

# Renewable Energy Opportunities for Remote Indonesian Grids: Electrical Energy Storage

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A blurred photograph of the Fluidic Energy logo, which consists of the words "FLUIDIC ENERGY" in a bold, sans-serif font, flanked by two dark blue squares. The background is out of focus, showing what appears to be a white wall or sign.

**FLUIDIC ENERGY**

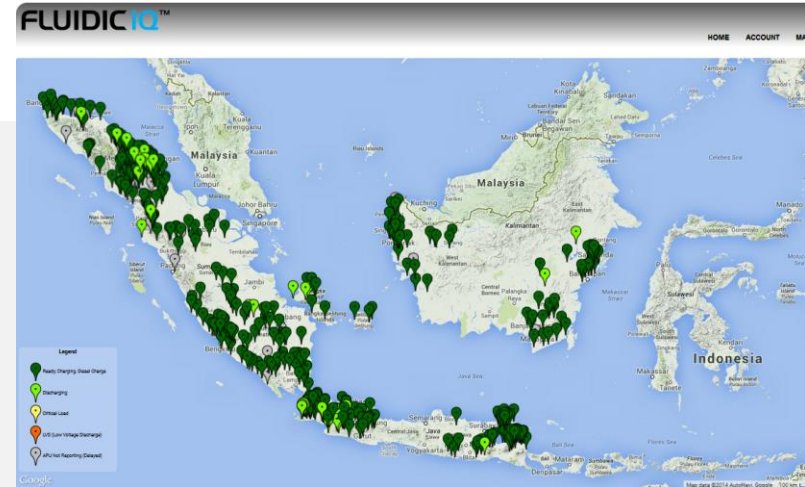
# Technology-Enabled Energy Storage Solutions

- Formed in 2006, headquartered in Scottsdale Arizona, more than 90 patents, over \$100M invested to date
- Intentionally “flying under the radar”, Fluidic began production and deployment of its energy storage systems commercially in 2011
- Backed by some of the worlds premier clean-tech investors
- Proprietary rechargeable Zinc-Air technology with integrated smart battery controls
- Load-shifting benefits in over 500,000 real world cycles at commercial customer locations
- Operations in United States, SE Asia, Latin America and expanding
- Only company to receive funding twice in the same technology field from the US DOE Advanced Research Program - Energy (ARPA-E)



# P.T Fluidic Indonesia

- P.T Fluidic Indonesia and Southeast Asia manufacturing hub established in Bogor in 2011
- Created more than 500 local jobs
- Only clean technology energy storage manufacturing in Indonesia
- Deployed more than 30,000 batteries in Indonesia alone, across Sumatra, Java, and Kalimantan
- Battle tested and proven technology and team



# Typical Energy Storage Challenges in Indonesia and Southeast Asia

- Logistics - weight
- Short or indeterminate lifetime
- Unable to quantify available energy
- Local Engineering Support
- Theft
- Spare/replacement
- Lack of visibility on performance
- Inadequate warranty



# Effects of Typical Energy Storage Challenges

- Failure of battery after short number of years
- Community cannot afford to replace batteries
- Unforeseen costs
- Dubious effectiveness of investment
- No measured results over 20 years



Slow & Limited Expansion of Micro Grids for Rural Communities

# Fluidic Solutions Solving the Energy Storage Challenge

## EXTENDED RUNTIME



8-72 hour discharges enable system to be used for demand response, peak shaving and critical backup power

## VERTICALLY INTEGRATED



Energy storage, electronics and software on a single platform

## CLEAN, INDOOR OR OUTDOOR



No lead/toxic material, no diesel exhaust, broad operating temperatures

## PROVEN TECHNOLOGY



35K batteries globally since 2011, setting new reliability levels

## SCALABLE ARCHITECTURE



Modular architecture from kWh to MWh, scale energy and power to meet actual demand anytime during the lifetime

## LONG LIFE



Unaffected by high temp, depth of discharge, state of charge or number of cycles

## 24/7 REMOTE MONITORING



Lower maintenance, increased reliability via cloud connectivity

## ELIMINATES THEFT



No theft value of the systems eliminates theft risk

# Financial Challenges to Mass Deployment of Energy Storage

- **Lowest Capital Cost in \$/KWh**
  - On par with lead-acid and significantly lower cost than Li-Ion.
- **Lowest Cost of Energy Throughput**
  - \$/Kwh delivered over lifetime
- **Lowest Cost of Levelized Energy (LCOE)**
  - Total all-in project costs
- **Predictable Operational Cost**
  - All agreements and systems designed for 10 or 20 years of life with all expenses included



# Thank You

[www.fluidicenergy.com](http://www.fluidicenergy.com)

