

Organic Flow Batteries

Cost-effective and eco-friendly energy storage



RIVUS
power that flows

The Problem

Battery Energy storage needed in 2050

9000 GWh

300x



The installed battery storage capacity needs to increase by 300 times to reach global climate goals by 2050.

Critical battery metals needed in 2040



26x



70x



140x

led

Today's batteries are all based on rare metals and it takes 15+ years to open a new mine. Time we don't have...



The Opportunity

Flow Batteries

- 2nd largest battery technology for stationary energy storage
- Some of the world's [largest batteries](#) are flow batteries
- Long lifetime (20+ years and 20,000+ cycles)
- Non-flammable and non-explosive
- Easy to repair and recycle at the end of line

The challenge: today, flow batteries use large amounts of vanadium in their electrolytes – an expensive heavy metal from China and Russia.





The Market

Global Battery Energy Storage Market



BNEF expects a 15-fold increase from 2022 to 2030, with annual additions reaching 88GW/278GWh and a market size of \$224B.

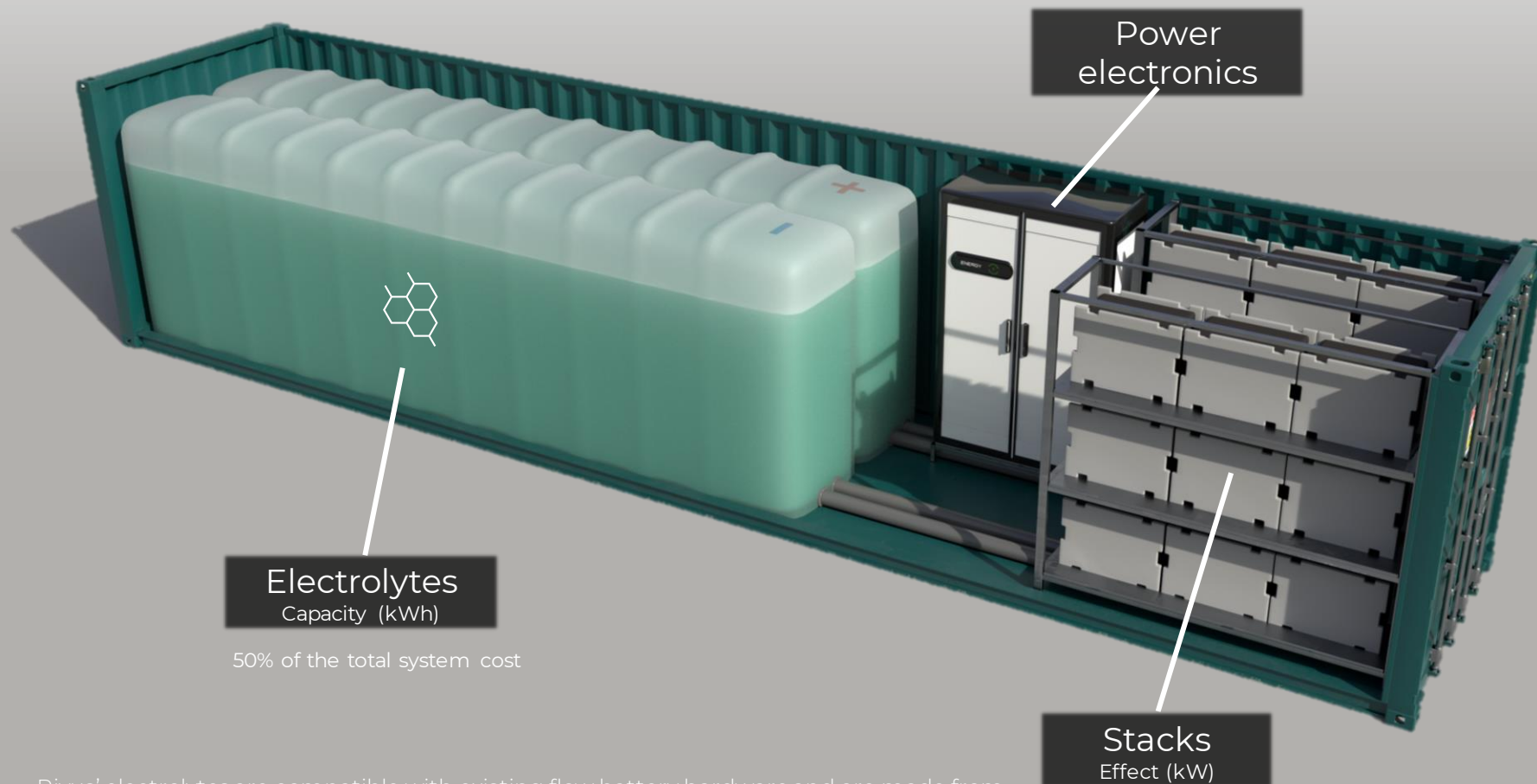
Rivus targets a 1% market share by 2030

1%
\$2.24B

BNEF predicts that flow batteries can compete with lithium-ion for 46% of the capacity needed by 2030 (*Emerging Energy Storage Technologies*, BNEF 2020)



Our solution: Organic electrolytes for flow batteries



Rivus' electrolytes are compatible with existing flow battery hardware and are made from readily available organic materials. A 60% lower price than vanadium electrolytes can be reached while the hardware remains the same as before.



Fireproof



Eco-friendly



Low Price

KPIs: Comparable performance to vanadium electrolyte, with higher energy density and lower cost.

Flow batteries: The energy is stored in two tanks of electrolytes that are pumped through stacks, where they are charged and discharged.



Business Model

RIVUS

Organic electrolytes
Novel electrolyte and patents



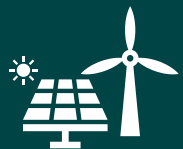
Chemical suppliers
Production in
existing facilities



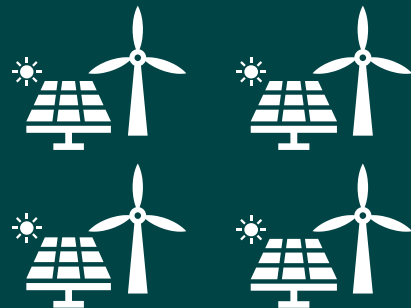
Flow battery company
Installs hardware at end users



Impact



10 GWh



Enables a massive build out of
renewable energy

3.4 million tons of CO₂

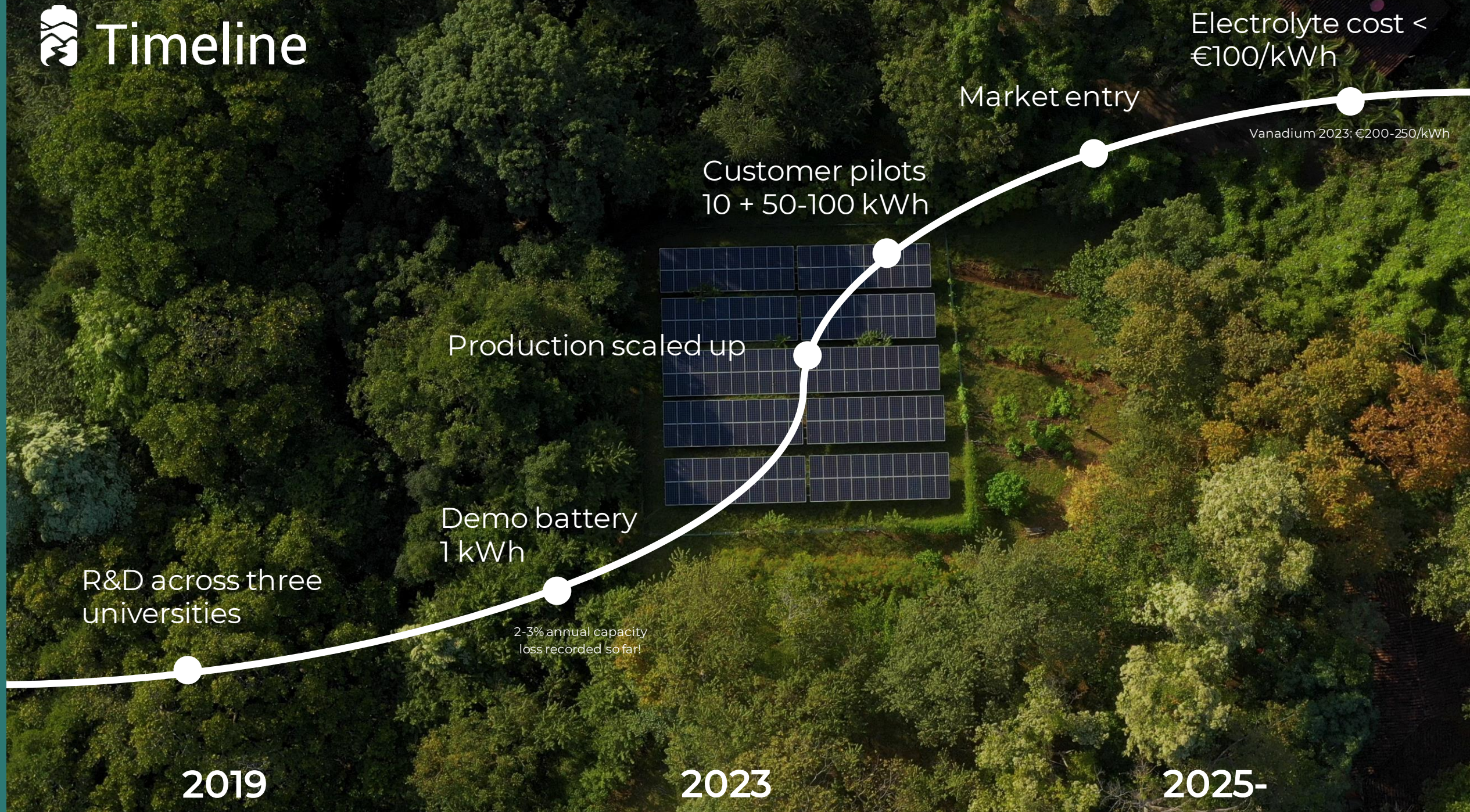
2023

2030





Timeline

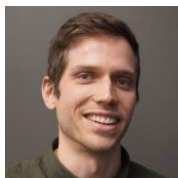


Team



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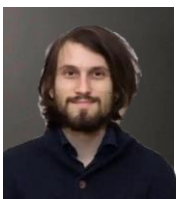
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