Li Wei-chun (General Manager, Solar & Fuel Cell, TUV Rheinland Greater China), and Mr. Cai Xue-feng (General Director, Energy Storage Products, Pylontech).

Best High Yield Savings Accounts & MMAs - January 2020

	Min. for APY :	APY:
	\$5,000	1.95%
★★★★☆ Jan 13, 2020		
BMO Harris Bank Member FDIC Money Market Account		
Open Account		

LITHIUM ION THE GAME CHANGER



Product Certification Capability



With the solid test facilities in its lab, Pylontech has done most of the critical simulation testing, passing the testing of the standard IEC, EMC, VDE, UL, etc..

Pylontech is the First ESS Company obtains all certificates including TUV, CE, UL, JET.

SONCAP

LITHIUM ION THE GAME CHANGER

Real World Test by ITP Renewables (ITP)

5.2. Phase 2 Capacity Test Results

Figure 12 shows the estimated state of health (SOH) against cycles completed for each Phase 2 battery pack still cycling. SOH is estimated by dividing the energy delivered at each capacity test by the energy delivered in the first capacity test.

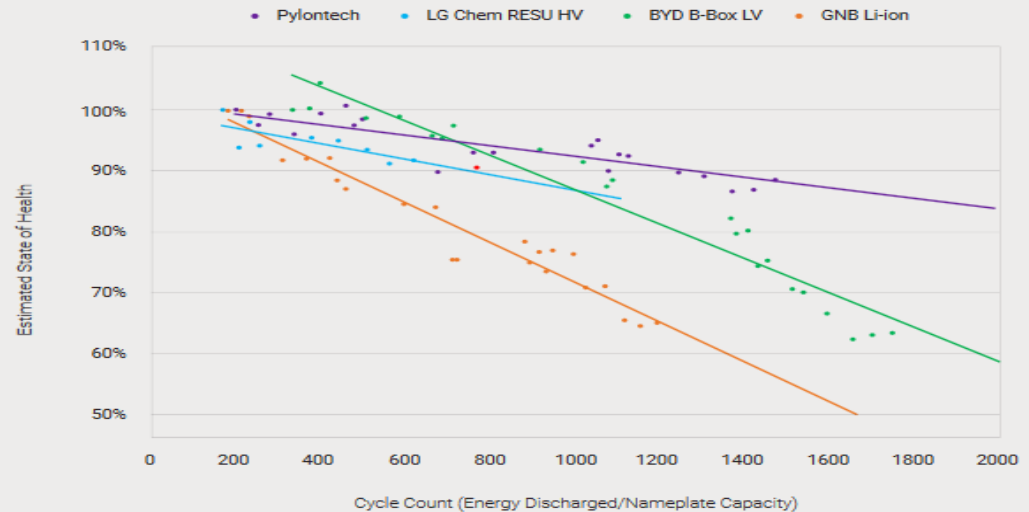


Figure 12. Capacity fade of Phase 2 battery packs based on monthly capacity tests

LITHIUM ION THE GAME CHANGER



9. Application

Application-Overall



Low Voltage Storage system products			High Voltage Storage system products		
UP series	US series		Powercube X series	Powercube H/M series	Powercube-20H/40H
			Force-H1 X1 	H1 H2 M1/M2/M3 	20H/40H
Back Up	Telecom	Home storage	Home storage	Commercial Storage	Grid Storage

LITHIUM ION THE GAME CHANGER



3. US Series (48V)

US2000B -2.4kWh

Modularization design
Low voltage in 48V, 50Ah
DoD: 90%
Life cycle: 6000
Design life: > 15years
Easy installation with brackets or cabinets
Communication protocols: CAN, RS485



Mechanical Characteristics

Dimensions	Width	442mm
	Depth	410mm
	Height	89mm
Weight	24kg	

LITHIUM ION THE GAME CHANGER



3. US Series (48V)

US2000B - 2.4kWh

Modularization design
Low voltage in 48V, 50Ah
DoD: 90%
Life cycle: 6000
Design life: > 15years
Easy installation with brackets or cabinets
Communication protocols: CAN, RS485

S



Mechanical Characteristics

Dimensions	Width	442mm
	Depth	410mm
	Height	89mm
Weight	24kg	

LITHIUM ION THE GAME CHANGER



3. US Series (48V)

US3000-3.55 kWh

Modularization design
Low voltage in 48V, 74Ah
DoD: 90%
Life cycle: 6000
Design life: > 15years
Easy installation with brackets or cabinets
Communication protocols: CAN, RS485, RS 232
Safety Certificate: CE, TÜV, UN38.3, RoHS



Mechanical Characteristics

Dimensions	Width	442mm
	Depth	420mm
	Height	132mm
Weight	35kg	

LITHIUM ION THE GAME CHANGER



2. UP Series (24V)

UP2500-2.84kWh

Modularization design
Low voltage in 24V, 111Ah
Design life: > 15years
Communication protocols: CAN, RS485
Lead Acid battery replacement



Mechanical Characteristics

Dimensions	Width	442mm
	Depth	420mm
	Height	119mm
Weight	27.5 kg	

LITHIUM ION THE GAME CHANGER



3. US Series (48V)

LV-HUB-For communication



Mechanical Characteristics

Dimensions	Width	442mm
	Depth	150mm
	Height	44mm
Weight	3.5kg	

LITHIUM ION THE GAME CHANGER



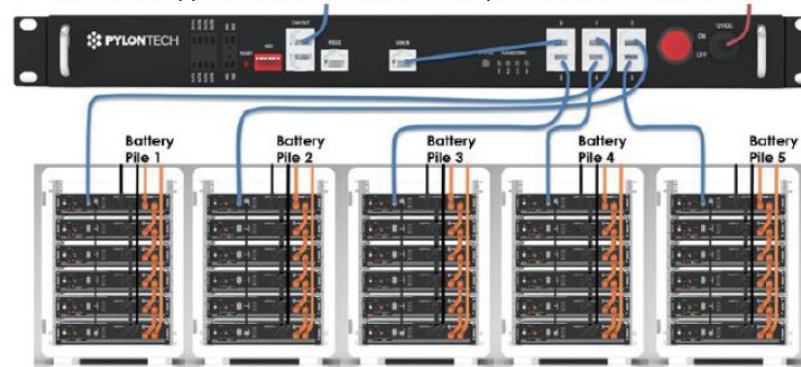
3. US Series (48V)

LV-HUB

Multi Battery Piles **CAN Communication** Cable Connection

Each Communication HUB connects maximum 5 battery string.

5 LV-hubs support maximum 200 batteries in parallel with communication.



Each battery pile can configure maximum 8pcs US2000B Plus or 8 pcs US3000.

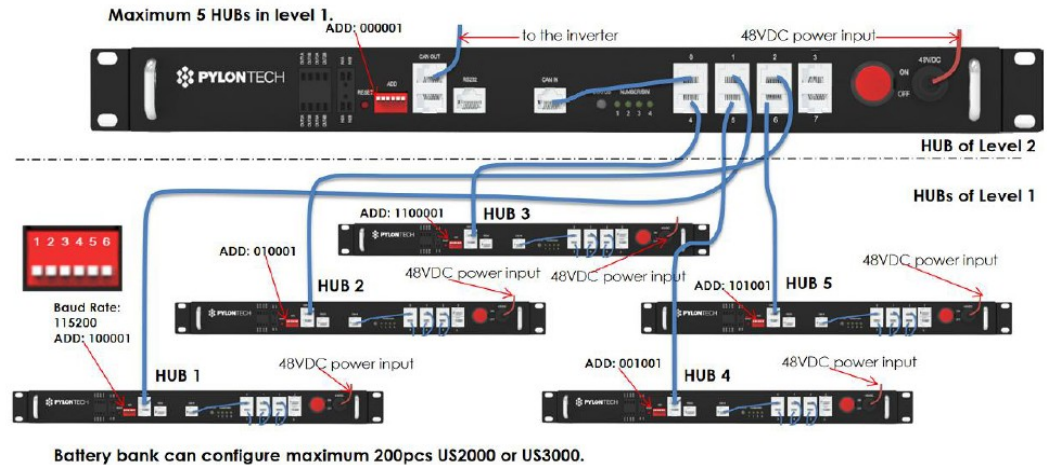
LITHIUM ION THE GAME CHANGER



3. US Series (48V)_V-HUB



Multiple HUBs CAN Communication Cable Connection



LITHIUM ION THE GAME CHANGER



LITHIUM ION THE GAME CHANGER



Conext™ XW

Released in 2006

- Pure sine wave inverter/charger
- Suitable for single phase and three phase systems
- Fast transfer time

Conext™ XW+

Released in 2014

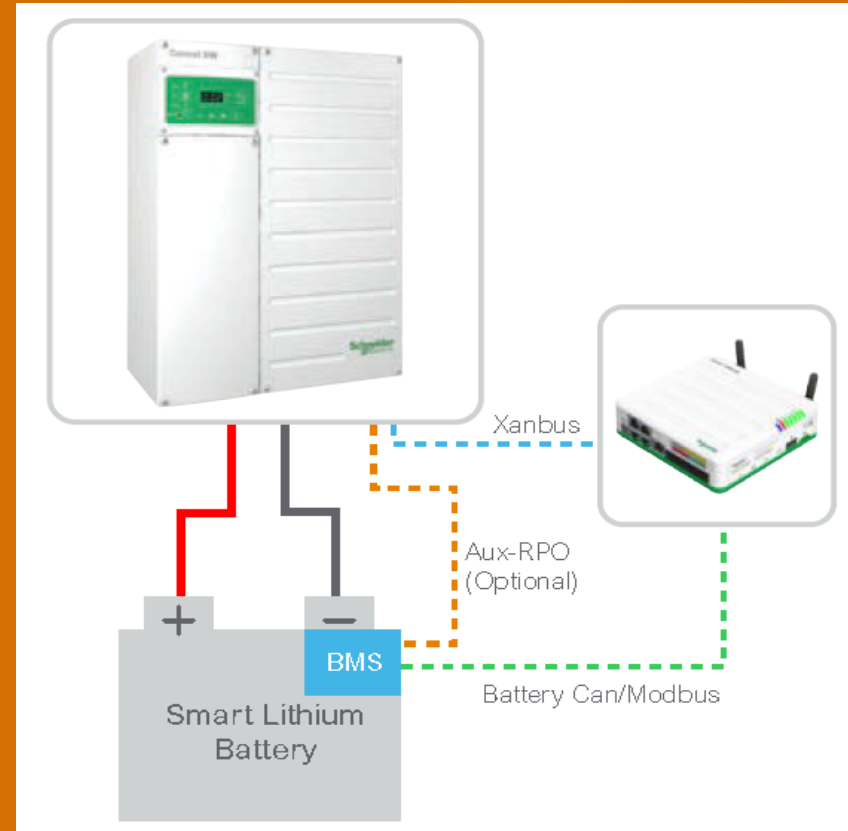
- Support for multi-unit and multi-cluster systems
- Support for AC coupling

Conext™ XW Pro

Released in 2019 UL / 2020 IEC

- Designed for evolving grid code requirements
- Li-ion with closed loop integration
- Enhanced AC coupling
- Closely Integrated with Conext™ Gateway & Insight 2

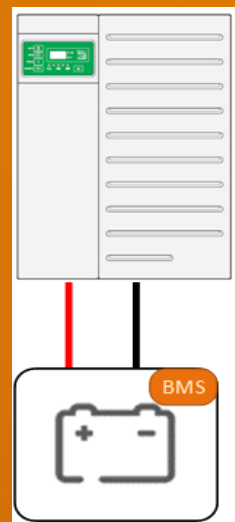
LITHIUM ION THE GAME CHANGER





TYPE 1 LEAD-ACID REPLACEMENT / OPEN LOOP (I)

- **Lead-Acid Replacement** are batteries designed to operate as drop-in replacement for lead-acid
- There is no necessity to interchange information with in-built BMS:
 - No communication with BMS
 - BMS has the whole responsibility for battery safe operation (if something fails it trips)
 - For better estimation of SoC, recommended to use *Conext Battery Monitor*
- Operation of Conext devices are based on fixed settings:
 - Always within safety tolerance ranges (conservative settings)
 - Normally recommended by battery manufacturer
 - We can study case by case

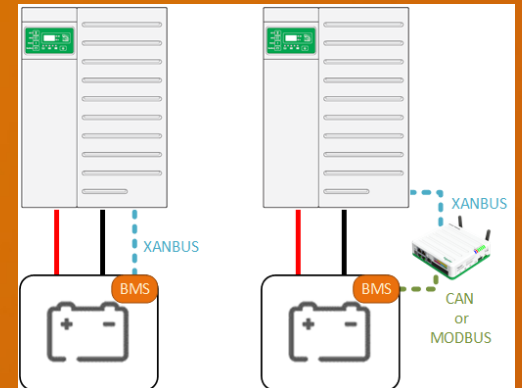




TYPE 2 ADAPTIVE SETTINGS / CLOSED LOOP (I)

- **BMS communication with inverter: SoC, Voltage, Temperature, Max Charge current, Max Discharge Current... that may change (based on operating conditions)**
- **The communication is used to dynamically update charging/discharging settings. In this case the battery safe operation is guaranteed by both, BMS & inverter.**
- **There are different communication possibilities**
 - **Xanbus (XW+ & XW Pro):**
 - **CAN (XW Pro + Conex Gateway):**
 - **Modbus (XW Pro + Conex Gateway):**

- **For examples: Pylontech**





TYPE 2 ADAPTIVE SETTINGS / CLOSED LOOP (II)



Advantages of Closed Loop

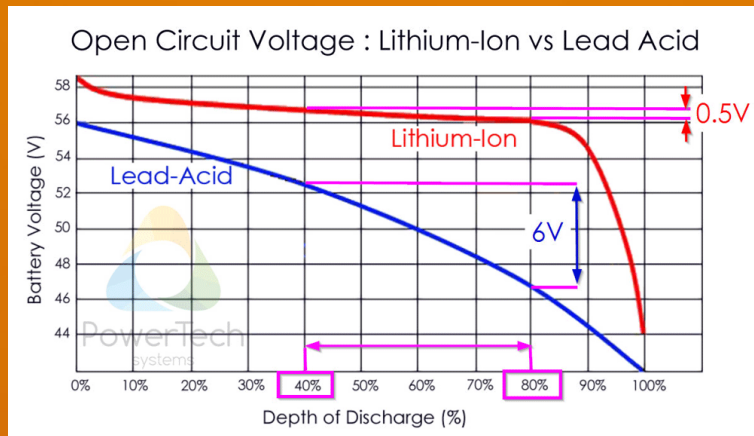
Easier setup and configuration using charge regulation directly from the BMS (no need to configure charge settings as part of inverter commissioning – dynamic adaptation to BMS)

- Better utilization of the full range of battery capacity
- Better utilization of the maximum available charge / discharge current based on ambient conditions e.g. temperature
- Improved state transitions and charge regulation using the SOC information from the BMS
- Improved regulation to avoid nuisance tripping by the battery BMS (as we're adapting to BMS)
- Improved AC coupling (SoC is more stable than voltage for this control)



Advantage of SoC Control

- Li-ion battery voltage is flat through most of the SOC range
- Li-ion Controls based on SOC provide significantly improved accuracy for state transitions (e.g. Re-charge, Grid Support, Load Shave, AC Coupled Charge Regulation)
- Control based on battery voltage works well for lead-acid with more linear slope of voltage vs SOC



Working with SoC Control on Li-ion batteries allows as improved energy usage, as battery status is more accurate

LITHIUM ION THE GAME CHANGER

Real World Successes

“The Hornsdale Power Reserve, owned by French renewable energy producer Neoen, uses Tesla’s utility-scale Powerpack system. Based on an impact study from consulting firm Aurecon, it appears that the big battery has saved consumers AUD 116 million or roughly **\$76 million in 2019**. The same report detailed how the HPR responded to **three separate major events** since it went online in 2018.”

Source: Teslarati: March 12, by Randell Suba

Boring Company has is planning to reduce tunneling cost by factor of 10 from \$1B per mile, most of that reduction comes from using Lithium ion batteries.

Soucre: Boring Company



LITHIUM ION THE GAME CHANGER



**10KWH, 4xUS2000
Lagos, Nigeria**



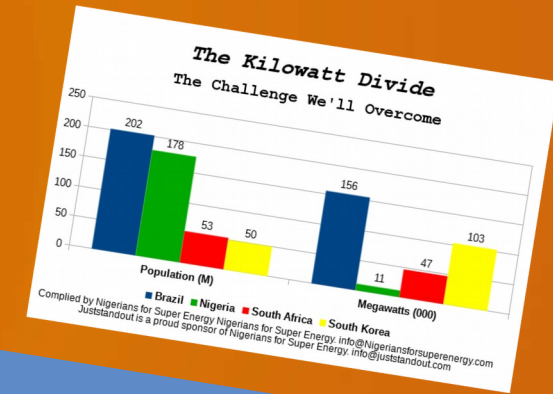
**42KWH, 12xUS3000
Lagos, Nigeria**

LITHIUM ION THE GAME CHANGER



**1MWH/4MWH 2x 20FT container
Changzhou China, Nigeria**

LITHIUM ION THE GAME CHANGER



LITHIUM ION THE GAME CHANGER

Thank You!!!

We can continue the conversation here :

LinkedIn - Juststandout

Twitter - @juststandout

Instagram - juststandout_energy

Facebook - juststandout limited

Newsletter :

www.juststandout.com



Authorized
Sole Partner
West Africa

Joseph Inyang
Joe@juststandout.com

LITHIUM ION THE GAME CHANGER



Webmail | Lonex Cont... | Lonex Webmail :: Com... | Easy Youtube Video And... | Download Firefox for... | New Tab | Petition - Reinstat... | +

https://www.change.org/p/minister-of-finance-nigerian-federal-government-reinstate-free-t...

change.org Start a petition My petitions Browse Search Log in

Reinstate FREE Tariffs on Solar in Nigeria

The Kilowatt Divide
The Challenge We'll Overcome

Country	Population (M)	Megawatts (000)
Brazil	202	156
Nigeria	178	11
South Africa	53	47
South Korea	50	103

7,922 have signed. Let's get to 10,000!

Safiya Aliyu signed this petition

Uka Ibe signed this petition

First name
Last name
Email

Please share my name and email address with Nigerians for Super Energy, so that I can receive updates on this campaign and others.

Display my name and comment on this petition

Nigerians for Super Energy started this petition to Minister of finance Nigerian Federal Government

Type here to search

2:04 AM 7/9/2020