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Research Commentary

Concentrating Risk Without Promoting Resilience: What the MP Materials Deal Means for U.S. Critical Mineral Strategy

Evidence from the Clean Investment Monitor

Brian Deese, Zehra Khan, and Robert Reese

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Abstract

Recent Chinese export controls on rare earth elements have sharpened concerns about the resilience of U.S. critical mineral supply chains. With processing capacity highly concentrated abroad, strengthening domestic production has become a bipartisan national security priority. In response, the federal government has begun deploying an expansive set of industrial policy tools to catalyze domestic capacity. This report evaluates one of the most significant recent interventions: the U.S. Department of Defense's deal with MP Materials, the only commercial rare earth miner and processor in the United States.

Using data and methodology from the Clean Investment Monitor, we decompose the MP agreement into its constituent subsidy instruments and estimate their combined net present value under multiple market scenarios. We model Neodymium-Praseodymium prices using a stochastic, mean-reverting framework with a time-varying long-run equilibrium, incorporate projected production ramps and contract mechanics, and discount expected cash flows at a risk-free rate. We find that total federal support ranges from $0.9 billion to $2.7 billion, equivalent to as much as 45 percent of the expected value of output over the life of the agreement. Therefore, in a low-growth case corresponding to the highest subsidy exposure across our modeled scenarios, we estimate the federal government is effectively underwriting nearly half of the project's anticipated market value.

Further, while the deal reduces risk of supply disruption by preserving a domestic producer, it concentrates an outsized level of public support on a single firm with tools that are not readily scalable or accessible to new entrants. Including a direct equity stake alongside price and revenue guarantees further muddies the policy design by blurring whether the government's role is to insure strategic capacity or to seek financial upside as a shareholder.

We conclude that U.S. rare earth strategy would be better served by a Congressionally authorized, market-wide price insurance program for oxide production. This approach could be designed to include clear fiscal guardrails and be competitively awarded and volume-limited. Such a framework would preserve the insurance function of the MP intervention while reducing taxpayer risk, encouraging competition, and building more durable domestic resilience over time.

Introduction

Rare earth elements (REEs) are essential inputs for defense systems, electric vehicles, and advanced manufacturing, yet global production remains overwhelmingly concentrated in China. While mining is more geographically diversified, the strategic vulnerability lies in downstream stages of processing, where China controls more than 90 percent of global capacity.[1] This dominance allows China to restrict exports or depress prices in ways that directly shape global supply and investment decisions.

The structural challenge is acute in the United States. MP Materials is currently the only commercial-scale rare earth miner and processor operating domestically, and until recently much of its concentrate was shipped to China for separation. Rare earth processing is capital-intensive, technically complex, and highly exposed to volatile, China-influenced prices. These conditions create significant barriers to entry and make large-scale private investment difficult. Recent Chinese export controls on REEs and REE-based (NdFeB) permanent magnets have underscored the national security risks of extreme supply-chain concentration in critical minerals and reinforced dependence on China for REE processing as an immediate strategic liability.

Building on efforts by prior Administrations to support domestic rare earth mining, in July 2025, the U.S. government took its most aggressive intervention in the sector to date by entering into a multi-faceted strategic agreement between the Department of Defense (DoD) and MP Materials. The agreement combines concessional lending and equity-linked instruments with a guaranteed price floor for Neodymium-Praseodymium (NdPr) and revenue support tied to downstream magnet production, effectively underwriting both upstream and downstream market risk.[2]

These measures signal a willingness to absorb substantial commercial risk in order to establish a domestic foothold in a supply chain still dominated by China. The current administration has indicated that this firm-specific approach may serve as a template for future agreements, including a tentatively announced equity and loan package with USA Rare Earth. As the federal government increasingly relies on complex industrial policy tools—ranging from loans and equity stakes to price guarantees—the need for transparent, comparable analysis of their fiscal cost and strategic effect has become urgent.

This month MIT CEEPR and the Rhodium Group launched a major expansion of the Clean Investment Monitor (CIM), a database that systematically tracks investment in the manufacturing and deployment of clean energy technologies. For the past three years, CIM has tracked that investment across the United States. This month marked the launch of global coverage by the CIM, providing the same level of detail for clean energy technologies worldwide. The expanded CIM will provide policymakers and investors with up-to-date information on activity in clean energy technology value chains, including data on manufacturing investments at various stages of completion, estimated annual production capacity by country, current and projected country-level demand, and public subsidies. Rare earth mining, processing, and magnet manufacturing subsidies are included as core components of our initial release for global CIM.

Using data from the CIM, this commentary uses the MP Materials agreement as a case study to assess the fiscal and strategic footprint of a multi-instrument industrial policy package in critical minerals. We estimate that total federal support to MP will cost between $0.9 billion and $2.7 billion on a present value basis, which could constitute a subsidy of close to 45 percent of the value of MP's expected output over the length of the agreement. This means that in a low-growth scenario coorespoing to high subsidy exposure the federal government is underwriting nearly half of the firm's anticipated market value.

We argue that, from an industrial strategy perspective, the MP intervention is both too much and too little. It concentrates an outsized amount of public support on a single firm without establishing a scalable framework for broader industry entry. As

1 See International Energy Agency, "With New Export Controls on Critical Minerals, Supply Concentration Risks Become Reality" (2025).

2 Neodymium-Praseodymium is a rare earth oxide/metal blend used for permanent magnets in electric vehicles, wind turbines, and electronics.

a result, the intervention risks undercutting its own core policy objective by privileging one producer rather than promoting long-term growth and competition in the industry.

Overview of Federal Support to MP Materials

The agreement between MP Materials and DoD is a multi-layered package that builds on earlier federal support provided to the company. This report evaluates only the subsidies provided to MP through that July 2025 agreement and excludes competitive grant and tax credit awards the company also received in recent years.

The July 2025 agreement with DoD significantly expanded the federal support to MP through a combination of financial and market-stabilization instruments structured specifically for the company, including:

- A direct loan to add heavy rare earth separation capabilities to their current processing facility in California;
- A direct federal equity investment structured through series-A, preferred shares and accompanied by warrants that provide an option to purchase additional common stock;
- A guaranteed price floor for NdPr production of $110 per kilogram; and
- A revenue support and offtake arrangement tied to MP's planned downstream 10X magnet manufacturing facility in Texas that guarantees the facility a minimum level of revenue each quarter once it begins operation.

Taken together, these instruments span the full mine-to-magnet value chain and combine traditional fiscal tools with more complex, market-based mechanisms. The breadth of this package distinguishes the MP support from prior rare earth interventions and makes it a useful case study for evaluating how modern industrial policy tools function in practice.

Using the Clean Investment Monitor

Box 1. Overview of the Clean Investment Monitor

The Clean Investment Monitor (CIM), created by Rhodium Group and MIT's Center for Energy and Environmental Policy Research, is a database that tracks private investment and subsidies for clean energy and decarbonization technologies in a consistent and comparable way across countries. The database includes subsidies provided by China, Europe (defined as the 27 EU member states, Norway, Switzerland, and the United Kingdom), and the United States and incorporates data on subsidies supporting the manufacturing of electric vehicles (including battery electric vehicles and plug-in hybrid electric vehicles), batteries, wind energy components, rare earth elements, and permanent magnets, and the deployment of electric vehicles.

Wherever possible, the subsidy data reflect funds committed to relevant programs or entities rather than announced or appropriated amounts and is sourced directly from government budget documents or government notices of funding awards. Where government data are not available for expenditures that we have confirmed occurred, we estimate those costs. For a detailed methodology, see the method section at cleaninvestmentmonitor.org.

For grants and tax credits, the cash value of awards made are recorded in the database. For loans and equity investments, it includes estimates of the portion of capital provided on below-market terms, defined as terms more favorable than private capital would require for comparable risk. Those subsidy levels are either collected from government sources or are independently estimated, allowing users to compare fundamentally different subsidy instruments on a common basis.

The initial global CIM release includes subsidies related to rare earth mining, processing, and magnet manufacturing, covering a wide range of subsidy instruments. (See **Box 1** for more information about the CIM data and methodology.) The analysis of the MP Materials agreement presented in this paper draws from the CIM's data and methodology.

Evaluating the equity portion of the MP deal, our analysis for CIM found that the preferred stock purchase itself appears to be materially below market when considered in isolation.[3] However, the agreement also granted the government long-dated warrants—financial instruments that give the holder the right to purchase common shares at a fixed price in the future—allowing the government to benefit if MP's stock price appreciates. Our estimated value of those warrants is sufficiently large to offset what would otherwise look like a subsidy embedded in the preferred equity instrument.

That conclusion raises a deeper question about valuation. The warrant value is driven by the price of MP Materials' common stock, which has settled at a substantially higher level following the announcement of the broader subsidy package. In recent months it has traded around $60 per share after peaking at over $90 per share in October (the month that the price floor for NdPr products took effect). This increase in the firm's valuation appears closely tied to the government subsidies in the agreement itself—most notably, the guarantee of a minimum price floor for NdPr sales that was roughly double prevailing market prices faced by MP in the third quarter of 2025 (when the deal was announced). MP's stock price is now approximately twice its pre-deal level, suggesting that the market is capitalizing the expected cash flows from the government-backed price support mechanism (see **Figure 1**).

As a result, any potential upside the U.S. government might realize from its equity position is effectively built on the back of the broader subsidy package it is simultaneously providing. This dynamic calls into question how the equity component should be interpreted in isolation and points to a more fundamental issue: what is the total net subsidy that has been provided to MP once all instruments are considered together?

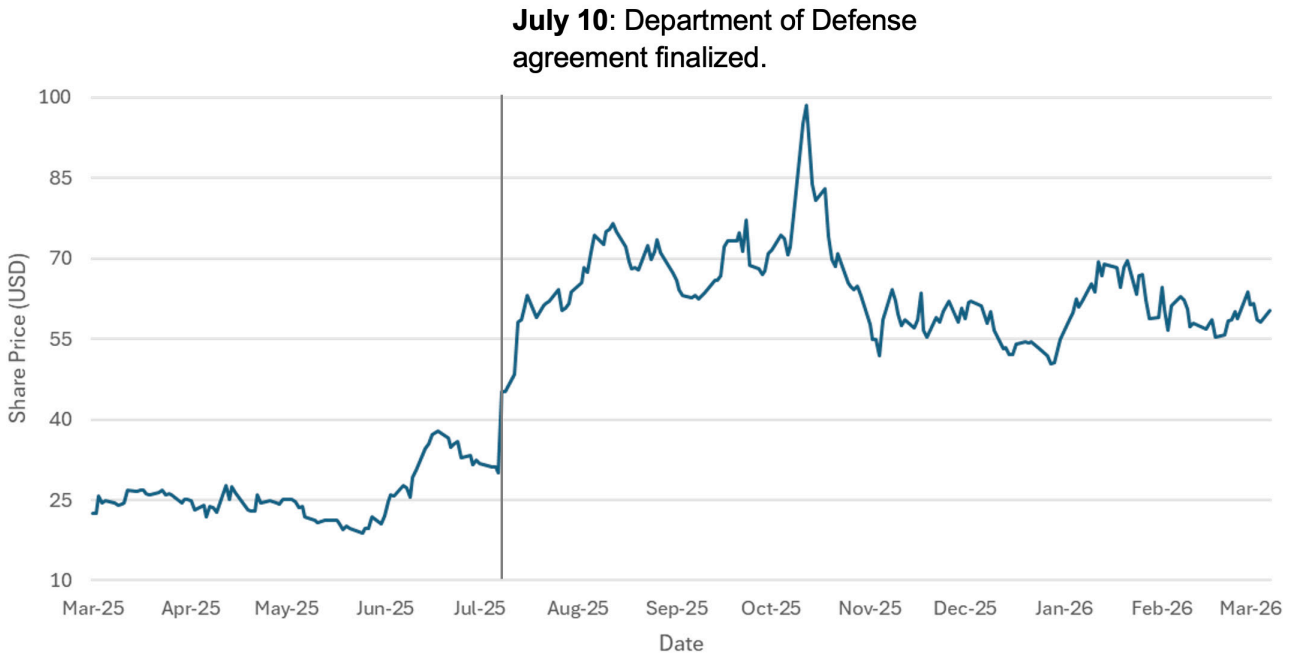

Figure 1. MP Materials (MP) Daily Closing Share Price, March 2025–March 2026.
Source: Yahoo Finance.

Our methodology for the data included in CIM is designed to capture each of these instruments in a consistent, comparable way. Importantly, that methodology treats price floors as ongoing subsidies rather than one-time commitments. In the case of MP Materials, the NdPr price floor is included in CIM as a recurring grant-like payment, with the actual cash transfers

3 Preferred stock functions like a hybrid between debt and equity: it typically provides a fixed dividend return and has priority over common shareholders.

made each quarter being captured. This approach aligns with how governments tend to report the costs of such instruments and provides a transparent framework for tracking the fiscal cost of the agreement over time. The first of these payments was made to MP in the fourth quarter of 2025.[4]

Using the CIM methodology as a foundation, this paper estimates the present value cost of the price floor and offtake arrangements included in the MP–DoD agreement by combining observed payments with forward-looking estimates. While all component parts of the MP agreement will ultimately be reflected in CIM as payments are realized, the multi-year nature of these commitments means they are not fully visible in the database now. This analysis therefore exemplifies the type of policy evaluation that CIM is intended to enable: rigorous, comparative assessments that build on a consistent base of observed subsidy data to evaluate the true scale, structure, and implications of government intervention.

Estimated Subsidy Outcomes

In total, we estimate that the net present value (NPV) of federal subsidies committed to MP under the July 2025 agreement with DoD equals about $1.5 billion.[5] Our estimated subsidy costs for that support to MP include four main vehicles:

1. A $150 million loan, which we estimate includes a subsidy of $7 million;
2. An equity investment, which we estimate has a net government savings of $360 million;
3. An NdPr price floor, which we estimate includes a total subsidy of over $1.5 billion; and
4. Guaranteed revenue support included in a magnet offtake agreement, which we estimate includes a total subsidy of $280 million.

These figures represent our midpoint estimate. Because there is substantial uncertainty around future NdPr prices, Chinese supply behavior, and MP's access to commercial magnet markets, and because the cost of the price floor and magnet revenue support are very closely tied to prevailing prices and other market dynamics, we supplement this midpoint with two other stylized price and market scenarios to bracket plausible upper and lower bounds.

The high cost, upper bound estimate is a NPV of about $2.7 billion and assumes no growth in long-run average NdPr or magnet prices. The low cost, lower bound estimate equals a NPV of $0.9 billion and assumes extremely strong growth in those prices each year over the next decade.

Below we go into more detail on the design of each subsidy instrument and our estimates under the different scenarios.

Loan

The subsidy amount included in this analysis for the loan comes directly from the CIM database with no adjustments. It is recorded on a cash-equivalent, present value basis. That amount does not vary in any of the three stylized scenarios.[6]

Equity

The MP-DoD deal included two equity elements:

1. A direct purchase of 4,000 shares of series-A preferred stock with guaranteed, benefit-in-kind returns of 7 percent annually, compounding quarterly; and

4 MP Materials Corp., *MP Materials Reports Fourth Quarter and Full Year 2025 Results* (February 2026), www.investors.mpmaterials.com.

5 Outside of the DoD agreement, MP received about $60 million worth of federal support over the 2020-2025 period from competitive grants and tax credits.

6 For more information on how the amounts are sourced or estimated, see the detailed CIM subsidy methodology included at cleaninvestmentmonitor.org.

2. A 10-year warrant allowing DoD to purchase over 11 million shares of common stock at $30.03 per share.[7]

To estimate the value of the equity stakes DoD secured in MP, we apply the ex-ante subsidy valuation method developed for CIM to assess below-market equity—that is, situations in which shares are purchased on terms more favorable to the firm than a private investor would require.

However, because the combined estimated value of the MP equity deal is positive—thus indicating above market returns—the equity value is not included in the CIM database. For the sake of this analysis, we include that value to accurately calculate the net subsidy provided to MP by the U.S. government across all instruments.

Preferred Stock. To estimate the value of the preferred stock, we follow the methodology used by the Congressional Budget Office to estimate the subsidy provided to preferred stock purchases under the 2009 Troubled Asset Relief Program (TARP). CBO explains their general method as follows:

> *Broadly speaking, the net cost is the purchase cost minus the estimated market value of the assets, which is the present value—calculated using an appropriate discount factor that reflects the riskiness of the underlying cash flows associated with the asset—of any estimated future earnings from holding the asset and the proceeds from its eventual sale [...] Under CBO's methodology, the present value of the preferred stock purchased by the Treasury was calculated using a discount rate equivalent to the yield on actively traded preferred stock for each company. If the institution does not have preferred stock, an average yield based on an industry index was used.*[8]

Prior to the DoD sale, MP had not issued any preferred stock and preferred stock is uncommon among other companies engaged in REE mining and processing in market-based economies.[9]

In absence of any direct market comparisons, we identified 10-15 percent as the industry benchmark for investments of similar risk. This range reflects the returns typically demanded for junior capital exposed to commodity price volatility, capital intensity, and execution risk, which can range in the mid- to high-teens, and even rise above 20 percent. Industry analysis from firms such as CRU and Wood Mackenzie highlights that rare earth separation facilities are capital-intensive, subject to long ramp-up periods, and face significant technical and market uncertainty.[10] Given MP's short history of successful commercialization in recent years and their vertical market penetration, we include them on the lower end of that spectrum.

Therefore, targeting a market rate of 12.5 percent to discount against and assuming that the government will hold the preferred stock for the lifetime of the longest portion of the agreement (approximately 13 years), we estimate the subsidy to be about 50 percent or $200 million dollars.

Warrants. To value the warrants, we again follow CBO's TARP methodology, which applies a modified Black-Scholes model to estimate the market value of options and similar financial instruments. The inputs for the model include the risk-free rate of interest and certain characteristics of MP's common stock, the term to maturity, and the strike price ($30.03 per share). However, while CBO used weekly returns for a 10-year period to estimate volatility, we instead use daily returns over the past year and weight more heavily the period that has passed since the agreement was reached. We also do not

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7 MP Materials Corp., Form 8-K, filed with the Securities and Exchange Commission, July 9, 2025.

8 Congressional Budget Office, *Report on the Troubled Asset Relief Program—January 2010* (January 16, 2010), p. 4-5.

9 In March 2025, USA Rare Earth filed a certificate of Designation of Preferences, Rights and Limitations to issue series A preferred stock with an annual benefit-in-kind return of 10 percent. Subsequent disclosures indicate that preferred shares have been issued, but their use appears limited to structured or private financing transactions rather than an open-market sale.

10 See, e.g., CRU, *Rare Earth Elements Special Report* (2025), discussing capital intensity, ramp-up risk, and financing challenges for non-Chinese rare earth processing capacity.

assume that the government will hold the warrants until maturity, and instead allow the government to exercise the warrants anytime between now and July 2035 when they expire.

Given those parameters, our estimate yields a value of roughly $560 million for all 11 million shares.

Net Value. While we break down the valuation of each piece above, the expected returns for hybrid equity instruments such as convertible preferred stock with warrants are typically evaluated on an internal-rate-of-return basis reflecting both fixed dividends and equity upside. In other words, because the preferred stock and warrants are packaged into a single transaction their value can only be evaluated when combined. Therefore, the total equity agreement can be considered above market while including concessionary terms.

From that standpoint, the combined estimated value of $360 million to the U.S. government indicates that on the whole it is an above-market investment.[11]

For the stylized market scenarios, we do make one adjustment to the equity value. In the case of a very weak market where NdPr oxide and magnet price growth is essentially zero, meaning that long-term prices remain deflated to the point that long-term profitability for MP is unlikely, we remove the upside value of the warrants to project a scenario where they go un-exercised. We include this as a way to show an upper-bound to the cost of the deal.

Price Floor for NdPr

The July agreement includes a price floor protection mechanism covering NdPr oxide, metal, and concentrate produced by MP. The agreement guarantees a minimum price of $110 per kilogram of NdPr-equivalent production for a ten-year period beginning October 1, 2025.

Under the agreement, a benchmark NdPr price is derived from the Asian Metal Market index for NdPr oxide. For each quarter, the benchmark price is calculated as a volume-weighted average across eligible NdPr production. If this weighted average benchmark price falls below $110 per kilogram, DoD makes a payment to MP equal to the difference between $110 and the prevailing benchmark price, multiplied by the quantity of NdPr sold or explicitly stockpiled during that quarter.

When the weighted average benchmark price exceeds $110 per kilogram, the treatment depends on the operational status of MP's downstream 10X magnet facility. Prior to the 10X facility reaching full production capacity, no payments are made by either party when prices exceed the floor. Once the 10X facility has reached operational status, MP is required to remit to DoD 30 percent of the price differential above $110 per kilogram, multiplied by the volume of NdPr sold or stockpiled in that quarter. This structure allows partial cost recovery for DoD during periods of strong market performance.

Price Projections and Scenario Design. We estimate the expected fiscal cost of the price floor agreement using a forward-looking Monte Carlo simulation that combines stochastic NdPr price paths, projected production volumes, and the contractual settlement rules described above. NdPr prices are modeled at a quarterly frequency using an Ornstein–Uhlenbeck process (a standard mean-reverting stochastic framework commonly applied to commodity prices). The model is calibrated to the historical volatility of neodymium oxide prices reported in the U.S. Geological Survey's *Mineral Commodity Summaries*.[12] Historical prices exhibit substantial volatility, including a sharp spike in 2011 when China sharply restricted exports, followed by several years of relative price stability before another surge during 2021–2022 driven by rapid growth in electric vehicle and wind demand (see **Figure 2**).

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11 Given our underlying criteria that an equity transaction be below-market to be included in CIM, the MP-DoD equity deal is excluded entirely from the CIM database rather than being included as a negative subsidy.

12 U.S. Geological Survey, Mineral Commodity Summaries (National Minerals Information Center), www.usgs.gov/centers/national-minerals-information-center/mineral-commodity-summaries.

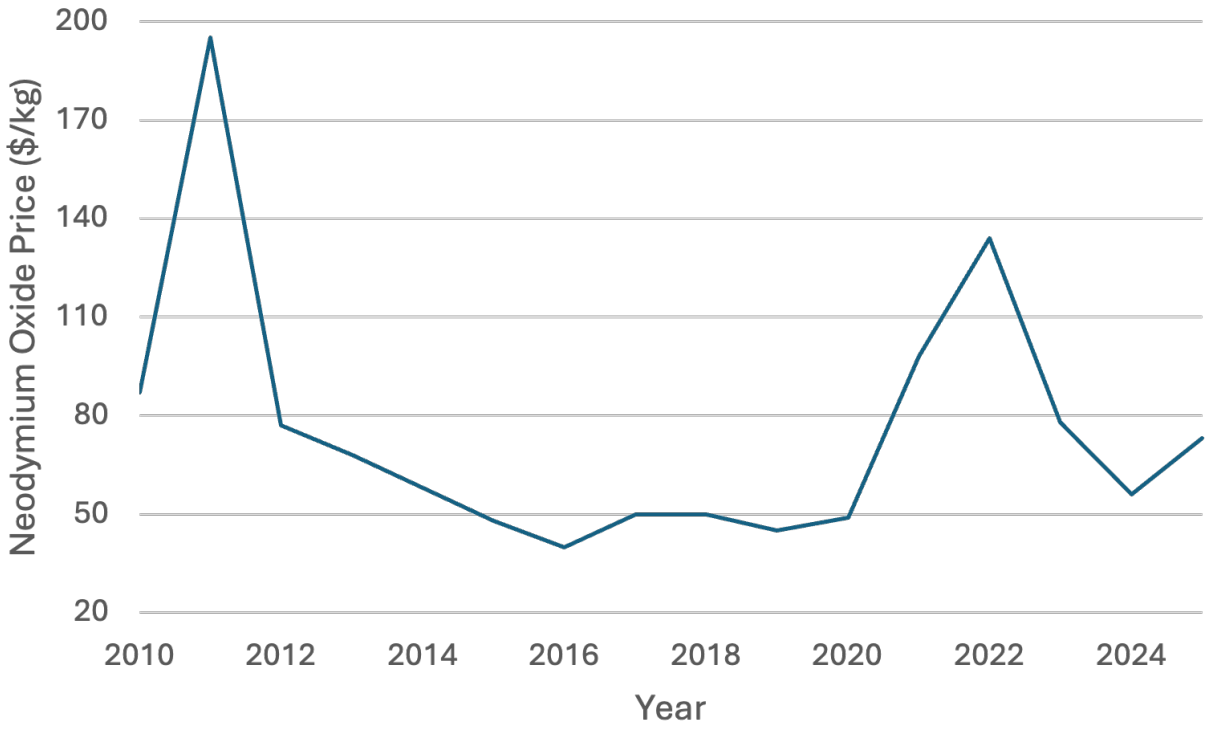

Figure 2. Annual Average Price of Neodymium Oxide, 2010–2025.
Source: U.S. Geological Survey.

To reflect expected structural changes in the NdPr market, the long-run equilibrium price in the model is allowed to evolve over time rather than remain fixed. This approach preserves historical mean reversion around a long-run anchor while allowing the equilibrium price level itself to rise in response to projected demand growth and near-term market tightness. The model therefore captures both short-run price volatility and longer-term shifts in market fundamentals.

Uncertainty around future NdPr prices is represented through three stylized scenarios that differ only in their assumptions about the long-run price trajectory. In the high-cost (no-growth) scenario, the long-run equilibrium price is held constant at its historically estimated level, consistent with the relatively stable average prices observed between 2010 and 2025 outside of discrete price shocks. While this assumption is unlikely given projected growth in rare-earth magnet demand, it provides a conservative lower bound on future prices and an upper bound on potential fiscal exposure.

In the low-cost (high-price growth) scenario, the long-run price is assumed to grow at 10 percent annually throughout the projection period. This implies nearly a tripling of prices over the projection period and reflects a scenario of prolonged market tightness and constrained supply response. While sustained price growth of this magnitude would ordinarily be expected to induce new entry, structural barriers discussed above including long development timelines and high capital intensity, could still limit the speed and scale of supply expansion over the time horizon of this analysis.

The middle (best estimate) scenario assumes 6 percent annual growth in the long-run price over the first four years of the agreement, driven by accelerating demand and near-term supply constraints, followed by 3 percent annual growth thereafter as additional non-Chinese production capacity comes online and market conditions gradually normalize.

Estimation of Fiscal Outcomes. Simulated price paths are combined with a projected ramp in NdPr-equivalent production from current levels to estimated full operating capacity, inclusive of NdPr sold as oxide and NdPr embodied in finished magnets. For each simulated price path, the model applies the price floor and upside-sharing provisions quarter by quarter. Consistent with the agreement's structure, upside-sharing payments to DoD are only permitted once the 10X magnet facility is assumed to have reached full operational capacity, which we model as occurring in 2030.

Quarterly net cash flows to or from the government are discounted using a fixed nominal 10-year U.S. Treasury rate of 4.19 percent, reflecting the risk-free nature of the government counterparty and ensuring consistency with nominal price assumptions. One thousand simulations are run under each price-growth scenario to capture the distribution of possible outcomes arising from price volatility over the life of the agreement.

The model produces a distribution of NPV outcomes representing the fiscal cost to the government, net of both direct payments to MP and receipts from upside-sharing mechanisms. Estimated expected NPVs under the three scenarios are as follows: approximately $2.1 billion under the no-growth (upper bound) scenario, $1.1 billion under the high-growth (lower bound) scenario, and $1.5 billion under the middle-growth (best estimate) scenario.

Guaranteed Revenue Support for 10X Facility

In addition to the NdPr price floor, the July deal includes a revenue support mechanism tied to DoD's offtake agreement with MP's downstream 10X magnet manufacturing facility. Unlike the upstream price floor, which is indexed to a market benchmark, the 10X support mechanism is linked to facility-level financial performance.

Under the agreement, DoD agrees to purchase up to 100 percent of the magnets produced by the 10X facility at cost and agrees to provide additional magnet facilitation payments to MP in quarters to meet a specified annual threshold of earnings before interest, taxes, depreciation, and amortization (EBITDA) generated by the 10X facility. While not explicitly stated by the agreement, these payments seem designed to ensure the 10X facility can meet revenue targets as it scales. Though DoD is guaranteed access to purchase all produced magnets, they need not, and may give MP permission to sell some share of the production on the open market. In years when third parties purchase magnets from the facility and EBITDA exceeds the agreed-upon threshold, DoD makes no payments. Instead, MP agrees to remit to DoD the first $30 million earned above that threshold and 50 percent of earnings beyond that amount. This structure creates an upside clawback similar to that embedded in the price floor. DoD also agrees to make additional payments to MP to offset amounts of certain uncapitalized facility costs incurred by MP up to a maximum of $30 million per year.

Revenue and EBITDA Projections. For the sake of this analysis we assume that all magnet facilitation payments constitute a subsidy but the at-cost purchase of the magnets do not. We estimate the expected fiscal cost of the 10X revenue support using a forward-looking simulation of magnet revenues, operating margins, and use over the life of the agreement. Facility revenues are derived from projected magnet output volumes and projected magnet pricing consistent with each NdPr price scenario. Production volumes are ramped from initial commissioning to full capacity over two years.

We estimate quarterly EBITDA for the 10X facility by applying assumed operating margins to simulated magnet revenues under each market scenario based on the expectation that the contract specified EBITDA threshold is the minimum viable earnings to support the facility. These margins capture the main cost drivers facing the facility, including the cost of NdPr inputs (which vary with simulated NdPr prices) as well as the fixed and variable costs typical of large-scale magnet manufacturing. Government revenue support is only triggered in quarters when modeled EBITDA falls below the threshold specified in the agreement, with payments equal to the amount needed to bring EBITDA up to that minimum level. Conversely, in quarters when estimated EBITDA exceeds contractual thresholds we model payments to the government according to the contract parameters.

Scenario Design. As with the price floor analysis, three stylized market scenarios are used to capture uncertainty around long-term demand growth, magnet pricing, and MP's ability to access non-government customers.

In the low-growth scenario, weak downstream market conditions limit magnet pricing and slow the transition to full commercial utilization. Under this scenario, EBITDA shortfalls persist for an extended period, resulting in substantial revenue support payments during the early and middle years of operation.

In the high-growth scenario, strong demand for NdFeB magnets from electric vehicles, wind power, and defense applications supports higher prices and faster utilization ramp-up. EBITDA thresholds are exceeded more frequently, sharply reducing the need for government support.

The middle-growth scenario reflects an intermediate outcome, with early revenue support during the ramp period followed by improving commercial performance as market access broadens and utilization stabilizes.

Estimated Fiscal Outcomes. For each scenario, quarterly revenue support payments are discounted using a nominal 10-year U.S. Treasury rate of 4.19 percent and aggregated to estimate the net present value of expected government support. One thousand simulations are run per scenario to account for variability in prices and margins over time.

Estimated expected NPVs of 10X revenue support are approximately $440 million under the low-growth (upper bound) scenario, $100 million under the high-growth (lower bound) scenario, and $280 million under the middle-growth (best estimate) scenario. These results indicate that while revenue support meaningfully reduces early operational risk for the 10X facility, expected fiscal exposure declines rapidly as utilization and commercial demand improve.

Subsidy Relative to Production Value and the Scale of Capital Expenditure

At full operating capacity, MP Materials is expected to produce approximately 6,500 metric tons per year of NdPr oxide, based on estimates from analysis by the Colorado School of Mines.[13] This would represent roughly 10–15 percent of current global NdPr supply, positioning MP as one of the largest non-Chinese sources of these critical materials. While this scale is not sufficient to displace China's dominance outright, it would meaningfully diversify upstream supply and reduce concentration risk in one of the most strategically sensitive segments of the clean energy and defense supply chain.

Downstream, MP's 10X facility is expected to reach an annual production capacity of approximately 7,000 metric tons of NdFeB magnets, equivalent to around 2–3 percent of global magnet output. At this scale, MP is unlikely to reshape global magnet pricing or materially influence commercial market dynamics. However, this level of output would be sufficient to meet defense needs and other strategically critical domestic industrial applications, providing assurance of supply even if global markets remain dominated by Chinese producers.

In absolute terms, estimated government support of $1–3 billion for these outputs from MP Materials is not unusual by recent U.S. industrial policy standards. However, relative to the value of output supported, the MP subsidy level is extremely high. Government support could amount to approximately 15 to 45 percent of the total market value of MP's NdPr and magnet production over the life of the agreement.

For the sake of comparison to other industrial policy, consider this relative to the capital expenditures that are required to support that production these subsidies are underwriting. Public disclosures indicate that cumulative capital investment required to establish MP's integrated mine-to-magnet capability is on the order of approximately $1.7–$1.8 billion.[14] The present value of federal support represents about 90 percent of that required capital investment (with the scenario ranges at 50–160 percent of total investment).

A recent comparable intervention was the support provided to Intel for semiconductor production under the CHIPS and Science Act, which was awarded nearly $8 billion in direct grants, alongside eligibility for the Section 48D investment tax credit support that will accrue over time.

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13 Payne Institute for Public Policy, "Explainer on the MP Materials–Department of Defense Partnership," Colorado School of Mines, 2025.

14 Based on company disclosures including the July 2025 Form 8-K, the DoD transaction agreement (Section 2.05), and public statements regarding heavy rare earth processing expansion and the company's separation costs for its Stage II initiative.

Intel has announced approximately $100 billion in domestic semiconductor investment. Assuming that about 60–70 percent of that total capital expenditure qualifies for the tax credit at a 25–35 percent rate, federal support would represent 25–33 percent of total capital investment. While those figures are approximate, they suggest that the MP agreement reflects materially higher subsidy intensity relative to project scale.

An earlier high-profile federal intervention provides an additional benchmark. In 2010, Tesla received a $465 million loan under the Department of Energy's Advanced Technology Vehicles Manufacturing program to finance retooling of its Fremont, California facility and launch production for its Model S. Government reporting shows the loan was executed with a credit subsidy rate of 20 percent, meaning the loan carried a $93 million subsidy.[15] Tesla's financial reporting shows that associated capital expenditures for the relevant facility was roughly $560 million. Therefore, the implied subsidy element would amount to 17 percent of the project's capital investment. This support represents what we now consider a more conventional form of federal industrial policy—repayable financing rather than equity exposure or revenue insurance—and was materially lower in intensity relative to project scale than the middle estimate for MP.

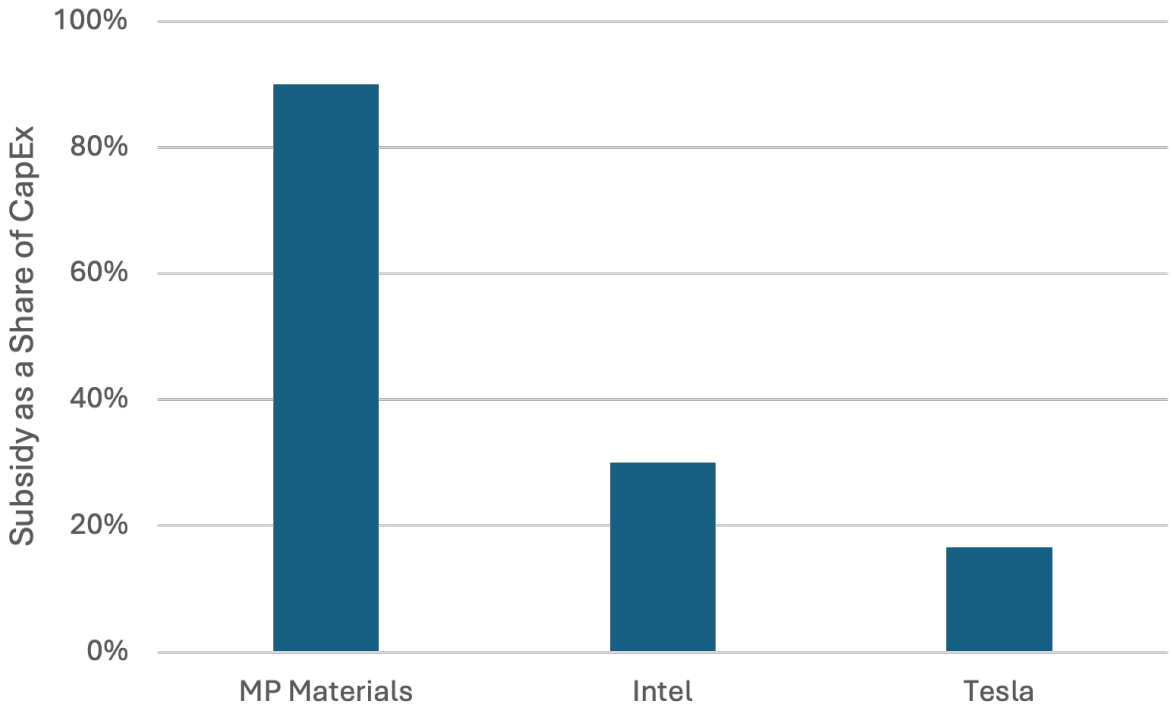


Figure 3. Estimated Federal Subsidy as a Share of Capital Expenditures for Select Companies.
Sources: Company financial filings and disclosures (MP Materials, Intel, Tesla); U.S. government program data (U.S. Department of Commerce CHIPS Program Office; U.S. Department of Energy Advanced Technology Vehicles Manufacturing loan program); authors' calculations

Taken together, these comparisons suggest that while large federal interventions in strategic industries are themselves not unprecedented, the MP agreement reflects unusually high subsidy intensity relative to supported capital investment (see Figure 3).

Implications for China's Market Power

Assuming those projected production levels are achieved, the implications for China's market power differ meaningfully between upstream oxide processing and downstream magnet manufacturing. Upstream, in NdPr oxide production,

15 This estimate uses the program-level average credit subsidy rate reported in the Federal Credit Supplement for Fiscal Year 2010, when the loan was executed, as a proxy for the degree of concessionality.

China's dominance would remain substantial but its effective monopoly power would be weakened. The emergence of a large, non-Chinese supplier reduces the effectiveness of export controls as a coercive tool and introduces meaningful redundancy into global supply. That said, China would retain the ability to flood markets and depress prices, and in doing so shift the fiscal burden of sustaining alternative supply onto the U.S. government that has underwritten a price floor.

Downstream, in NdFeB magnet manufacturing, China's global dominance would remain firmly intact. MP's projected magnet output is too small to materially affect global pricing, market structure, or commercial leverage. As a result, the strategic value of the 10X facility lies less in altering market power and more in ensuring secure access for critical domestic and defense applications.

Net Strategic Effect

Taken together, the agreement meaningfully reduces scarcity risk rather than price risk. It does not insulate the U.S. market from possible price manipulation by China, but instead ensures that some domestic production capacity remains viable even under unfavorable global conditions. In doing so, the deal effectively converts geopolitical and supply-chain risk into a U.S. government budgetary exposure.

Interpretation: What the MP Deal Is and If It Is a Worthwhile Investment

In a market as concentrated and geopolitically exposed as rare earths, it is reasonable for the federal government to take on long-duration risk to preserve a minimum domestic supply capacity. The core weakness of the MP approach is not its ambition, but its structure: by guaranteeing a high price floor to a single producer, the government concentrates fiscal exposure, discourages competition, and risks locking in an incumbent whose future viability is uncertain.

In this sense, the MP deal is both too much and too little. It is too much in that deploying what could amount to nearly $3 billion in public support (equivalent to 160% of MP's planned capex) represents an outsized level of firm-specific industrial policy intervention relative to the scale of the market it targets. At the same time, it is too little because the tools employed are narrowly applied and not industry-wide, leaving them ill-suited to catalyze a growing domestic rare earth industry. Further, by concentrating support on a single incumbent, the intervention risks undercutting that objective by discouraging entry and stifling competition.

The structure of the MP deal reflects a willingness by the U.S. government to absorb price volatility in exchange for keeping one domestic producer viable, rather than an effort to diversify supply and shore up domestic resilience in critical minerals. While the deal may succeed in keeping one domestic producer afloat, it does not meaningfully diversify the risk being borne by the U.S. government. The inclusion of a direct equity stake further concentrates the government's exposure by aligning its financial position with the performance of a single firm. In doing so, it shifts the government's role from market stabilizer to shareholder, potentially complicating future policy decisions.

There are other U.S.-owned firms operating along the mine-to-magnet value chain, but none are close substitutes to MP today. Aside from MP, the only U.S.-owned firms with mining-plus-processing ambitions for NdPr are USA Rare Earth and American Rare Earths, both of which remain in early development stages and are likely multiple years away from commercial oxide production. Their infancy underscores the challenge of building a diversified upstream rare earth sector. Given China's market power, industry maturity, and long history of subsidization, prevailing NdPr oxide prices appear structurally too low for new entrants to reasonably become profitable on typical private-sector timelines. This reinforces the need to create policy frameworks that prioritize broad market participation and competitive entry rather than firm-specific backstops.

Recent federal actions illustrate alternative, but still fragmented, approaches. The Department of Commerce's recent announcement of a roughly $1.3 billion loan and $0.3 billion equity-linked payment to USA Rare Earth represents a more conservative form of support, emphasizing early-stage project finance while limiting long-term exposure to price risk. Its contrast with the MP agreement, however, highlights the absence of a consistent policy framework governing how the federal government supports rare earth supply across firms and stages of development.

The recent announcement of a project to create a strategic critical mineral reserve backed by a $10 billion loan from the Export-Import bank further confuses matters. The project addresses supply risk through stockpiling rather than direct production support. While conceptually complementary, it operates largely independently of upstream subsidies and price guarantees. Recent industry reporting also has highlighted a potential tension between that national stockpiling effort and another recently announced effort to create a preferential trade zone for critical minerals among allies that ensures minimum prices, as stockpiling could place European and Asian manufacturers in direct competition with U.S. government procurement, driving up input costs and downstream prices.

Taken together, these actions reveal a pattern of aggressive but loosely coordinated responses to the same underlying supply vulnerability. The absence of a unifying framework linking stockpiling, international cooperation, early-stage project finance, and long-duration price support, risks producing a collection of well-intentioned but poorly aligned subsidies that address U.S. critical mineral processing vulnerability without coherently reshaping the incentives facing producers or encouraging durable growth in domestic rare earth production. A more durable strategy would preserve the insurance function of price support while encouraging competition, limiting fiscal tail risk, and steadily shifting some of the cost of resilience from taxpayers toward the market over time.

Recommended Policy Solutions

The United States should adopt a comprehensive policy framework for rare earth supply resilience that specifies when and how different instruments—grants, loans, equity, and price stabilization—are deployed across the mine-to-magnet value chain. The goal should not be to categorically avoid riskier policy tools, but to make support predictable, durable, and scalable.

Firm-by-firm negotiations risk inconsistent terms that may keep individual firms alive without building market-wide resilience. A market-wide framework also clarifies expectations for entrants: firms can invest toward a known set of eligibility and performance criteria rather than lobbying for one-off deals. This does not imply that the United States could or should support a large number of rare earth processors. Given China's structural cost advantages, current permitting constraints, and the sector's capital intensity, the optimal outcome may be facilitating stability for a handful of U.S. producers to ensure production for strategic domestic end use. But domestic resilience for this industry would improve materially if risk can be diversified across more than one firm, especially given the risk of geopolitical disruptions. Therefore, the goal should be a framework that allows a number of capable firms to scale and compete on the margin, rather than picking a single winner.

Below is our recommended suite of policies to stabilize this market while minimizing fiscal risk.

Create a Congressionally Authorized, Market-Wide Price Insurance Program

Given the structure of the global rare earth market, processing—specifically the separation of mined ore into individual rare earth oxides—is the critical supply chokepoint, with more than 90 percent of global capacity located in China. Therefore, any effective rare earth policy should prioritize this stage of the value chain.

Chinese firms benefit from substantial cost advantages derived from scale, entrenched market position, and decades of

government support. This leaves prevailing oxide prices structurally too low for new entrants to achieve profitability on standard private-sector timelines. As a result, the binding constraint on domestic capacity expansion is price risk during the scaling phase.

In this context, the most valuable policy intervention is one that provides temporary price assurance while preserving competition. Congress should therefore authorize a market-wide price insurance program for rare earth oxide production that competitively awards price support contracts to qualifying firms. Unlike firm-specific price floors, such a program would not rely on a single administratively set floor, also called a strike price. Instead, strike prices would be determined through competitive applications. This could also allow support levels to vary across producers while maintaining a common policy objective, limiting fiscal exposure, and encouraging entry and scale across the industry.

This program should be universally available to producers that meet uniform eligibility criteria with selection made based on firm fundamentals, specifically their production costs, current scale, and commercial readiness. Support should be awarded through transparent solicitations that provide price insurance against only a defined volume of production, and condition their eligibility on verified production milestones. The contracts should be structured to provide more support when awardees are ramping production or opening new facilities, and taper as those facilities reach stable, full capacity production.

The program should include clear fiscal limits to minimize tail risks. These guardrails would include annual spending caps, volume limits on supported production, regular reassessments of the strike price to reflect evolving market conditions and costs, and clear termination standards if recipients fail to meet agreed upon milestones. Additionally, on a case by case basis, contracts should include symmetric upside repayment terms to allow the government to recover costs during favorable markets, if it is determined that would not undermine incentives for firms to further increase U.S. investment.

This design mirrors the contract-for-difference (CfD) frameworks used in European electricity markets, where governments guarantee developers a fixed strike price and retain upside when prices exceed that level. CfDs are designed to cap public exposure by awarding contracts competitively and periodically reassessing strike prices.

In the near term, such a framework would likely still direct most or all support to MP, given the absence of other commercial producers. Over time, however, it would provide clearer incentives for new entrants and diversify supply.

The Limits of Deploying Equity Stakes

Equity investments can play a constructive role in industrial policy under certain conditions, particularly where technology risk is high, private capital is unavailable, or the policy objective includes firm stabilization or governance influence. However, in the case of rare earth oxide processing, we think equity is likely to be a less efficient primary tool than price-based support mechanisms.

The central constraint facing U.S. rare earth processors is exposure to prolonged periods of low and volatile prices during the scaling phase. Chinese producers' cost advantages have left oxide prices structurally low, creating a mismatch between private-sector investment horizons and the time required for new entrants to achieve competitive scale. Equity investments do little to mitigate this risk directly, as they do not stabilize revenues or reduce downside exposure once production begins.

While equity stakes are sometimes justified as a means for the government to share in potential upside and offset subsidy costs, this logic is less compelling in commodity-linked segments where asset values are highly volatile. In such settings, equity increases fiscal exposure without proportionately improving the likelihood of sustained production or industry entry. By contrast, a price insurance program would directly address the core constraint facing rare earth processing by

reducing revenue uncertainty while preserving firms' incentives to control costs and scale efficiently. Moreover, equity blurs the objective of the intervention. If the policy goal is to insure against supply disruption and build durable domestic processing capacity, the government's role is better conceived as that of a risk absorber rather than a speculative, profit-seeking investor. Taking an ownership stake also puts taxpayer dollars at risk based on how the company's market value rises or falls, which is not directly connected to the strategic objective of securing supply.

Recent U.S. precedent for large-scale equity interventions, most notably under TARP, arose in a fundamentally different context in which restoring firm solvency and stabilizing financial markets were the primary objectives and where equity purchases were paired with extensive ex-ante governance frameworks. The United States faces a different set of challenges with critical minerals policy: ensuring continuity of production, encouraging entry, and diversifying supply in the face of market prices currently dictated by Chinese export policy. In that context, price support mechanisms are likely to be more effective and scalable than equity-based approaches.

This is not to suggest that equity has no role in the rare earth value chain. Equity investments may be more appropriate at earlier development stages for processing capabilities. However, for advancing the commercialization of oxide processing specifically, policy efforts should prioritize market-wide instruments that stabilize prices and encourage competition.

Complementary Tools and the Importance of a Coherent Market-wide Framework

A market-wide price support mechanism for rare earth oxide production should be the centerpiece of the United States' rare earths policy, but it should not operate in isolation. Other fiscal interventions can play a supporting role if they are structured to reinforce rather than distort the underlying market. The unifying principle across these tools should be that support is awarded through transparent, competitive processes and applied broadly across eligible firms, rather than automatically selecting winners or entrenching incumbents without fair competition.

Furthermore, when designed with this discipline, complementary supply-facing policies can enhance the effectiveness of price support while limiting fiscal risk. Strategic stockpiling can help smooth short-term supply disruptions and stabilize downstream demand, reducing the scale and duration of price support necessary. Similarly, international coordination like friendshoring arrangements, joint investment frameworks, and aligned approaches to price stabilization can expand the effective market for non-Chinese producers and improve the long-run viability of alternative supply chains. Taken together, these measures can help shift rare earth markets toward a more competitive global equilibrium; thus, allowing public intervention to increasingly support scale, coordination, and resilience rather than permanently substituting for market pricing.

Conclusion

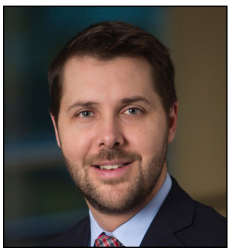
We estimate that the MP agreement will cost the U.S. government between $0.9 billion and $2.7 billion on a net present value basis and conclude that the MP deal is not an effective or fiscally efficient deployment of government resources. While the MP deal may succeed in preserving a minimum level of domestic NdPr processing capacity, its firm-specific structure delivers limited resilience relative to its cost. Concentrating price support, fiscal risk, and policy attention on a single incumbent constrains competition, raises tail risk for taxpayers, and does little to address domestic supply chain constraints that have left the United States vulnerable in the first place.

The same level of public commitment could be deployed more effectively through a market-wide framework that targets the true binding constraint in this sector: sustained exposure to low and volatile prices during the scale-up phase of processing capacity. A competitively awarded price insurance program would preserve the insurance function that

motivates the MP deal, while spreading risk across firms, encouraging entry, and creating clearer incentives for cost discipline and expansion over time.

How the United States intervenes matters as much as how much it spends. Absent a coherent, market-wide approach, large subsidies risk becoming expensive stopgap measures that fail to build a durable industry. By contrast, a framework that prioritizes competition, scalability, and fiscal discipline offers a more credible path toward a domestic rare earth supply chain that is resilient to future shocks and less dependent on continued government support.

About the Authors



Brian Deese is the current Institute Innovation Fellow at MIT and CEEPR, where he is focused on researching and developing strategies to address climate change and promote sustainable economic growth. As the former Director of the White House National Economic Council, Deese advised President Biden on domestic and international economic policy and coordinated the economic agenda of the Biden-Harris Administration. Deese is a crisis-tested advisor with broad experience in accelerating economic prosperity, empowering working Americans, and harnessing the economic opportunities that come from building a clean energy economy and combating the climate crisis. Deese received his B.A. from Middlebury College and his JD from Yale Law School.

Zehra Khan is a Research Advisor for MIT Innovation Fellow Brian Deese. Before joining MIT, Zehra worked for the U.S. Federal Trade Commission on a range of issue areas related to labor, consumer protection, competition and innovation. She previously worked at the White House Council of Economic Advisors. Zehra received her B.A. in economics and political science from McGill University.

Robert Reese is the Lead Data Analyst and Manager of Public Sector Research for MIT Innovation Fellow Brian Deese. He works on climate change and industrial policy projects, including the Clean Investment Monitor. Before joining MIT, Robert served as Chief of the Natural and Physical Resources Cost Estimates Unit at the Congressional Budget Office. There he oversaw the production of cost estimates for bills related to agriculture, energy, environment, transportation, and natural resources policy. Before being promoted to the chief role, Robert was a principal analyst in the same unit for over seven years where he worked on surface transportation and housing policy. He received both his B.A. and M.P.P. from the University of Virginia.

Contact.

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General inquiries: ceepr@mit.edu

Media inquiries: ceepr-media@mit.edu

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MIT Center for Energy and
Environmental Policy Research
Massachusetts Institute of Technology
77 Massachusetts Avenue, E19-411
Cambridge, MA 02139-4307
USA

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