

BloombergNEF

Transition Metals Outlook 2026



Contents

Section 1.	Executive summary	1
Section 2.	About the report	3
2.1	What's new in TMO 2026	3
2.2	Scenarios in TMO 2026	3
2.3	Frequently asked questions	4
Section 3.	State of the industry and key trends	5
3.1	Supply capacity meets demand for most metals	5
3.2	Copper is the main outlier	6
3.3	Capacity is not availability, availability is not security	6
3.4	Demand grows for eight of 10 materials	8
3.5	Supply grows fastest for battery metals, falls for copper	11
3.6	No region is fully self-sufficient	12
3.7	New reserves must be developed	14
3.8	Recycling is key to meeting demand for most metals	15
3.9	Commodity cycles drive metal supply and demand	16
Section 4.	Comparison with last year's outlook	18
Section 5.	Aluminum	20
5.1	Demand	21
5.2	Supply capacity	22
5.3	Prices	23
5.4	Two things that could change our view	23
Section 6.	Cobalt	24
6.1	Demand	25
6.2	Supply capacity	26
6.3	Prices	27
6.4	Two things that could change our view	27
Section 7.	Copper	28
7.1	Demand	29
7.2	Supply capacity	30
7.3	Prices	31
7.4	Two things that could change our view	31
Section 8.	Graphite	32
8.1	Demand	33
8.2	Supply capacity	33
8.3	Prices	35
8.4	Two things that could change our view	35
Section 9.	Lithium	36

	9.1 Demand	37
	9.2 Supply capacity	37
	9.3 Prices	39
	9.4 Two things that could change our view	39
Section 10.	Manganese	40
	10.1 Demand	41
	10.2 Supply capacity	42
	10.3 Prices	43
	10.4 Two things that could change our view	43
Section 11.	Nickel	44
	11.1 Demand	45
	11.2 Supply capacity	45
	11.3 Prices	47
	11.4 Two things that could change our view	47
Section 12.	Palladium	48
	12.1 Demand	49
	12.2 Supply capacity	49
	12.3 Prices	51
	12.4 Two things that could change our view	51
Section 13.	Platinum	52
	13.1 Demand	53
	13.2 Supply capacity	54
	13.3 Prices	55
	13.4 Two things that could change our view	55
Section 14.	Steel	56
	14.1 Demand	57
	14.2 Supply capacity	57
	14.3 Prices	59
	14.4 Two things that could change our view	59
Section 15.	Methodology	60
	15.1 Metals covered in this report	60
	15.2 Key terms	60
	15.3 Demand	61
	15.4 Primary supply capacity	62
	15.5 Secondary supply capacity	63
	15.6 Market balance	64
	15.7 Price outlooks	64
About us		65

Section 1. Executive summary

8 of 10

Number of materials in this outlook whose demand rises by 2050

1 of 10

Number of materials with a significant shortage – copper

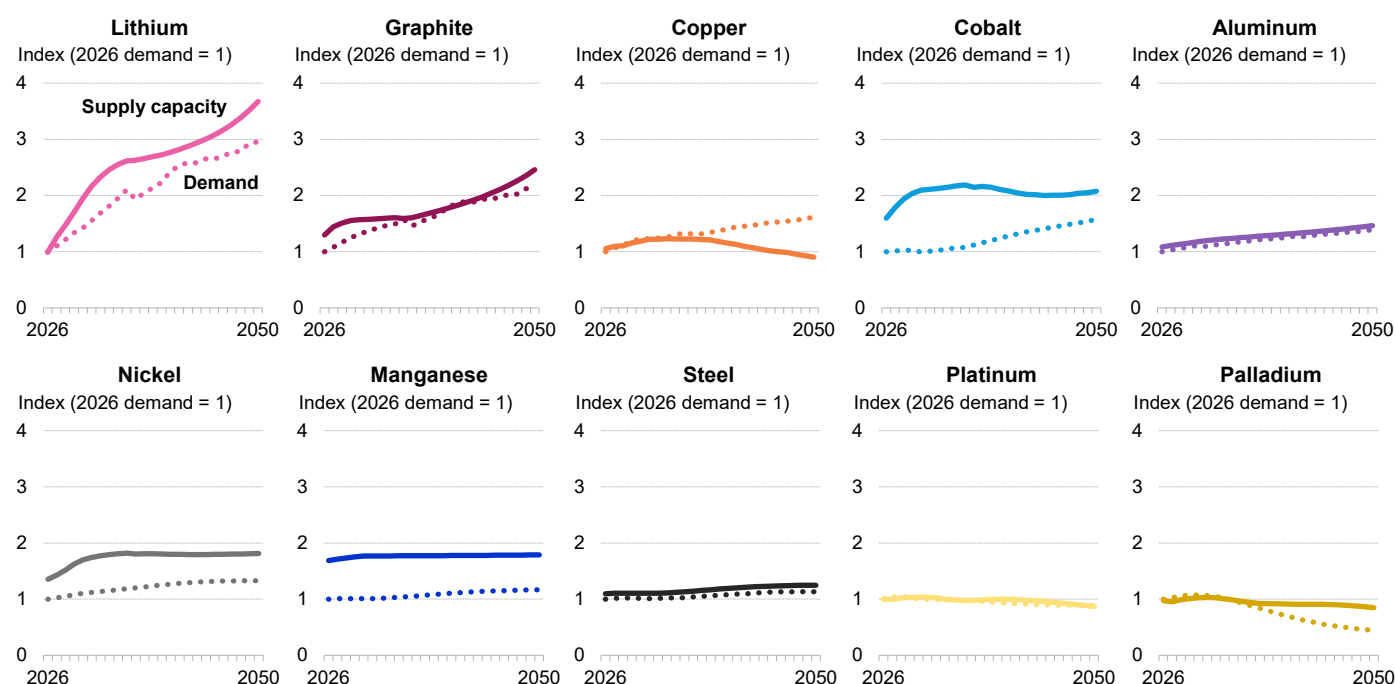
\$332 billion

Amount of investment in new mines needed to plug the looming gap in copper supply

The acute metal capacity shortfalls forecast a few years ago have largely eased, except for copper. However, security of supply and short-term availability of some metals have been constrained. The next task for governments and companies is to diversify the supply of the 10 materials covered in this outlook.

- **Most metals will have enough supply capacity through 2050**, assuming adequate mine development. That is different from last year's edition of *TMO*, in which three materials were headed for deficit, and from a few years ago, when many appeared to be facing a shortfall.
- **Lithium and palladium face near-term supply deficits**, but these are temporary. New supply capacity coming online in 2027 should clear up the lithium shortfall. Palladium faces a slight deficit until 2034, but it enters heavy overcapacity thereafter as demand falls sharply.
- **Copper faces a large long-term deficit from 2028**. Without additional supply, this could cause persistently high prices, substitution and demand destruction, slowing the electrification of the global economy. Bridging the shortfall may require \$332 billion of new mine investment.
- **Demand grows fastest for lithium and graphite**, tripling and more than doubling respectively by 2050 with rising sales of battery electric vehicles and energy storage. Cobalt and nickel demand grow more slowly than in previous editions as battery technology evolves.

Figure 1: Growth in supply capacity and demand for transition materials over 2026-2050, Economic Transition Scenario



Source: BloombergNEF. Note: Charts are indexed to 2026 demand. Sorted left to right by demand growth from 2026 to 2050.

- **Expect long-term downward price pressure on oversupplied metals** – cobalt, lithium, manganese, nickel and palladium – even if some of these prices are high today. Miners will likely respond via cost reduction, production discipline, and in some cases, capacity cuts.
- **Metals with sufficient supply capacity may not always be available.** Government policy – such as cobalt and nickel restrictions in the Democratic Republic of Congo and Indonesia – can make metals scarcer than their supply capacity would imply on paper.
- **Even when metals are available, supply may not be secure.** China dominates refined metal supply, which increases risk for buyers outside of the country. Supply diversification is thus needed for most buyers to improve resilience, but this may come at a cost.
- **Recycling is essential.** By 2035, six of the 10 materials covered in this outlook will require recycling for sufficient supply; by 2050, that figure rises to eight. Battery metal recycling expands faster in 2026-2050 than primary production.
- **Compared with last year, TMO 2026 points to looser long-term balances** across most materials, reflecting revised assumptions and weaker demand for several battery metals. Graphite, platinum and steel shift from deficit to surplus. Surpluses widen for manganese, cobalt, nickel and palladium. The copper deficit is lower in the near term. Lithium moves into a near-term deficit before returning to a smaller surplus. Aluminum's surplus narrows.
- **The accompanying data viewer** contains full results and input assumptions. Its structure makes it easy to plug into any workflow or model.
- **Modeling approach:** BNEF used proprietary datasets and models combined with publicly available information to estimate demand and supply capacity for each material.

Table 1: BNEF transition materials scorecard 2026

Material	2026 market balance	12-month price view	Near-term supply availability	Exposure to supply disruption	What to watch out for
<u>Aluminum</u>	Surplus	↔			Duration of Middle East disruptions and the rate of scale-up of new capacity outside China
<u>Cobalt</u>	Surplus	↑			Changes to volume or implementation of export quotas in the Democratic Republic of Congo
<u>Copper</u>	Surplus	↔			Supply- and demand-side response including new mine approvals and demand destruction
<u>Graphite</u>	Surplus	↔			Speed of scale-up of projects outside China and development of further trade restrictions
<u>Lithium</u>	Deficit	↓			Significant capacity reductions and the growth of battery demand
<u>Manganese</u>	Surplus	↑			Extensions at large mines and infrastructure improvements in South Africa
<u>Nickel</u>	Surplus	↔			Changes to Indonesia's production quotas and the stringency of their enforcement
<u>Palladium</u>	Deficit	↑			Ability of recycling to meet near-term demand and emerging end-uses
<u>Platinum</u>	Balanced	↑			Substitution between palladium and platinum in autocatalysts and rising hybrid truck sales
<u>Steel</u>	Surplus	↓			Chinese capacity closures, trade policy changes and the scale-up of Indian capacity

Source: BloombergNEF. Legend: *High availability / low disruption exposure, some hiccups likely, low availability / high exposure.*

Section 2. About the report

Unless otherwise stated, charts and analysis in this report show the Economic Transition Scenario (ETS)

The *Transition Metals Outlook* (TMO) is BloombergNEF's annual long-term outlook for metals essential to the energy transition. TMO 2026 projects long-term demand, supply capacity, availability and security, and near-term price trends, for 10 metals and minerals: aluminum, cobalt, copper, graphite, lithium, manganese, nickel, palladium, platinum and steel.

TMO 2026 combines near-term forecasts (from 2026 to 2035) with two long-term scenarios (from 2036 onward). Scenarios are future-focused simulations and differ from forecasts, which are shorter-term predictions of what we think will happen.

Section 3 of the report summarizes broad trends across the 10 metals and minerals covered.

Section 4 compares this year's results to those in TMO 2025. The last 10 sections dive deep into each of the 10 metals and minerals covered.

2.1 What's new in TMO 2026

The full results are available in the data viewer

The main enhancements in this edition include:

- **Markets covered.** The demand-side modeling now covers 21 markets, up from six in 2025.
- **A full dataset** of results is available in the accompanying [data viewer](#).
- **Price forecasts** for 2027-2030 from Bloomberg Terminal are included for nine commodities.
- **Updated material intensities** and more granular data for solar and autocatalysts.
- **Updated demand** for traditional aluminum, lithium and steel applications.

2.2 Scenarios in TMO 2026

The scenarios in this report are based on the results of corresponding scenarios in BNEF's *New Energy Outlook 2026* ([web](#) | [terminal](#)) and *Electric Vehicle Outlook 2026* ([web](#) | [terminal](#)). Unless otherwise stated, the charts and analysis in this report show the Economic Transition Scenario.

- **Economic Transition Scenario (ETS):** This is the main scenario in this report. It assumes no new policies or regulations are enacted that impact the market for metals, minerals and their uses. The ETS also does not assume any long-term climate targets are hit. Instead, adoption is primarily driven by techno-economic trends and market forces. It is likely to limit global warming to 2.4 degrees Celsius by 2100.
- **Net Zero Scenario (NZS):** This scenario investigates metals supply and demand in a world that reaches net-zero emissions by 2050 and warms 1.81 degrees Celsius. Economics is the main factor deciding which technologies – and hence metals – are used to hit the 2050 target. The NZS is one of many possible pathways that could meet this goal, and not necessarily the most likely. The results of this scenario are included in the accompanying data viewer.

2.3 Frequently asked questions

- **What is the default scenario in the report?** The charts and analysis in this report show the Economic Transition Scenario, unless noted otherwise.
- **Do your numbers refer to ore or finished metal?** They refer to contained metal, refined product or commodity-equivalent units rather than gross ore tonnage. See Table 5 for the boundary used for each material.
- **What does a surplus or shortfall/deficit mean?** Unless noted otherwise, this is the ratio of excess supply capacity to demand. If this ratio is positive, it's a surplus. If negative, it's a deficit. *Formula: Surplus [or shortfall] = supply capacity / demand - 1.*
- **Are your supply numbers capacity or production?** Capacity, unless noted otherwise.
- **Which products are modeled?** The modeled supply boundary differs by material, as summarized in Table 5.
- **Does supply respond to price in your modeling?** No.
- **Are prices shown in the report nominal or real?** Nominal (not inflation-adjusted).
- **As of what date are the price charts in the report?** As of Sept. 30, 2026.
- **How are inventories treated?** Inventories are not considered, unless noted otherwise.

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