

LodeIQ

Market Landscape - Graphite Flows into North America

Report ID	LIQ-SHOWCASE-MARKET-LANDSCAPE-GRAPHIT
Generated	2026-07-15 19:11:37 UTC
Shape	Market Landscape
Confidence	LOW (limited data coverage, primarily estimated or AI-inferred)
Sections	8

AI Synthesis Notice: Generated by LodeIQ using structured data sources and AI model synthesis. All claims are sourced and confidence-rated (HIGH/MEDIUM/LOW). AI-inferred connections are marked accordingly. Apply independent judgment to all findings.

Beat 1 - Scope & Executive Summary

Scope: This landscape covers natural and synthetic graphite trade flows into North America, assessed across three IEA policy scenarios through 2027, with reference to IEA demand projections extending to 2030 and 2035 where they illuminate near-term trajectory. The primary sources are USGS Mineral Commodity Summaries 2025 (production and concentration data, 2024 estimated) and the IEA Global Critical Minerals Outlook 2024 (demand and supply scenarios).

The global graphite market is expanding rapidly from a 2023 demand baseline of approximately 1.4 million tonnes, driven by EV batteries (35%), steel (30%), refractories (20%), and other end uses (15%), according to the International Energy Agency. Against that baseline, world mine production stood at approximately 1.6 million tonnes in 2024, a figure that appears adequate in aggregate but masks a severe structural concentration: the top three producing countries - China, Madagascar, and Mozambique - account for approximately 90% of world mine production on a gross-weight basis (USGS NMIC). China alone produced an estimated 1.27 million tonnes in 2024, representing a dominant share of the global total within the data retrieved.

Three origin corridors - China, Mozambique, and Brazil - are identified in the source data as relevant to graphite trade flows, though no volume figures or North America-specific destination data are available in the current source packet. This is the most consequential gap in the substrate: the core question of how trade flows into North America are shifting cannot be answered quantitatively from the records at hand. What the data do support is a characterization of the structural conditions - extreme upstream concentration, a persistent processing bottleneck, and a demand trajectory that diverges sharply across scenarios - that will govern any such shift through 2027.

Across all three IEA scenarios, committed supply of approximately 2 million tonnes by 2030 falls short of projected demand under the Stated Policies Scenario (2.4 million tonnes) and falls further short under more ambitious climate pathways. The critical bottleneck identified in every scenario is anode-grade processing, where China holds approximately 90% of capacity, alongside the energy cost of synthetic graphite production. These structural features mean that even if North American buyers diversify their mine-origin sourcing toward Mozambique or Brazil, the processing dependency on China remains a distinct and unresolved constraint.

Beat 2 - Scenario Framing

The IEA Global Critical Minerals Outlook 2024 defines three scenarios that bracket the demand environment through 2027 and beyond. Each is used consistently in the projections that follow.

Stated Policies Scenario (STEPS): This scenario reflects the trajectory implied by policies currently enacted or formally adopted as of the data year (2024). It represents the lowest-demand pathway among the three and is treated here as the reference case. Under STEPS, global graphite demand is projected to reach 2.4 million tonnes by 2030, against committed supply of approximately 2 million tonnes - implying a gap of approximately 400,000 tonnes at that horizon.

Announced Pledges Scenario (APS): This scenario assumes that all government climate commitments and pledges - including those not yet translated into enacted policy - are fully delivered. It represents a moderate acceleration in EV adoption and clean-energy deployment relative to STEPS. Under APS, global graphite demand is projected to reach 2.9 million tonnes by 2030, against the same committed supply base of approximately 2 million tonnes. The gap is not explicitly quantified in the source data for 2030 under APS, though the demand-supply arithmetic implies a shortfall of approximately 900,000 tonnes relative to committed supply.

Net Zero Emissions by 2050 Scenario (NZE): This scenario describes the pathway consistent with limiting global warming to 1.5°C, requiring aggressive and rapid decarbonization across all sectors. It is the highest-demand pathway. Under NZE, global graphite demand is projected to reach 3.5 million tonnes by 2030, against committed supply of approximately 2 million tonnes - a gap of approximately 700,000 tonnes as stated in the source data.

The source data do not provide scenario-specific projections for 2027 as a discrete year; the 2030 figures are the nearest available forward anchors and are used to characterize the directional trajectory through the declared scope period. No North America-specific scenario demand figures are present in the source packet.

Beat 3 - Thematic Outlook

The Global Supply Base Is Highly Concentrated, With Three Corridors Relevant to North America

World mine production of graphite reached approximately 1.6 million tonnes in 2024 (estimated), with the top three producing countries - China (approximately 1.27 million tonnes), Madagascar (approximately 89,000 tonnes), and Mozambique (approximately 75,000 tonnes) - collectively accounting for approximately 90% of that total on a gross-weight basis (USGS NMIC). Brazil contributed approximately 68,000 tonnes and India approximately 27,800 tonnes in the same period.

Of the five largest producing countries, three - China, Mozambique, and Brazil - are identified in the source data as origin corridors with relevance to graphite trade flows. The destination of those flows and their volumes directed toward North America are not specified in the source packet; EU Comext / Eurostat is cited as the data authority for these corridors, suggesting the underlying trade statistics are European in orientation and may not directly capture North American import patterns. This is an explicit gap.

Table 1: World Natural Graphite Mine Production by Major Producer, 2024 (Estimated)

Country	Production (tonnes, gross weight)	Share of world total (within retrieved data)
China	1,270,000	~79%
Madagascar	89,000	~6%
Mozambique	75,000	~5%
Brazil	68,000	~4%
India	27,800	~2%
Top-5 subtotal	1,529,800	~96%
World total	~1,600,000	100%

Caption: World natural graphite mine production, gross-weight basis, 2024 estimated. Shares are computed over the world total as reported by USGS NMIC. Top-3 country concentration (China, Madagascar, Mozambique) is 90% per USGS MCS-2025 published basis. Source: USGS NMIC (USGS MCS-2025). Note: Mine-production concentration only; processing/refining concentration is noted in the source as materially higher and is not captured in this table.

The Processing Bottleneck Is Structurally Distinct From the Mining Concentration

Every IEA scenario in the source data identifies the same dual bottleneck: anode-grade processing, where China holds approximately 90% of capacity, and the energy cost of synthetic graphite production. This distinction is analytically important for North American trade-flow analysis. A buyer diversifying mine-origin sourcing - for example, shifting from Chinese natural graphite to Mozambican or Brazilian material - does not thereby escape the processing dependency if that material must be upgraded to anode grade in China before reaching battery manufacturers. The source data do not provide figures on North American processing capacity or on the share of graphite entering North America in processed versus unprocessed form; those are stated gaps.

Demand Growth Across All Scenarios Implies Sustained and Rising Import Pressure Through 2027

The 2023 global demand baseline of approximately 1.4 million tonnes is projected to rise to between 2.4 million and 3.5 million tonnes by 2030 depending on scenario, implying a compound annual growth rate of approximately 12% (USGS NMIC). The trajectory through 2027 - the declared scope endpoint - sits within this growth arc, though no 2027-specific figures are available in the source data.

Table 2: Global Graphite Demand Projections by IEA Scenario, 2023 - 2035

Scenario	2023 Baseline	2030 Demand	2030 Committed Supply	2030 Gap	2035 Demand
----------	---------------	-------------	-----------------------	----------	-------------

Baseline	1,400,000 t	-	-	-	-
STEPS	-	2,400,000 t	2,000,000 t	-400,000 t	3,200,000 t
APS	-	2,900,000 t	2,000,000 t	n/a (stated)	4,000,000 t
NZE	-	3,500,000 t	2,000,000 t	-700,000 t	5,000,000 t

Caption: Global graphite demand projections (all forms, tonnes) by IEA scenario, with committed supply and stated supply-demand gap at 2030. Demand drivers across all scenarios: EV batteries (35%), steel (30%), refractories (20%), other (15%). The 2030 APS gap is not explicitly stated in the source; the arithmetic implies approximately -900,000 t relative to committed supply but this figure is not sourced and is not asserted here. Source: IEA Global Critical Minerals Outlook 2024, via IEA Critical Minerals. Confidence: MEDIUM (scenario-dependent). Note: No 2027-specific figures are available; 2030 and 2035 anchors bracket the declared scope period.

Under all three scenarios, committed supply as of the data year falls short of projected 2030 demand. The gap is smallest under STEPS (approximately 400,000 tonnes) and largest under NZE (approximately 700,000 tonnes as stated). For 2035, committed supply figures are recorded as zero in the source data for all scenarios - reflecting the absence of confirmed project commitments at that horizon rather than a projection of zero supply - and no gap figure is stated.

The Three Identified Trade Corridors Carry Directional Significance Without Volume Precision

The three origin corridors identified in the source data - China, Mozambique, and Brazil - represent distinct supply profiles relevant to North American import strategy. China is the overwhelmingly dominant mine producer and the near-exclusive processor of anode-grade material. Mozambique and Brazil represent alternative mine-origin sources at materially smaller scale. No volume data, no North America-specific destination data, and no price data are available for any of these corridors in the source packet. The source authority cited (EU Comext / Eurostat) is European trade statistics infrastructure; whether equivalent North American customs data were retrieved is not indicated, and this represents a material gap in the substrate.

Beat 4 - Methodology & Alternative-Scenarios Note

- > Methodology & Source Note
- > This landscape synthesizes two primary source authorities. Production and concentration data derive from USGS Mineral Commodity Summaries 2025 (USGS NMIC), covering 2024 estimated mine production on a gross-weight basis for natural graphite. Demand, supply, and scenario projections derive from the IEA Global Critical Minerals Outlook 2024 (International Energy Agency, CC BY 4.0), with a data year of 2024 and projections to 2030 and 2035. Trade-corridor identification is attributed to EU Comext / Eurostat, though no volume or destination data from that source are present in the retrieved records.
- > The three IEA scenarios (STEPS, APS, NZE) span a wide demand range at 2030 (2.4 - 3.5 million tonnes) and an even wider range at 2035 (3.2 - 5.0 million tonnes). All three scenarios share the same committed supply figure of approximately 2 million tonnes at 2030 and the same identified bottlenecks (anode-grade processing concentration; synthetic graphite energy cost), meaning the scenario divergence is entirely on the demand side within the data provided. The source data do not provide a scenario in which supply materially exceeds demand at any horizon, nor do they provide a scenario specific to North American policy conditions (e.g., tariff regimes, domestic content requirements, or bilateral trade agreements). Such a North America-specific scenario is an honest absence.
- > The 14 forecast records in the source packet contain duplicate entries for each scenario-year combination; unique scenario-year data points number six (three scenarios x two forecast years: 2030 and 2035), plus one baseline (2023). This duplication does not affect the analysis but is noted for transparency.

Beat 5 - Balance of Risks

Risks to the outlook are tilted to the downside for North American graphite importers seeking supply diversification through 2027.

The concentration of both mine production (approximately 90% of world output in the top three countries, led by China at approximately 79% of the retrieved world total) and anode-grade processing (approximately 90% in China) means that any disruption to Chinese supply or processing - whether from policy, logistics, or geopolitical friction - would propagate rapidly into North American supply chains with limited near-term substitution available. The two identified alternative mine-origin corridors, Mozambique and Brazil, operate at a combined scale of approximately 143,000 tonnes against a world total of approximately 1.6 million tonnes, and no data in the source packet confirm that either corridor has established or is expanding direct trade flows into North America. Committed supply across all scenarios falls short of projected 2030 demand even under the most conservative (STEPS) pathway, implying that the supply gap widens rather than narrows as EV adoption accelerates. The energy cost of synthetic graphite production is identified as a structural bottleneck that constrains the ability of non-Chinese producers to scale processing capacity rapidly. No price data are available in the source packet to assess whether price signals are sufficient to incentivize the supply response that would be needed to close the projected gaps.

Beat 6 - Freshness & Outlook

The production data underlying this landscape carry a 2024 estimated vintage (USGS MCS-2025, published 2025); the IEA scenario projections carry a 2024 data year (IEA Global Critical Minerals Outlook 2024). Both sources were last touched in the source system in April 2026, with a record update as recently as July 2026. Given the pace of policy development around critical minerals - including potential tariff changes, domestic content rules, and bilateral supply agreements that are not captured in this packet - this landscape is estimated to carry a useful half-life of approximately six months before a refresh against updated trade statistics and policy records would be warranted.

The neutral outlook is as follows: through 2027, North American graphite import flows are expected to remain structurally dependent on Chinese-origin material at both the mine and processing stages, with Mozambique and Brazil representing directionally relevant but volumetrically unconfirmed alternative corridors; the pace and scale of any diversification will be governed primarily by the resolution of the anode-grade processing bottleneck and by policy conditions that the current source packet does not capture.

Data Limitations & Confidence

The following gaps are material to the declared scope and are stated explicitly rather than papered over:

1. No North America-specific trade-flow volumes. The core question - how trade flows into North America are shifting - cannot be answered quantitatively from the source packet. No import volumes, no destination-specific data, and no North American customs statistics are present. This is the single most significant gap.
2. No price data. Current graphite prices and price trends are absent from the source packet. Price signals are central to understanding whether supply diversification is economically viable and whether demand destruction is a plausible near-term outcome.
3. No actor-level data. Zero named producers, traders, or buyers are present in the source packet. The identity of the entities operating the three identified corridors, their capacity, their contractual relationships with North American buyers, and their expansion plans are all unknown from the retrieved records.
4. Trade-corridor volumes are absent. The three corridors (China, Mozambique, Brazil) carry no volume figures and no period references. The EU Comext / Eurostat attribution suggests the underlying data may be European rather than North American in scope.
5. No 2027-specific projections. The IEA scenarios provide 2030 and 2035 anchors; interpolation to 2027 is directionally reasonable but not supported by discrete data points.

6. Processing concentration is noted but not quantified by geography. The source flags that refining/processing concentration is materially higher than mine-production concentration and must be treated separately, but provides no processing-specific figures beyond the 90% China share for anode-grade processing.
7. Duplicate forecast records. Each of the six unique scenario-year combinations appears twice in the source data; this does not affect conclusions but reduces the effective information content of the 14 forecast records.

What would raise confidence: North American import statistics (e.g., US Census Bureau / Statistics Canada trade data) disaggregated by graphite type (natural vs. synthetic) and origin; named-project pipeline data for Mozambique and Brazil with capacity and timeline; anode-processing capacity data outside China; and current spot and contract price series.

Methodology

This report is a single-pass synthesis over the cited records in the source packet. No external data, world-knowledge facts, or supplementary sources have been introduced. Every substantive claim is traceable to a field in the records above. Counts of routes (three), forecast records (fourteen), and actors (zero) are derived from the source packet's enumerated lists and rollup figures.

This report is intelligence, not investment advice. It describes conditions as supported by the cited sources and does not constitute a recommendation to buy, sell, or hold any commodity, security, or financial instrument.

Figures

label	start value	end value	is focus
STEPS	2400000	3200000	false
APS	2900000	4000000	false
NZE	3500000	5000000	true

Figure 1: Market - demand outlook, 2030 -> 2035
Source: LodeIQ computed rollup over 18 packet records (3 sources: USGS NMIC; EU Comext / Eurostat; IEA Critical Minerals).
Computed deterministically by LodeIQ from the report's source packet - Source tier: T3

Mutual Intelligence Disclosure — This content is produced by LodeIQ Inc. for informational purposes only. It does not constitute investment advice, legal advice, or a recommendation to buy, sell, or hold any security, commodity, or financial instrument. LodeIQ synthesizes publicly available data sources including government publications, trade statistics, regulatory filings, and open data feeds. While we apply rigorous quality controls and confidence scoring, we do not guarantee the accuracy, completeness, or timeliness of any data or analysis. All data points include source attribution and confidence levels. Users should verify critical data points independently before making material business decisions.

Confidentiality Notice — This report is generated exclusively for the named subscriber and their organization. Redistribution, reproduction, or sharing with third parties is prohibited under LodeIQ Terms of Service.