

allegro

Microemulsion Flow Batteries

Designed to deliver GW and GWh by 2030

Fraser Hughson: Co-Founder, CTO
Fraser@allegro.energy



Oil + Water



Emulsion



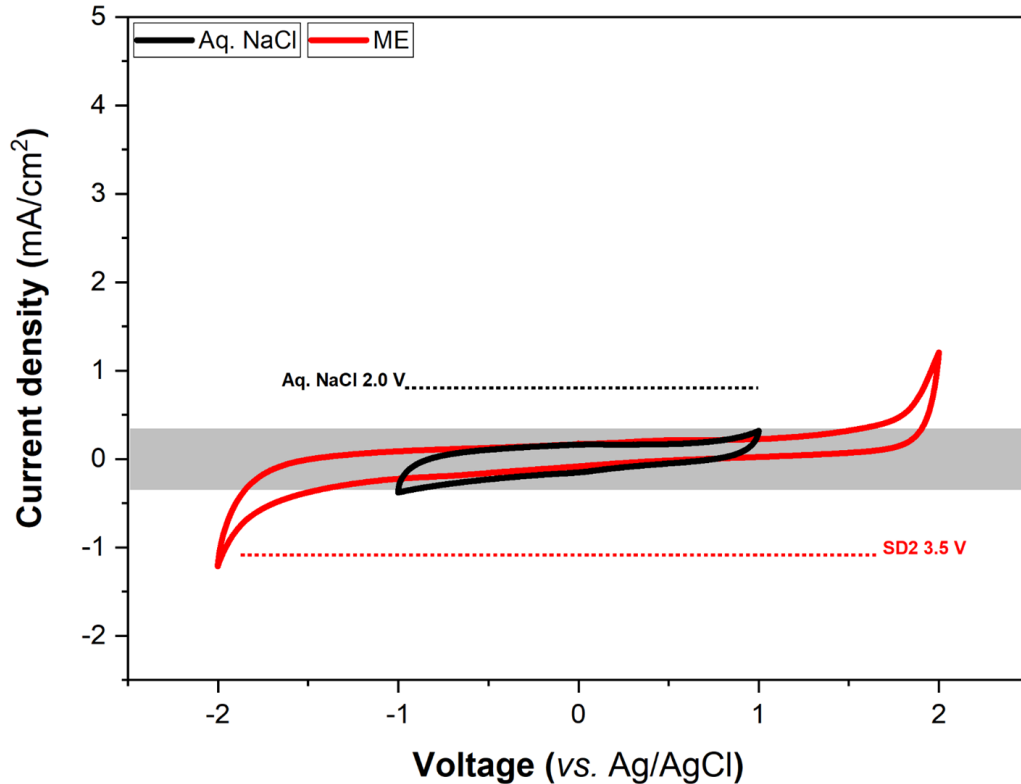
Microemulsion

Microemulsions - The Perfect Electrochemical Solvent

Not just one superpower!

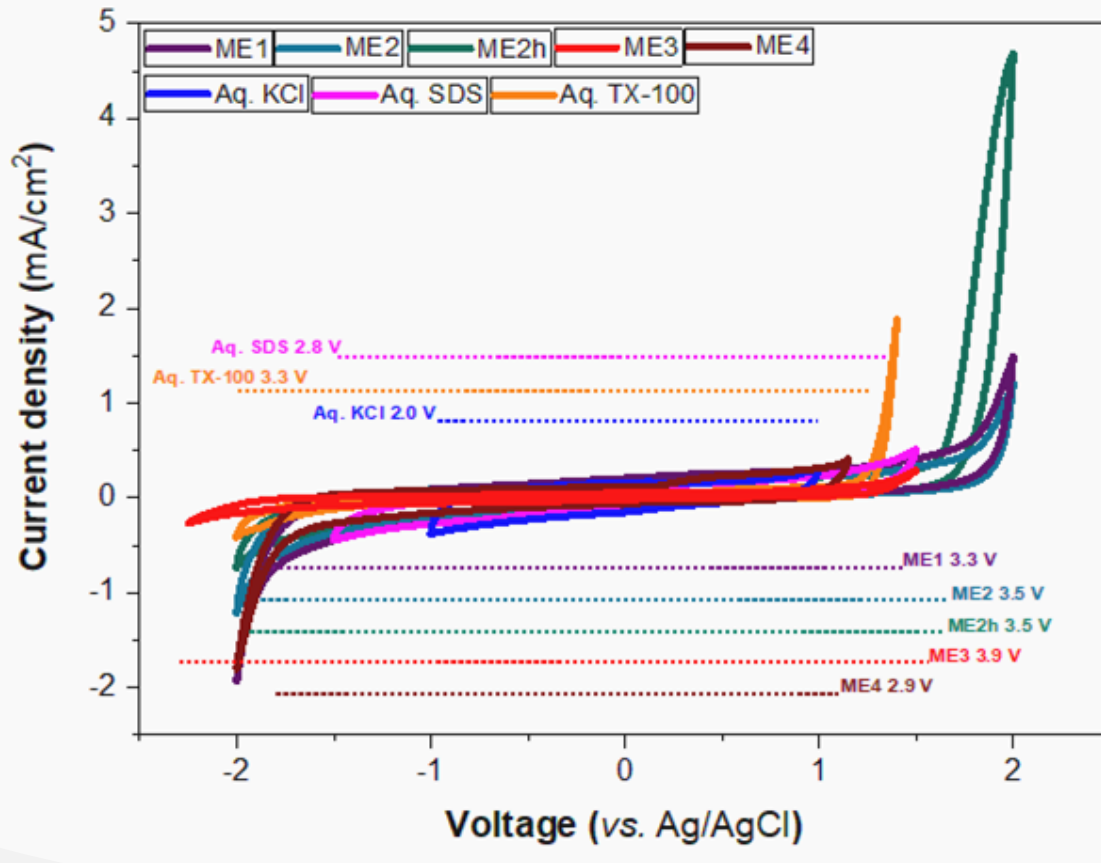


Superpower 1: Electrochemical Window



Voltage that can be applied before irreversible solvent breakdown occurs

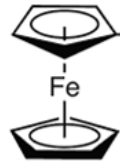
Bounds at 0.35mA/cm²



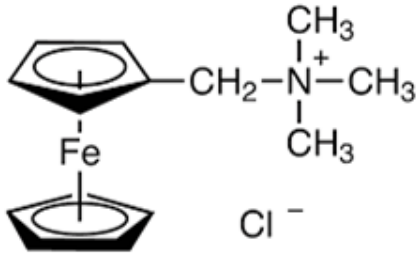
Generalisable to **all** microemulsions

Superpower 2: Active Material Solubility

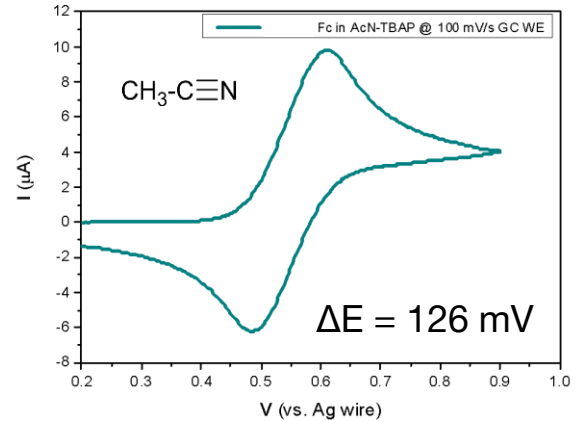
Organic synthesis



Organic electrolytes

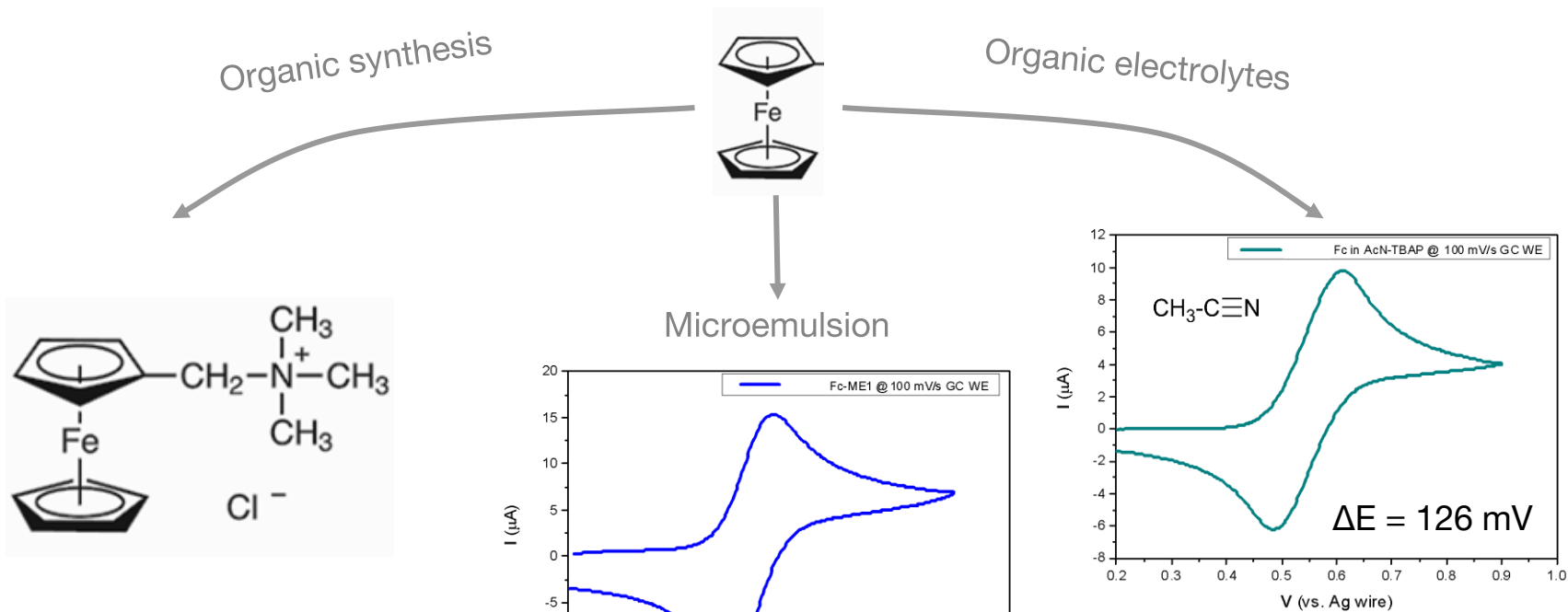


- Water soluble
- High cost
- Not available



- Organic salt costs
- Conductivity
- Flammability/toxicit

Superpower 2: Active Material Solubility

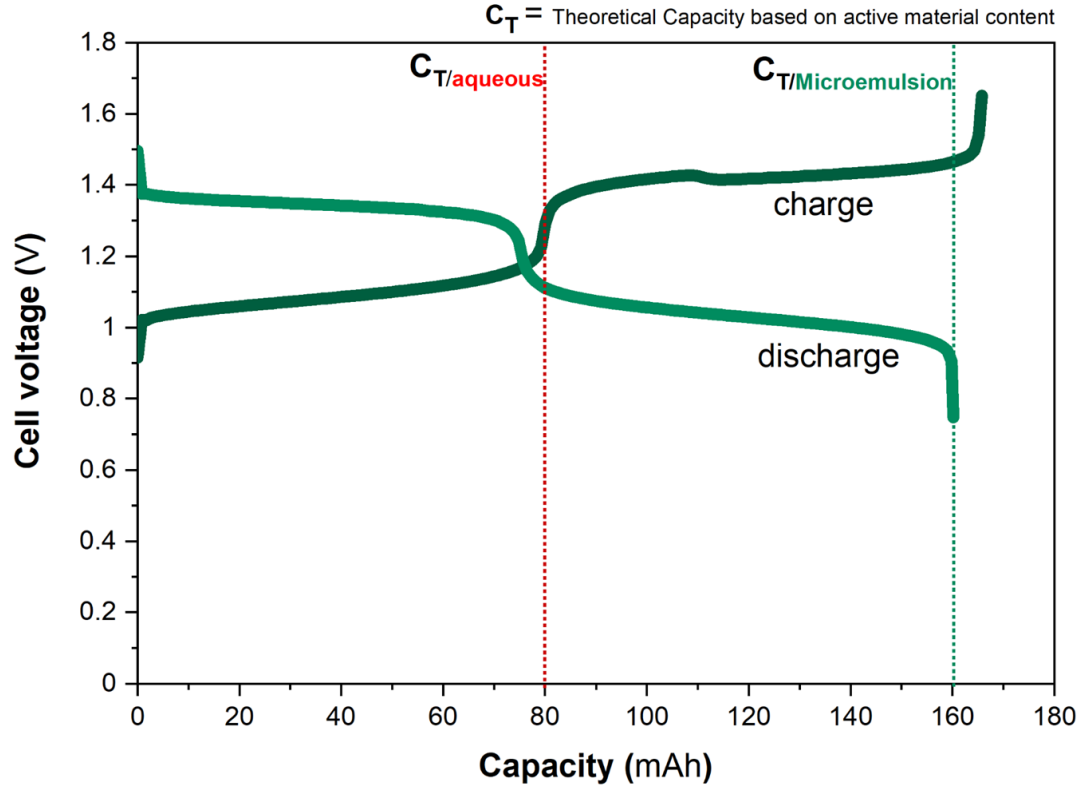


- Water soluble
- High cost
- Not available

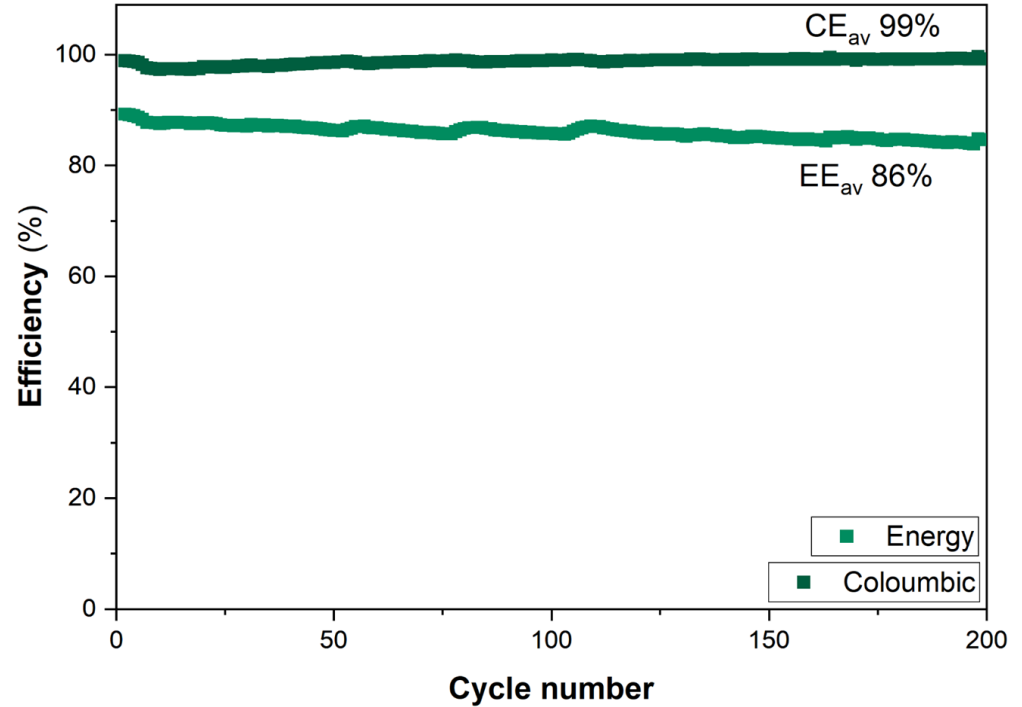
- Organic salt costs
- Conductivity
- Flammability/toxicit

2e process with 100%
capacity utilisation at
100 mA/cm²

All states are soluble in
the microemulsion



99+% CE and average
EE of 86% over 200+
cycles



Call to Action!

Please research **Microemulsion Electrolytes!**

- Enhanced reaction kinetics
- Membrane interactions with surfactants + oils
 - Inner-sphere vs Outer-sphere reactions
 - Ion batteries and supercapacitors
 - Dyes, biomolecules as actives

Product Philosophy

1. Solve fundamental problems with **chemistry not engineering**
1. Everything we use must be available at or near **GW/GWh** scale **today**
 1. “**Commercial-off-the-shelf**” where possible, including stacks



Electricity & gas

Internet

Solar & batteries

LPG

EVs

Moving

Business

Help

Search

About

Log in



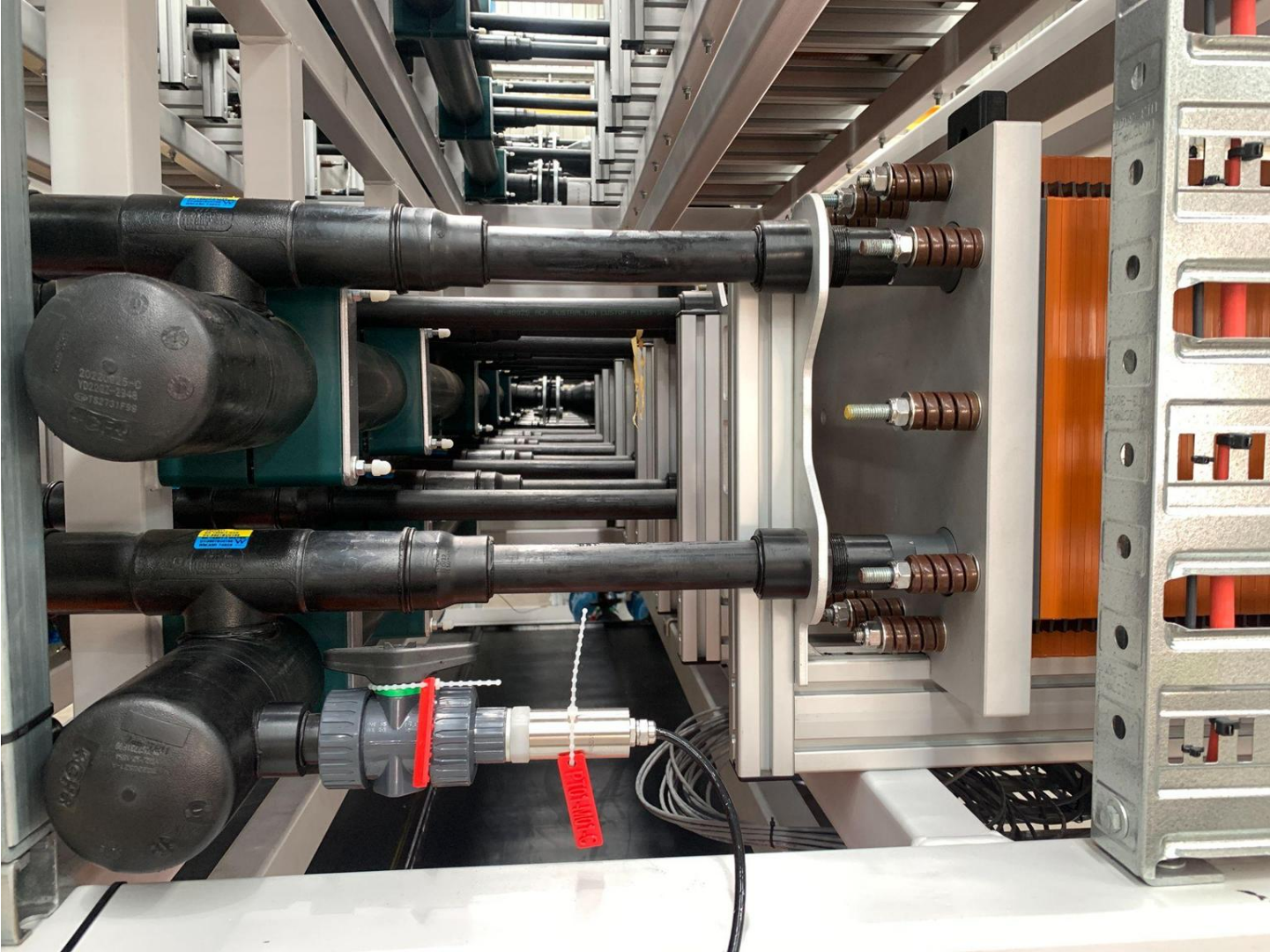
Home » Origin acquires interest in Newcastle's Allegro Energy and agrees to long duration storage trial at Eraring

28 JUNE 2023

Origin acquires interest in Newcastle's Allegro Energy and agrees to long duration storage trial at Eraring



AIP
AUSTRALIAN
INDUSTRIAL
PLASTICS



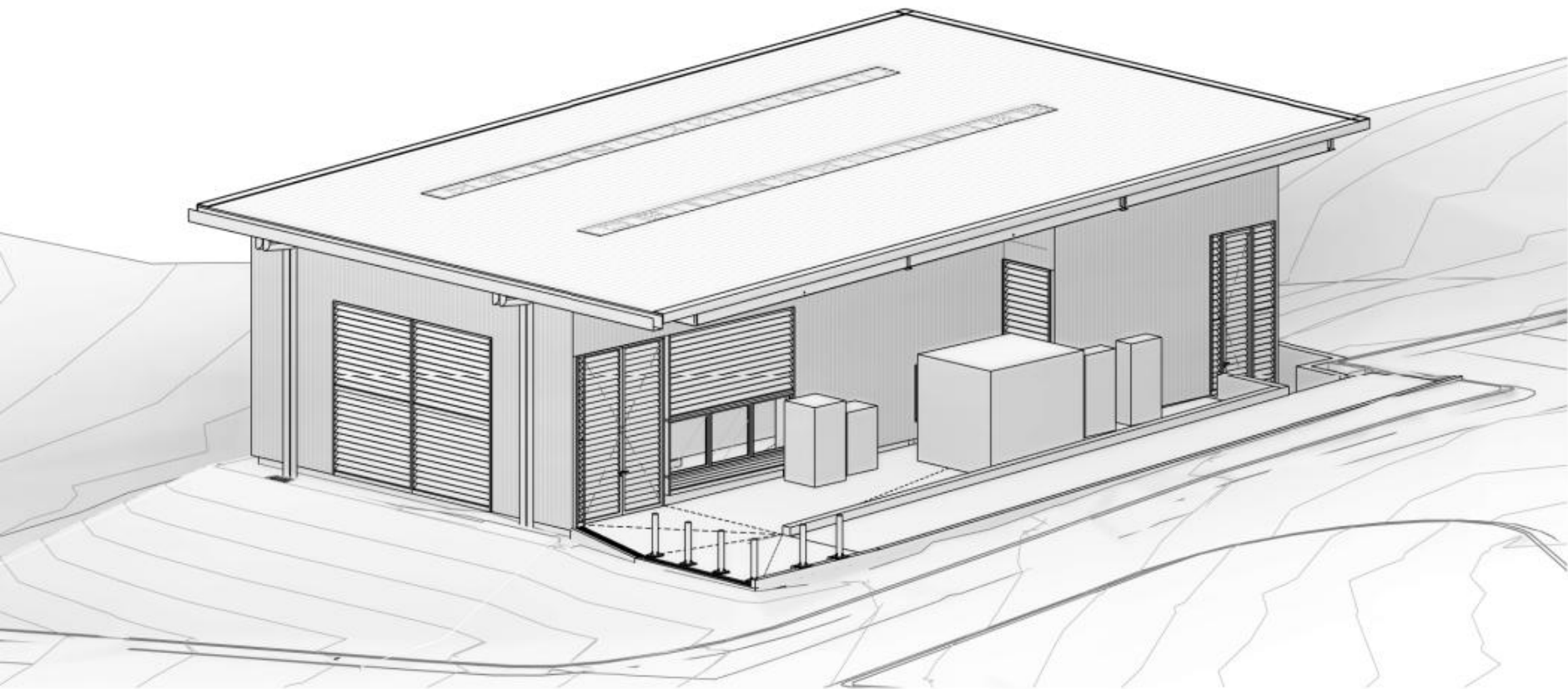
2004025-C
YD2222-2446
64782731F98

84024

1000000000







NORTHEAST VIEW



Container shaped **NOT**
containerised

No engineering **band-aids**

Stackable to 4 power
modules high (**200 kW**)

Distributed manufacturing
network approach



The team at Allegro Energy - Driven to make GW and GWh a reality