The History of Selling Copper

How copper became a commodity—from ancient ingots and merchant caravans to cathode premiums, futures contracts, and graded scrap

By the All Metal Prices Research Desk. Published August 23, 2026; last reviewed August 23, 2026.

> **Editorial note.** This article draws on peer-reviewed archaeology, economic history, mining history, official exchange rules, and public statistical sources. It distinguishes evidence of copper *movement* from evidence of an actual *sale*: metal could also move as tribute, tax, gift, wages, booty, or ritual payment. That distinction matters most for periods before surviving contracts and accounts.

Copper has been exchanged for thousands of years, but it did not become a single integrated world commodity all at once. Early communities valued native copper objects for rarity, color, workmanship, and social meaning. Bronze Age producers cast larger, recognizable ingots that could travel by ship and caravan. Old Assyrian tablets then provide one of the earliest detailed archives of merchants buying, financing, transporting, and reselling copper. Roman authorities, medieval mine owners, merchant houses, smelters, corporations, national governments, and commodity exchanges each built a different answer to the same commercial problem: how to make a variable material trustworthy enough to price and transfer.

Today there is still no single transaction called "selling copper." A mine may sell concentrate; a refinery may sell cathode; a mill may sell rod, tube, sheet, or strip; a recycler may sell bare wire, heavy solids, motors, or shredded material; and a trader may buy or sell a futures contract without moving a specific shipment. These markets are connected, but each has its own rules for weight, purity, assay, delivery, credit, and price.

> ***The central finding:*** *the history of selling copper is the history of turning uncertain material into a trusted claim on a defined quantity, quality, location, delivery date, and price.*

Key takeaways

- Archaeology can prove that copper moved long distances before it can prove that the metal was bought and sold.
- Standard forms - ingots, stamped bars, assayed ores, cathodes, warehouse warrants, and scrap grades - made comparison easier without making every lot physically identical.
- The earliest unusually detailed copper business records come from Old Assyrian merchant archives in Anatolia during the nineteenth and eighteenth centuries BCE.
- Industrialization separated mines, smelters, refineries, fabricators, and customers across continents, which made assay, freight, credit, and price benchmarks more important.
- Modern benchmark prices do not equal the final invoice. Premiums, discounts, treatment and refining charges, impurities, recovery, freight, duties, and payment terms still determine what a seller actually receives.
- Scrap has never been a side market. Copper's durability and recyclability have repeatedly returned old objects and manufacturing waste to commerce.

Contents

Reading guide. Sections 1-9 reconstruct how copper commerce developed; sections 10-14 explain benchmarks, saleable forms, pricing, scrap grades, and historical price comparison; section 15 converts those findings into a practical framework for present-day sellers. The FAQ and glossary are designed for readers who need a direct answer without reading the paper in sequence.

Copper-selling history at a glance

Period	What moved or was sold	How buyers judged it	Main commercial development
Neolithic and Copper Age	Native copper, ornaments, tools, partly worked metal	Appearance, weight, workmanship, provenance, trusted relationships	Specialized metalworking encouraged exchange, but sale is often impossible to distinguish from gift or tribute
Third-second millennia BCE	Ore, copper metal, cast ingots, finished objects	Form, weight systems, seals, origin, reputation	Bulk copper moved across the Persian Gulf, Anatolia, and the Mediterranean
Nineteenth-eighteenth centuries BCE	Copper bought and resold within Anatolia	Named qualities, weighed quantities, written obligations	Old Assyrian merchants used credit, agents, partnerships, toll payments, and dispute procedures
Roman era	Ore, metal, coin alloy, military and civic supplies	Administrative control, weights, marks, mint and workshop requirements	Imperial power joined mining rights, taxation, procurement, and coinage
Medieval Europe	Mine output, bars, sheets, coinage metal	Local weights, marks, privileges, merchant reputation	Fragmented mining rights were linked to towns, mints, and regional fairs
Sixteenth-eighteenth centuries	Central European, Swedish, Japanese, Chinese, Indian Ocean, and African copper	Assays, merchant accounts, monopoly rules, recognized forms	Merchant finance and chartered companies connected distant mines and consuming markets
Nineteenth century	Ores, regulus, refined copper, wire and manufactured goods	Sampling, chemical assay, auction rules, corporate brands	Swansea and other industrial centers created a world market in ores; electricity enlarged demand
Late nineteenth-twentieth centuries	Large-scale mine output, producer brands, exchange-deliverable metal	Laboratory analysis, company specifications, public quotations	Corporations, market corners, producer prices, futures markets, and nationalization changed price power
Present market	Concentrate, blister, cathode, semi-fabricates, scrap, warrants, futures and options	Assay, exchange specifications, brand approval, scrap grades, documentation	A global benchmark is combined with negotiated charges, premiums, discounts, and risk transfer

Five questions every copper sale has had to answer

Across periods, institutions changed but the commercial questions remained remarkably stable:

1. **What is the product?** Ore, concentrate, partly refined metal, pure cathode, alloy, manufactured form, scrap, or a financial claim are not interchangeable.
2. **How much saleable copper is present?** Gross weight matters, but moisture, gangue, alloying elements, attachments, insulation, and other contaminants can make net recoverable copper much lower.
3. **Who verifies quality and title?** A producer's reputation, a seal, an assay, a brand list, a warehouse warrant, and an umpire laboratory solve different versions of the same trust problem.
4. **Where and when does delivery occur?** Mine gate, port, warehouse, factory, quotation period, prompt date, freight responsibility, and payment timing all affect value.
5. **How is the final price calculated?** A quoted benchmark may be only the starting point. The sale is completed through premiums, discounts, charges, penalties, credits, taxes, freight, finance, and currency conversion.

A note on evidence: when does movement become a sale?

The oldest evidence is material rather than contractual. Chemical and lead-isotope analysis can associate copper with an ore field; workshop remains can reveal smelting and recycling; shipwrecks can show the scale and packing of cargo. None of those findings automatically identifies the owner, buyer, price, or legal terms. A

distant ingot may have passed through commerce, diplomacy, tribute, or several of them in sequence. For prehistoric and palace economies, "organized circulation" is often more defensible than a confident claim about an open market (Gale 2011; Pulak 1998; Roberts, Thornton, and Pigott 2009).

Written records create a different bias. Cuneiform tablets, Roman administrative evidence, merchant books, company correspondence, and exchange rulebooks preserve the practices of people and institutions able to write. Small workshop purchases, household resale, illicit mining, smuggling, and informal scrap collection appear less consistently. Documentary detail should therefore be read as evidence of commercial techniques, not as a complete census of every participant (Dercksen 1996; Hirt 2010).

Historical price series also require caution. A number labeled "copper price" may refer to ore, contained metal, refined copper, a producer quotation, an exchange settlement, a scrap grade, a unit value, or a price converted from another currency. The physical product and contractual basis can change even when a chart appears continuous. For that reason, this history follows the form of copper being transferred as closely as it follows the number attached to it (Schmitz 1997; Svedberg and Tilton 2006).

1. Before recorded sales: copper, skill, and social exchange

Copper was among the first metals people worked because native copper can be hammered and annealed without first being extracted from an ore. That physical fact made early experimentation possible, but an object does not disclose the terms on which it changed hands. A pendant or axe could have been commissioned, inherited, given, paid as tribute, exchanged for another valuable, or taken in conflict. Its worth may have rested as much on color, rarity, technical skill, and social connection as on a measurable quantity of metal.

Extractive metallurgy changed the economic possibilities. Evidence from the Balkans, including material associated with Belovode in present-day Serbia, shows deliberate copper smelting by the fifth millennium BCE. Smelting required a chain of knowledge and labor: locating ore, mining and sorting it, preparing fuel, controlling furnace conditions, separating metal from slag, and casting or working the result. The more specialized that chain became, the less likely it was that every user also produced the metal. Exchange became increasingly necessary even where no impersonal market existed (Radivojević et al. 2010; Roberts, Thornton, and Pigott 2009).

The earliest recurring sales problem was hidden quality. A finished object offered some visible clues, but ore, matte, and partly processed copper concealed much of their value. Before laboratory assay, buyers relied on color, density, fracture, sound, origin, and the standing of the producer. Reputation was not separate from the product; it was part of the evidence that the seller's claim could be trusted.

Copper also returned to circulation. It can be repaired, cut, melted, alloyed, and recast rather than consumed in one use. Archaeologists often detect recycling indirectly through mixed compositions, remelted forms, workshop waste, or the scarcity of discarded metal. That reversibility created an early secondary market in principle, even when the transactions themselves left no written trace. The modern scrap yard is institutionally new, but the commercial advantage behind it is ancient: used copper remains a stock of recoverable value.

2. The Bronze Age: when bulk copper became recognizable merchandise

By the third and second millennia BCE, copper moved through networks large enough to leave both geological and archaeological signatures. Copper associated with Oman - Magan in Mesopotamian texts - reached Mesopotamia and settlements around the Arabian Gulf. Isotope and chemical studies cannot turn each artifact into an invoice, but they do demonstrate sustained movement between ore-producing regions and distant consumers (Begemann et al. 2010).

The cast ingot was a major commercial technology. Its value was not that every ingot had identical purity or weight. Rather, casting converted loose or irregular metal into a recognizable, countable, transportable form. The best-known Late Bronze Age example is the "oxhide" ingot, named by modern scholars for its four projecting corners. The shape gave handlers convenient grips and announced that the object was raw copper prepared for movement and remelting. It was metal and packaging at once (Gale 2011).

The Uluburun shipwreck, dated to the late fourteenth century BCE, makes the scale visible. The vessel carried roughly ten metric tons of copper, mostly oxhide ingots, together with about one metric ton of tin and a varied cargo of other materials and high-status goods. The copper was far beyond a traveler's personal reserve. It had been assembled for redistribution into economies that produced bronze, the alloy that joined copper to the much scarcer tin (Pulak 1998).

Uluburun does not prove a modern-style spot sale. Its cargo may have involved royal procurement, diplomatic exchange, merchant activity, or overlapping systems that did not separate public and private trade as later commercial law would. The responsible conclusion is narrower and still important: institutions could mobilize, standardize, load, insure in a practical sense, and transport industrial quantities of copper across the eastern Mediterranean.

Weights, seals, and recognizable forms reduced transaction costs. A buyer did not need to begin with an unshaped mass whose quantity and origin were wholly uncertain. Yet standardization remained incomplete. Oxhide ingots vary; metal could be cut; purity could differ; and a familiar shape did not eliminate the need for weighing, inspection, or trusted intermediaries. Standard form made negotiation possible at a larger scale, not unnecessary.

The Bronze Age therefore established several features that remained central to copper commerce: production concentrated near ore bodies, consumption at distant workshops and courts, high transport costs, metal moving in semi-standard units, and political authorities able to influence access. What later markets added was not the basic fact of long-distance movement. They added denser records of ownership, price, credit, default, and resale.

3. Old Assyrian merchants: the first exceptionally detailed copper business archive

The merchant archives from Kültepe, ancient Kanesh in central Anatolia, provide the earliest unusually detailed view of copper as a business. Thousands of cuneiform tablets from the nineteenth and eighteenth centuries BCE record partnerships, loans, agents, caravan costs, customs duties, prices, correspondence, and disputes. Assyrian merchants are best known for bringing textiles and tin into Anatolia, but they also participated extensively in the regional copper trade, buying metal in producing districts and moving it toward other markets (Dercksen 1996).

These records reveal a commercial world that cannot be reduced to barter. Silver served as a unit of account and means of settlement; merchants advanced capital; agents handled goods; partners divided risk and return; and written tablets preserved obligations over distance. Traders had to calculate more than a purchase price. Tolls, transport, delays, losses, credit terms, local demand, and the quality of the copper all affected whether a journey produced a profit.

Copper was not treated as one undifferentiated substance. The tablets distinguish qualities and forms, and the value of metal depended on where it was acquired and where it could be resold. That matters because it shows an early version of a problem still found in concentrate and scrap markets: a headline amount of "copper" is commercially incomplete until the parties agree what kind, how clean, how much, and at what location.

Distance made documentation valuable. A merchant could not personally watch every caravan, inspect every lot, or collect every debt. Sealed tablets, witnesses, family firms, reputation, and institutions of adjudication allowed obligations to travel with or apart from the metal. Veenhof described several "modern" features of Old Assyrian trade, not to claim that Kanesh had a modern capitalist economy, but to emphasize the sophistication of its credit, agency, and partnership techniques (Veenhof 1997).

The Old Assyrian evidence marks a turning point in what historians can say with confidence. Earlier archaeology shows organized copper circulation. The Kanesh archive shows people deliberately purchasing, financing, transporting, and reselling copper under recorded obligations. It is not the beginning of copper

exchange, but it is one of the earliest places where the business of selling copper becomes visible from inside the transaction.

4. Rome and medieval Europe: state demand, mining rights, and specialist markets

In the classical Mediterranean, larger states increased both the scale of copper procurement and the number of ways metal could move. Cyprus, the Iberian Peninsula, the Balkans, and other mining regions supplied copper and copper alloys for coinage, military equipment, buildings, water systems, household goods, sculpture, and tools. Roman mining did not operate under one uniform business model. Imperial ownership, provincial administration, leases, contractors, private investment, taxes, compulsory labor, and local custom could coexist in different combinations. Hirt's study of imperial mines is valuable precisely because it replaces the simple picture of a state directly running every major deposit with a more varied administrative landscape (Hirt 2010).

Coinage made procurement political. Bronze and brass denominations were not valued only by metal weight; their monetary value rested on public authority. A mint therefore bought or received copper for fiscal purposes as well as manufacturing. Taxes in kind, requisitions, monopoly rights, contracts, and ordinary purchases could all feed the same demand. Meanwhile, urban workshops acquired fresh metal and scrap, adjusted alloys, and sold vessels, fittings, weapons, architectural components, and art. Primary copper and recycled metal met in the same furnaces.

Roman weights, coin money, written law, roads, ports, and commercial agents reduced some of the uncertainty of long-distance trade. They did not eliminate it. A stamp could indicate an official source or producer without disclosing every impurity; legal title could be sound while the metal disappointed a founder. A sale remained a package of assurances rather than a single act of weighing. Nor did copper production simply stop when Roman political integration weakened. Evidence from the later empire points to regional contraction, continuity, and reorganization rather than one universal collapse (Edmondson 1989).

Medieval Europe rebuilt copper supply through mining districts, lords, towns, monasteries, mints, merchants, and specialized craft centers. Demand came from coinage, bells, roofs, church objects, cauldrons, weapons, and brass making. The Harz Mountains and the wider Rammelsberg system supplied central and western Europe before Falun reached its early modern height. Copper moved along rivers, through toll stations and fairs, and into workshops whose purchasing needs differed sharply. Refined metal could travel farther than low-grade ore because less of the freight was worthless rock (Asmus 2018).

Mining rights shaped every sale. A ruler might grant claims, levy royalties, reserve first purchase, control smelting, or direct metal toward a mint. Merchants advanced money against future output. Towns and guilds regulated furnaces, market access, and craft knowledge. The "seller" was therefore often a chain rather than one person: claim holder, miner, washer, smelter, landlord, tax collector, financier, carrier, and wholesaler all took part of the value between ore body and finished metal (Blanchard 2001).

Medieval trade also sharpened the distinction between an ore market and a metal market. Ore was heavy, local, and uncertain. Smelted copper contained more value per unit of freight but still differed by source and purity. Mints, brass makers, bell founders, and other specialists wanted metal suited to particular recipes. Repeated relationships, maker's marks, source reputations, and contractual descriptions became more valuable as buyers' technical requirements grew.

5. Merchant capital and the first truly interregional copper systems

The late fifteenth and sixteenth centuries joined finance, mining, smelting, political credit, and distribution on a new scale. The Fugger family of Augsburg and the Fugger-Thurzo enterprise in the Hungarian mining regions are the classic example. Their advantage did not come only from owning or leasing mineral rights. They could reorganize production, advance money, finance rulers, control smelting, arrange transport, warehouse metal, and sell through commercial centers such as Nuremberg, Venice, Antwerp, and Lisbon (Häberlein 2012).

That combination changed the timing of a copper sale. A merchant house could provide cash before the ore was mined because future output could support a loan. In exchange, it sought privileged access to production or revenue. Copper became collateral for sovereign finance, while political favor became a business asset. A concession, monopoly, or first claim on output could be worth more than a small improvement in mining efficiency.

Portuguese oceanic trade carried European copper into African and Asian markets, where it could serve as coin material, utensils, armaments, or a trade good exchanged for pepper and other commodities. Research on Fugger participation in Indo-Portuguese commerce shows central European output entering the Indian Ocean through Lisbon and Goa. This was an early global commodity chain, but not a single global market. Armed empire, chartered privilege, segmented currencies, shipping risk, and regional scarcity produced several connected prices rather than one world quotation (Mathew 1997).

Swedish copper created another powerful system. Falun had medieval roots, but the Great Copper Mountain became one of the world's most important copper districts during the seventeenth century. Mine, smelters, worker settlements, transport routes, warehouses, managerial buildings, and the town itself formed a landscape organized around the sale and fiscal use of copper. Output supported Swedish state finance and moved through Baltic and Dutch networks; metal could be exported, pledged, or converted into copper coin (UNESCO World Heritage Centre 2001).

Falun exposed a problem familiar to every large producer. More output can raise total revenue while depressing the unit price. Restricting supply may support price, but only if the producer can finance inventory and prevent competing sellers from breaking ranks. Copper can be stored, yet storage ties up capital and makes stocks visible to creditors and buyers. Early modern states could call copper a treasury or strategic material, but they could not decree unlimited demand.

In East Asia, Japanese copper became a major intra-Asian commodity under a different mixture of state regulation and merchant organization. As restrictions reduced Japanese silver exports in the later seventeenth century, copper gained importance in foreign trade. The Dutch East India Company bought Japanese copper and distributed much of it within Asia, using the trade to help finance purchases in India, Southeast Asia, and China rather than treating Japan merely as a supplier for Europe (Glamann 1953; Shimada 2006).

Qing demand gave that network a large institutional buyer. Copper cash supported everyday small-denomination exchange within a broader silver-copper monetary order. Central mints relied heavily on imported Japanese copper before expanding production in Yunnan and other southwestern regions altered the balance after the beginning of the eighteenth century. Transport, mint quotas, monopoly purchasing, and currency policy could make a distant mining district a fiscal priority (Cao 2019; von Glahn 1996).

These cases explain why the phrase "world copper price" is misleading for most of early modern history. The same metal carried different values when it crossed a monopoly border, entered a mint, became acceptable in a local currency system, or reached a port with a shortage. Merchants profited by understanding those institutional differences. The portable commodity was copper, but the price was local to law, credit, and use.

6. Copper as commodity money in African exchange

Southern Central Africa offers a particularly clear example of copper being both something sold and something used to buy. Copperbelt production and long-distance exchange predated colonial industrial mining by centuries. Cross-shaped ingots - often called croisettes or, in later collecting language, Katanga crosses - varied in size, form, and distribution. Depending on place and period, they could be raw material, prestige objects, tribute, bridewealth, stores of wealth, or media of exchange (Nikis and Livingstone Smith 2017).

It would be wrong to treat every copper cross as a coin with one fixed denomination. Value depended on customary recognition, political authority, size, location, and the obligation being settled. Still, the cast form carried commercial information. A recognizable shape made copper easier to count, transport, display, and trust than ore or an anonymous lump. Its usefulness as remeltable metal and its social meaning reinforced one another.

Colonial mining changed scale, ownership, and destination. Railways, concessionary companies, smelters, and export corridors redirected Copperbelt production toward industrial markets overseas. Saleable forms and grades were increasingly defined by corporate refineries, manufacturers, banks, and exchanges far from the communities that supplied labor. The region's modern mining economy brought wage work and urban growth, but it also exposed workers and states to corporate investment cycles and volatile copper prices (Larmer 2017).

The transition was not a simple march from barter to market. Precolonial systems already contained specialist production, recognized forms, political control, and long-distance trade. Colonial rule subordinated many of those institutions to a capital-intensive export system. The enduring question was not whether Africans had markets, but who had the authority to define the saleable product, command transport, publish the price, and retain the margin.

7. Industrialization: ore auctions, global smelting, and electrical copper

The nineteenth century changed copper commerce as decisively as it changed copper production. Steamships and railways lowered the cost of moving heavy material; coal-fired smelters processed ores on a scale that earlier furnaces could not match; chemical analysis made quality more measurable; and industrial companies needed supplies that were regular enough for continuous production. Mine, smelter, refinery, fabricator, and customer could now sit on different continents. Selling copper became the work of coordinating that distance.

Swansea and the separation of mine from smelter

Swansea in South Wales became the best-known example. The district's advantage was coal, shipping, skilled labor, accumulated furnace knowledge, and a commercial network able to buy ores from many origins. Its smelters first drew heavily on Cornwall, then received material from Cuba, Chile, Australasia, southern Africa, and elsewhere. The result was a world market in ores centered on an industrial district that did not control one dominant ore body of its own (Newell 1990; Evans and Saunders 2015; Evans and Miskell 2020).

This arrangement broke the old assumption that ore should always be smelted close to the mine. The economic calculation depended on grade. A high-grade ore could bear a long ocean voyage because a larger share of the freight represented saleable copper. A low-grade ore carried too much waste rock. Coal cost worked in the opposite direction: sending ore to a coal-rich smelting center could be cheaper than carrying large amounts of fuel to a remote mine. The profitable route was therefore determined by a ratio of copper content, fuel, freight, processing losses, and expected sale price.

Swansea's ore trade made sampling and assay commercial institutions. Buyers did not want to pay the full cargo weight as though it were copper. They needed a defensible estimate of contained metal and of elements that would make treatment easier or harder. Sellers needed a procedure that prevented a buyer from choosing an unrepresentative poor sample. Lots were sampled, divided, tested, and priced through rules that attempted to turn a chemically variable cargo into an agreed monetary quantity.

The industrial ore sale can be reduced to an idea that still governs concentrate contracts:

> ***Expected metal value minus the cost and risk of converting the material into saleable metal.***

That calculation included more than assay. Moisture increased shipping weight without adding copper. Certain minerals affected furnace performance. Valuable silver or gold could justify a credit, while unwanted elements justified a deduction. Freight, insurance, interest during the voyage, treatment loss, and uncertainty all entered the bid. The laboratory did not replace bargaining; it gave bargaining a technical language.

Chile, long-distance finance, and merchant information

Chile became central to the nineteenth-century Atlantic copper system. Pacific producers, local mine owners, foreign merchants, shipping agents, and Welsh smelters divided the margin between ore body and finished metal. A voyage around Cape Horn exposed capital for months. Merchants financed production and cargoes before European sale, maintained correspondence across slow information routes, and judged whether a quoted difference would survive freight and time.

This was already a global market in the practical sense: a production decision in Chile could affect smelter purchases in Wales, while European demand could alter mine finance on the Pacific coast. It was not yet one frictionless global price. Different quotations described different products and locations, and news could be stale before a vessel sailed. The merchant earned a return for carrying information, credit, title, and risk as much as for moving copper.

Electricity raises the value of purity

Industrial demand changed the definition of good copper. Brass, bronze, ship sheathing, boilers, munitions, and general metalware remained important, but telegraphy, submarine cables, lighting, generators, motors, and power distribution rewarded electrical conductivity. Small differences in impurities that mattered little in a cauldron could matter greatly in a wire. Electrolytic refining made very high-purity copper available on a large scale, and standardized wire bars and cathodes gave fabricators a more predictable input (Ayres, Ayres, and Råde 2003).

The commercial consequence was profound. Buyers increasingly paid for performance that could be measured, reproduced, and warranted. A recognized refinery brand carried information about chemistry and processing consistency. Contracts became more exact because the customer's equipment became less tolerant of variation. Copper was no longer sold only as a reddish metal of sufficient weight; it was sold as a specified industrial input expected to behave in rolling, drawing, alloying, and electrical service.

The rise of integrated producers

The United States built large copper systems in Michigan, Montana, Arizona, Utah, and other regions. Mechanized mines, concentrators, railways, smelters, refineries, and wire plants required capital beyond the scale of an ordinary partnership. Companies integrated several stages or secured them through long-term contracts. Integration lowered the danger that a mine would lack a smelter, a smelter would lack feed, or a refinery would lack customers. It also concentrated commercial information and price-setting power (Hyde 1998; LeCain 2009).

Industrial copper selling now involved two products at once. The first was physical material with increasingly precise specifications. The second was future output. Mines borrowed against reserves and expected production; smelters contracted for feed months or years ahead; manufacturers sought dependable supply; merchants financed stocks. The long interval between investment and sale made price risk permanent. Producer quotations, forward contracts, cartels, futures exchanges, and hedging all emerged from that mismatch between today's capital and tomorrow's copper.

8. Big business, market corners, and the struggle to publish the price

From roughly 1870 to 1930, capital-intensive mining and processing favored large corporations. Porphyry deposits could yield enormous output, but only after heavy spending on excavation, concentration, transport, smelting, and refining. Scale reduced unit cost and gave integrated firms more control over when and how metal reached customers. A producer with mines, refineries, inventories, and a sales organization could blend output, maintain brands, extend credit, and announce prices to a customer base (Schmitz 1986, 1997).

The Secrétan copper corner

The most spectacular attempt to control the market was the French copper syndicate associated with Eugène Secrétan and the Société des Métaux in 1887-1889. The syndicate contracted for an extraordinary share of mine output and accumulated stocks in order to restrict available supply and force prices higher. For a time, quotations rose. The strategy then encountered the basic problem of every copper corner: a high price changes behavior.

Consumers delayed purchases or economized. Marginal mines became attractive. Producers outside the agreements expanded. Scrap returned to the market. Stocks demanded ever more financing. Once lenders lost confidence, the structure could not carry its inventory, and the collapse affected the French financial system as well as copper merchants. A contemporary account in the *Quarterly Journal of Economics* treated the episode as

a lesson in the limits of attempting to monopolize a widely produced, storable, and recyclable industrial material (Andrews 1889).

The episode remains useful because it shows that visible supply is not fixed. The seller who withholds copper may raise the value of every substitute and every old object that can be remelted. A successful restriction must therefore govern current mine output, competing production, scrap response, credit, inventories, and expectations. Few institutions can hold all of those forces together for long.

Producer quotations versus exchange quotations

Large U.S. companies often announced producer prices, while dealers and exchanges published other quotations. A producer price claimed that major integrated firms could offer stability through customer relationships and planned output. An exchange price claimed that bids and offers from many participants, tied to standardized delivery, should establish the public reference.

Neither number described every sale. A producer might quietly change terms, rebates, freight allowances, or customer premiums without changing the headline quotation. An exchange settlement applied to a defined grade, place, and date, not to every brand or region. Historical records can therefore contain several legitimate copper prices at the same moment. The disagreement is not necessarily an error; the prices may belong to different institutions and products.

The London Metal Exchange, founded in 1877, gradually became the dominant international benchmark for base metals. Its importance did not come from physically handling all copper. It came from creating a repeatable contract, a public forward curve, an approved warehouse system, and a place where producers, consumers, merchants, and financial participants could transfer price risk. Bilateral trade remained larger and more varied than exchange delivery, but more of that trade came to be written *against* an exchange reference (London Metal Exchange 2026a; Svedberg and Tilton 2006).

Why a long copper-price chart can mislead

A chart from the nineteenth century to the present can appear to show one continuous commodity. In reality, the quoted basis may move from an ore auction to a refined-metal quotation, from British pounds per long ton to U.S. cents per pound, from a producer announcement to an exchange settlement. Quality standards, delivery locations, inflation measures, currencies, and taxes also change. Svedberg and Tilton's reconstruction of real copper prices from 1870 to 2000 is valuable partly because it exposes how much analytical work is needed before two distant observations become comparable (Svedberg and Tilton 2006).

The modern architecture that emerged from this era is a benchmark plus a differential. The benchmark represents a widely recognized core product at a stated time and place. The differential represents the actual shipment: brand, region, freight, quality, credit, duty, scarcity, and service. That architecture remains the foundation of copper selling.

9. Nationalization, producer states, and the politics of the sale

By the mid-twentieth century, the central dispute was no longer only whether corporations could produce copper cheaply. It was who owned the resource, who controlled marketing, and who kept the rent. In Chile, Zambia, the Congo, Peru, and other producing countries, copper supplied a large share of export earnings and public revenue, while foreign corporations often controlled production, technical information, customer relationships, and transfer prices. A sales contract could decide how much national wealth crossed a border.

Chile and the meaning of ownership

Chile moved through negotiated state participation, usually described as Chileanization, and then constitutional nationalization of the large copper mines in 1971. The change transferred more than shares. The state assumed responsibility for investment, production, technical staffing, customer contracts, finance, and exposure to the copper cycle. National ownership increased the government's claim on rents, but it also made the public budget more directly responsible for operating risk and reinvestment (González, Sánchez, and Castillo 2024).

The history resists a simple verdict. The value of nationalization cannot be measured by one year's copper price or one compensation calculation. It must account for control of reserves, subsequent investment, fiscal transfers, operating performance, political objectives, and the cost of capital across decades. What is clear is that the seller's identity changed. The copper contract became an instrument of national policy as well as commercial exchange.

Zambia, Zaire, and export dependence

Newly independent states in the Central African Copperbelt also increased public ownership and control. They inherited mines together with railways, towns, payrolls, social services, debts, and an economy organized around one export. A high copper price could fund development. A downturn could weaken the currency, government revenue, employment, and maintenance at the same time. Larmer's account of Copperbelt precarity helps explain why ownership alone could not eliminate vulnerability to the world market (Larmer 2017).

CIPEC and the difficulty of producer coordination

Chile, Peru, Zambia, and Zaire established the Intergovernmental Council of Copper Exporting Countries, or CIPEC, in 1967. Its members hoped to coordinate policy, strengthen bargaining power, and stabilize export earnings. The organization was sometimes compared with OPEC, but copper was a difficult material around which to build oil-style control.

Mine supply was geographically dispersed. Scrap could return when prices rose. Consumers could postpone purchases or redesign products. Member governments needed revenue and had strong incentives to maintain output even when collective restraint might support price. New capacity outside the group weakened discipline. CIPEC therefore never gained decisive control over the market (Radmann 1973; Mingst 1976).

Its limited power should not obscure its significance. Producer countries asserted that London, New York, and multinational sales offices should not alone define rational copper policy. They demanded better data, greater control of taxation and transfer pricing, and a larger connection between mineral wealth and development. The debate changed even where coordinated supply restriction failed.

Nationalization and benchmark pricing eventually coexisted. State companies sold under international quotations, negotiated premiums, borrowed from global lenders, and hedged price risk much like private producers. Sovereignty changed who received the proceeds and what objectives the company served. It did not remove assay, freight, credit, customer qualification, or the discipline imposed by inventories and alternatives.

10. From private quotations to public benchmarks

Modern copper trade separates the public reference price from the private terms of the shipment. The most influential benchmark is the London Metal Exchange Official Price. The LME describes it as the global benchmark used to index primary and secondary copper contracts and to support hedging. Its standard copper futures contract is based on Grade A copper, quoted in U.S. dollars per tonne, with a standard lot of 25 tonnes and physical settlement through approved brands and warehouses (London Metal Exchange 2026b, 2026c).

What an LME warrant represents

A warehouse warrant is a document of title to a specific lot of exchange-compliant metal in an approved warehouse. The warrant allows ownership to change without unloading and reinspecting the copper for every trade. A participant can buy a futures position, take delivery of a warrant, finance inventory against it, transfer it, or sell it onward. The financial claim remains anchored to physical copper through quality, brand, warehouse, and delivery rules.

This is the crucial institutional achievement of an exchange. It does not make all copper identical. It makes a defined class of copper substitutable enough for clearing and settlement. Metal outside that class can still be sold, but it will be priced through a relationship to the benchmark rather than delivered automatically against the contract.

COMEX and the importance of units

COMEX copper futures provide another major reference, particularly for North American trading. The standard contract represents 25,000 pounds and is quoted in U.S. cents per pound (CME Group 2026). An apparent difference between COMEX and LME prices can reflect more than market opinion. The comparison must account for unit conversion, contract month, warehouse location, currency, freight, insurance, financing, tariffs, and the practical ability to move metal between delivery systems.

For unit conversion:

- **U.S. dollars per metric tonne ÷ 2,204.62262 = U.S. dollars per pound.**
- **U.S. dollars per pound × 2,204.62262 = U.S. dollars per metric tonne.**

A trader who compares one exchange's cash price with another exchange's three-month contract without aligning dates and delivery basis is not observing a clean arbitrage. The spread may be compensation for time, location, or a barrier that cannot be crossed cheaply.

How hedging separates metal from price risk

A physical contract can preserve a commercial relationship while an exchange position offsets the benchmark risk. Suppose a cable manufacturer agrees to buy cathode next month at the monthly average LME settlement plus a regional premium. The manufacturer still cares about brand, delivery schedule, documentation, and service. It can separately hedge the benchmark component through futures or an average-price instrument. The seller can do the same on the other side.

The hedge will not remove every risk. The premium may change; production may be delayed; the physical quantity may differ from the futures lot; and the chosen reference may not move exactly with the shipment's value. This remaining difference is basis risk. Hedging is useful because it divides a complicated exposure into parts, not because it turns a physical business into a risk-free one.

The benchmark is not the invoice

A cathode seller rarely receives exactly the number shown beside “copper” on a financial screen. The final amount may include:

- a regional or brand premium;
- freight, insurance, and terminal charges;
- import duties, taxes, or tariff effects;
- financing and payment timing;
- quantity tolerances and weight settlement;
- currency conversion;
- quality claims or late-delivery adjustments.

Concentrate and scrap contain still larger deductions because the buyer must recover saleable copper from variable material. Public prices improve comparability and reduce dependence on one buyer's private quotation. They do not abolish the expertise needed to understand the rest of the contract.

11. What is actually sold in the copper market today?

“Copper” is an umbrella for several linked markets. The International Copper Study Group separates mine production, smelter output, refined production, semi-fabricated production, use, trade, stocks, and prices because the products and bargaining relationships differ at every stage (International Copper Study Group 2025). A country can mine copper yet import cathode, refine imported concentrate, export semi-fabricates, or depend heavily on scrap.

Saleable form	Typical seller and buyer	What determines value	Main commercial risks
Ore	Mine to nearby concentrator or custom processor	Grade, mineralogy, moisture, distance, processing response	Sampling error, low value per unit of freight, recovery uncertainty

Saleable form	Typical seller and buyer	What determines value	Main commercial risks
Concentrate	Mine or trader to smelter	Dry weight, copper assay, payability, quotation period, treatment and refining charges, by-products, penalties	Assay dispute, moisture, impurities, smelter availability, price-period mismatch
Blister copper or anodes	Smelter to refinery	Copper content, impurities, precious-metal content, refining terms	Refining loss, impurity penalties, logistics
Refined cathode	Refiner or trader to fabricator, merchant, or warehouse	Benchmark price, grade, approved brand, location, premium, delivery and payment terms	Regional premium, credit, sanctions or documentation, delivery delay
Rod, tube, sheet, strip, wire, and alloys	Fabricator to manufacturer or distributor	Metal value plus conversion charge, dimensions, tolerance, alloy, packaging and service	Yield loss, energy and labor cost, specification failure
Prompt scrap	Manufacturer or processor to mill, refiner, or dealer	Known composition, cleanliness, recoverable yield, lot consistency	Contamination, mixing, benchmark timing
Obsolete scrap	Collector, demolition firm, dealer, or processor to downstream buyer	Sorting, attachments, insulation, alloy, recovery, labor and freight	Misgrading, theft/title concerns, hazardous components, processing loss
Warehouse warrant	Warrant holder to another participant	Exchange rules, brand, location, prompt date, financing value	Warehouse access, rent, location premium, cancellation queues
Futures or options	Commercial or financial participant to another market participant	Benchmark expectations, time, volatility, margin and contract rules	Basis risk, leverage, liquidity, margin calls

Ore and concentrate are not the same product

Ore is the material removed from the deposit. Most internationally traded mined copper is not raw ore but concentrate produced after crushing, grinding, and mineral separation. Concentrate contains much more copper per unit of weight than the original ore, yet it still carries sulfur, iron, moisture, and trace elements. Its exact composition varies by mine and even by production period.

The concentrate contract is therefore a settlement procedure as much as a delivery agreement. It defines how samples are taken, how moisture is measured, which laboratories analyze the material, how assay differences are reconciled, which quotation period supplies the benchmark, what percentage of contained copper is payable, and what charges or penalties apply. Private terms and chemical variation make concentrate pricing less visible than cathode pricing (Díaz-Borrego, Escobar-Pérez, and Miras-Rodríguez 2021).

Blister, anodes, and cathode

Smelting separates much of the iron and sulfur and produces copper-rich intermediate material, commonly including blister copper. Fire refining and anode casting prepare material for electrolytic refining. Cathode is the high-purity sheet deposited during electrorefining or produced through solvent extraction and electrowinning for suitable leach ores. The U.S. Geological Survey describes modern pure-copper production as a multistage system of mining, concentration, smelting, and electrolytic refining, with an increasing share also produced through acid leaching of oxidized ores (U.S. Geological Survey 2026).

Cathode is the principal refined form behind international benchmark contracts. Exchange-deliverable cathode must meet chemical and shape requirements and come from an approved brand. Outside exchange delivery, buyers can still prefer specific origins or brands because their furnaces and product lines respond consistently to familiar feed. Standardization is therefore strong enough for a benchmark but not absolute in industrial practice.

Semi-fabricates are commodity-plus-manufacturing sales

A copper rod, tube, sheet, or strip invoice usually combines a metal component with a conversion charge. The metal component may follow an exchange average. The conversion charge covers fabrication, energy, yield loss, dimensions, tolerances, surface finish, alloying, packaging, certification, and service. A customer can hedge the copper portion while negotiating the manufacturing margin separately.

This modular system lets a global metal benchmark reach deep into the supply chain without pretending that a precision tube and a cathode are the same product. It also explains why a falling copper benchmark does not always produce an equal percentage decline in a finished copper product: conversion costs may be unchanged or rising.

Scrap is a family of products, not one discount category

Copper scrap ranges from bare, clean production wire to mixed appliances and residues. High-grade prompt scrap can substitute directly for refined metal in suitable furnaces. Insulated cable must be stripped or granulated. Motors and transformers contain steel, insulation, varnish, and other metals. Brass and bronze are copper alloys rather than pure copper. Fine residues may require specialized recovery.

Copper's recyclability makes secondary material a permanent source of supply, but availability depends on collection, sorting, product lifetimes, design, and price. Technical recyclability is not the same as actual recovery. A cable installed in a building may remain unavailable for decades; a tiny quantity dispersed in electronics may be uneconomic to collect; mixed alloys can lose value when separation is poor (Graedel et al. 2011).

The scrap seller therefore sells information as well as metal: what the material is, how it was generated, what has been removed, how uniform the lot is, and what recovery the buyer can expect.

12. How copper sale prices are calculated

No universal formula covers every copper transaction. Contracts differ by product, jurisdiction, delivery point, tax treatment, credit, and bargaining power. The following models are simplified explanations of the commercial logic, not quotations or contract advice.

Refined cathode: benchmark plus the shipment differential

A simplified cathode invoice can be represented as:

Final cathode value = benchmark price × settled quantity + premium or discount + logistics and contractual adjustments

The benchmark may be a single LME Official Cash Settlement Price, a monthly average, another agreed quotation, or a formula combining several dates. The differential can include brand, region, duty status, warehouse or port, freight, insurance, payment timing, and temporary local scarcity. The contract must also say whether the quantity is based on shipped weight, delivered weight, or another settlement procedure.

A premium is not evidence that the benchmark is “wrong.” It prices characteristics that the benchmark contract does not fully capture (London Metal Exchange 2026d). A buyer inland from an exchange warehouse may pay more for immediately available, duty-paid cathode delivered to its plant. A seller of an unfamiliar or inconvenient brand may accept a discount even when chemistry meets a broad standard.

Concentrate: contained value less the cost of making metal

A concentrate settlement is often understood in stages:

1. **Dry metric tonnes = wet shipment weight × (1 − moisture fraction).**
2. **Contained copper = dry metric tonnes × copper assay.**
3. **Payable copper = contained copper × contractual payability.**
4. **Gross payable metal value = payable copper × agreed quotation price.**

5. **Net settlement = gross payable value + by-product credits − treatment charge − refining charge − impurity penalties − freight, insurance, finance, taxes, and other agreed deductions.**

The treatment charge, commonly abbreviated **TC**, is usually applied to dry concentrate tonnage. The refining charge, **RC**, is usually connected to payable metal. Contract wording governs the actual units and calculation. Gold, silver, or other valuable elements may generate credits once they exceed thresholds; arsenic, mercury, fluorine, lead, or other troublesome elements can generate penalties or rejection rights.

This formula explains why the copper benchmark alone cannot reveal mine revenue. Two concentrates with the same copper percentage can settle differently because one carries valuable by-products and the other costly impurities. A tight concentrate market can also lower TC/RCs and shift margin toward miners even when the refined copper benchmark barely changes. Conversely, abundant mine supply relative to smelting capacity can strengthen smelters' terms.

Semi-fabricates: metal value plus conversion

A simplified semi-fabricate price is:

Finished copper product price = metal basis + conversion charge + specification and service extras

The metal basis may use the copper content of the product multiplied by an agreed benchmark average. The conversion component covers melting, casting, rolling, extrusion, drawing, annealing, alloying, energy, labor, yield loss, quality control, and ordinary margin. Extras may apply for small lots, unusual dimensions, tight tolerances, special packaging, certification, rush delivery, or a difficult alloy.

This separation is useful to both parties. A manufacturer can compare conversion performance without confusing it with global copper-price movement. A fabricator can hedge the metal component while preserving a commercial margin for the work it performs.

Scrap: recoverable value less preparation and risk

A simplified scrap calculation is:

Estimated gross metal value = gross lot weight × expected recoverable copper fraction × reference copper price

Net purchase value = estimated gross metal value − processing − disposal − freight − financing − quality risk − buyer margin

For clean bare copper, expected recovery may be close to the lot's copper content. For insulated wire, motors, radiators, mixed alloys, or residues, the difference between gross weight and recoverable copper can be large. The buyer may use a fixed grade price, a percentage of a published reference, a sample-and-assay settlement, or a recovery test.

The word **recovery** deserves attention. It may refer to the proportion of the gross lot that becomes saleable copper after insulation, steel, dirt, moisture, and other material are removed. It may also reflect metallurgical losses during processing. A seller who compares two offers without confirming whether both use the same weight and recovery basis may choose the apparently higher percentage and receive the lower net payment.

Quotation periods transfer price risk

A contract also needs to decide *which day's* benchmark applies. Common possibilities include the date of shipment, date of arrival, a fixed month, an average of several days, or a seller's or buyer's optional period within defined limits. This is the quotation period.

The quotation period allocates market risk while material is produced and transported. A miner may prefer the flexibility to select a period after shipment; a smelter may demand limits so that the seller cannot choose only after observing the price. Average pricing reduces dependence on one day's settlement but can create a mismatch with a hedge if the hedge uses a different average.

A quotation checklist

Before comparing offers, the seller should put every quote on the same basis:

Question	Why it changes the net price
What exact product or grade is being priced?	Different grades imply different expected recovery and processing routes
Is the weight gross, tare-adjusted, wet, dry, shipped, or received?	Moisture, packaging, and scale procedures alter payable quantity
Which benchmark and unit are used?	LME dollars per tonne and COMEX cents per pound require aligned dates and conversion
What quotation period applies?	The benchmark can move between collection, shipment, assay, and settlement
Which content is payable?	Contracts may deduct units, apply a percentage payability, or require thresholds
What charges and penalties apply?	Treatment, refining, contamination, insulation, attachments, freight, and finance reduce proceeds
Are by-products credited?	Gold, silver, or other recoverable materials may materially increase value
Who controls sampling and assay?	An unrepresentative sample can change the whole settlement
When is payment made?	Delayed payment has a financing cost and introduces credit risk
Who bears freight, insurance, duty, and rejection costs?	A high headline price can be inferior after logistics and claims

The history described in this paper can be read as the gradual construction of this checklist. Every era devised a different method for making product, quantity, quality, delivery, and payment explicit.

13. How the copper scrap market learned to speak in grades

Scrap trading is one of the oldest forms of copper commerce because copper objects can be remelted repeatedly. Archaeological metal assemblages often show recycling, but modern scrap grades belong to an industrial world of truckloads, shredders, wire granulators, refineries, mills, and cross-border contracts. A grade name compresses a long description into a repeatable commercial shorthand.

The Recycled Materials Association's internationally used specifications retain code words developed under its former name, the Institute of Scrap Recycling Industries. The specifications are guidelines for buyer and seller; a contract may vary them by mutual agreement. Their value lies in providing a shared starting description rather than a government-fixed price (Recycled Materials Association 2026).

Common unalloyed copper scrap descriptions

Code word	Common description	Commercial meaning in the published specification
Barley	No. 1 copper wire, commonly called bare bright	Bare, uncoated, unalloyed copper wire; gauge and certain conditions remain subject to agreement
Berry	No. 1 copper wire	Clean, untinned, uncoated, unalloyed wire and cable, free of brittle burnt wire and copper tubing
Birch	No. 2 copper wire	Miscellaneous unalloyed wire with nominal 96% copper content and a 94% minimum by electrolytic assay, subject to exclusions

Code word	Common description	Commercial meaning in the published specification
Candy	No. 1 heavy copper solids and tubing	Clean, unalloyed, uncoated clippings, punchings, bus bars, commutator segments, and clean tubing
Cliff	No. 2 copper solids and tubing	Miscellaneous unalloyed scrap with nominal 96% copper content and a 94% minimum, subject to exclusions
Clove	No. 1 copper wire nodules	Chopped or shredded bare unalloyed wire nodules with at least 99% copper and tight contamination limits
Dream	Light copper	Sheet, gutters, downspouts, kettles, boilers, and similar unalloyed scrap, nominally 92% copper with an 88% minimum, subject to exclusions
Droid / Druid	Insulated copper wire scrap	Insulated wire sold on a sample or recovery basis under agreed conditions

These names should not be confused with every local yard label. “Bare bright,” “No. 1,” “No. 2,” “light copper,” “insulated wire,” and “motor scrap” can be used more loosely in retail recycling. A commercial shipment must be judged against the buyer's written specification, not the color of a sign at the scale house.

Prompt scrap and obsolete scrap

Prompt scrap is generated during manufacturing: clippings, punchings, rejected wire, bus-bar offcuts, and other material whose origin and composition are usually known. Its cleanliness and consistency can make it highly valuable. **Obsolete scrap** comes from products after use: demolished wiring, plumbing, motors, appliances, vehicles, electronics, roofs, and industrial equipment. It usually needs more collection, dismantling, sorting, and verification.

The distinction affects information cost. A factory can document the alloy and process that produced a clean clipping. A demolition load may contain solder, steel attachments, paint, scale, insulation, oil, and several copper alloys. The obsolete seller is paid not only for copper but for the amount of uncertainty already removed through preparation.

Why clean copper earns more

Preparation can raise the price by increasing expected recovery and lowering the buyer's labor, disposal, and furnace risk. Common value losses include:

- insulation and plastic;
- steel screws, fittings, and armatures;
- solder, tinning, coatings, and paint;
- brass or bronze mixed into unalloyed copper;
- oil, sediment, ash, moisture, and dirt;
- sealed containers or unsafe components;
- uncertain provenance or weak documentation.

Stripping, sorting, and removing attachments are not automatically profitable. Labor, equipment, electricity, safety, and the value of the recovered plastic or steel must be compared with the increase in copper payment. Industrial processors can profitably perform steps that make no sense for a small seller, while a clean, segregated high-volume stream may justify a direct mill contract that an occasional retail seller cannot obtain.

Sampling and settlement disputes

Large mixed lots may be shredded, sampled, and settled by assay or recovery. The sampling plan matters because valuable copper and low-value contamination are rarely distributed perfectly evenly. The contract should address lot preparation, sample size, sample division, laboratories, retained samples, allowable differences, and an umpire procedure. It should also state what happens when prohibited material is found after delivery.

This is the modern version of an ancient trust problem. The buyer cannot inspect every fragment before committing funds; the seller cannot surrender a load to a process controlled entirely by the buyer without some right of verification. Shared specifications and dispute procedures turn that mutual suspicion into a tradeable lot.

14. Why historical copper prices are difficult to compare

Readers often search for “the copper price in 1900” or “a chart of copper prices through history.” Such figures can be useful, but only after the quotation is identified. A historical number without its basis can produce false precision.

Seven variables that must be aligned

1. **Product.** Ore, contained copper, refined ingot, wire bar, cathode, scrap, and futures are different goods.
2. **Quality.** Impurity limits and standard forms changed over time. An old refined grade may not be equivalent to current exchange-deliverable cathode.
3. **Location.** A Swansea ore price, a New York producer price, and an LME warehouse price include different freight positions.
4. **Time basis.** Spot, cash, prompt, three-month, monthly average, annual average, and realized company revenue are not interchangeable.
5. **Unit.** Long tons, short tons, metric tonnes, pounds, kilograms, piculs, local weights, and monetary units require documented conversion.
6. **Currency and inflation.** Nominal currency conversion is not the same as measuring purchasing power or real production economics.
7. **Contract terms.** Credit, duty, commission, packaging, taxes, and quality deductions may sit outside the reported price.

Price series select institutions as well as numbers

A continuous series must choose among overlapping quotations. In some years, a major producer's announced U.S. price may be more representative of industrial contracts than an exchange quote; in others, the exchange may dominate. Wartime controls, cartels, tariffs, and multiple exchange rates can widen the gap between official and effective prices. The act of building a chart is therefore an argument about which institution represented the market.

For website readers, the safest presentation is to label every chart with product, source, unit, currency, location or benchmark, frequency, and inflation treatment. If a series stitches together sources, the transition dates and method should be visible. A smooth line should never conceal a change in what the number means.

15. What the history means for someone selling copper now

The technology is new; the commercial questions are not. A household seller, demolition contractor, machine shop, mine, and cathode producer operate at different scales, but each receives more reliable offers when the material and settlement basis are clear.

Identify before pricing

Separate unalloyed copper from brass, bronze, aluminum, steel, and insulated assemblies. Keep clean, known production scrap apart from mixed obsolete material. Record the source when lawful and appropriate. Photographs can help obtain an indicative quote, but they do not replace weighing, inspection, or assay.

Compare net proceeds, not the advertised percentage

A buyer offering a higher percentage of "spot" may use a lower recovery, a different benchmark day, a received-weight basis, or larger processing deductions. Ask for the formula in writing. Convert all offers to the same unit and estimate freight, handling, payment delay, and rejection risk.

Match the buyer to the lot

A retail recycler is built for convenience and mixed small quantities. A broker can aggregate and place material. A processor can recover copper from cable, motors, and complex scrap. A mill or refinery may pay strongly for large, consistent lots that meet its feed specification, but it may reject material outside that narrow range. The highest theoretical buyer is not always the highest net buyer once minimum quantities and preparation are considered.

Preserve the commercial record

Keep certified weight tickets, photographs, load descriptions, assay reports, purchase orders, transport documents, and settlement statements. These records make disputes easier to resolve and create a history that can improve future quotes. For businesses, documented title and supplier checks also matter because metal theft and sanctions or trade restrictions can make provenance commercially important.

Treat live prices as references, not promises

A public copper price is useful for orientation. It does not guarantee a local scrap payment, a cathode premium, or a concentrate settlement. The exact product and deductions must be known before a benchmark becomes a usable estimate. That is not a defect in the market; it is the consequence of copper being sold in materially different forms.

Conclusion: selling copper has always meant selling trust

Copper commerce did not progress in a straight line from barter to a perfect market. It accumulated institutions around a difficult material. Copper deposits are unevenly distributed. Ore and scrap vary. Extraction and refining require capital. The metal can be stored, alloyed, remelted, and returned to use after decades. Those physical properties repeatedly created the same commercial uncertainties even as the participants changed.

Standard forms were one answer. Early ingots, recognized crosses, bars, refined shapes, cathodes, and scrap grades made material easier to describe and compare. Measurement was another: weights, sampling, assay, impurity limits, conductivity standards, and recovery tests translated physical matter into payable quantity. Documentation allowed the claim to travel: tablets, letters, privileges, bills of lading, warehouse warrants, and electronic records separated ownership and obligation from the immediate movement of metal. Finance bridged time between mine investment, shipment, manufacturing, and payment.

Power moved among institutions rather than disappearing. Palaces and empires organized procurement through tribute, taxation, rights, and contracts. Medieval authorities granted mining privileges and claimed dues. Merchant houses joined mine finance to sovereign credit and global distribution. Industrial corporations integrated mines, smelters, refineries, and sales departments. Producer states nationalized resources and attempted cooperation. Exchanges published benchmarks that limited the authority of any one private quotation, while traders and large buyers retained advantages in information, credit, logistics, and contract design.

The most important continuity is easy to miss when attention settles on a live price. Copper has never been sold as one timeless object. Ore, concentrate, blister, cathode, rod, tube, alloy, clean wire, mixed scrap, warehouse title, and futures positions belong to different markets. The benchmark connects them, but conversion costs, location, time, quality, and risk determine the final proceeds.

That is why the history of selling copper is larger than a history of prices. It is the history of making a claim believable: that the seller owns a stated quantity; that the material contains what the seller says; that it will

arrive at an agreed place and time; that deductions will follow known rules; and that payment will settle the obligation. From Bronze Age cargoes to exchange warrants and recovery-based scrap contracts, the successful sale has always depended on that structure of trust.

Frequently asked questions

When was copper first bought and sold?

No surviving evidence identifies the first copper sale. Copper objects moved between communities long before written contracts, but archaeology cannot always distinguish sale from gift, tribute, ritual exchange, wages, or plunder. Some of the earliest unusually detailed records of copper business come from Old Assyrian merchant archives in Anatolia in the nineteenth and eighteenth centuries BCE. Those tablets document quantities, qualities, credit, agents, transport, tolls, and resale rather than merely showing that metal traveled (Dercksen 1996; Veenhof 1997).

What are oxhide copper ingots?

Oxhide ingots are large cast copper forms associated especially with Late Bronze Age Mediterranean trade. Their four projecting corners gave many examples a hide-like outline and likely made heavy ingots easier to handle. Shipwreck cargoes, including Uluburun, show that such ingots moved in organized bulk. They were standardized enough to support transport and accounting, but surviving examples vary; they should not be treated as identical coins with a universal fixed value (Pulak 1998; Gale 2011).

Was copper ever used as money?

Yes, but in several different senses. States struck bronze and copper-alloy coins whose face value depended on public authority. Qing monetary systems relied heavily on copper cash for small transactions. In parts of Africa, recognized copper forms could serve as media of exchange, tribute, bridewealth, or stores of wealth while remaining useful as remeltable metal. It is inaccurate to assume that every copper ingot or cross had one fixed monetary denomination (von Glahn 1996; Nikis and Livingstone Smith 2017).

When did a modern world copper market emerge?

Its foundations appeared during the nineteenth century. Steam transport, industrial smelting, chemical assay, telegraph communication, corporate mining, and electrical demand connected mines and customers across oceans. Swansea's global ore catchment was an important early system. The London Metal Exchange, established in 1877, later supplied a standardized forward market and an international benchmark. The result developed over decades rather than on one date (Evans and Saunders 2015; London Metal Exchange 2026a).

How is most mined copper sold internationally?

Much mine output enters international trade as copper concentrate rather than raw ore. Concentrate contracts settle dry weight, copper assay, payability, a benchmark quotation period, treatment and refining charges, by-product credits, and impurity penalties. Some operations produce refined cathode directly from leach solutions through solvent extraction and electrowinning. The product and processing route determine the contract (U.S. Geological Survey 2026; Díaz-Borrego, Escobar-Pérez, and Miras-Rodríguez 2021).

What is copper cathode?

Cathode is high-purity refined copper, commonly produced by electrolytic refining or electrowinning. It is a standard feed for rod, tube, sheet, strip, alloy, and other fabrication. LME-deliverable Grade A copper must satisfy specified chemical standards, be in cathode form, and come from an approved brand. A physical cathode sale still includes location, premium, delivery, payment, and documentation beyond the benchmark (London Metal Exchange 2026b, 2026c).

Why is my local scrap price lower than the copper price online?

The displayed benchmark usually refers to standardized refined copper at a specified exchange basis. Scrap may include insulation, solder, steel, dirt, moisture, alloying elements, or other material that must be removed.

A recycler also bears collection, sorting, processing, freight, financing, price movement, and resale risk. High-grade clean scrap can trade close to refined value under suitable conditions; mixed or low-recovery material cannot.

What is the difference between No. 1 and No. 2 copper scrap?

The distinction concerns cleanliness and expected copper content, but local usage varies. Under widely used ReMA specifications, Berry and Candy describe clean No. 1 wire or heavy solids, while Birch and Cliff describe No. 2 wire or solids with nominal 96% copper content and a 94% minimum, subject to detailed exclusions. A buyer's written specification governs the actual sale (Recycled Materials Association 2026).

Is copper sold by the pound or by the tonne?

Both. LME copper is quoted in U.S. dollars per metric tonne, while the standard COMEX contract is quoted in U.S. cents per pound. Scrap yards may quote per pound or kilogram, and industrial contracts may use metric tonnes. The units and benchmark date must be aligned before comparing offers (London Metal Exchange 2026c; CME Group 2026).

Does a futures contract mean copper will be delivered?

It can, but many positions are closed or offset before delivery. The standard LME copper futures contract is physically settled, and its warehouse system provides a route to delivery of compliant metal. Futures are also used to hedge or take a price view without an intention to receive a specific shipment. Physical delivery rules anchor the contract even when most trading serves risk management.

Can old copper prices be compared with today's price?

Yes, but not by currency conversion alone. The researcher must identify the product, quality, unit, location, time basis, contract institution, exchange rate, and inflation adjustment. A nineteenth-century ore bid and a modern cathode settlement represent different stages of the production chain. A credible long-run series explains how those differences were reconciled (Svedberg and Tilton 2006).

Why does recycling matter to copper pricing?

Recycling creates supply outside current mine production. When prices rise, more material can be collected, sorted, and processed, which limits the power of primary producers to restrict supply. The response is not immediate or unlimited because much copper remains installed in long-lived buildings and equipment, and some dispersed material is uneconomic to recover. Scrap is both a stabilizing source and a market with its own delays (Graedel et al. 2011).

Glossary of copper-trading terms

Assay: A chemical or metallurgical determination of the content of copper and other elements in a sample.

Basis risk: The risk that the value of a physical shipment and the futures or benchmark used to hedge it do not move by exactly the same amount.

Benchmark: A published reference price used to index contracts. It describes a defined product, time, and delivery basis rather than every physical sale.

Blister copper: A high-copper intermediate produced by smelting and converting, named for the blistered appearance associated with escaping gases during older processing.

Cathode: High-purity refined copper in sheet form produced by electrorefining or electrowinning and used as feed for fabrication.

Concentrate: A processed mineral product enriched in copper minerals but still containing sulfur, iron, moisture, impurities, and sometimes valuable by-products.

Contained copper: The calculated mass of copper in a material, usually dry weight multiplied by assay. Contained copper is not always fully payable or recoverable.

Conversion charge: The manufacturing charge added to metal value for turning copper into rod, tube, sheet, strip, wire, or another semi-fabricated product.

Electrorefining: Refining in which impure copper anodes dissolve and high-purity copper deposits on cathodes through an electrolytic process.

Electrowinning: Recovery of copper from solution by electrodeposition, often following leaching and solvent extraction.

Off-take agreement: A contract under which a buyer commits to purchase part or all of a producer's future output, often helping support mine finance.

Payability: The contractual proportion of contained metal for which the buyer pays after specified deductions or thresholds.

Premium or discount: An amount added to or subtracted from a benchmark to reflect brand, quality, form, location, freight, duty, credit, and market conditions.

Prompt scrap: Scrap generated during manufacturing, usually with a more recent and better-documented origin than post-consumer material.

Quotation period: The date or range of dates whose benchmark price is used in final settlement.

Recovery: The amount of saleable metal expected or actually obtained from gross material after separation and processing.

Semi-fabricate: An intermediate manufactured copper product such as rod, tube, sheet, strip, or wire that will be made into a finished product.

Treatment and refining charges (TC/RCs): Charges that allocate the cost and commercial margin of converting concentrate into refined copper between miner and smelter.

Umpire assay: A third analysis used under contract when buyer and seller assays differ beyond an allowed range.

Warehouse warrant: A transferable document of title to exchange-compliant metal held in an approved warehouse.

Research and editorial methodology

This article was prepared as a historical synthesis rather than a price forecast. The research followed four rules.

First, evidence of movement was not automatically called a sale. Archaeological provenance, cargo, and workshop evidence can establish circulation without identifying price, buyer, or legal form. Where written evidence is absent, the wording remains cautious.

Second, the product was tracked through the chain. Ore, concentrate, blister, cathode, semi-fabricates, scrap, warrants, and futures were treated as connected but distinct commodities. This prevents a refined benchmark from being mistaken for mine revenue or a scrap-yard payment.

Third, institutional sources were used for current market mechanics. LME materials support descriptions of its benchmark, contracts, brands, and physical settlement; CME materials support the standard U.S. futures contract; USGS and ICSG materials support production-chain and statistical categories; ReMA specifications support scrap terminology. Scholarly sources support archaeology, merchant systems, industrialization, corporate history, nationalization, price history, and recycling.

Fourth, no historical price series was reproduced without a consistent product and unit basis. Readers seeking live prices should treat this article as context and use separately timestamped market pages. Historical claims and current contract mechanics should be reviewed when the page is materially updated; changing a visible "last reviewed" date without substantive work would misrepresent the editorial record.

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