Reinventing the critical metal supply chain

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NTH CYCLE

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THE PROBLEM

IN THE WORLD

The metals needed for the clean energy transition are currently located in **Non-Fair-Trade countries**, include **human/child labor** and are **extremely hazardous** to our **health and environment**.

IN THE INDUSTRY

The current global supply chain has extreme bottlenecks, caused by outdated centralized smelting technologies. To truly build a clean energy economy, we must **modernize** and **localize** our supply of critical metals.

Transition Metals Are A **$10 Trillion Opportunity** as Demand Rises and Supply Continues to Lag

Source:
BloombergNEF

OUR MISSION is to get as much metal into the supply chain and keep it in circulation forever **[to the Nth]**, so that our peers in the space can continue to manufacture the end cathodes, magnets, and other products needed for the transition, **and do it compliantly.**

OUR SOLUTION

Nth Cycle's refining technology and business model modernizes the supply chain by:

1) **Localizing supply to where it is needed = reducing the number of steps it takes to refine metal**

2) **Reducing carbon footprint and permitting time by using significantly lower amounts of energy**

3) **Creating a flexible asset that can process anything along the value chain**

INTRODUCING THE OYSTER

(Optimized hYdrolysis System Targeting Element Recovery)

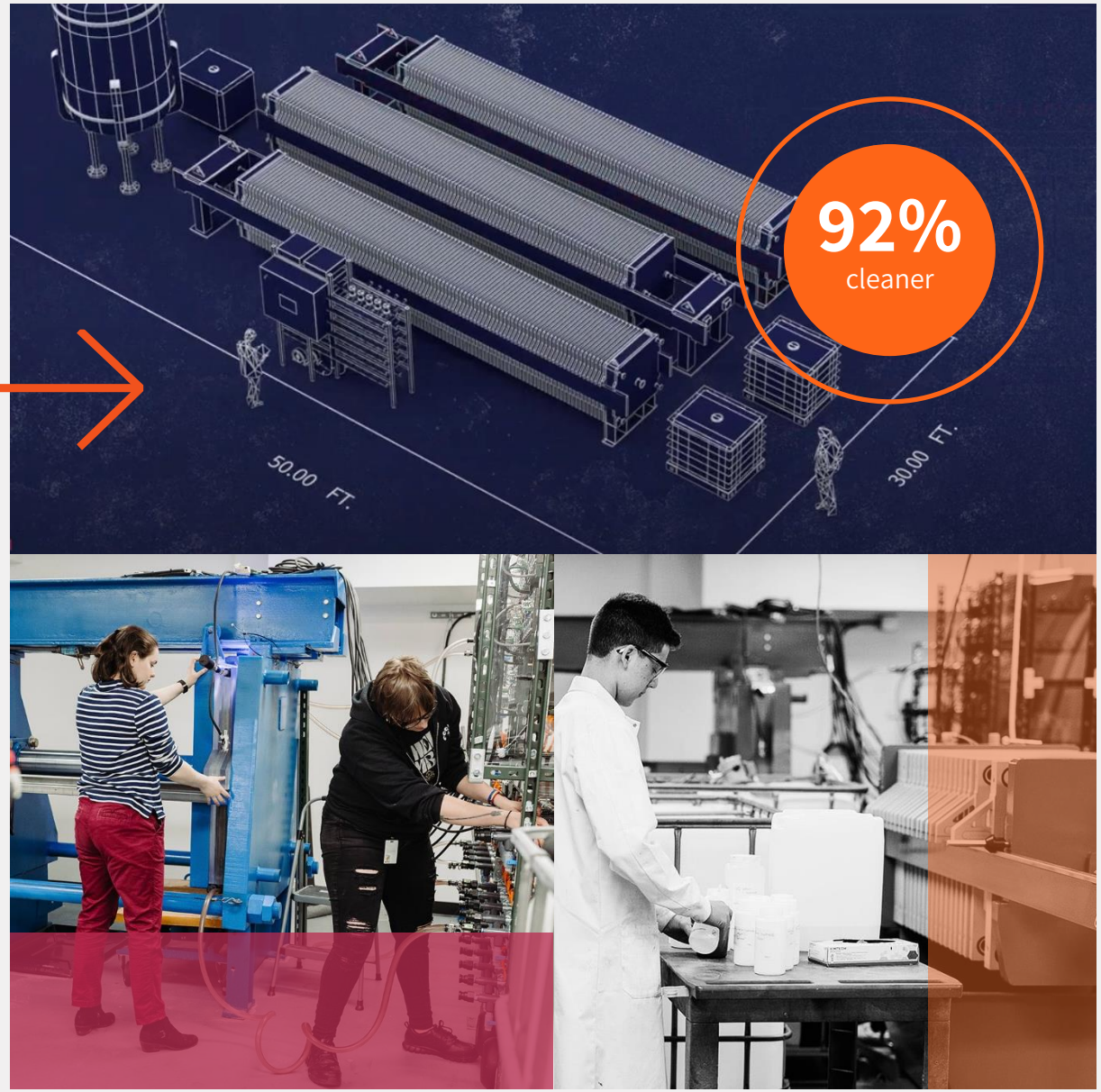
Footprint of **< 2,000 sqft** enables on-site refining for our partners (no transportation of hazardous/low grade materials)

Scalable and Customizable technology with **> 95% metal recovery** and low level of impurities

Can process **any type** of non-ferreous metal-bearing feedstock (ore, scrap, tailings)

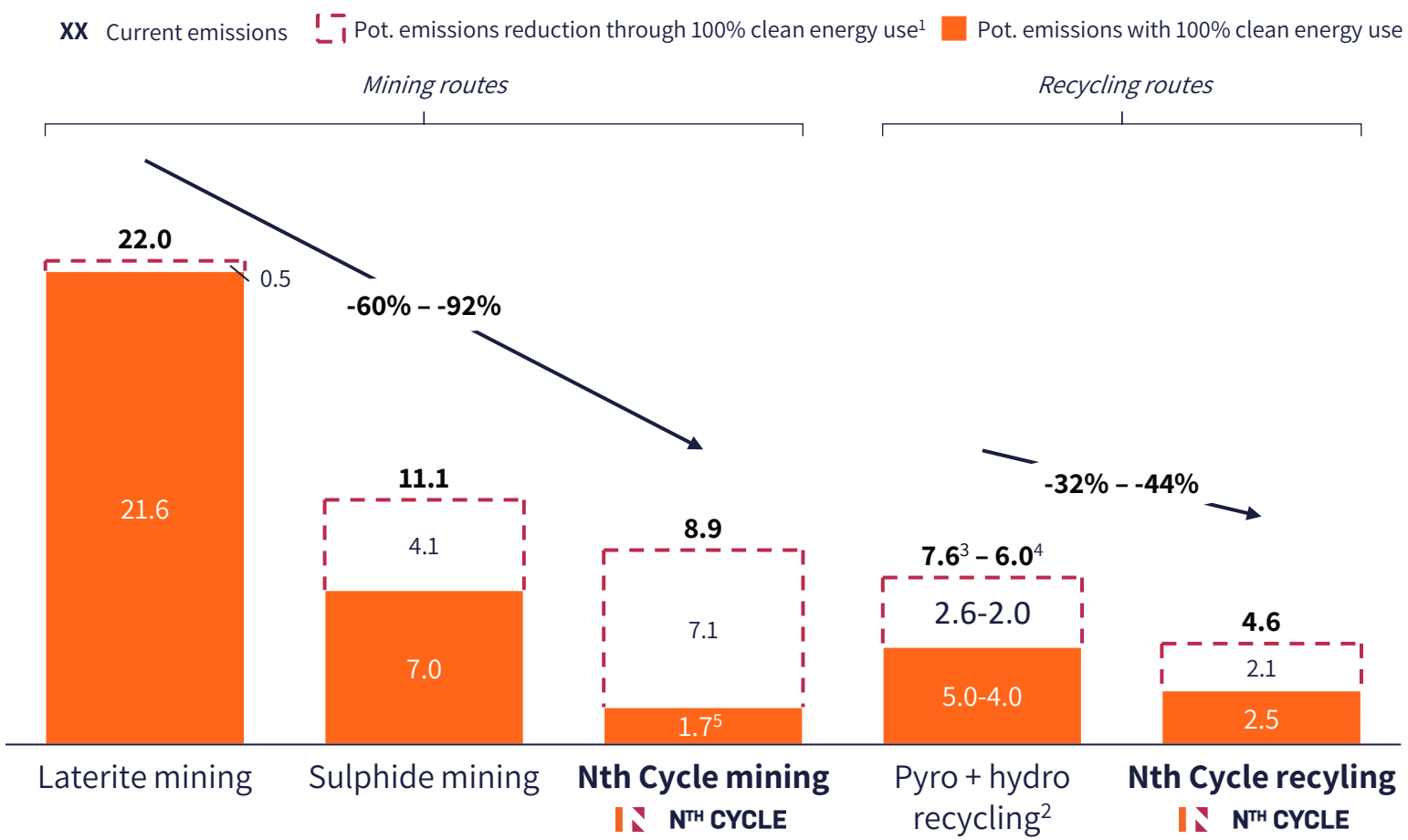
Lower Capital Intensity and available this year for commercial production with build times in **6-12 months**

Patented by us



Nth Cycle's estimated emissions are significantly lower than both traditional mining and traditional recycling routes

Overview of carbon emissions by route, tCO2e / t Ni eq.



1. Electrification / decarbonization of transportation is not assumed for the purpose of this analysis (consistent throughout the document)
2. Assumes a low temperature pyro process converts 10% of the graphite to CO2, based on multiple expert conversations & Nth Cycle input; also providing a range for the lithium recovery in the pyro step [0%-90%] due to the many claims in the space. This pyro + hydro recycling route is modeled assuming Western emissions regulations.
3. Assumes 0% lithium is recovered in the pyro step and 10% of graphite is converted to CO2. These values could change based on process variability
4. Assumes 90% lithium is recovered in the pyro step and 10% of graphite is converted to CO2. These values could change based on process variability
5. Very low emissions from Nth Cycle's mining process are enabled by 100% clean electricity, consumption of CO2, and re-generation of all consumables

Source: Third party database, external analysis

Takeaways

Nth Cycle's mining process from concentrate is expected to have a **carbon footprint ~60% lower than traditional laterite mining** and **~20% lower than traditional sulphide mining**

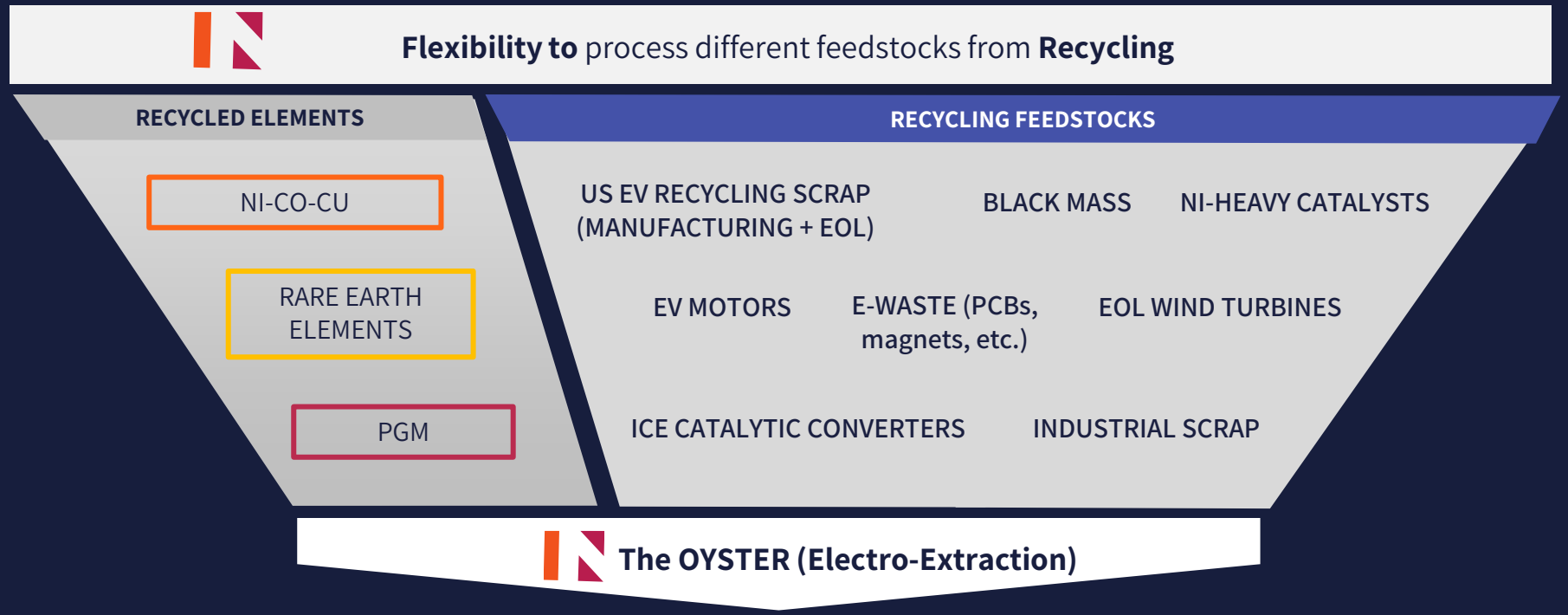
Nth Cycle's recycling process is expected to generate **between ~32-44%% less emissions** (tCO2e / t Ni eq.) **than traditional pyro + hydro recycling routes**

Using 100% clean electricity, Nth Cycle's GHG potential in mining is **~92% lower than laterite mining's** and **~76% lower than sulphide mining's one**. Also, **Nth Cycle's recycling process** has the potential to be ~**44% lower GHG content than pyro + hydro.**

Nth Cycle has the **potential** to allow customers to **overcome** the **current bottleneck in smelting capacity in Europe and NA**

VARIETY OF FEEDSTOCKS

Turning undervalued materials and into valuable products



MHP, Ni/Co hydroxide, NMC, Cu Powder

Sellable today for any application (EV, Alloy, Specialty) or to P-CAM producers.

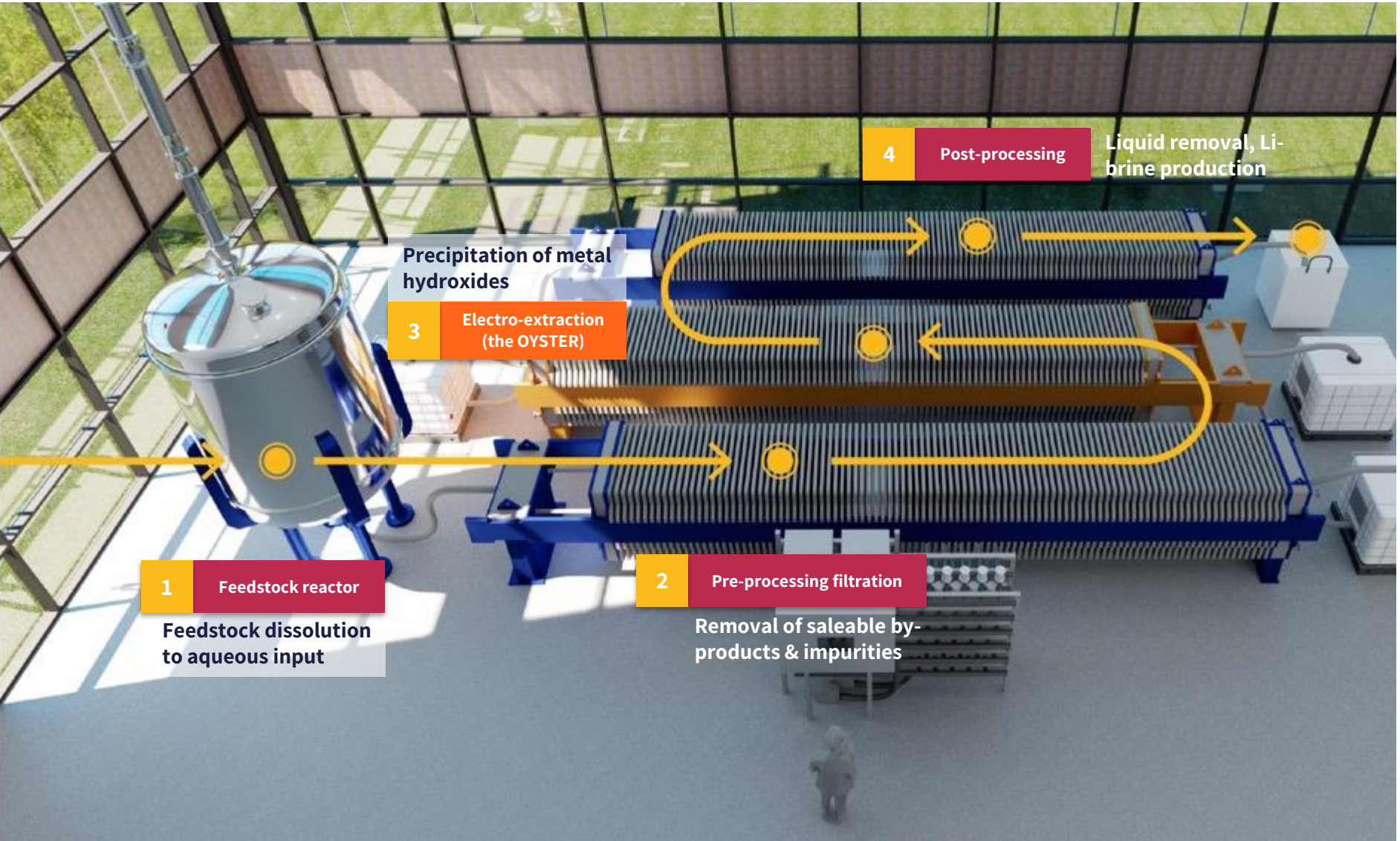
Nd-Pr oxide powders

Goes back into the supply chain of rare earth elements.

Pt, Pd, Rh, Au

Goes straight back into the supply chain for many electronics.

Electro-Extraction Process & Flow Sheet



Overview

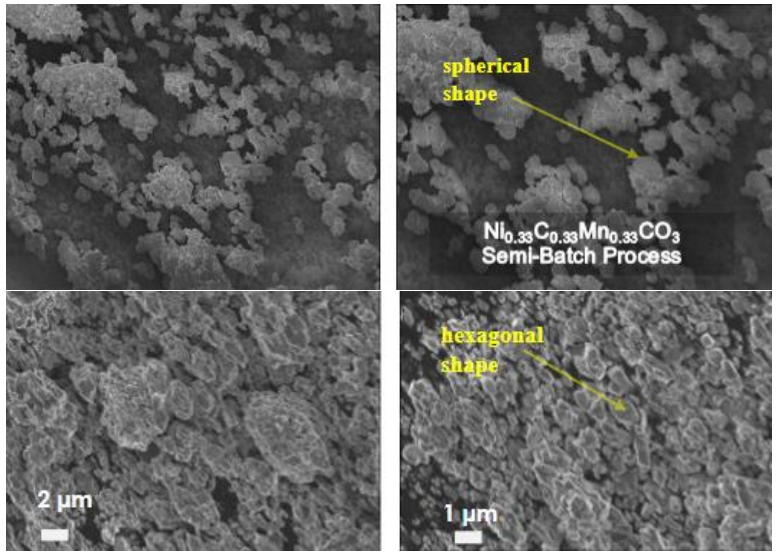
Critical metal bearing precipitates (nickel, cobalt, copper, REE, PGM), directly applicable to EV sector requirements (e.g., high grade MHP).

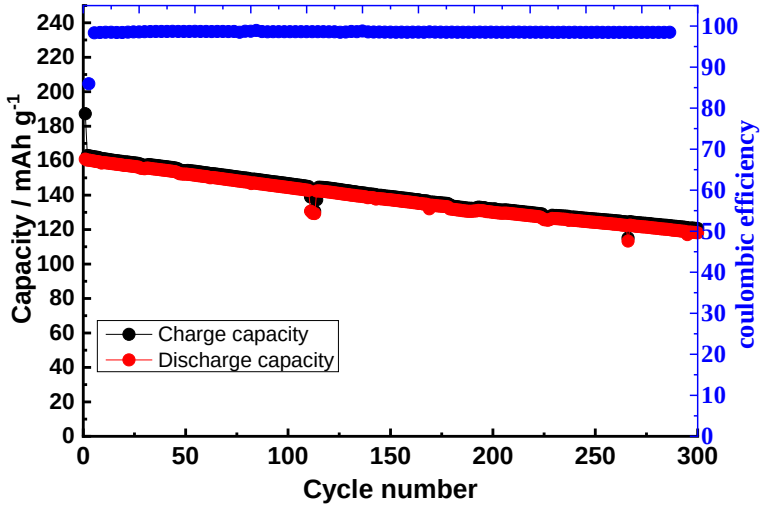
1. Highly customizable for different metal feedstocks
2. Standardized design, with parameters customizable to recover >20 different metals
3. Post-processing optional based on the customer specifications and feedstock composition

Area	2,000 sqft per unit
Inputs	Electricity, H20, H2SO4, NaOCl, NaSO4, H2O2
Power	3-4 kWh/kg input
Input	c. 1,000-1,300t black mass per unit per 4,000hr operating year

Nth Cycle's product shows similar results as commercial pCAM material

In July 2022, Nth Cycle tested its recycled product (NMC111) by doing pouch cell testing in collaboration with the DOE's ORNL for its use as a precursor cathode active material, showing the following results...





Similar morphology when compared side-by-side to a commercial NMC111 precursor...

- Battery precursor materials, whether recycled or virgin, need to have a specific morphology including both spherical shapes (with the right particle size) and crystals that will support the material's consistent electrochemical performance over time.
- Nth Cycle's fully recycled unoptimized carbonate consistently meets these specifications.

Similar electrochemical performance when compared to a commercial NMC111...

- The recycled material achieves the same theoretical capacity (170 mAh/g) and behavior (charge-discharge) expected from an optimized cathode material.
- The recycled material achieves the same retention in capacity after tested through 200 cycles compared to standard NMC111 commercial material.

Proving the ability to integrate Nth Cycle's recycled material as a final pCAM when mixed in the right ratio.

PARTNERING WITH US

1. Sign NDA
2. MOU - road map for testing samples and deployment of commercial unit
3. Send us a sample
4. Review results
5. Value Proposition and Final Agreements
6. Unit in operation <12M from execution of Final Agreement