

Momentum Technologies

AI for a More Resilient Materials Supply Chain

September 2026



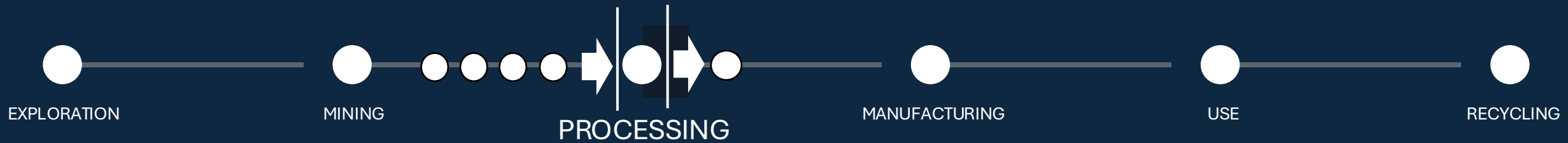
AI Accelerates Resource Pipeline Development

Mine Development Stage	Traditional Approach	AI Enabled Approach
Concept and Design	Information is distributed	Integrated project context and rapid analysis
Engineering	Manual document prep and checks	Automated document review and cross-discipline checking
Permitting	Manual document assembly and obligation tracking	Searchable requirements and automated compliance tracking
Procurement	Disconnected equipment, schedule, and cost data	Equipment requirements linked to design and construction schedule
Construction	Manual progress reports	Real-time progress and predictive schedule risk monitoring
Commissioning	Manual troubleshooting across systems	Integrated operating data and AI assisted root cause analysis
Ramp Up	Periodic human adjustment	Continuous optimization using current data

AI increases the number and diversity of resources entering the development pipeline.

But Pipeline Does Not Equal Supply

Finding more resources only shifts pressure downstream to processing.



As AI increases the rate of resources that are discovered and mined, physical processing must adapt or the processing bottleneck will intensify.

The Lynas Lesson

Lynas Rare Earths Posts Profit Miss After 'Painful Time'

By Bloomberg News

August 26, 2026 at 8:58 AM GMT+8

Updated on August 26, 2026 at 12:19 PM GMT+8

- Revenue reached a record A\$977.9 million, up 76%, though the stock dropped 8% after earnings.
- Lynas reported challenges ramping a new large scale processing facility.
- Ore variation affected downstream processing, while commissioning and ramp up contributed to costs.

The processing bottleneck is not theoretical, when processing cannot adapt to ramp-up challenges and feed variation, even record market success will not translate into reliable value.

The Next Unit of Supply is Becoming Harder to Produce

Future Resources are Increasingly:

Lower Grade:

Copper mine grades have declined 40% since 1991 (IEA)

More Distributed:

Electronics are geographically dispersed

More Complex:

New AI technologies and industrial uses generate non-standardized feedstocks

More Variable:

No universal black mass specification exists, and impurity levels can vary by as much as 6x

Harder, less predictable feedstocks make adaptability an economic requirement.

Shredded Hard Drives Makes the Problem Visible

Recycled feedstocks are inherently variable

- New internal characterization methods were developed to account for variability.

	Calculated Nd/Pr (wt.%)
Sample1	2.03%
Sample 2	2.57%
Sample 3	2.76%

- Representing a 36% fluctuation from the lowest to the highest sample.
- Magnet material available for processing into NdPr Oxide per batch is very low.
- Black Mass can be even more variable.



Intelligence + Modularity = Adaptive Refining

Intelligence

- Characterize incoming feed
- Predict the required process configuration
- Adjust flow, pressure, pH and chemistry
- Detect performance drift
- Optimize recovery, purity and cost simultaneously
- Learn from each operating campaign



Modular Processing

- Add or remove capacity incrementally
- Reconfigure separation stages
- Operate across different volumes
- Isolate maintenance without stopping the entire process
- Deploy closer to distributed feedstocks

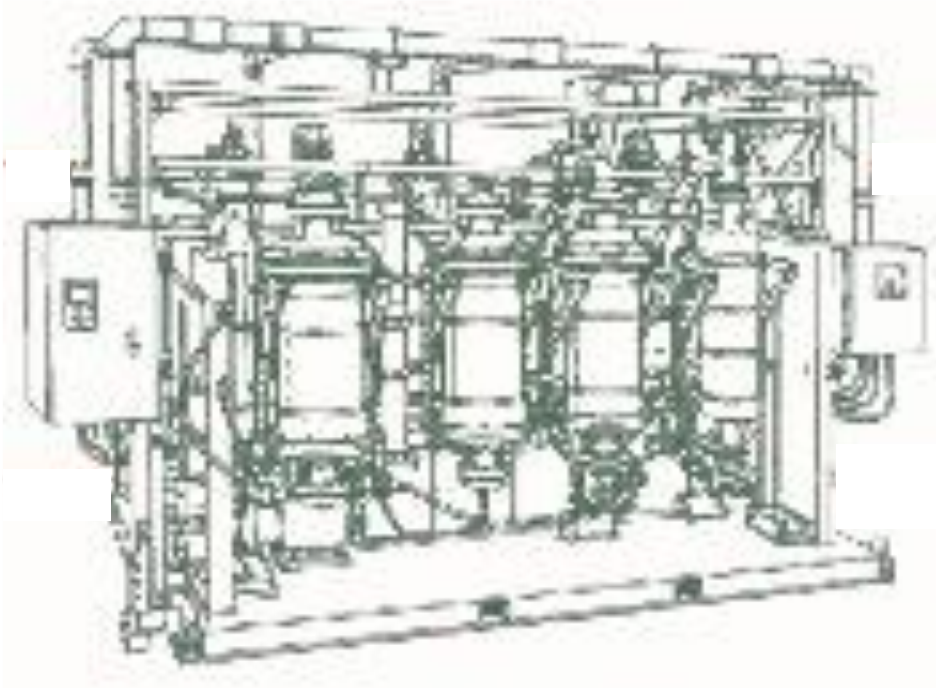
Intelligence coupled with physical modular infrastructure allows processing to adapt to the conditions necessary to produce the next unit of supply economically.

MSX is the Physical Architecture for Adaptive Refining

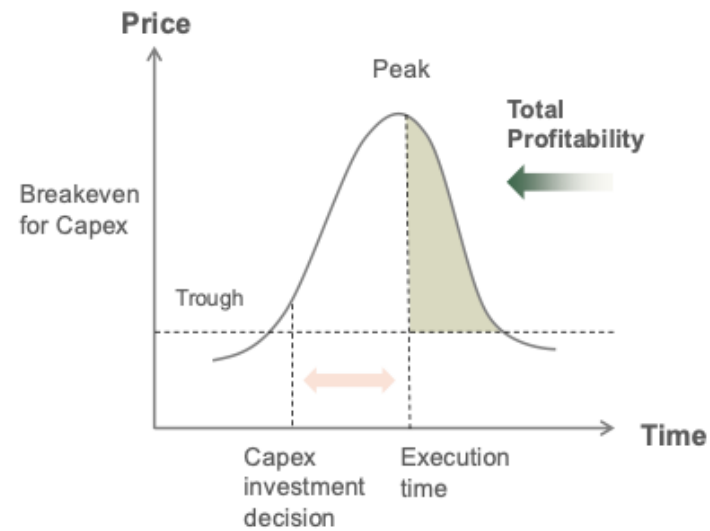
Adaptive Requirement	Conventional SX Constraint	MSX Physical Architecture
Reconfigure the separation	Fixed train of mixer-settler stages	Contactors stages can be reconfigured
Respond to feed variability	Optimized around a defined feed envelope	Operating conditions can be adjusted as the feed changes
Scale with available feed	Capacity added through major equipment expansions	Capacity scaled incrementally, module by module
Correct performance drift	Mixer-Settler train cannot react quick enough to a changing feedstock	Instrumentation and control points support earlier detection and corrective action

MSX provides the physical means to respond to the intelligence.

Modularity = Faster Deployment = Greater Value Capture



Modular MSX Skid



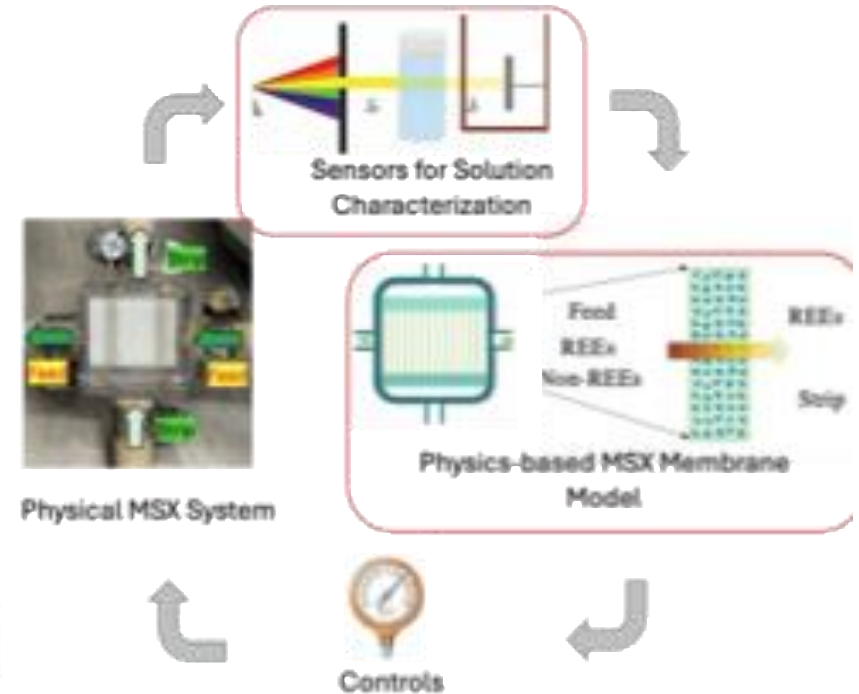
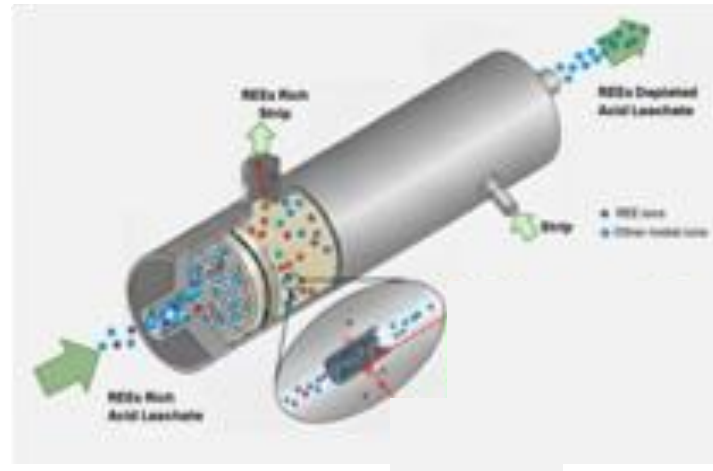
Typical 3 Year Metals Pricing Cycle



Fast Deployment to Capture the Most Value

Building the Intelligence Layer for MSX

- Working with Oak Ridge National Lab to build a system that can:
 - Sense
 - Simulate
 - Predict
 - Adapt
- Target is to move analysis time from 20 minutes to less than a minute.
- The digital twin will provide the predictive intelligence needed to operate it adaptively.



How We Will Continue to Prove Out Adaptive Refining

- **Adaptation Speed**
Time from receiving a changed feed to stable operating conditions
- **Output Consistency**
Recovery and product purity across variable feed compositions
- **Operating Flexibility**
Validated throughput and configuration adjustment range
- **Resource Efficiency**
Reagent, energy, water and waste per unit recovered
- **Intelligence Quality**
Prediction accuracy and time from detected variation to corrective action

The Conclusion

- AI is accelerating resource discovery
- But the next unit of supply will increasingly come from lower grade, more distributed, more complex and more variable resources.
- Momentum's opportunity is to pair MSX's modular physical architecture with intelligence that maintains recovery, purity and economics as feedstocks change.
- The competitive advantage will be converting changing material into consistent product, faster.

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