QUINO·ENERGY

Low Cost, Fast-Scaling Organic Flow Batteries that Actually Work

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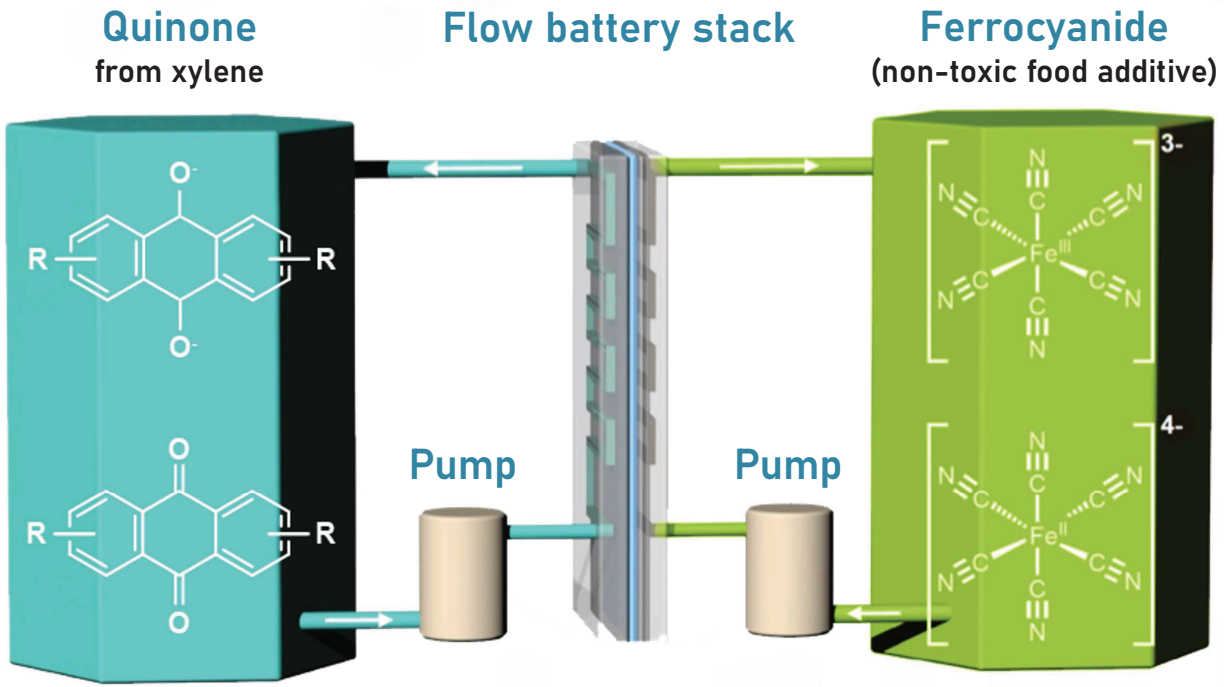
v13.2

Quino Energy Makes Organic Flow Batteries

Our water-based quinone battery is:

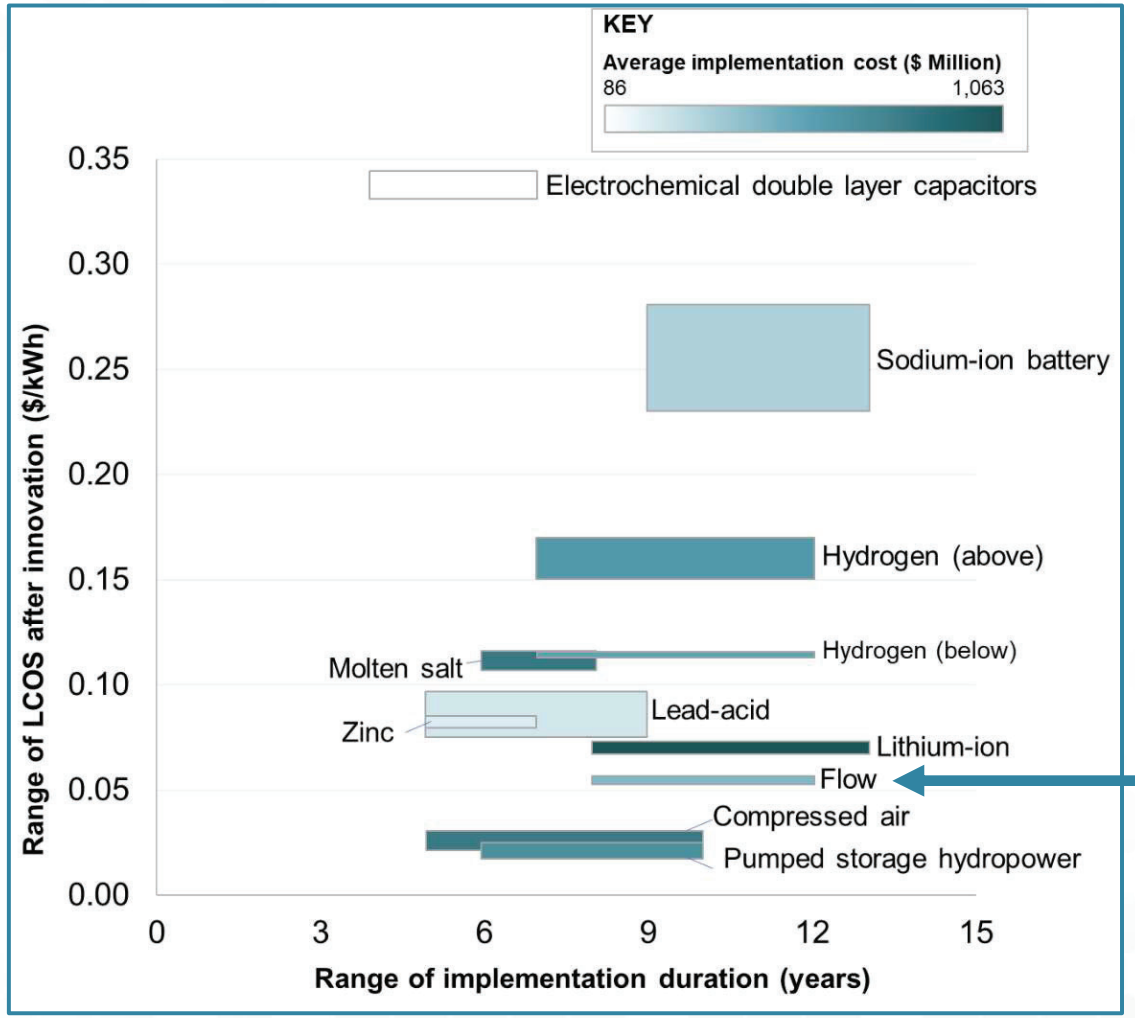
- 30-40% cheaper than LFP
- with a 3x smaller footprint,
- doesn't catch fire, and
- is Made in USA with no critical or PFAS materials.

Quino's vision is to become the dominant battery tech for mid-duration storage. (8-40 hours)



Fundamental technology licensed from Harvard

DOE: Organic Flow Batteries Will Be the Only Non-Geologic LDES Technology with Lower LCOS than Lithium-Ion



Aug 2024 DOE LDES Report:

Novel active electrolytes and their manufacture (that's us!) will realize an LCOS closest to the $0.05/kWh goal.

Li-ion needs 3x the investment and still cannot be low enough.

https://www.energy.gov/sites/default/files/2024-08/Achieving%20the%20Promise%20of%20Low-Cost%20Long%20Duration%20Energy%20Storage_FINAL_08052024.pdf

Quino Energy's Drop-In Replacement for Vanadium Leverages Existing Hardware and is Fast to Deploy

Vanadium is by far the largest cost component of flow batteries. (~70% for a 10-hr system)

We replace vanadium with an organic reactant that is 1/4 the cost, Made in USA, and unconstrained in supply: >20,000 GWh/year.

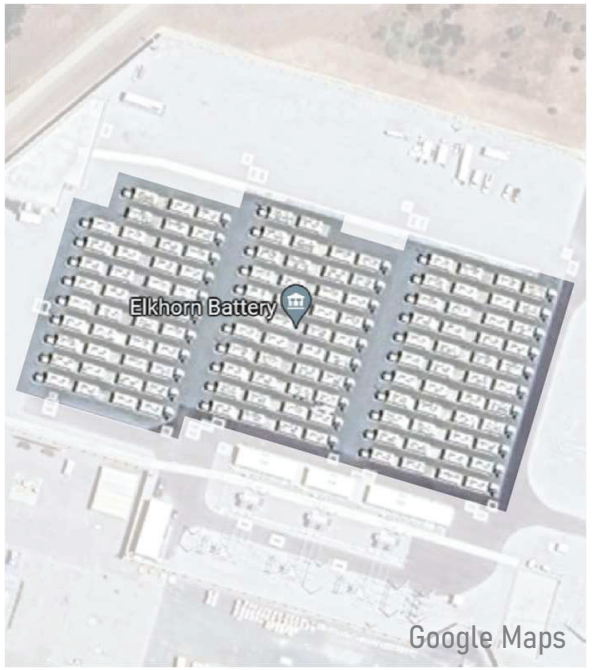
Proven at up to 100 kWh with commercial hardware and on an onsite microgrid: TRL 6

Zero-waste pilot production line for organic reactants in Buffalo NY: MRL 7

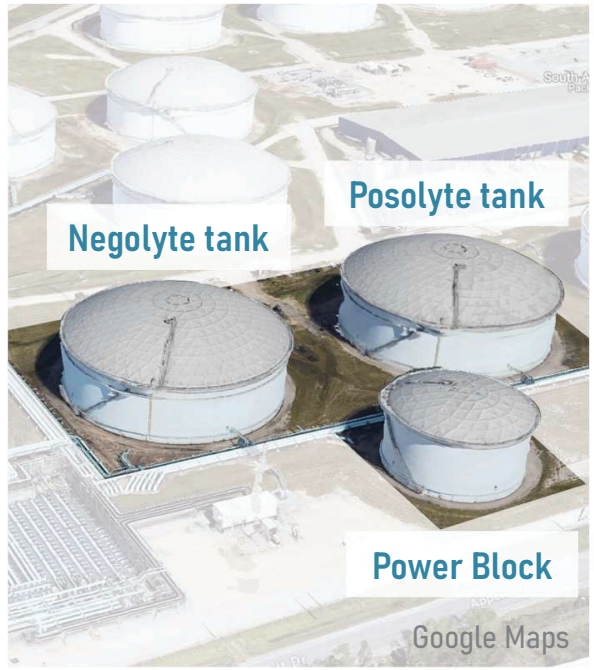
3x Higher Energy Density than LFP and No Fires

- LFP batteries must expand horizontally, Quino's batteries can expand vertically
- Chemically compatible with carbon steel tanks unlike vanadium RFBs

Repurposing liquid terminal assets for utility-scale projects saves time and project costs.



Elkhorn Battery in Moss Landing, CA (Tesla Megapack 2 XL)
730 MWh, 13,500 m^2, 54 kWh/m^2



Enterprise Products Tank Farm in Houston, TX (Hypothetical Quino RFB)
3 GWh, 18,000 m^2, 167 kWh/m^2

Opportunities

Piloting	➢ **Host sites** for C&I scale at 2-10 MWh (BTM or FTM ok) ➢ Conventional 40-foot container or large tank form factor
Chemical Manufacturing	➢ **Toll manufacture site(s)** to host and expand the pilot line ➢ Packaging and intermodal logistics ➢ Sourcing and supply chain management
Permitting	➢ **Updating the fire code** to simplify installation and siting for true non-flammable flow batteries like Quino's

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For more information, get in touch

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U.S. DEPARTMENT OF ENERGY

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Quino Energy's LCOS is 40% Lower than LFP -- Why?

LCOS differences come from:

- ✓ Higher depth of discharge vs. LFP (100% vs. 80%)
- ✓ >10x slower degradation vs. LFP
- ✓ Surprisingly, lower taxes due to increased charging costs arising from lower efficiency