
simpliphi
POWER
Power. On Your Terms.™

LITHIUM ION BATTERY ENERGY STORAGE

LITHIUM ION BATTERY INNOVATION: HOW COBALT-FREE CHEMISTRY INCREASES THE SAFETY, RELIABILITY & LIFECYLCE OF ENERGY STORAGE

February 2018

ABOUT SIMPLIPHI POWER

COMPANY OVERVIEW

Established	Founded 2010, Re-Brand & Delaware Incorporation in 2015
Business	Design and Manufacture Integrated Energy Storage Solutions
Investors	Privately Funded. <$3M injected to date
Facilities	• Current: Headquarters & Manufacturing – Ojai, CA • 2018: Expand Headquarters & Advanced R&D Facility • Future: Regionalized High Volume Manufacturing Centers Domestic & International
Installed Base & Customers	• ~30 MWh of Products Shipped to Date • >250 Customers across Commercial & Industrial, Residential, and Portable On & Off Grid Power & Security Markets Globally
Financials	Doubling YOY since 2010; Tripled in 2017; ~40% GM
Certification & Recognition	• UL/CE Listed Components; UN/DOT & ROHS Compliant • 'Safe for Use' – U.S. Army Aberdeen Proving Grounds • FAA/USDOT – Special Permission for Air Transport • California Center for Sustainable Energy (CCSE) • U.S. Green Building Council (USGBC) • FEMA – First Responder Database • UL Cert: PHI 3.4 kWh 24/48V

2017 STEVIE SILVER WINNER AMERICAN BUSINESS AWARDS

LACLEANTECH INCUBATOR

EDISON AWARDS 2016 NOMINEE

2016 GOLD STEVIE WINNER AMERICAN BUSINESS AWARDS

Lee Iacocca E-Bike

Ojai, CA Headquarters

CUSTOMER SEGMENTATION

Installers

OEMs

Distributors

Developers

ABOUT SIMPLIPHI

SimpliPhi is dedicated to offering

the safest

the most efficient

and the simplest

way to use energy storage

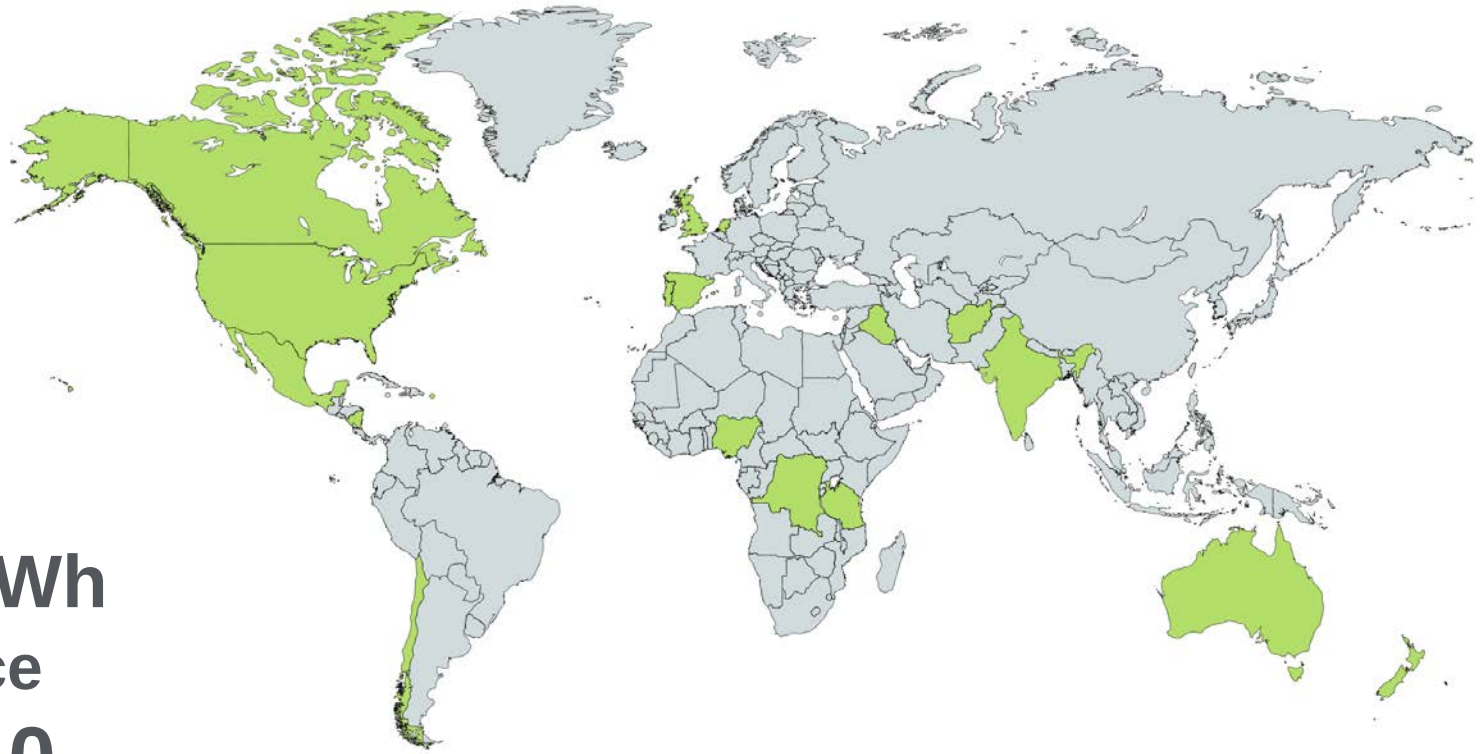
ABOUT SIMPLIPHI

SimpliPhi optimizes

Any power generation source

On or Off-grid

GLOBAL SCALE: DEPLOYED IN 23+ COUNTRIES



30 MWh
since
2010

COMMERCIAL & INDUSTRIAL

RESIDENTIAL

EMERGENCY RESPONSE

OFF GRID POWER & SECURITY

PRODUCT LINE OVERVIEW

ABOUT SIMPLIPHI



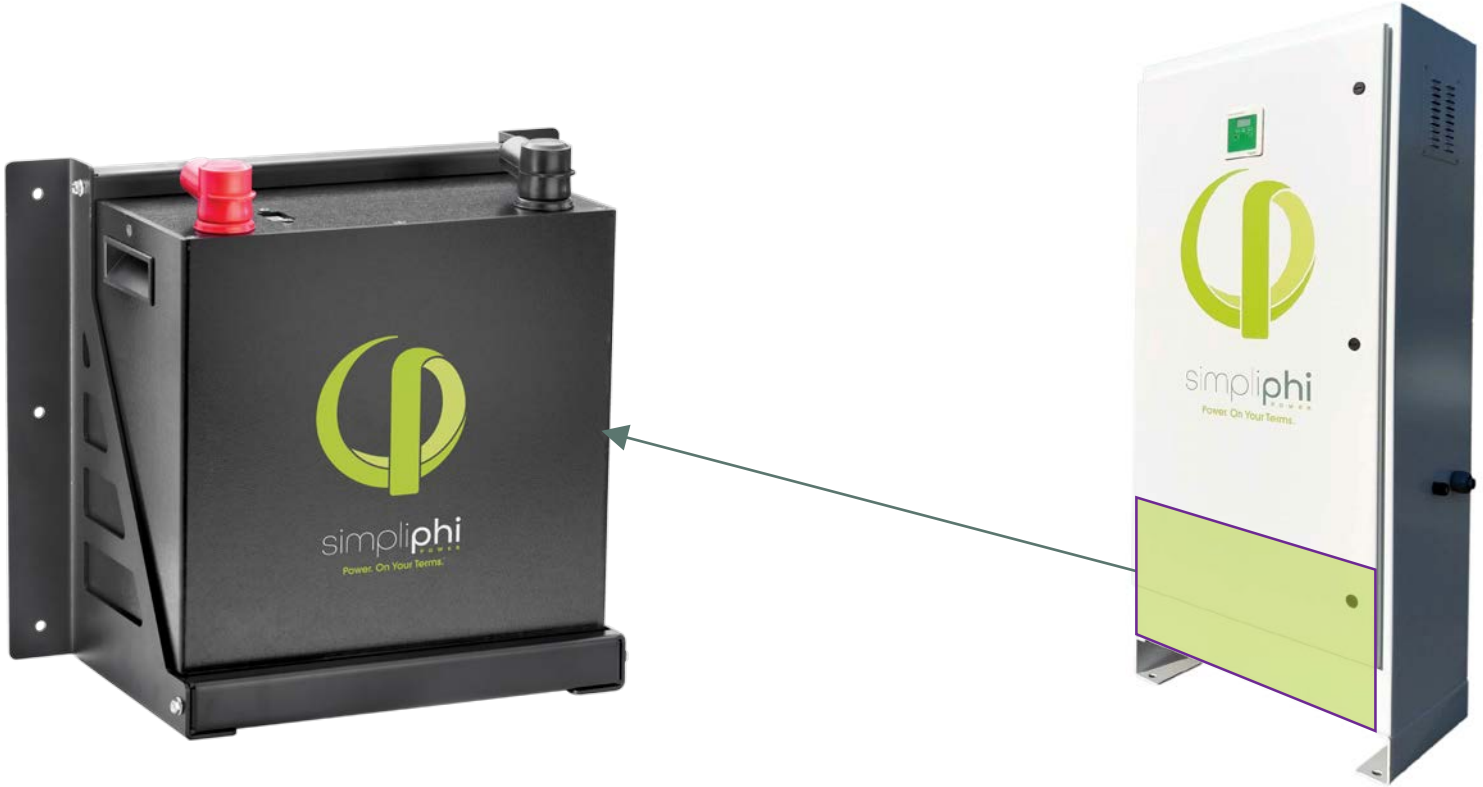






PRODUCT LINE OVERVIEW

AccESS



ABOUT THE AccESS

- Plug & Play
- Outback Inside
- DC or AC Couple
  - New or Existing PV
- NEMA-3R – Outdoor ready
- No Maintenance
- Top of the line safety

DEPLOYMENTS

CA: RESIDENTIAL – OFF-GRID CAR CHARGING & DISASTER RELIEF

CA: RESIDENTIAL – OFF-GRID

The governor who's castigating the president on climate change

58 | BILL WHITAKER CBS NEWS

Dec 10, 2017 7:08 PM EST

CA: RESIDENTIAL – MODULAR BACKUP POWER & SECURITY

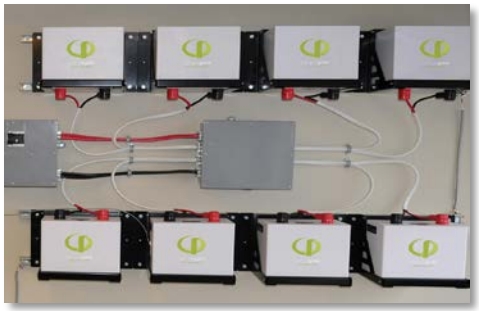
CA: RESIDENTIAL & COMMERCIAL – MOBILE HYBRID OFF GRID POWER

CA: COMMERCIAL – MICROGRID & DISASTER RELIEF

CA: AGRICULTURAL MICROGRIDS & COST SAVINGS

CA: COMMERCIAL – OFF GRID HYBRID POWER

Before:



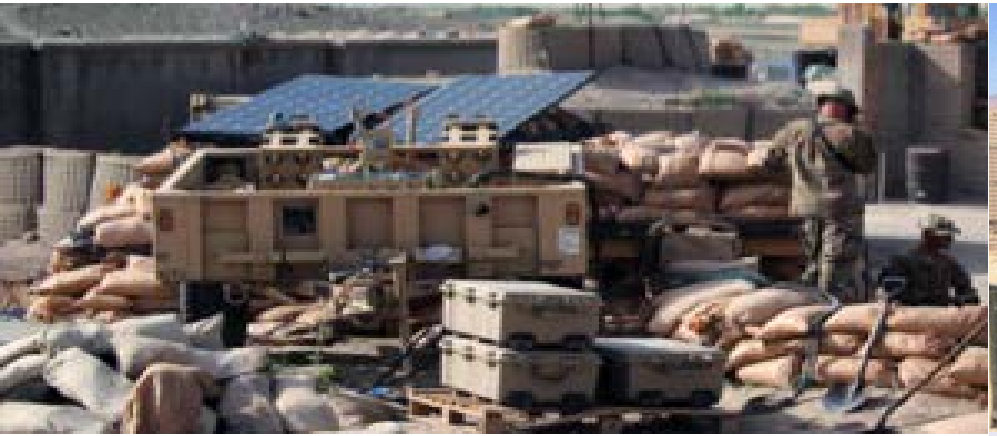
After:

CARIBBEAN: RESIDENTIAL - GRID-TIED BACKUP POWER

- Supports **essential loads for up to 16 hours** of backup power
- Can be **easily expanded** for longer durations of backup power in the future, if needed
- **10 kW** ground mount system
- Location: St. John, U.S. Virgin Islands

HAWAII: HYBRID OFF-GRID SCHOOLS & COST SAVINGS

AFGHANISTAN & IRAQ: DOD FORWARD OPERATING BASES



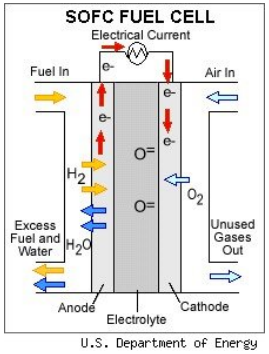
ABOUT LFP

TYPES OF STORAGE

Lead Acid

Lithium

Other



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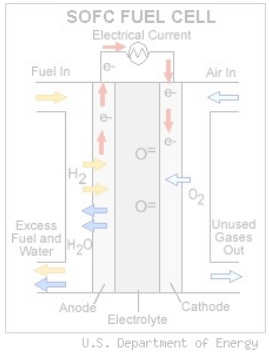

LITHIUM ION: CHEMISTRY & FORM FACTOR

Chemistry

- **LCO**
  - Lithium Cobalt Oxide
- **NMC**
  - Lithium Nickel Manganese Cobalt Oxide
- **LMO**
  - Lithium Manganese Oxide
- **LFP**
  - Lithium Iron Phosphate
- **NCA**
  - Lithium Nickel Cobalt Aluminum Oxide

Form Factor

Cylindrical

Pouch

Prismatic

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COBALT BATTERIES

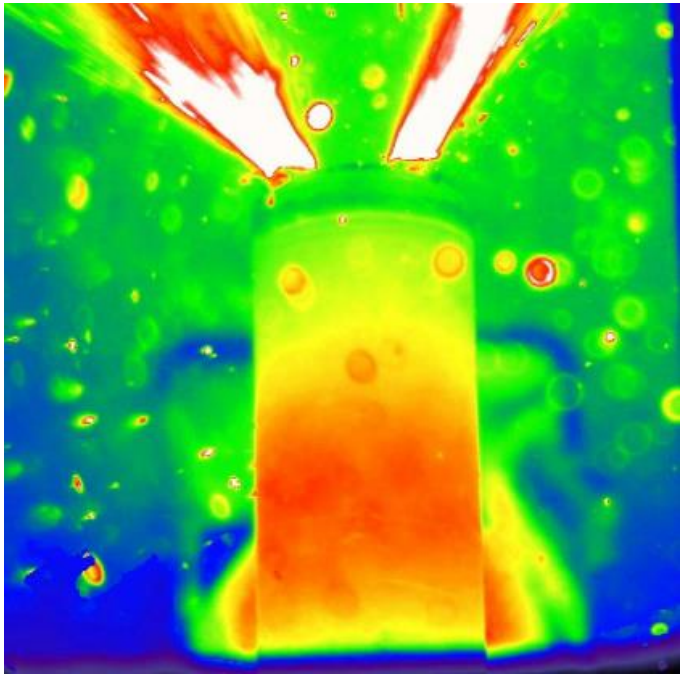
- Thermal Runaway
- Decreased Lifecycle
- Narrow Temperature Window
- Toxic
- Inefficiencies

LG Chem

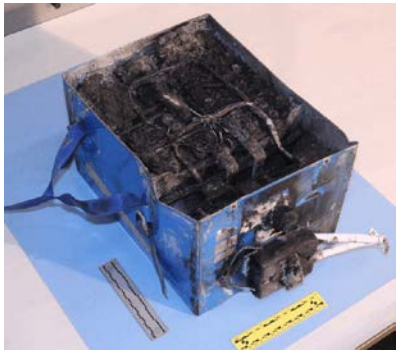
ABOUT LFP

- Lithium Iron Phosphate (LFP) addresses **4** major issues with current lithium cobalt technologies:
    1. Safety
    2. Lifecycle
    3. Temperature
    4. Environmental Impact

COBALT: THERMAL RUNAWAY

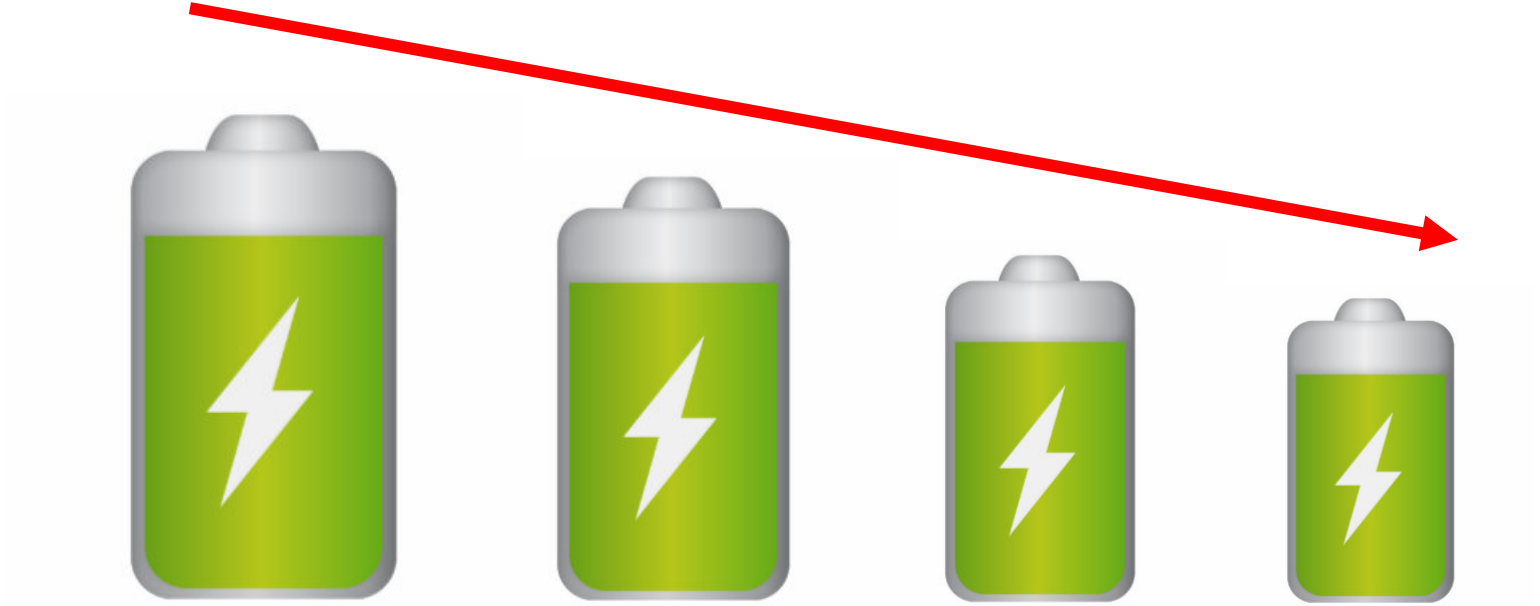


NCA Chemistry
(Cobalt)



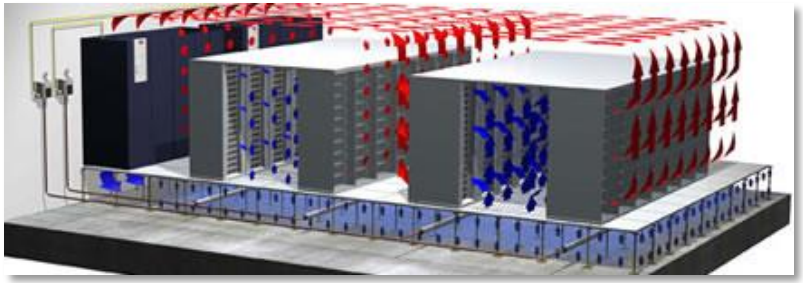
Boeing Dreamliner
(Cobalt)

COBALT: REDUCED LIFECYCLE

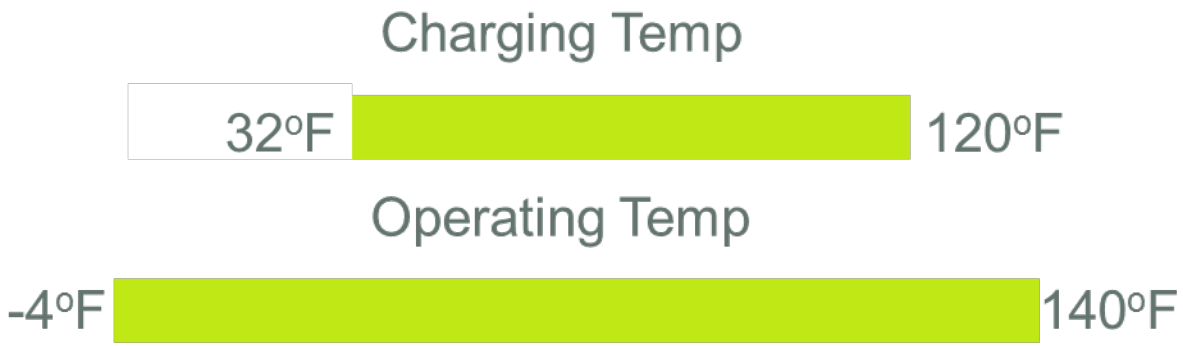


COBALT: NARROW TEMPERATURE WINDOW

23 to 104 F



LFP: WIDE TEMPERATURE WINDOW



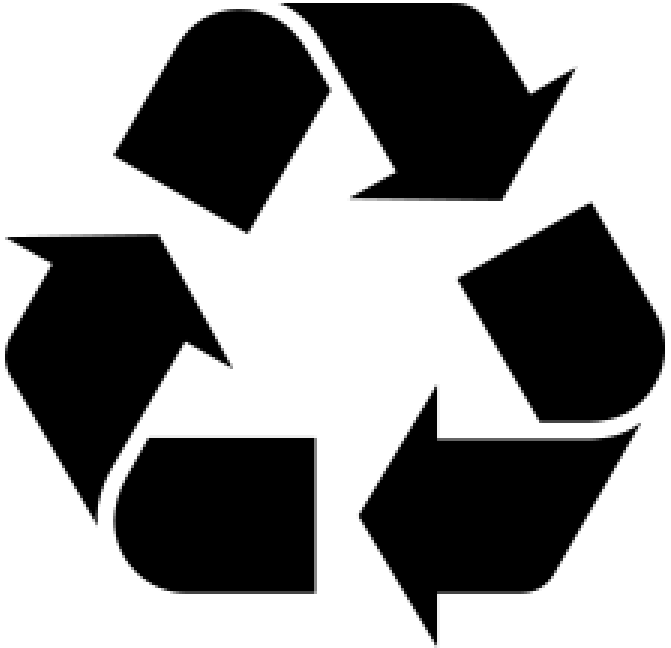
No need for:

- Coolant
- HVAC
- Ventilation

COBALT: ENVIRONMENTAL IMPACT

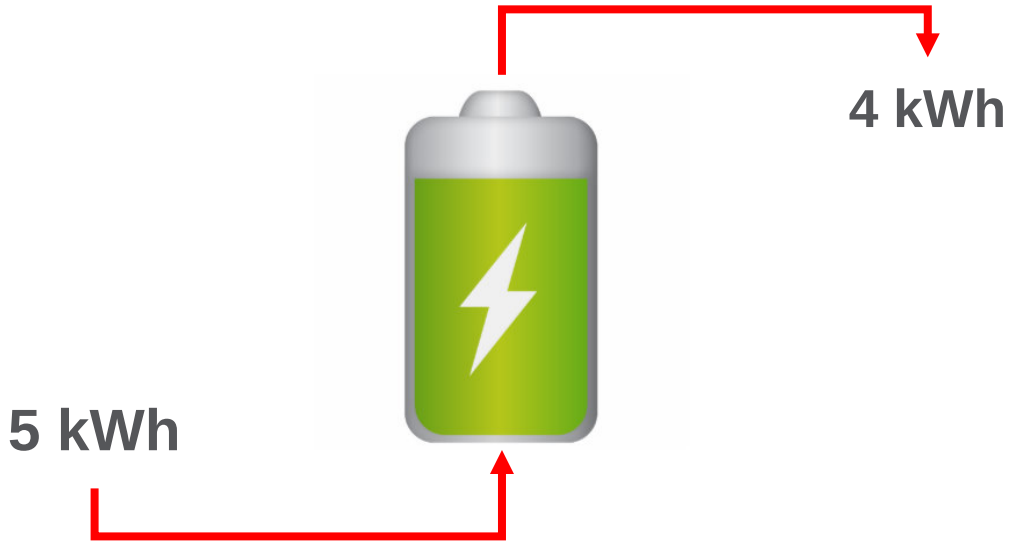
LFP: ENVIRONMENTAL IMPACT

No fumes



Recyclable

COBALT: INEFFICIENT



= 80% Round-trip Efficiency

WARRANTY

90% DoD
10 Years
5,000 Cycles

80% EOL

80% DoD
10 Years
10,000 Cycles

LEVELIZED COST OF ENERGY

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What’s the cost of every kWh I can get out of this system?

LEVELIZED COST OF ENERGY

What's the cost of every kWh I can get out of this system?

$$\left(\frac{Price}{Capacity \times Cycles \times \eta \times DoD}\right) + Ancillary\ Costs$$

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What's the cost of every kWh I can get out of this system?

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AKA Hidden Costs

- Square Footage → Installation Location
- Weight → Shipping Costs
- Forklift/Install Equipment → Rental to Site
- Maintenance → Truck Rolls
- Cooling → Additional Cost + Materials
- Ventilation/Setback Requirements → Area
- Construction Support → Weight Related
- Replacement Costs → Performance Related

THANK YOU!

the **safest**

the most **efficient**

and the **simplest**