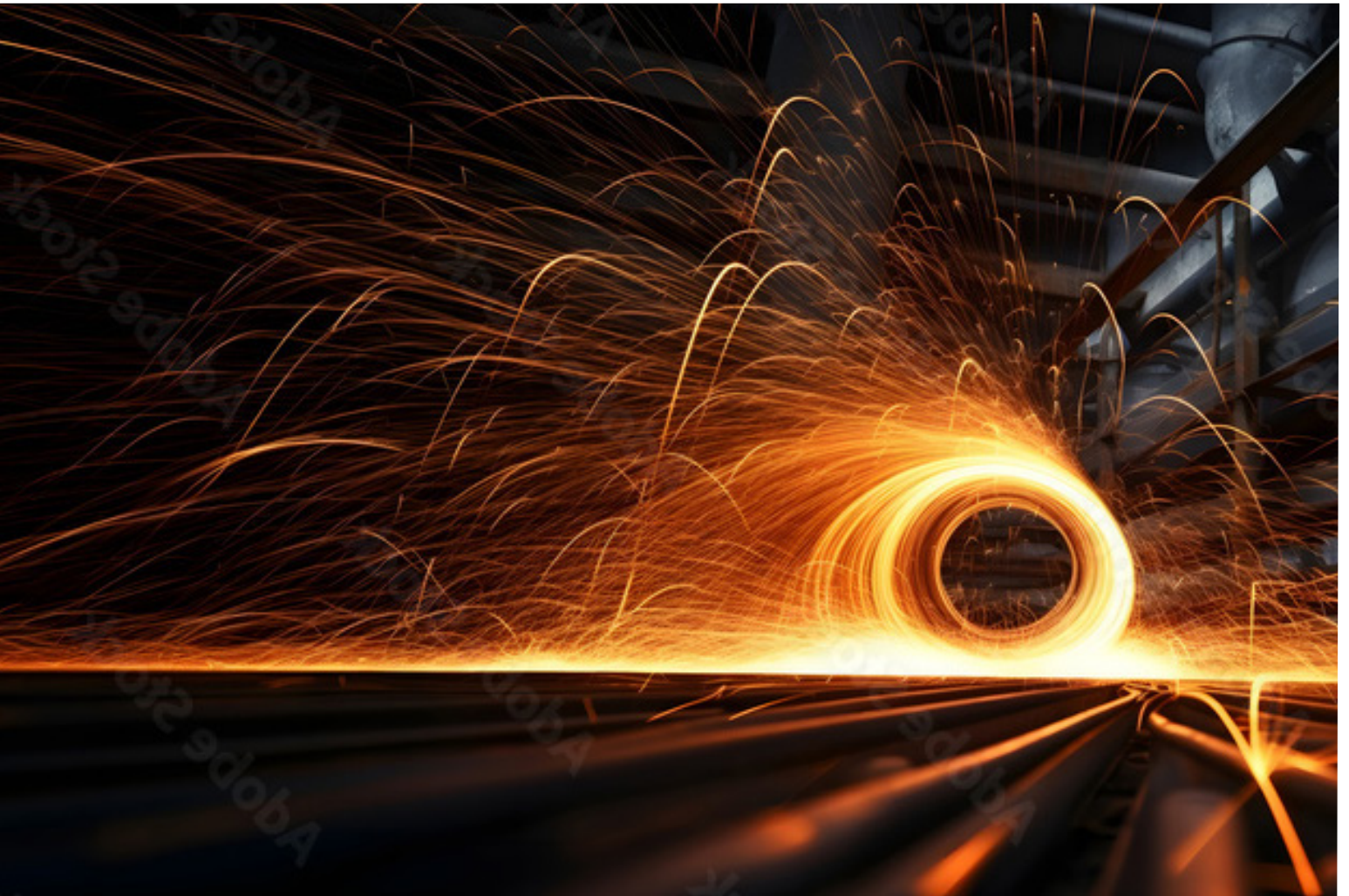


Metals in Motion: Navigating the Volatility and Value in the Global Metals Market



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INTRODUCTION

The surge in interest in metals seen over the last few years is set to continue spurred by the global renewable energy transition combined with increased industrialization and electrification in many parts of the world. Battery metals, rare earth metals, and even precious metals, are seeing increased demand and price volatility because of their importance in the manufacture of batteries, use in electronics and electrification, construction, and manufacturing. In the period leading up to the end of 2022, the markets for these metals experienced rising value and price volatility, with the composite Q1 2023 price average around 51% higher than the 2015-2019 average price, according to the world bank. Since then, prices have declined somewhat, but remain volatile.

Fundamental factors of supply and demand are, of course, driving that price volatility and for a while, demand for lithium and other battery metals outpaced supply, driving prices higher. Recently, however, prices have slipped as demand weakened with slower than expected sales of electric vehicles (EVs) along with increased supply of rare earth metals from China, Indonesia, and the Democratic Republic of the Congo. Meanwhile, geopolitical instability, including the wars in the middle East and Europe, have helped drive up gold prices to record highs, though silver prices have remained weak.

Despite the recent weakness in battery metals prices, with the value of Lithium off almost 70% and the value of Nickel down almost 40% at the time of this writing, volatility will likely continue as the market comes to grips with supply and demand issues and geopolitical drivers. While there have been supply increases, these are still likely to be woefully insufficient in the longer term to

satisfy demand by battery manufacturers, particularly as bringing on new sources of supply often takes years and is both expensive and environmentally challenging. Gold prices also reflect issues like inflation, decline in values of other asset classes, as well as the BRICS interest in re-establishing gold-backed currencies to challenge the supremacy of the US Dollar. For these and other reasons, metals are likely to steadily rise in value against the dollar over time and remain very volatile.

According to Commodity Technology Advisory's (ComTech's) annual CTRM software market sizing and trends estimates¹, the metals commodity side remains by far the smallest of the three large categories (metals, ags & softs, and energy). Expenditure on metals focused CTRM implementations was estimated to be around \$173m USD for FY2022, which represented about 9% of total expenditures that year on CTRM software. Even though the metals side of CTRM software sales

¹2023 Market Sizing, Outlook and Trends through 2027, Commodity Technology Advisory, LLC, <https://www.ctrmcenter.com/publications/reports/2023-market-sizing-outlook-and-trends-through-2027/>

is expected to grow over the next several years, it is unlikely to exceed the size of the CTRM software market for either energy or ags & softs anytime soon. That said, CTRM solutions servicing the metals market will benefit from the sharper focus on this increasingly important group of commodities by virtue of the global renewable energy transition and drive to net zero CO2 emissions targets, and we should expect to see healthy growth in the metals-related market segment of the CTRM software business foreseeable future.

Historically, there have been just a few CTRM and related metals vendors and solutions with features and functions addressing the physical market aspects of trade and logistics management. Solutions for managing financial aspects of the metals trading business have historically been more common and there are several viable software platforms addressing

the needs of that market.

Because of the likely growth in trade in physical metals and a limited number of software solutions on the market, some CTRM software buyers have taken the view that partnering with a preferred CTRM vendor, who will build out the metals side of their offering, can provide buyers with a usable solution. In fact, this has occurred and there are now several additional solutions available to buyers. However, some of these solutions are used only by one or two companies and have yet to properly mature to address the needs of a wider metals market. Despite this concern, the market now has several additional capable software solutions addressing the needs of physical metals trading companies, offering buyers options and alternatives to the older solutions that once dominated the metals market.

CTRM OR COMMODITY MANAGEMENT

Building a CTRM solution for physical metals can be extremely complex. There are at least four or five basic categories of metals depending on how you view things, including industrial (base and ferrous), precious, concentrates, and scrap (recycled). Each category can have a vastly different set of detailed requirements depending on its supply chain, pricing mechanisms, and physical qualities. Additionally, the emergence of ‘green’ metals and associated trading instruments (contracts) adds further complexity in that the “green” label requires robust traceability for certification. Given that each metal has unique physical properties in addition to supply chain dynamics, building the required depth and variability of functionality needed to support them all can be very difficult.

Beyond the unique properties of the individual metals, there are two aspects to tracking metal transactions from a software perspective. The first is trading and risk management; and the second is supply chain management. Typically, a CTRM solution is used for trading and risk aspects. An ERP (Enterprise Resource Planning software - software used by a company to manage key parts of operations, including accounting and resource management) also often known as a Commodity Management (CM) solution, is used for the supply chain aspects. Both aspects must be integrated.

Further, physical trading and management of metals often requires additional trading and risk management functionality beyond that required to manage trading risk for other commodities. These additional capabilities will include support for inventory management, warehousing, logistics, assays, and others. As such, metals CTRM solutions for physical metals traders are almost always endowed with some degree of commodity

management/ERP functionalities. Conversely, an ERP solution often does not usually support the trading and risk management capabilities necessary for managing physical trading and risk management (in fact, as discussed by ComTech in a whitepaper² on the topic, the CTRM and ERP software categories often significantly overlap in terms of functionality), and an extension of ERP capabilities is often required to properly capture and value trades, manage positions, and measure risk exposures. Another area of complexity and potential cost lies in the integration of accounting with CM or CTRM (this has recently been addressed in detail in another whitepaper³ recently.)

Pricing of metals can be particularly complex given the many and varied physical characteristics of each metal or ore/concentrate. Complex formulas are used to calculate contract price down to a specific decimal point accuracy. Pricing and valuation of metals also requires managing price curves from a variety of

² CTRM as an Architecture, ComTech Whitepaper, <https://www.ctrmcenter.com/publications/white-papers/ctrmcm-architecture-approach-20-year-old-condundrum/>

³ Approaches to Accounting Integration, ComTech whitepaper, <https://www.ctrmcenter.com/publications/white-papers/approaches-to-accounting-integration/>

sources, including exchanges, broker quotes, and other trusted industry sources. Additionally, the quality of an ore or concentrate will affect its value. Premiums are paid for the desired part of an ore or concentrate. Penalties are deducted for contaminant elements of an ore or concentrate. Premiums and Penalties may be negotiated as a fixed value, an indexed (from a publication) value, or a tiered value. There may be additional charges as well for treatment or specialized handling.

Furthermore, as the metals or ores move through the supply chain, multiple assays (sampling and analysis of the quality of an exchanged commodity) may be conducted. Each assay may result in changes to the valuation of a load or cargo. Each assay will affect the valuation of any provisional invoices issued prior to the issuance of a final invoice. Each assay will also impact risk exposure and position calculations, resulting in suboptimal hedges. As such, a robust pricing and valuation engine is an essential functional component, not only for position calculations and risk management, but also for trade settlement and invoicing.

Increasingly, the ability to trace, or traceability of, a metal bar, ingot, or load to its source manufacturer or mine is also an important requirement. Traceability may be required to defend and prove a metal product as a “green” (or low CO₂) metal. Traceability is intended to demonstrate “sustainability” or serve some other social or environmental requirement or regulation. Processing, refining of ores and concentrates, as well as any movement and inventory placement, is part of

traceability.

Contract management is another important piece of functionality, especially in ores and concentrates. These contracts include many terms that need to be not just managed but optimized, such as various forms of optionality against penalties, premiums, and other aspects. Even if the entity is only trading in finished industrial or precious metals, there is still significant potential complexity in areas of pricing, warehouse management, custody transfer, etcetera.

Given the unique requirements of metals, a vendor seeking to develop a functional product for these markets faces a significant challenge. Even if that development effort is ‘seeded’ by a customer who works to help the vendor understand and add required capabilities, one customer does not represent the industry; and one customer’s best practices, processes, and portfolio of commodities may not represent those desired by software customers.

Any vendor seeking to serve these markets must incorporate new features and functions of its application desired by one of its customers in such a way that any new features and functions do not affect or impact the use of the application by another customer. A vendor must have the appropriate design skills in house to interpret new requirements and guide the build-out or new requirements in a usable and configurable manner. In summary, developing a physical metals CTRM solution that has broad applicability and appeal to the metals industry is indeed a tall order.

ENUIT'S ENTRADE AND METALS

Enuit is a good example of a vendor, initially more involved in energy commodities, that has extended a CTRM solution into many aspects of the metals trading business., Enuit has constantly evolved its solution, known as ENTRADE, by working with various customers along the way. In the last several years, not only has it worked with customers to add considerable metals functionality in areas like ores and concentrates, and base and ferrous metals, but it has also extended ENTRADE's overall functionality into commodity management.

Their effort to build out their Commodity Management (CM), or supply chain management, capabilities in their ENTRADE solution was largely driven through their relationship with a multi-national, cross commodities trading company, which helped guide the design and buildout of the functionality necessary to manage the life cycle of trading contracts from cradle to grave, including capabilities previously supported only within ERP systems. This new solution is called ENTRADE Unite for Commodity Management. It incorporates all the aspects of a Commodity Trading Risk Management (CTRM / ETRM) system with specific aspects of an ERP solution in a single platform. As Enuit explains well on their website,

ENTRADE® Unite creates an integrated solution that supports today's supply chain needs of any trading organization, giving companies the opportunity to integrate trading and risk data with supply chain functions. Where ENTRADE is an ETRM/CTRM application, which calculates and

reports PNL, Positions at Risk, and Credit Exposure the UNITE extension manages inventory cost and value due to supply chain and logistics events. It produces journal entries, which are sent to a general ledger package through an integration interface.

Prior to starting work on ENTRADE Unite, Enuit also engaged with a customer to extend their capabilities to manage the trading of coal, iron ore, and aluminum within the ENTRADE solution. This meant a great deal of new functionality needed to be added to the solution specifically in areas like contract management and pricing because, like many other metals, aluminum pricing is complex, and contracts will include penalties for contaminants.

Moreover, Enuit also added capabilities to address the warehousing side of the solution as well, given that much of that client's trading activity was focused on managing ingots in a warehouse with the attendant transfer of custody, and so on, adding complexity. For the iron ore side of the business, further pricing

enhancements were needed, including a highly specific need to manage quality and pricing to several decimal points of accuracy. Addressing this need required Enuit to redesign much of its pricing engine, but the effort did result in an all-around improved pricing capability.

This project, together with some work for another large customer, helped Enuit address areas like pricing, inventory and warehouse management, and logistics (including a new cargo scheduling module that incorporated abilities such as loading a vessel and matching multiple sales to supply or purchase deals). It also included adjustments to ENTRADE's accounting and settlement capabilities to generate activity-based or event-driven journal entries to feed into a general ledger system via an API interface. Examples of activities, which may occur during the life cycle of a trade, are prepayments, title transfer, provisional and final payments, and so forth.

A later project with a customer for concentrates showed that further adjustments were needed for the product to have broader applicability. These efforts involved more work on the pricing engine and the ability to incorporate a broad range of assays, including load port, discharge port, umpire, and final assays. It also required the valuation engine to be modified to support disaggregation of each metal within a metal concentrate, based on an assay, so that each may be

valued against a specific price curve.

Other projects that Enuit has undertaken have resulted in exposure to commodities like uranium, precious metals, and base metals (LME). In the area of precious metals and uranium, foreign currency exposure (FX) and interest rate (IR) elements were emphasized. In the base metals area, various functional tweaks to provide better reporting around LME needs were added. An existing large customer wanted to add steel coverage to the system, bringing with them incremental enhancements in areas like inventory, cargo and shipping and quality specifications.

The efforts of Enuit in working with a variety of different customers has resulted in a comprehensive and usable commodity management solution for metals. That is not to say that other enhancements might not be required for companies that operate in niche markets or in lightly traded commodities.

Enuit has developed a solution that has benefits for entities in all areas of metals. Many other newer solutions in the metals area have only a single current user and have yet to experience the true complexities of the space. Meanwhile, older solutions are reaching end of life in terms of the technologies and architectures used and many will be seeking to replace soon.

SUMMARY AND ENUIT'S CAPABILITIES

Enuit is one vendor that has emerged with metals capabilities in recent years. It has evolved its solution working with customers around the world in varying industry segments and geographies – not just for industrial metals, ores & concentrates and precious metals but also for supply chains generally. The result would appear to be a viable CTRM/Commodity Management solution for metals. Enuit itself points prospects to three areas where it has developed comprehensive functionalities.

Metals Concentrate and Mining

According to the company, global markets are moving away from fixed-price, long-term contracts and towards short-term spot- or index-based contracts, spurred in large part by emerging exchanges with quoted prices and indices for metals and steel. In this new environment, prices are more volatile, and managing

costs, including secondary costs, is vital for a profitable business operation especially if the business involves the mining, transportation, or production of metals and metal concentrates. For this complex market, ENTRADE has functionality that helps manage the specifications, warehouse costs, and shipping costs of products. And as the market shifts, positions are modified to reflect all the costs and production values involved.

Coal Logistics and Metals Mining

With coal prices historically lower and more stable than oil and gas, coal is likely to remain the most affordable fuel for power generation in many developing and industrialized countries for decades. Additionally, with renewables currently failing to provide reliable and low-cost energy in many countries, the politics is moving back in the direction of coal, too, like a swinging pendulum.

With low volatility in coal prices, managing costs for coal traders and industrial consumers (such as utilities, merchant generators and steel producers) is most important. To control costs, major coal users need to focus on supply chain and inventory efficiency as well as managing quality specification from contract to delivery. Entrade's capabilities in supply chain management can help users track the myriad details of these transaction to ensure better bottom line performance.

Precious and Base Metals

As with many markets, global metals markets are moving away from fixed-price, long-term contracts and towards short-term spot or index-based contracts, and toward exchange-based trading that increased price

transparency via quoted prices and indices. However, this has also brought increased price volatility. In this environment, proper hedging and cost management are keys to operating profitably. Here, Enuit has significant functionalities built in applicable to dealing with these challenges.

ABOUT ENUIT LLC

Enuit, founded in 2008, aims to deliver affordable and effective trade management software with Entrade. This tool supports the complete transaction lifecycle, from deal finalization to billing. As a comprehensive ETRM/CTRM and CM solution, ENTRADE® caters to all commodities, users, and features on a single platform.

Key ENTRADE® features include:

- Comprehensive commodity support, encompassing NGLs, LNG, natural gas, power, renewables, crude oil, refined products, metals, and coal.
- A holistic view of renewable energy transactions for sustainable business operations.
- Detailed transaction lifecycle visibility, from deal discussions to invoice issuance.
- An analytical pricing engine designed for complex pricing structures.
- Adaptability for diverse trading scenarios, including both physical and financial commodities.
- Streamlined processes for deal recording,

scheduling, cost tracking, inventory management, valuation, settlements, invoicing, and risk monitoring.

- In-depth logistics support, detailing costs and movements from purchase to delivery.
- Transparent reporting with both standard and ad-hoc reporting capabilities, aiding swift decision-making.

Furthermore, ENTRADE®'s transparent data model grants clients a clear understanding of their data storage locations, offering enhanced control.

In essence, ENTRADE® isn't just a tool - it's a pathway to streamlined operations, echoing Enuit's dedication to supporting clients throughout their growth journey.



ABOUT

Commodity Technology Advisory LLC

Commodity Technology Advisory is the leading analyst organization covering the ETRM and CTRM markets. We provide the invaluable insights into the issues and trends affecting the users and providers of the technologies that are crucial for success in the constantly evolving global commodities markets.

Patrick Reames and Gary Vasey head our team, whose combined 60-plus years in the energy and commodities markets, provides depth of understanding of the market and its issues that is unmatched and unrivaled by any analyst group.

For more information, please visit:

www.comtechadvisory.com

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