Advanced Rail Energy Storage (ARES)

Market Needs & Technology Overview

Russ Weed
Chief Development Officer

Public Service Commission of Wisconsin / U.S. Department of Energy
Energy Storage Series, Session 5
June 23, 2021
Presenter Background

- **30 yrs experience** - business & project development, marketing & sales, legal management
- **University of Wisconsin Law School** – J.D., 1991
- **CleanTech Strategies** - consultancy
  - established 2018
  - energy storage, renewables, electronics
- **Chief Development Officer** - Advanced Rail Energy Storage (ARES)
  - rail-based gravity storage with fixed-motor, chain-drive, high-slope engineering
  - focused on 50MW Nevada project, development of further projects and strategic partnerships, go-to-market strategy
Market Needs
For Grid Modernization & Resiliency, Enabling Renewable Supply

Energy Storage Which Is:
- Low Cost
- Durable
- Reliable
- Flexible
- Made in America
Market Requirements
For Grid Modernization & Resiliency, Enabling Renewable Supply

Energy Storage Which Is:
- Low Cost (≤$0.05/kWh, 20+ yr total cost of ownership)
- Durable (20-40 yrs life, minimal degradation)
- Reliable (≥95% uptime, non-flammable)
- Flexible (15min to 12+hr duration)
- Made in America
Li-Ion Batteries Are Electro-Chemical Challenges

Lister Drive Grid Substation
Liverpool, England
September 14-15, 2020
20MW Li-ion Battery


https://www.liverpoolecho.co.uk/news/liverpool-news/live-updates-fire-rips-through-18934842

5 – June 23, 2021
Gravity as “Active Species”

32 feet per second$^2$
The Power of Gravity

250 kWh Energy Per Mass Car

662,000 lbs

1 kWh = 3,600,000 J

1000 ft elevation gain
ARES Rail-Based Gravity Storage - Concept
ARES Rail-Based Gravity Storage – Engineering Design
ARES Rail-Based Gravity Storage – Engineering Design
Gamebird Pit In Operation Today

DRONE VIDEO: https://youtu.be/oH-Lq9U5lGI
ARES Nevada Project – 2020 ground-breaking

https://youtu.be/DRSu5O056NM
Thank you

To Public Service Commission of Wisconsin, U.S. Department of Energy, Sandia National Laboratories, Dr. Imre Gyuk, Dr. Babu Chalamala, Dr. Howard Passell

Russ Weed
Chief Development Officer
Advanced Rail Energy Storage (ARES)
505 Market St.
Kirkland, WA  98033
206.851.1653
russ@aresnorthamerica.com
ARES North America - The Power of Gravity
Post-Script