For What it's Worth
The Value of Storage on the Grid

Leading edge hybrid lead-acid

John Wood, CEO

For What it is Worth

The Value of Storage on the Grid

Ecoult UltraBattery® Projects

Island Grid

Wind Smoothing

Solar Smooth. & Shift.

Reg. Services

Remote Telecom

100% renewable grid

Light industrial

Microgrid


Value
Cost


Cost
ARRA Grants
Value

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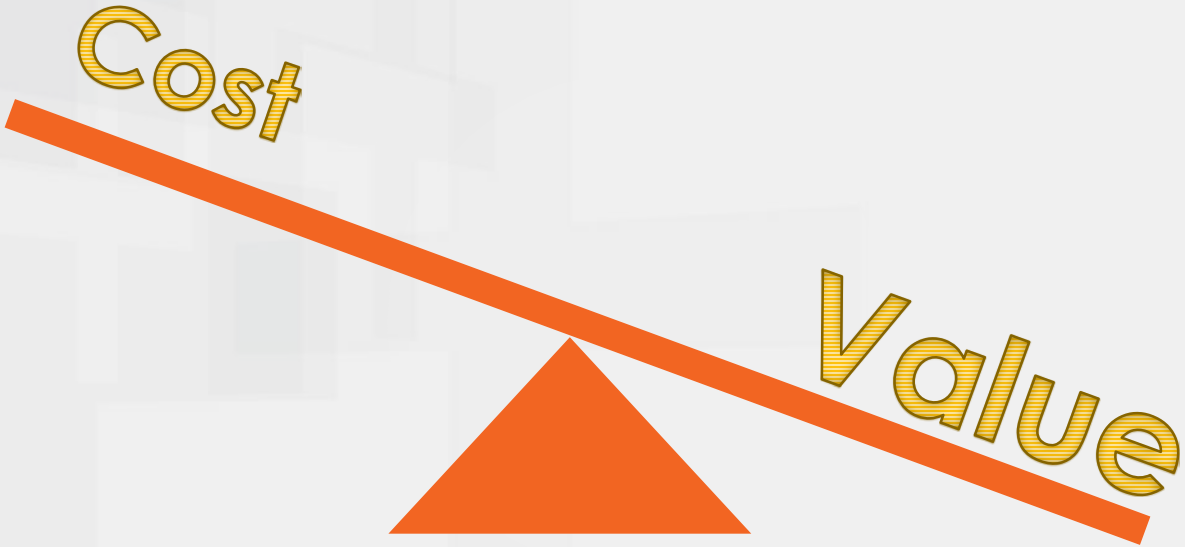


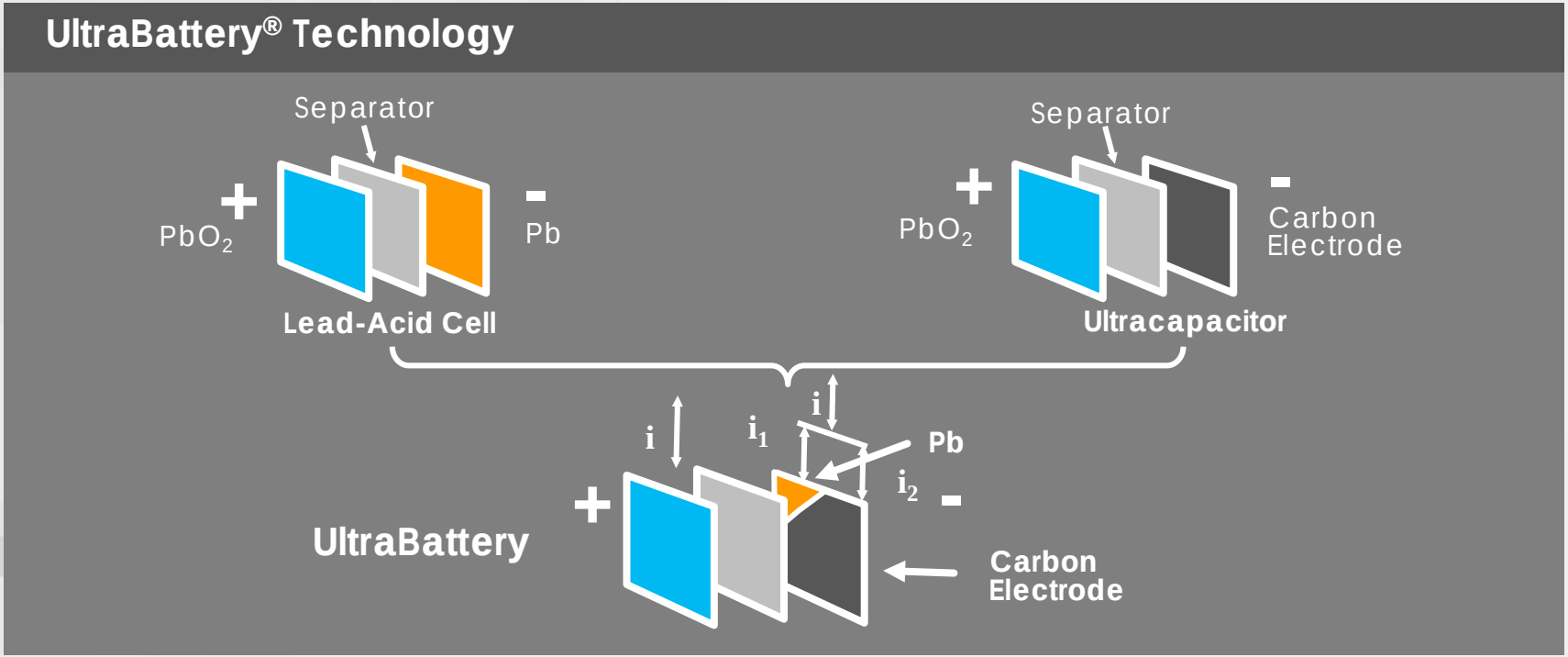
Trusted Dispatchability

Safety

US Department of Energy ARRA grant East Penn Manufacturing Regulation Services using UltraBattery®

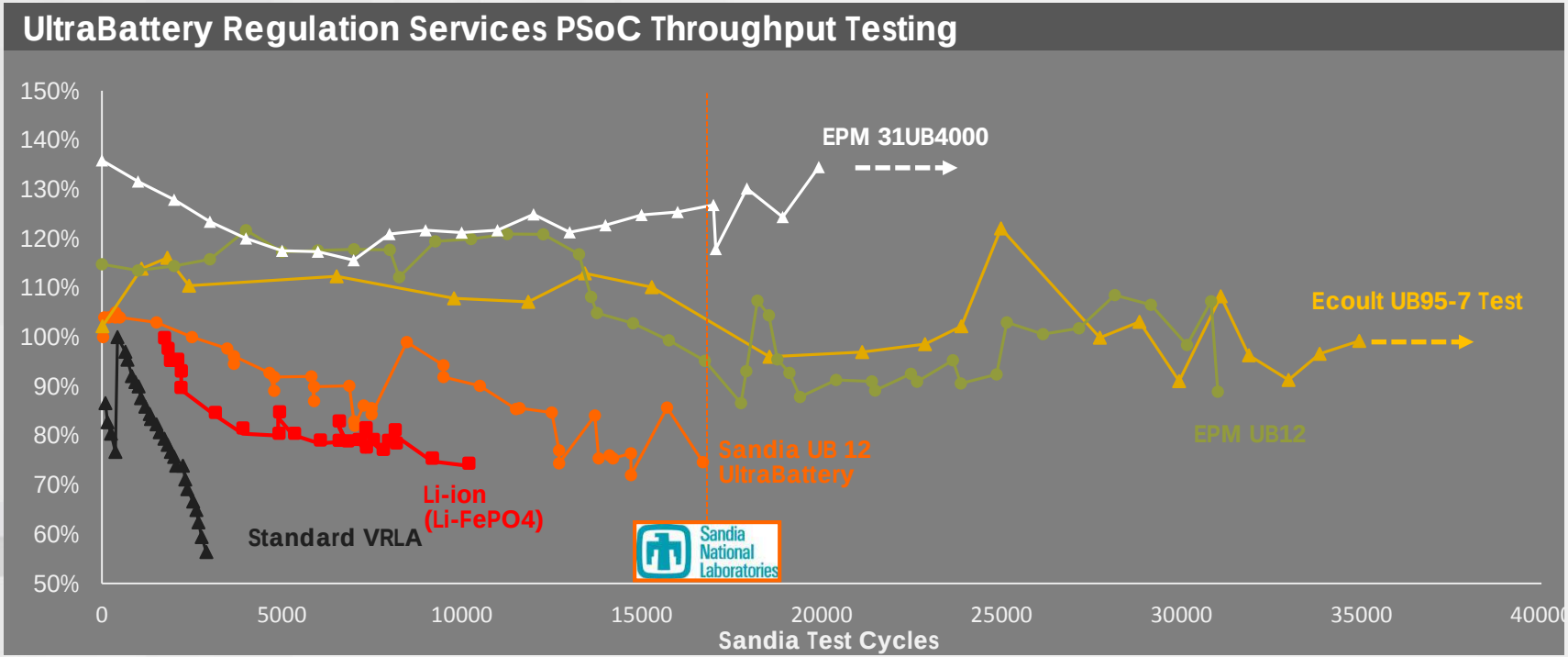
21st Century lead-acid

VRLA for stand-by. UltraBattery for cycling.



UltraBattery Regulation Services [2013]

PSoC Throughput Testing



RETURN

US Department of Energy ARRA grant

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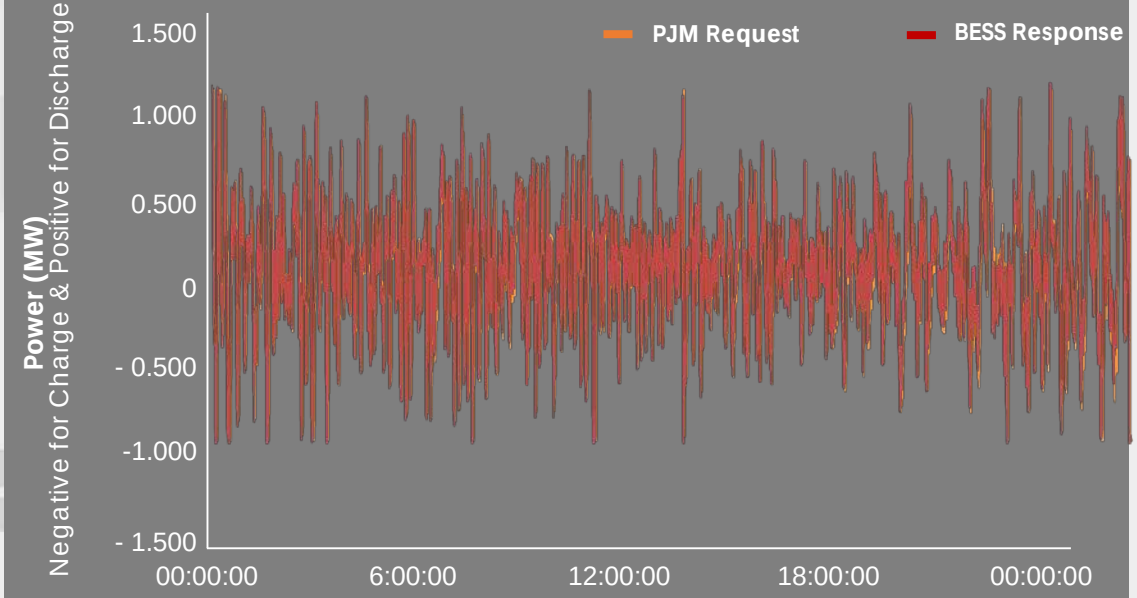
Reg. Services

Lead-acid providing accurate provision of Regulation Services

Dynamic PJM Regulation Services Signal, 22 May 2014



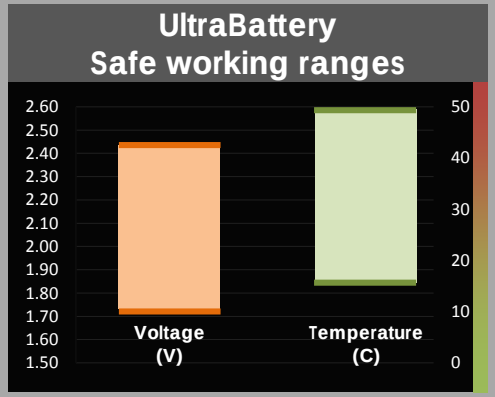
Trust and Safety

Leadership in safe energy storage with trusted dispatchability

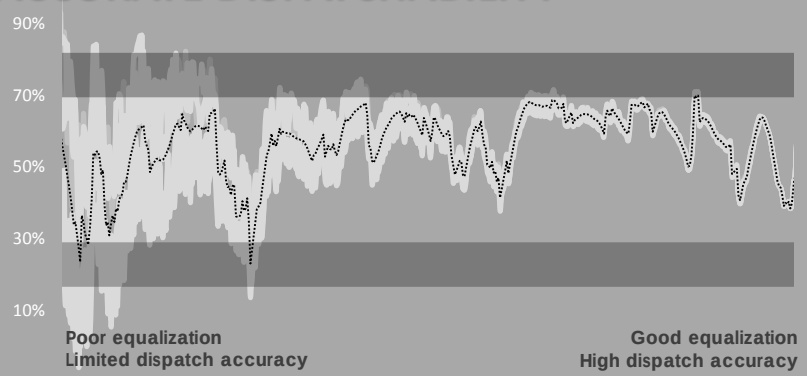
Understanding, monitoring, interpretation, prediction, control, reporting

Deka unigy UltraBattery

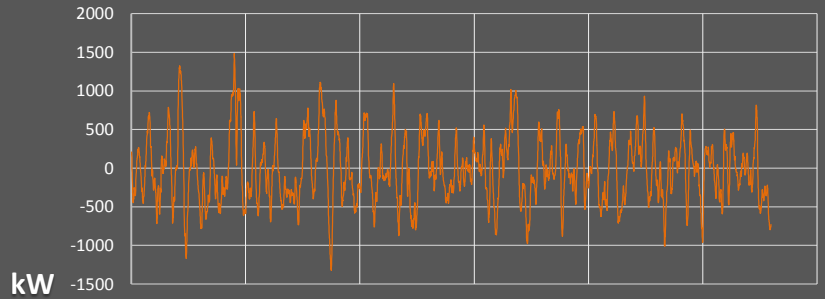
SAFETY



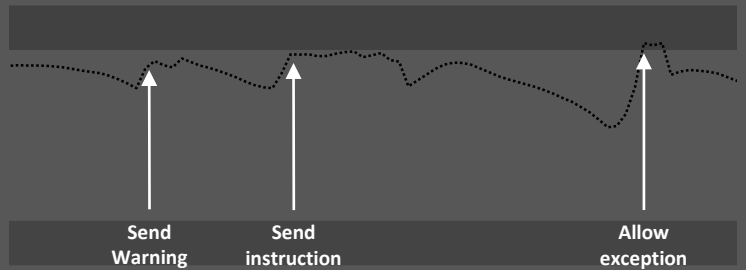
ACCURATE DISPATCHABILITY



CUSTOMER REQUIREMENT



ADAPTIVE CONTROL



Momentum

Momentum

New UB700 formats since ARRA Grant

- 2 V and 12 V formats in identical form factor
- Large (2x) increase in power handling
- Continuing to increase power rates
- Continuing to increase RoC
- Reducing need for parasitic loads (air conditioning)

New HMI and control designs and software

- Development of web-based reporting, control and HMI
- Individual battery sensing and monitoring
- Adaptive control

Momentum

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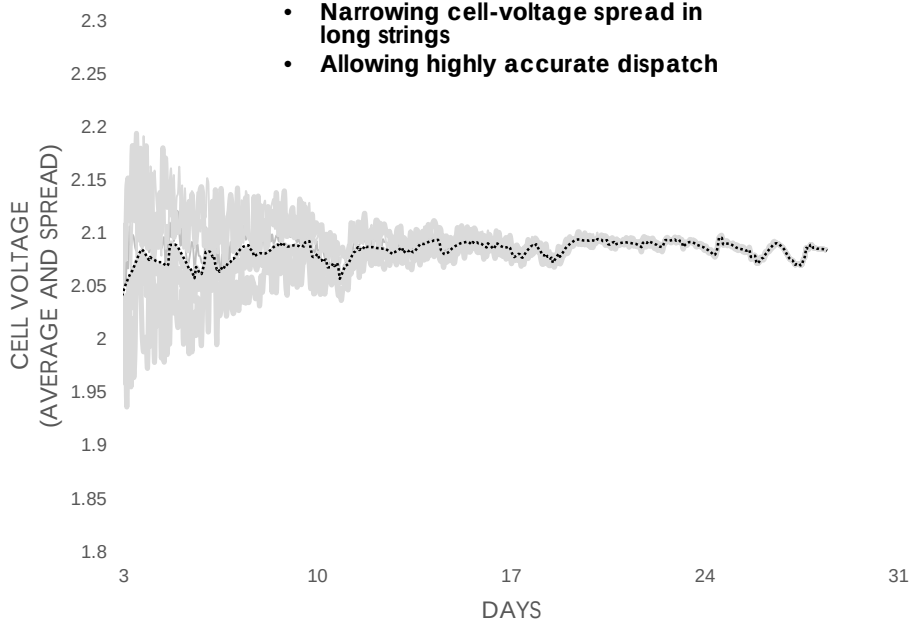
Battery monitoring

- Safety and reliability
- Scope beyond UltraBattery
- Data transformed to information
- Reporting over internet

Automatic equalisation

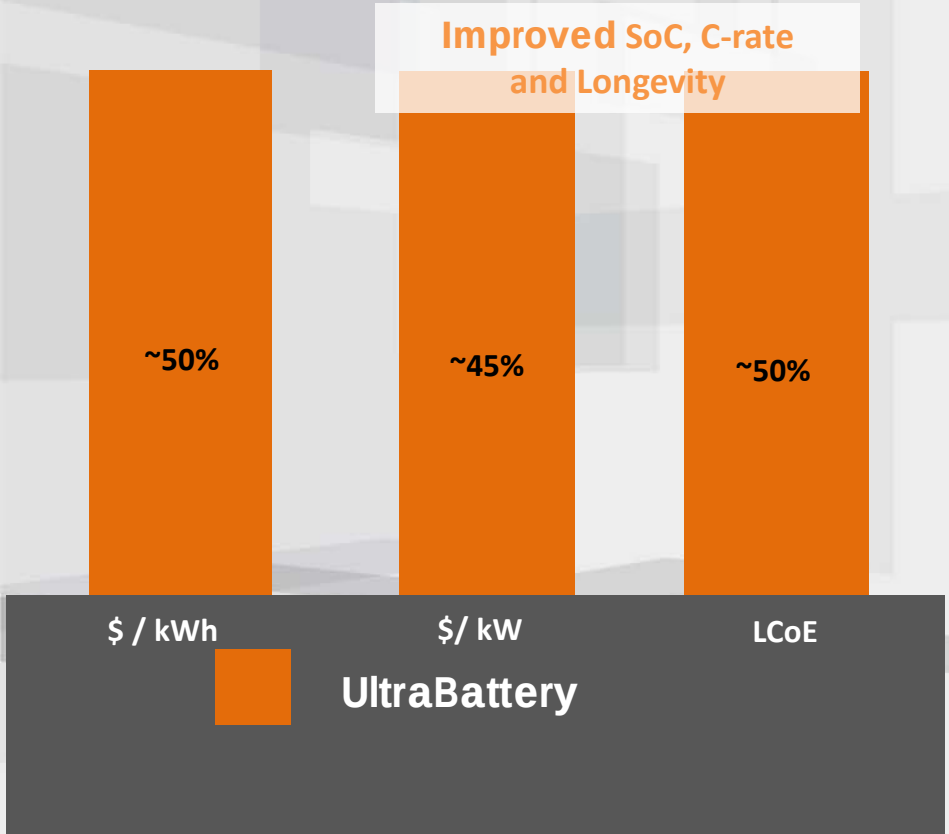
- Narrowing cell-voltage spread in long strings
- Allowing highly accurate dispatch

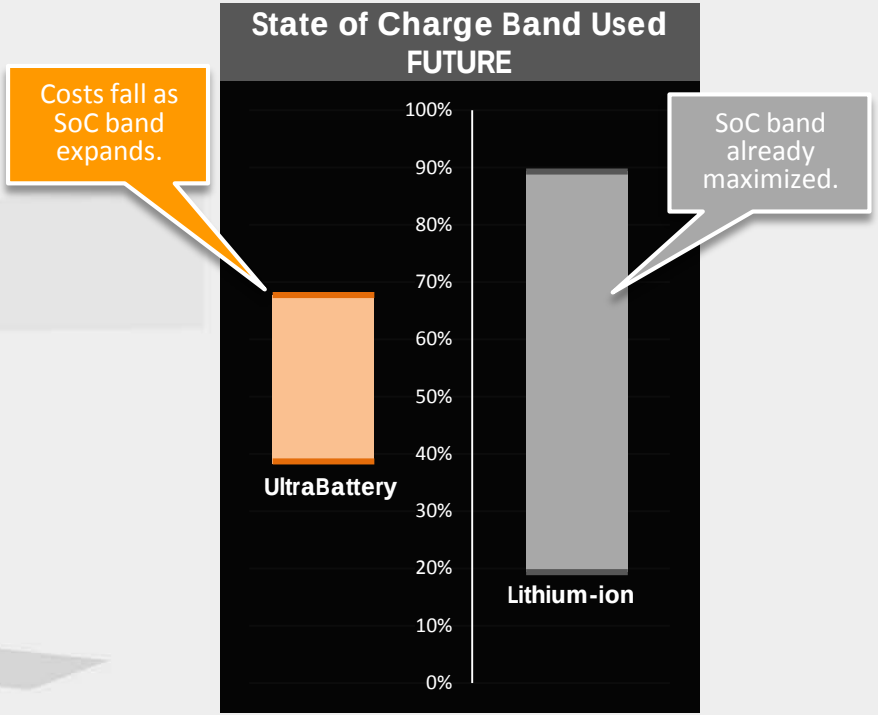


Cost

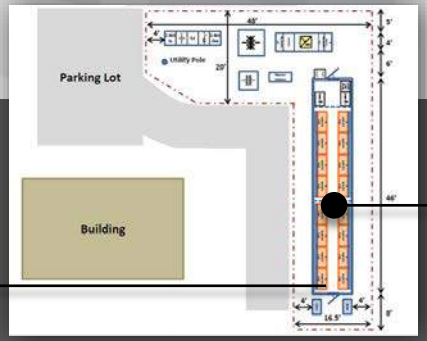
Cost Leadership for Lead Acid in terms of $/kW,$/kWh and LCOE

Scope for cost leadership through Performance Enhancement

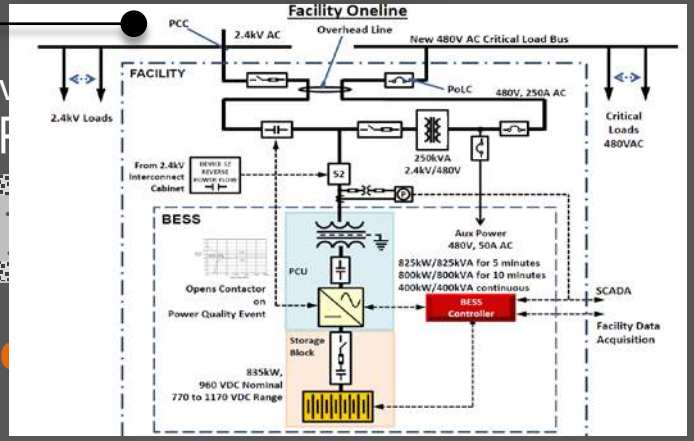




Value



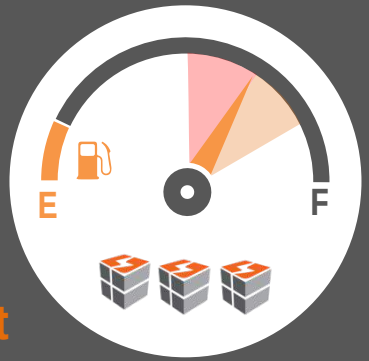
Large MW-scale dual-purpose US project underway



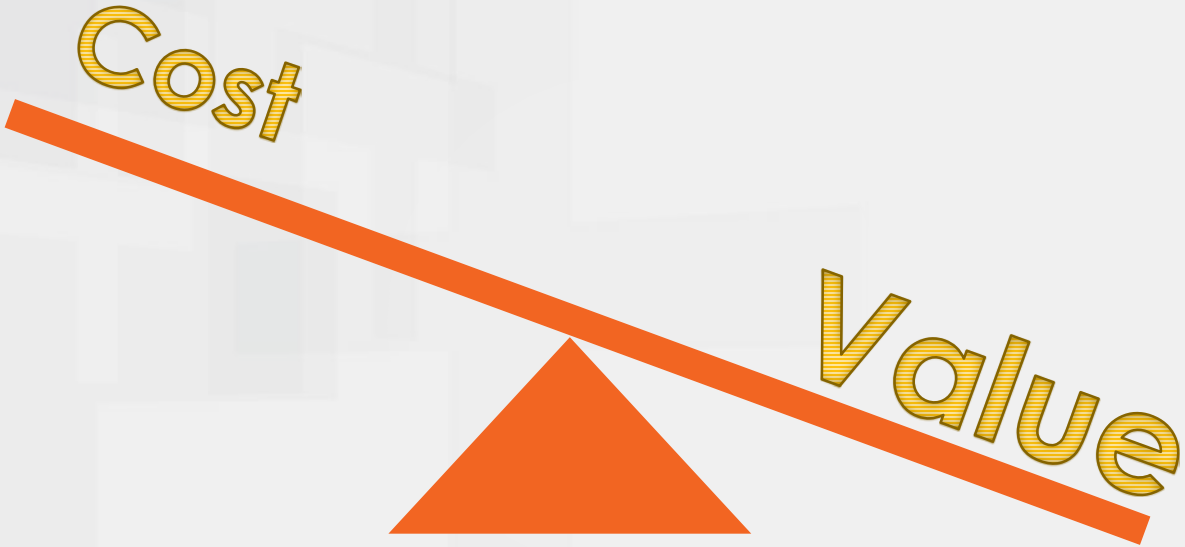
Conv
on F

Re

Battery
in Partial State
of Charge



Reserve Event


Cost
Value

Partial State of Charge

The New Dimension in a Lead Acid World

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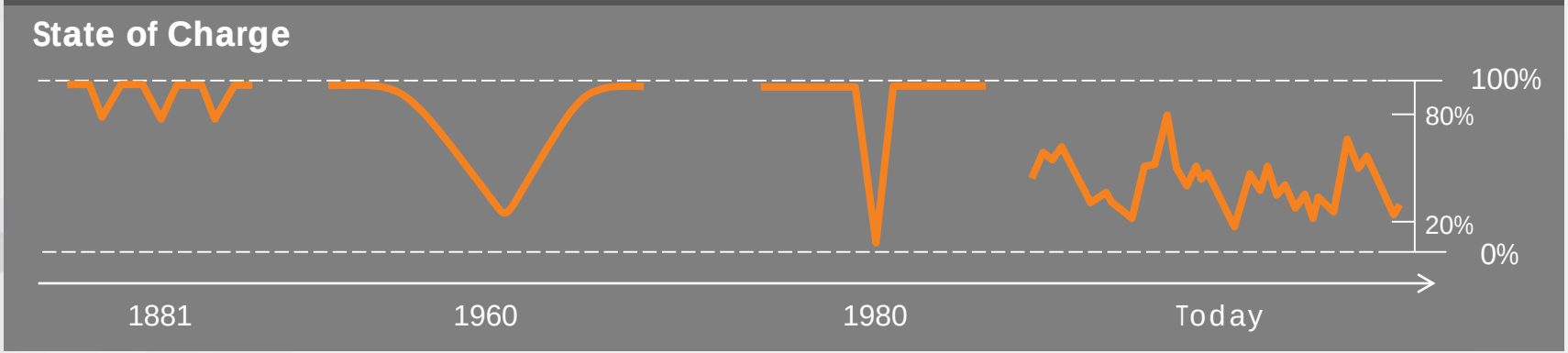
Starter Battery
Market Size:
$15B

Motive Battery
Market Size:
$3.5B

Standby Battery
Market Size:
$6B

PSOC UltraBattery
New Lead-Acid Market



Toward Large Format PSoC

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Lead-acid

- Large-format ✓
- PSoC ✘

Li-ion

- Large-format ✘
- PSoC ✓

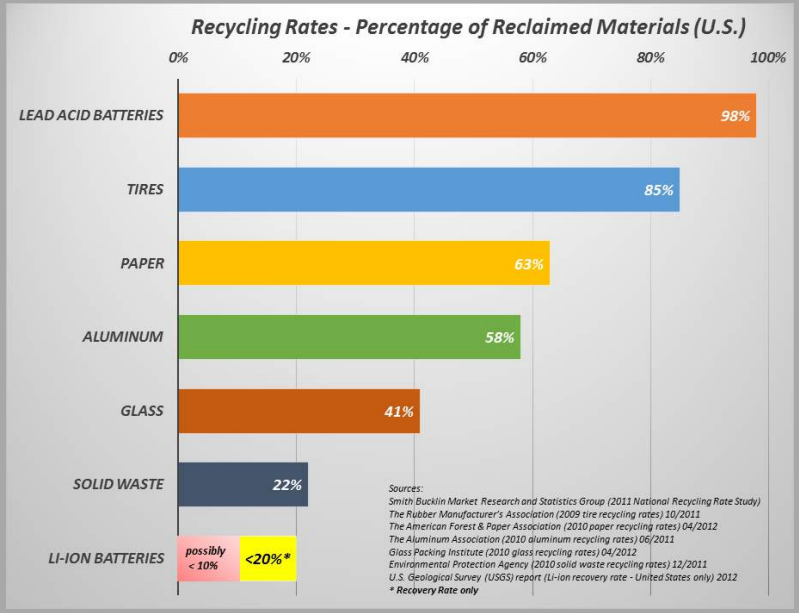
UltraBattery

Exceptional Large Format
PSoC Performance

Seeks Large Format
PSoC Market

Sustainability and market sizes

UltraBattery vs. li-ion



Lead-acid technology has recycling and full-reuse **perfected and priced-in**

Lead-acid
>350 GWh
Annual replenishment

Close to 100% closed loop, sustainable recovery

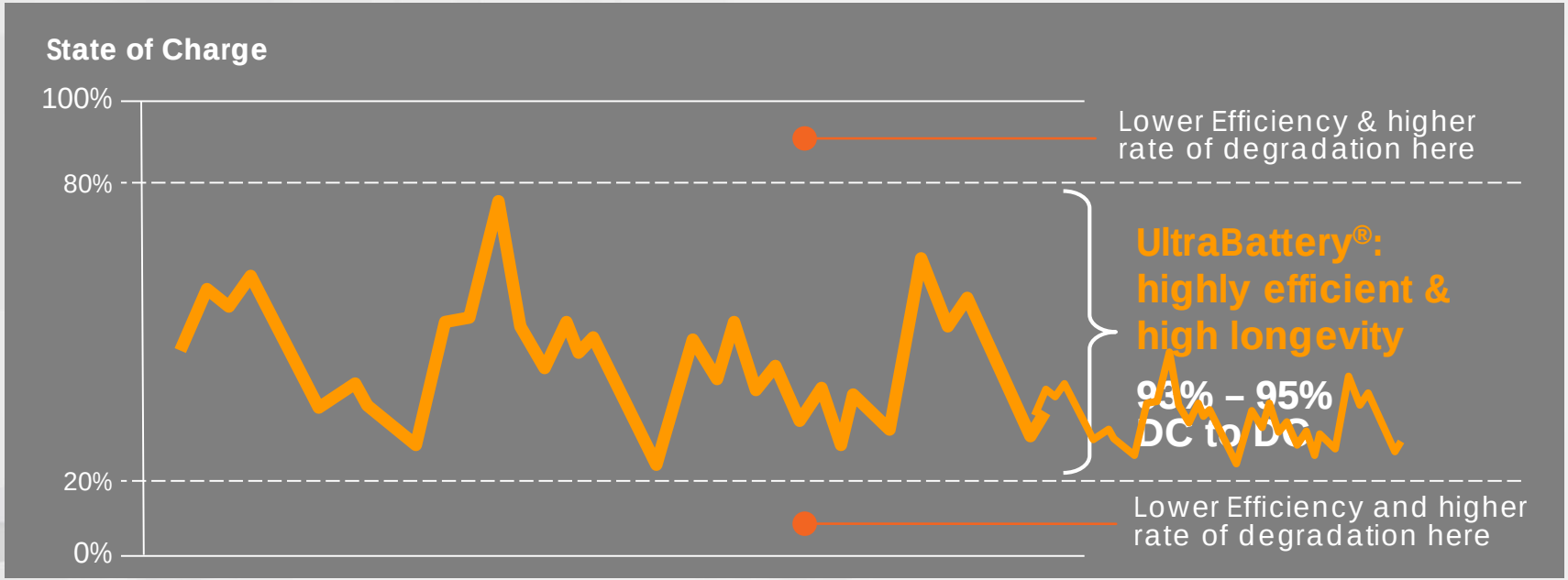
Almost no sustainable recovery

Li-ion
<50 GWh
Annual Replenishment

Both markets are growing, but the much larger lead-acid market is growing sustainably

Market size source: *Battery Market Development for Consumer Electronics, Automotive, and Industrial: Materials Requirements & Trends*, Avicenne Energy, 2013 and other industry sources.

High Efficiency in Partial State of Charge Use



Ambient Temperature advantages of PSoC

Products

Building block

Monitored
12UB700 and 2UB700
Building Blocks

kW

UltraFlex

UltraMax

UltraRax

MW

Services

Ecoult's mission
Energy Storage for a Cleaner Planet