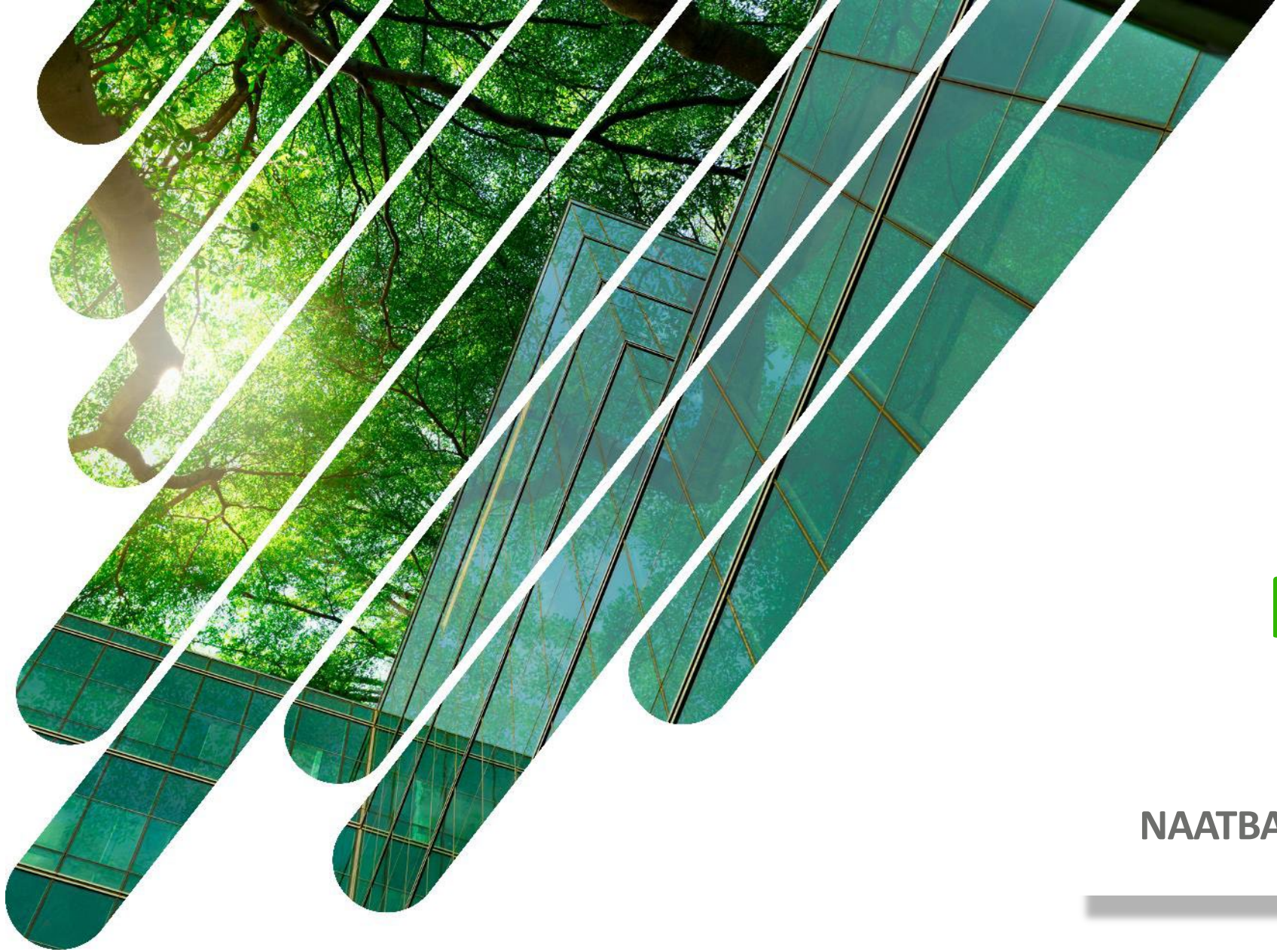


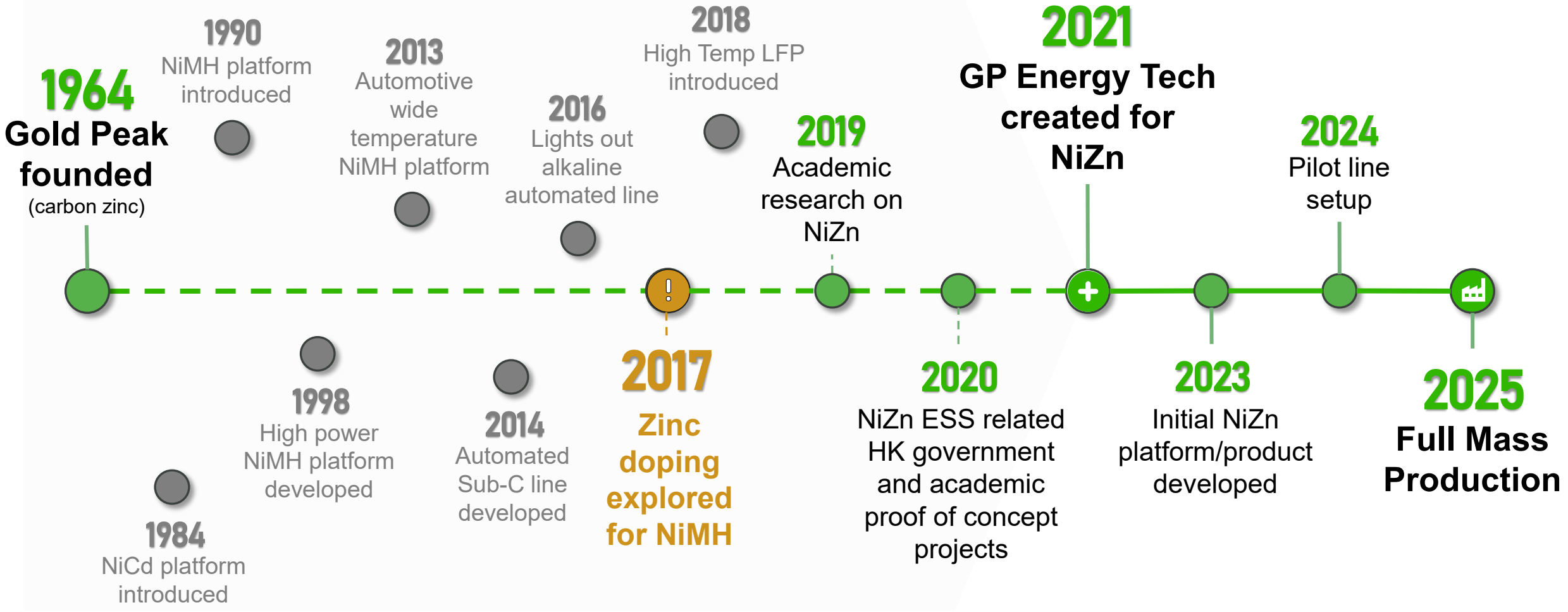
GP ENERGY TECH

Working to Remove the Unknowns

NAATBATT Sodium-Zinc Workshop
18 – 19 November 2025

Company history and development

Our Journey to Nickel-Zinc Manufacturing



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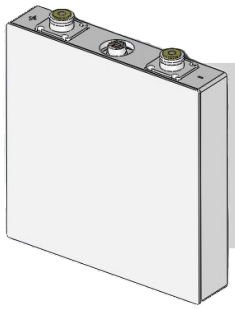
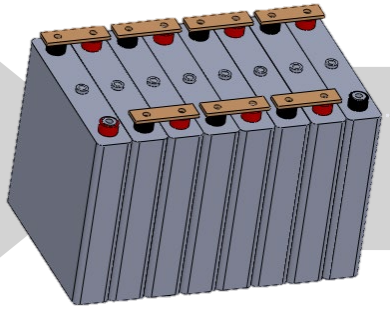
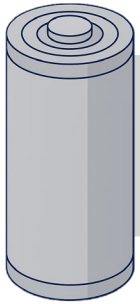
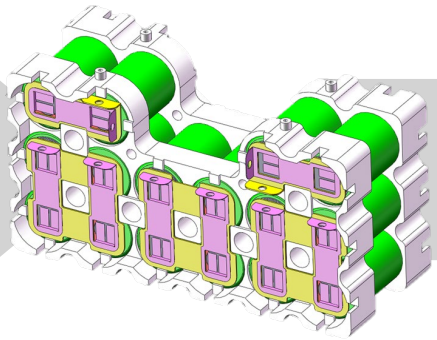
Testing form factors

Original Go to Market Thinking









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Challenges encountered…

Original strategy meets dynamic market

Original strategy from initial kickoff

- Problem to solve statement based upon a certain usage and runtime

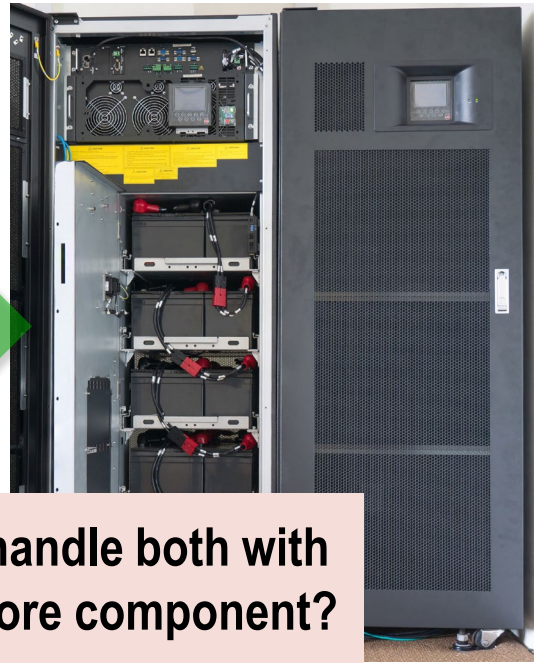
Market's application needs *changing*

- Runtime and power needs were changing
- End solution preference changing
- AI

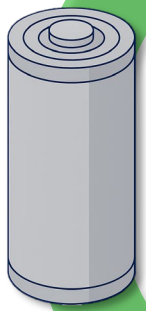
Difference in regional markets

- Customer needs in different markets questioned the original strategy

Do we remain the course or do we pivot?



Could we handle both with the same core component?



Do we offer multiple core components based upon region?

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Time to Rethink

Removing the unknowns and return to the knowns

TARGET APPLICATION:

- Immediate power backup for Data Center UPS

CUSTOMER FEEDBACK:

- Quicker recovery time after discharge
- Run-time less, power greater

FORM FACTOR	DISCHARGE RATE	HEAT DISSIPATION	DESIGN COMPLEXITY	IMPROVEMENT ITINERATION	MANUFACTURING READINESS	TIME TO MARKET
	**20C** capable (30C ?)	**QUICK**	Flexible small packs, but ***large number*** of cells for cabinets	**QUICK**	***Comparable*** to existing chemistry with ***automation***	**SHORT**

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Developing a manufacturing solution for Sub-C

Drawing on our experience from adjacent chemistries

Now — **Development of tag less connection for Higher Power (NiZn) performance.**

2014 — Development of **Fully Automated** production line for the Sub-C format.

2000s — Development of rugged gasket for **Wide** and **Elevated Temperature range** and **Extended Life**

Development of multiple point tag for **Higher Power Efficiency**

1998 — **Development of Sub-C format for High Drain Nickel Metal Hydride (NiMH) platform.**

1984 — **Development of Sub-C format for High Drain Nickel Cadmium (NiCd) platform.**

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Removing the unknowns

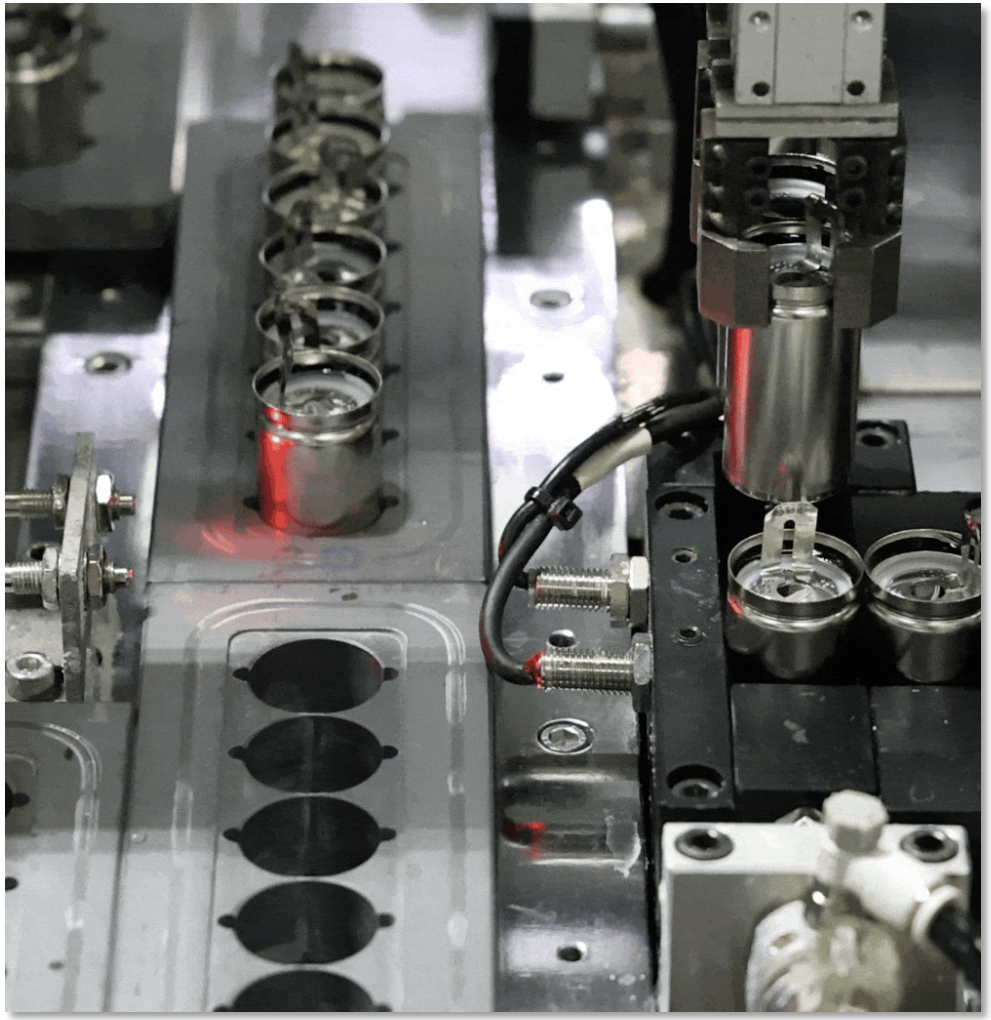
Working towards a plug and play manufacturing solution

2014 Development of **Fully Automated** production line for the Sub-C format.

COVID TIMES Discovered the key production ***bottlenecks*** and ***pain points*** with current automation.

2023 Designed and tested potential solutions to move towards a **plug and play** method.

2024 Detected ***issues*** specifical related to ZnO anode and potential NiZn options for automated production.



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Tagless solution for ZnO anode

Struggles to get Anode and Cathode into similar solution

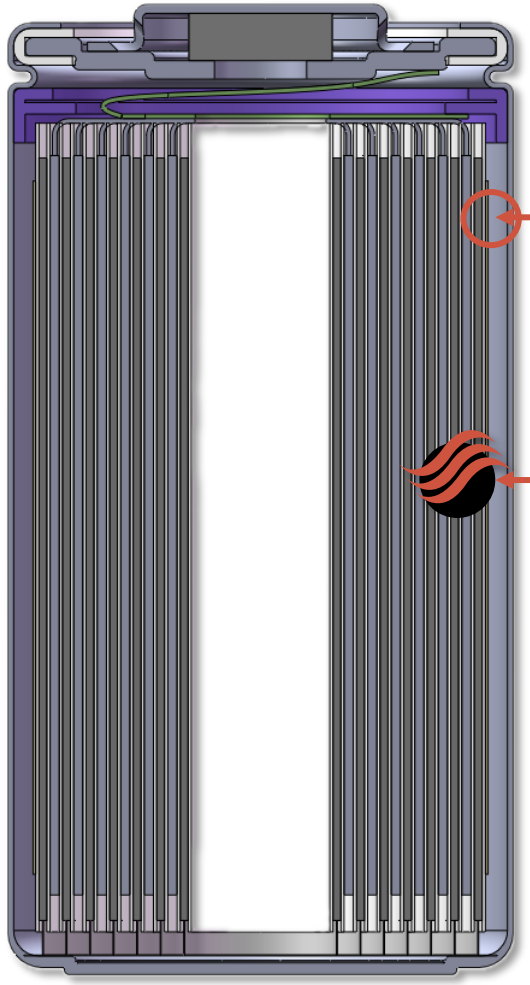
Major Issue

Welding the current collector at thin edge of the anode.

Anode uses a **copper substrate,** and copper is a *good conductor.*

Not suitable for our **standard resistance** welding.

- Needed to change high precision input control welding



Available edge space for high energy weld is *quite small*

Risk creating **heat zones** that may **burn** the separator

- Required testing of different methods
- Find the most suitable power supply

Redesign the current collector

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Removing the unknowns

Working towards a plug and play manufacturing solution

2014 — Development of **Fully Automated** production line for the Sub-C format.

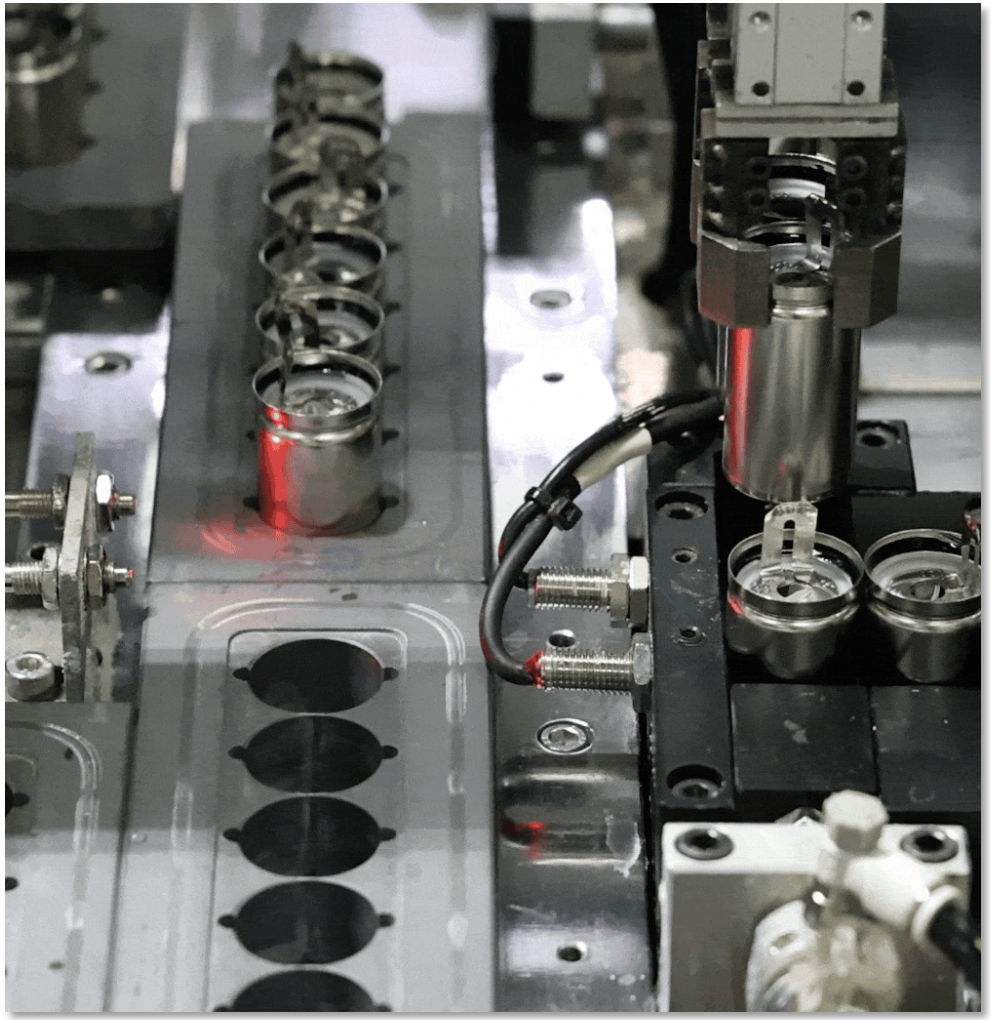
COVID TIMES — Discovered the key production ***bottlenecks*** and ***pain points*** with current automation.

2023 — Designed and tested potential solutions to move towards a **plug and play** method.

2024 — Resolved ***issues*** specifical related to ZnO anode and potential NiZn options for automated production.

Now — Lights out automated production

Next — *Market and customer determines a production line needed*



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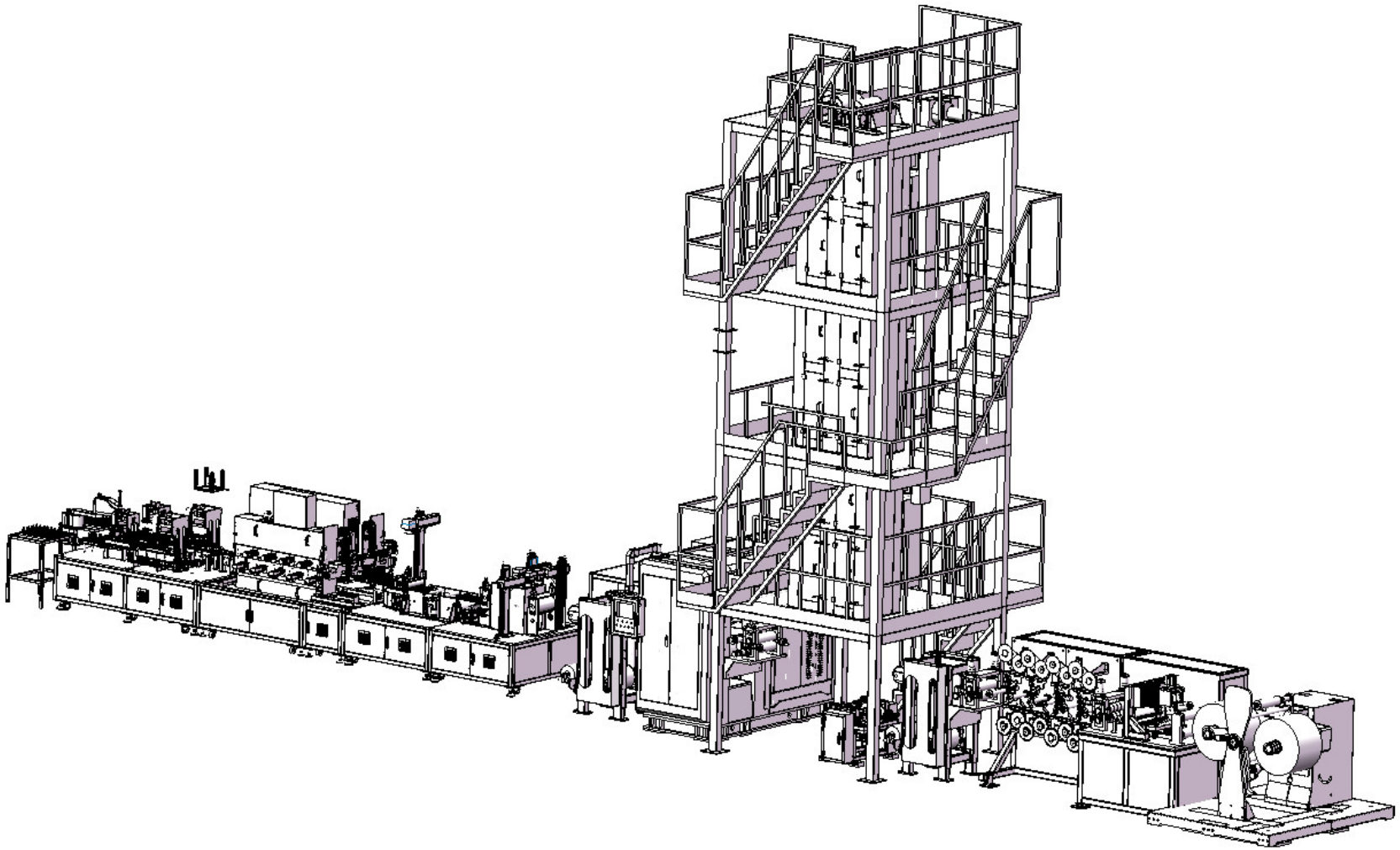
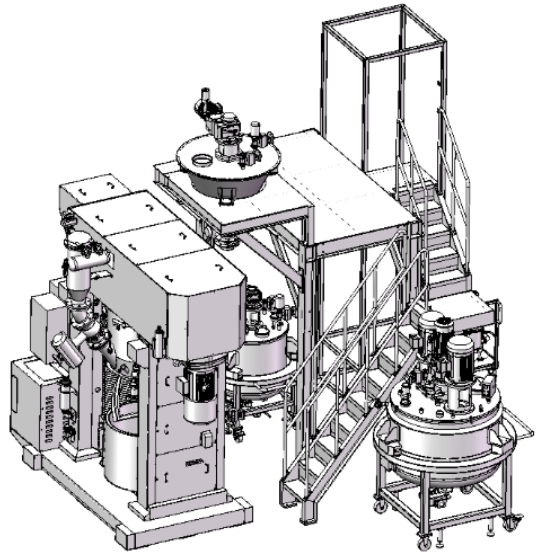
Cathode production line





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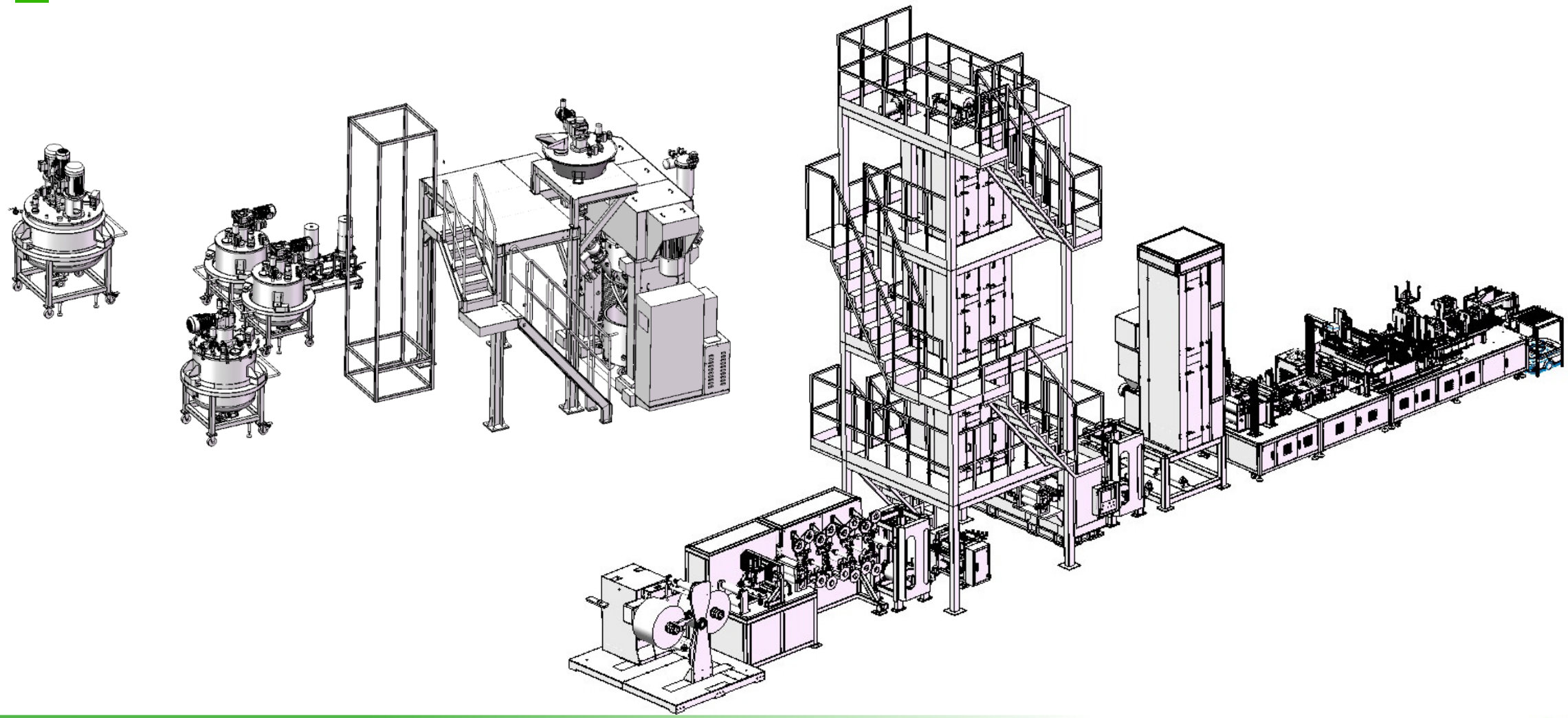
Anode production line



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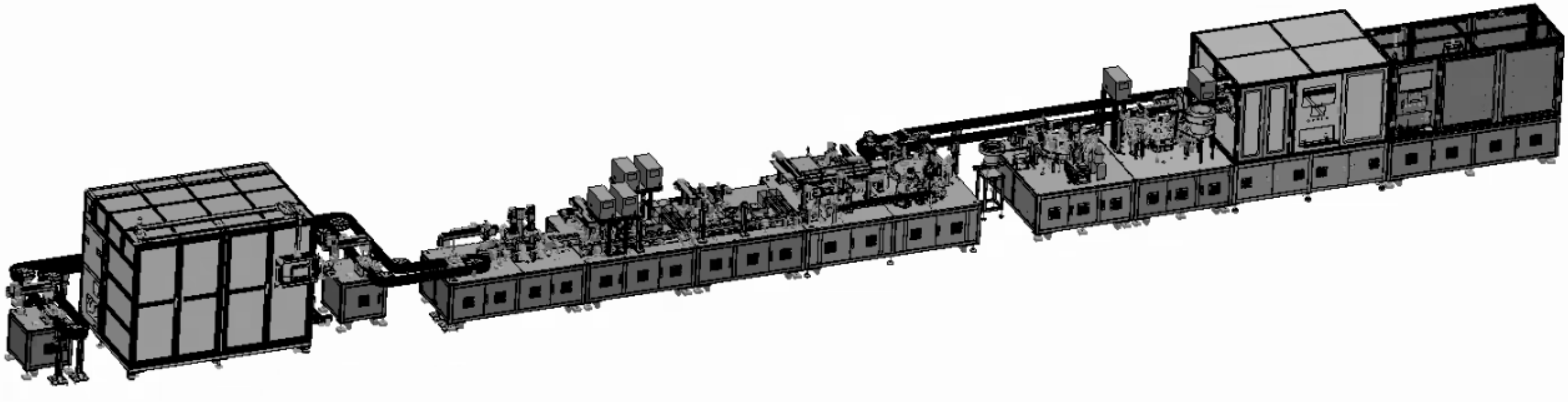
Cell assembly production line



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Key lessons learnt

REFRAIN from ultimate solution mentality

- Remember the target application and critical feedback

REVIEW and RETHINK

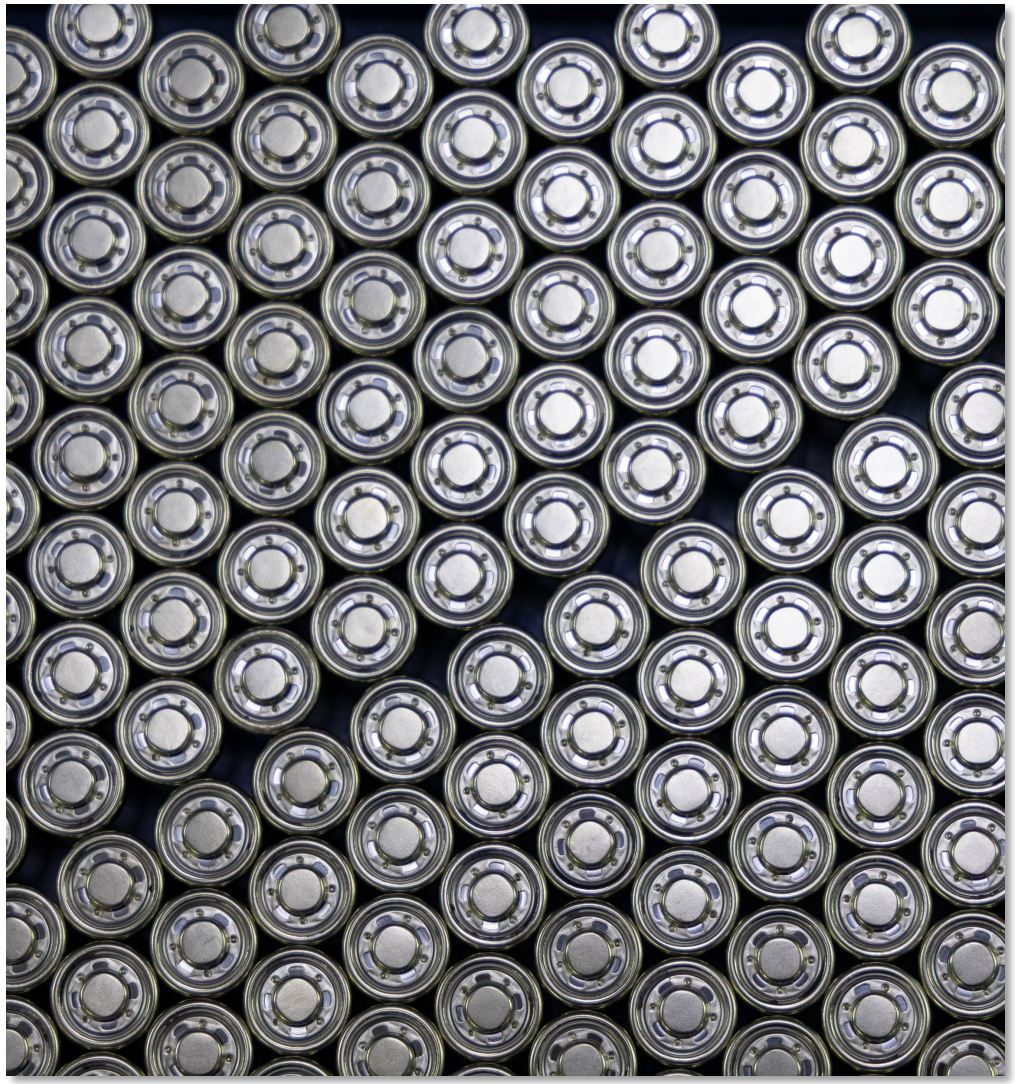
- Compare option timelines versus expectations

ITERATE continuously

- Small and medium iterations measure if incorporates the review and rethink step.

EXPLORE adjacent options

- Adjacent chemistries may have useful solutions



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We see a new world empowered by

GP ENERGY TECH

Glenn Austin GREEN

Senior Business Development Manager

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Performance Outcome

Basic building block – RZ2SCY Sub-C Cell

THE BASICS

Dimensions:	Ø23mm; 43mm Height
Nominal Voltage:	1.65V
Capacity:	1900mAh minimum

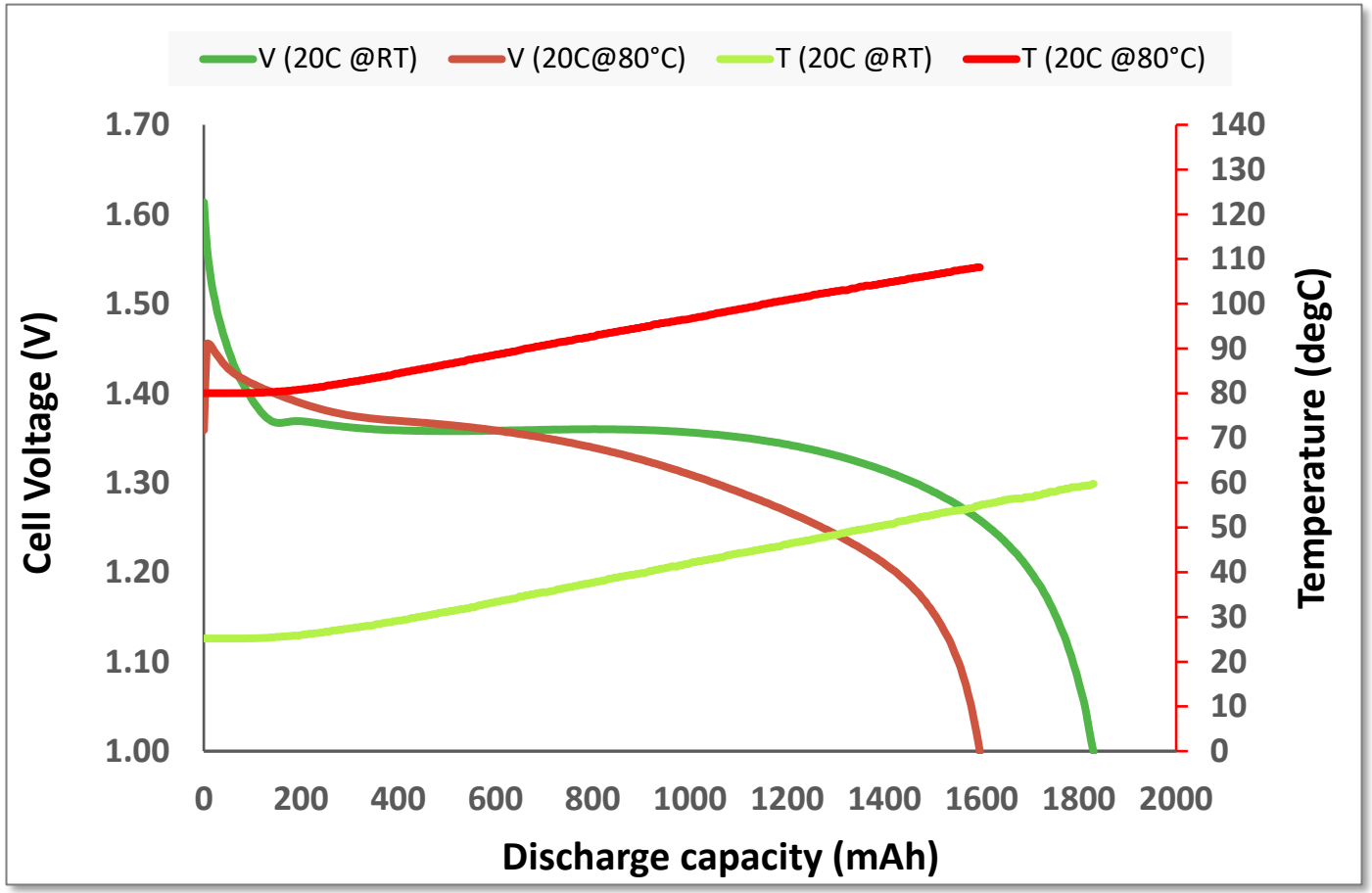
Constant Power

Discharge:

- **31.5W**/1V for **5** minutes
- **47W**/1V for **3** minutes

UL9540A PASSED

Testing the extreme – NO EXPLOSION/FIRE



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Performance Outcome

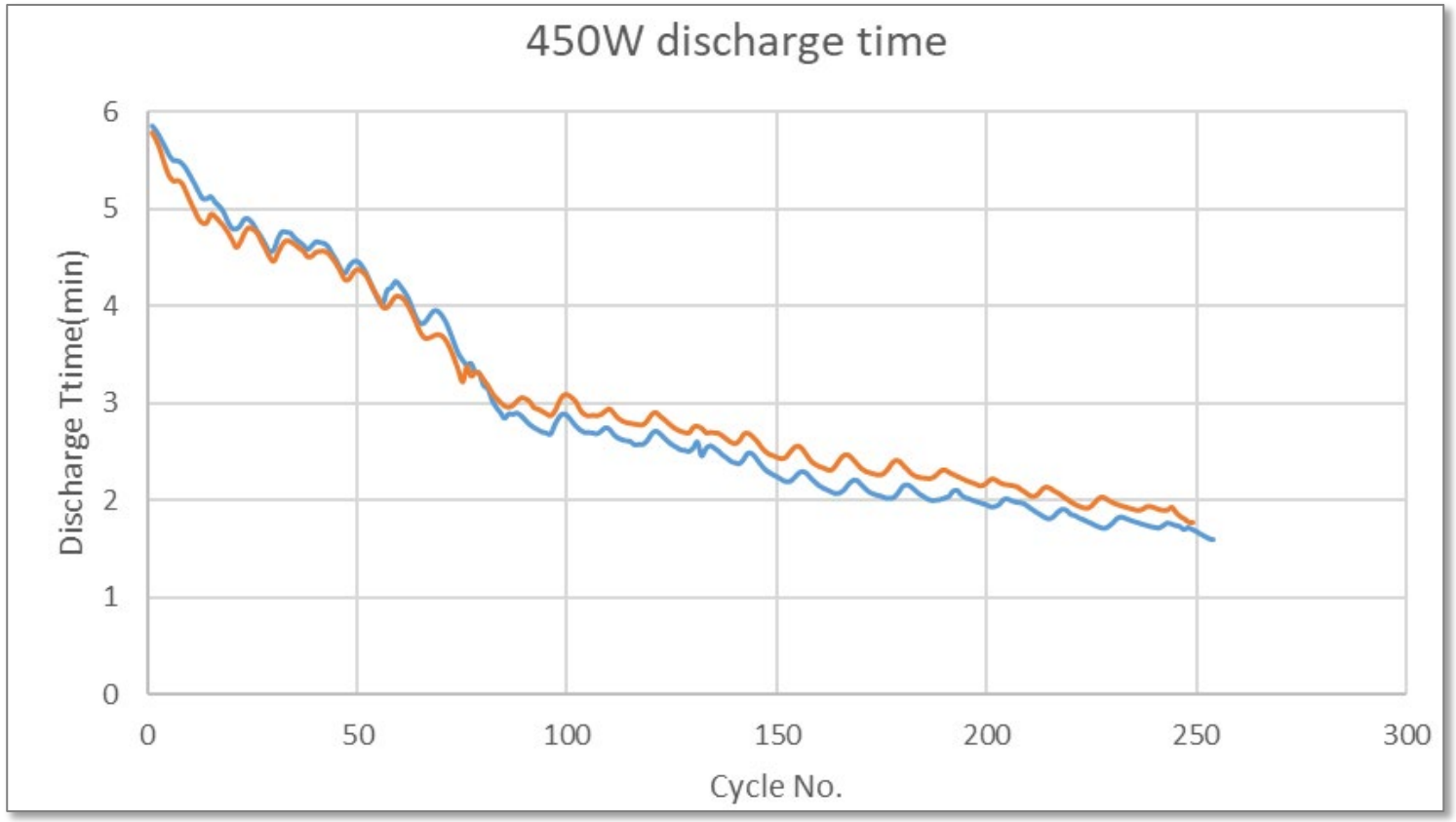
Building up to a common lead-acid monobloc

THE BASICS

Configuration:	8s2p
Nominal Voltage:	1.65V
Capacity:	3600mAh minimum

WEIGHT: ~1kg

450W Constant Power Requirement



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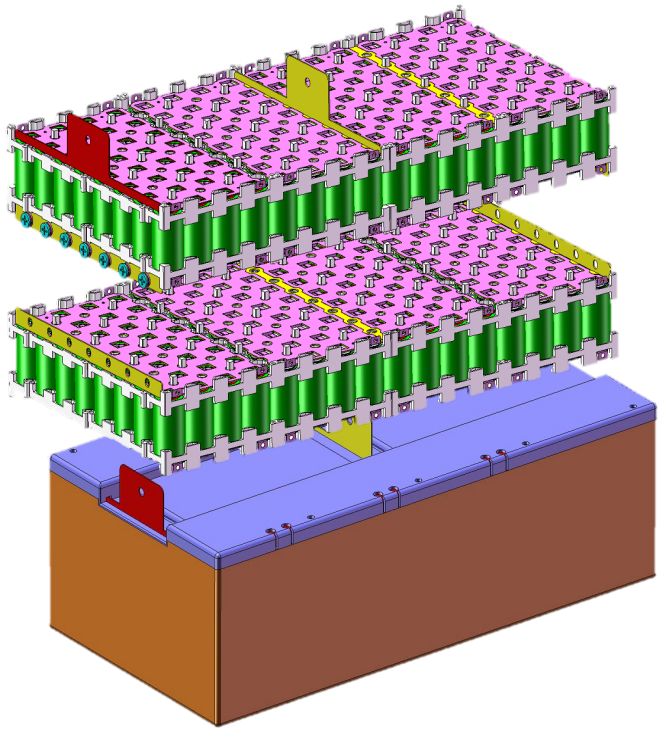
Performance Outcome

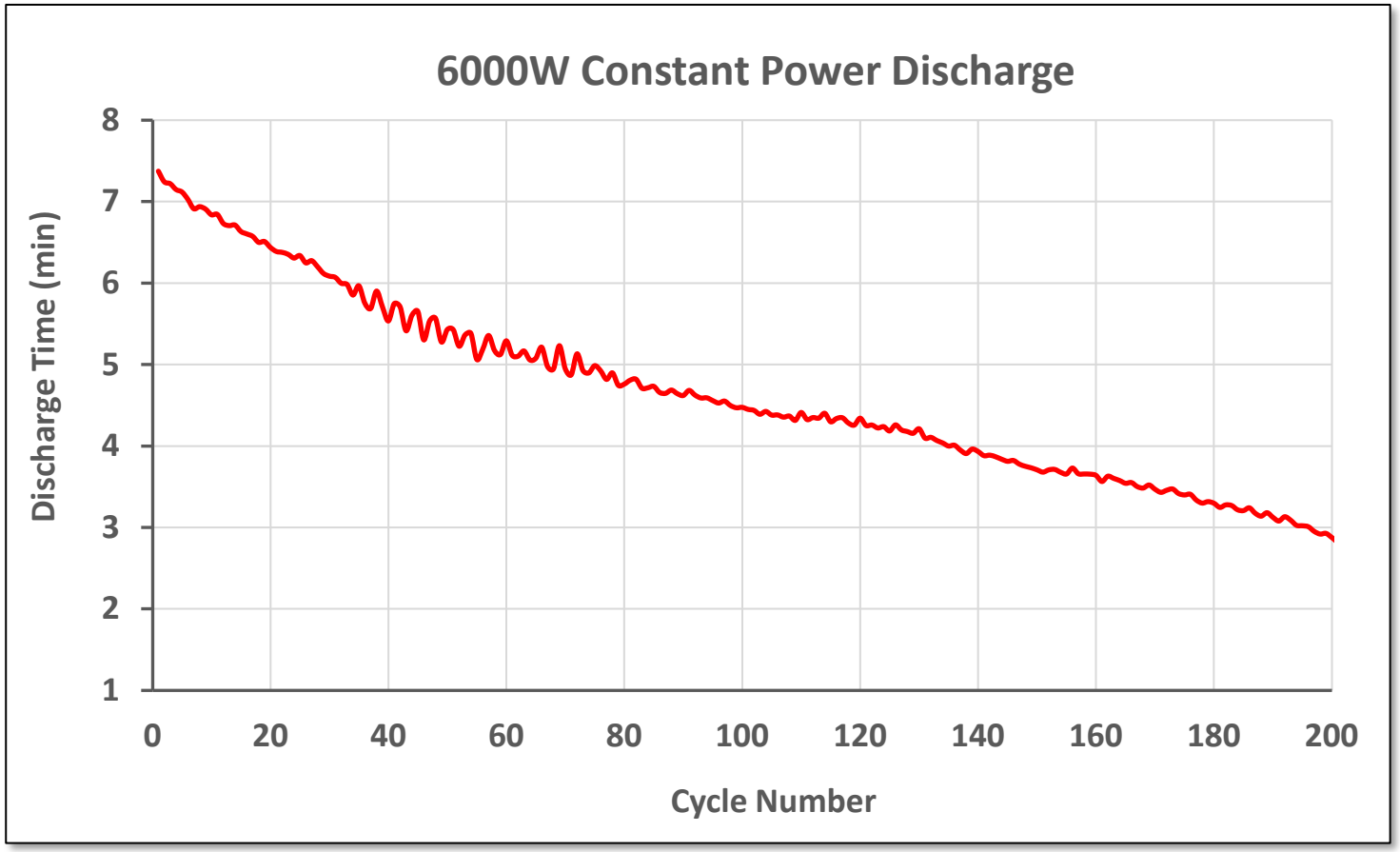
Black box testing without electronics or cooling with several layers

THE BASICS

Configuration:	8s32p
Nominal Voltage:	1.65V



450W Constant Power Requirement



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