



# Energy Storage: Safe, Efficient, Affordable

Zinc-Manganese Flow Battery — 70% lower cost than Li-ion, zero fire risk, 100% recyclable

**\$506B**

Annual Loss from Inefficient Storage

**70%**

Lower Cost vs Li-ion

**25+**

Years System Life

**4x**

Lower 30-Year TCO

### TECHNOLOGY

- **Membrane-free** — 40% lower production cost
- **Non-flammable** — No thermal runaway risk
- **Abundant materials** — Zinc, manganese, carbon
- **All-climate** — No cooling systems needed
- **100% recyclable** — Circular economy ready

### MVP PERFORMANCE

- **96%** Coulombic efficiency
- **67%** Energy efficiency → 79% target
- **20 Wh/l** Capacity → 80 Wh/l target
- **500** Verified cycles → 25,000 target
- **2V** Cell voltage (Zn/Mn)

### MARKET & COMPETITION

	WiS	Li-ion	Vanadium
Cost/kWh	<b>\$80-120</b>	\$120-180	\$200-350
Cycles	<b>20-25k</b>	6-10k	20k+
30yr TCO	<b>\$650</b>	\$2,300	~\$1,000
Safety	☐	⚠	☐

**\$70B**  
Global Market 2031

**\$25B**  
Europe 2030

**\$4B**  
SOM (RES Integration)

### BUSINESS MODEL

- **Product:** 1 MW / 4 MWh storage systems
- **Price:** ~\$520,000 (\$130/kWh)
- **Margin:** ~30% operating profit
- **2034 Target:** \$130M revenue, 250 units

### ROADMAP

- **Stage I:** 100W Module (TRL 4-5) — ☐ Done
- **Stage II:** 10kW Demo (TRL 5-7) — **Pre-Seed**
- **Stage III:** 100kW Pilot (TRL 6-8) — Seed
- **Stage IV:** 1MW System (TRL 8-9) — Series A

### TEAM

**Paweł Bartlewski**  
CEO & Founder (85%)

**Piotr Przybył**  
COO & Co-Founder (15%)

Research partners: Politechnika Warszawska, AGH Kraków, UMK Toruń

**Pre-Seed: €2M for Stage I-II R&D & 10kW demo (18 months)**