Outlook and Opportunities for U.S. Coal Exports

Prepared by the
National
COAL COUNCIL

July 21, 2026

Outlook and opportunities for U.S. coal exports

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Dear Secretary Wright:

On behalf of the National Coal Council's Coal Export Subcommittee, we are pleased to submit "Outlook and Opportunities for U.S. Coal Exports." The leadership that President Trump and you have shown in re-establishing the Council and providing a vehicle for these recommendations is greatly appreciated and presents a significant opportunity to support U.S. energy dominance and economic success.

The United States possesses the world's largest coal reserves and a foundational coal mining legacy but remains under-positioned in global markets. The primary constraint is not resource availability but access to markets and prohibitive regulatory, tax and fee structures. To unlock the full economic and strategic value of U.S. coal resources, the nation must prioritize the development and modernization of world-class export infrastructure, remove unfair trade impediments, reform regulatory, tax and fee policies, and continue to promote world-class mining innovation.

Critically, the U.S. lacks a high-capacity West Coast export terminal capable of bulk commodity processing at a scale that meets Western U.S. coal export potential. Establishing such a gateway is essential to accessing fast-growing Asian markets and competing with other global suppliers that currently hold a structural advantage due to geography and logistics. President Trump's support for additional West Coast export terminals, including but not limited to the proposed port in Oakland, is a welcome and needed advancement along with exploring additional options along the West Coast and with our neighbors to the North and South.

In parallel, the United States must expand and modernize logistics networks, advance new port opportunities, upgrade inland infrastructure such as waterways, locks and channel capacity, and streamline permitting processes that currently delay or hinder critical mining and infrastructure investments.

U.S. coal exports have a cost and logistical disadvantage in the Asian market relative to more advantageously located international competitors such as Australia, Indonesia and Russia. U.S. coal exporters need additional West Coast terminal capacity to provide current shippers with marketing scale and prospective shippers with port access.

To ensure global competitiveness, the report also recommends reviewing federal and state tax and fee structures across the coal supply chain, with the goal of reducing cost burdens and encouraging private capital investment. In addition, integrating U.S. coal import targets into constructive, equitable, bi-lateral trade agreements has the potential to advance U.S. economic and security interests on a range of fronts.

Developing U.S. coal export potential will not only expand market access, but also support domestic job creation, improve trade balance, and reinforce U.S. leadership in energy security.

In short, infrastructure investment, fair access to markets, regulatory reform, and world-class innovation are the decisive levers required to position U.S. coal exports as cost-competitive, reliable, and globally relevant.

Sincerely,

James Grech,
National Coal Council Chair

Jimmy Brock,
National Coal Council Vice Chair

Rich Nolan,
Report Chair

Executive summary

The United States has an abundance of coal. Even after over a century of mining, the U.S. still has the largest reserves of coal in the world, and coal remains the most abundant energy resource[1] in the U.S.

The U.S. is becoming an increasingly important global coal supplier, both for power generation and steel production, and industrial applications. U.S. coal is needed to address the looming imbalance in global coal demand. With more than 1,200 new coal generating units under development globally, and new steel production facilities coming online in Asia, U.S. coal is necessary for the stability of the global economy.

U.S. coal production also supports high-paying jobs and is central to mining, transportation, and maritime communities. According to National Mining Association research, every million tons of coal exported supports 1,320 jobs[2] including the miners, support personnel, transportation providers, port operators and other indirect jobs.

Exports of coal from the U.S. also help with the balance of trade as the U.S. ships over 30 times more coal offshore than it imports[3]. Further, the abundance of high-quality thermal and metallurgical coal in the U.S. could easily support additional exports, which would provide global partners with energy certainty and a hedge against more volatile energy supplies from other regions of the globe.

The competitiveness of U.S. coal in the export market is driven by two primary factors: (1) quality, and (2) cost. For many years, the U.S. has been viewed as a "swing supplier" in the global coal marketplace. However, with growing global electricity demand and the need to expand steel production, the U.S. has become a critical supplier to the seaborne coal marketplace. Currently, the capability to grow is constrained because of limited infrastructure, especially on the West Coast as well as a cumbersome permitting and regulatory environment that spans not only the production of coal but also coal transportation and mining equipment manufacturing.

The global "energy hedge"

The closure of the Strait of Hormuz has amplified the need to develop and maintain energy diversity. The need for more balanced energy sources reduces the risk of economic shock. Environmental aspirations are increasingly coming up against real-world conditions and practical realities regarding reliable electric power. Coal provides an "energy hedge" against geopolitical upheaval, ultimately providing additional certainty and energy security for nations that have experienced two energy shocks in just four years.

[1] https://www.eia.gov/coal/reserves/
[2] https://uscoalexports.org/boosting-americas-economy
[3] https://www.eia.gov/totalenergy/data/flow-graphs/coal.php

To make the U.S. a more dependable large-scale supplier to the global market, additional investments and regulatory reforms are needed to level the global playing field and increase the competitiveness of U.S. seaborne coal.

Changes that improve mining permitting, productivity, transportation, and port operations would lower costs and therefore increase the competitive position of U.S. producers. At the same time, technological improvements in coal production and handling would improve safety from the mine to the export terminals. In the market, it would also improve U.S. standing as a trade partner and increase overall global competition.

U.S.-based technologies could also prove to be a valuable export. This includes higher-efficiency boilers and newer technologies for gasification or liquefaction. Further, U.S. manufacturers would benefit from the sale of equipment that extracts residual products from coal for other products, such as cement, wallboard, and rare earth element processing.

The U.S. Department of Energy (DOE) should support efforts to make U.S. coal more competitive in the international market, where Asia has the largest coal demand upside. While U.S. coal is already flowing into Asia, the opportunity to dramatically increase exports exists. U.S. coal should be an integral part of trade negotiations and there remains a critical need for low-cost, established pathways for coal to reach deep-water ports on the Pacific coast.

The timing for exploring upside in U.S. coal exports is opportune. The world is entering a new phase of rapidly rising electricity demand that has pushed coal demand to record levels. Sustained supply challenges among U.S. competitors in the global coal landscape – notably Indonesia, which is looking to limit its own coal exports with quota limitations and significantly higher royalties and export levies, and Russia, which remains cut off from much of the world's demand centers, enhance the opportunity for U.S. coal demand.

Other ways to increase the global competitiveness of U.S. coal includes reducing or eliminating tax and fee structures. Higher sales-sensitive costs magnify the cost differential with coal produced outside the U.S. Increasing the exports of coal represents a national priority that comes with meaningful benefits and value creation that would outweigh revisions to tax and fee structures. The associated benefits for the U.S. would be increased economic activity and investment and the attendant benefits that come with it, including broader tax revenue; more stable global energy markets and thus a more stable global economy, which would benefit the U.S., and enhance trade dynamics, contributing to a more favorable balance of trade.

Action items:

Develop and modernize world-class export infrastructure

- Prioritize the buildout of large West Coast coal ports. West Coast export capacity – at a terminal or terminals capable of serving large, oceangoing vessels (ideally including Capesize vessels) – would dramatically expand U.S. export potential. Policymakers should continue to evaluate ways to support such projects, through financing mechanisms as well as via efforts to overcome politically motivated resistance to such facilities at the state and local level. New and expanded U.S. port facilities would supplement U.S. coal exports through British Columbia, where coal export capacity is extremely limited and becoming more so given growing Canadian output across a range of commodities. Continue to support the proposed Oakland Terminal, which also stands to benefit western U.S. coal exports. President Trump's June 4, 2026, announcement of Defense Production Act funding for the terminal was a seminal step forward for the port. The need for this facility is all that much greater given the impending closure of the Levin-Richmond Terminal in late 2026.

- Explore opportunities for additional port capacity in Mexico, particularly at the Port of Guaymas. Although Guaymas would likely have higher rail- and vessel -related costs than a West Coast port, it has the potential to play a strategic role in a portfolio of new or expanded West Coast coal ports.
- Explore opportunities for additional port capacity in the U.S. Pacific Northwest that has the potential to play a strategic role in a portfolio of new and expanded West Coast coal ports.
- Explore opportunities to expand capacity for exports from East Coast ports. The U.S. government should seek to facilitate capacity expansions at existing East Coast coal terminals – via increased investment, improved efficiency, and a more supportive regulatory environment – while exploring the potential for new East Coast facilities suitable for coal exports.
- Increase funding and streamline the environmental permitting to better support efforts by the Army Corps of Engineers to modernize locks and dams on major transportation routes and to increase channel depths at key ports, with the objective of facilitating the use of larger vessels for U.S. coal exports. Finding ways to lower logistics costs – from the mine to the port and from the port to the end user – is essential to unlocking the full potential of U.S. coal exports. This may involve coordinating efforts between the Department of Transportation, the U.S. Army Corps of Engineers, and the states.

Reduce excess costs through reforming regulations, taxes and fee policies

- Reduce and/or eliminate taxes and fees to make U.S. coal more competitive in world markets. The coal industry currently incurs a wide range of federal, state, and county taxes, fees, and royalties that, in aggregate, weigh on the competitiveness of U.S. coals in foreign markets. Identifying opportunities to reduce these fees can act to render U.S. producers more competitive with producers in countries such as Australia and Indonesia, which are far more proximate to global growth markets.
- Evaluate additional reductions in the royalty rate for federal coal, whether mined using surface or underground techniques. While the Trump Administration and Congress recently took the highly impactful step of legislating a reduction in the maximum federal royalty rate, the Department of the Interior (DOI) has the authority to lower the current rate still further should it deem such a move in the public interest. Incremental reductions in this rate would act to further support U.S. exports of coal mined on federal lands.
- The Department of the Interior should modernize the federal coal leasing program by reforming Fair Market Value (FMV) determinations to improve transparency, predictability, and consistency. FMV methodologies should reflect the current economics of coal mining, market conditions, transportation costs, and the need for U.S. coal producers to remain competitive in domestic and international markets.
- Suspend collection of the coal Abandoned Mine Land fee and develop a process to assess if or when collection of subsequent fees will be necessary going forward. After nearly 50 years, the U.S. coal industry has made AML payments well in excess of the amount required to clean up historical sites. The AML represents yet another friction cost that renders U.S. coals less competitive in global markets.
- Urge coal companies and rail operators to redouble their efforts to collaborate to lower the cost of moving coal from the mine to the port. U.S. coal producers are already facing ocean freight rates that can be $20 to $30 higher than producers in competing countries. As a result, it is essential that cost control in every other phase of the supply chain – including production and rail – be exceptionally rigorous.
- Review taxes and regulatory requirements across the coal supply chain. For example, there are significant federal regulatory reform opportunities being pursued today by the rail industry to leverage existing and emerging technologies that will enable railroads to operate much more efficiently.

- Streamline the permitting process between federal and state agencies for new and existing coal mines as part of a broader effort to reduce costs, shrink lead times, and reduce administrative burdens.
- Reduce state fees. States that represent coal export production should consider providing relief by suspending costs associated with severance taxes and fees.
- Make the current suspension of 301 shipping fees permanent and ensure that the fees do not apply to coal and other mined exports until commercially viable shipping alternatives exist.

Improve global trade terms

- Eliminate tariffs and non-tariff barriers on U.S. coal in export markets, including China and India. U.S. producers already face high logistics costs when competing in these markets. Tariffs can effectively lock U.S. producers out of these markets by rendering economic barriers insurmountable.
- Include coal in any expanded efforts to sanction Russian energy products. Russian coal, like Russian oil and natural gas, contributes to funding that country's ongoing war effort. Legislation to create secondary sanctions on countries purchasing Russian energy should include coal as should any similar efforts from the Trump Administration.
- To increase U.S. coal exports, Washington should negotiate new binding Agreements on Reciprocal Trade (ARTs) and aggressively enforce existing agreements that encourage Southeast Asian nations to reform state-owned utility monopolies. By leveraging access to the U.S. consumer market, trade negotiators could encourage countries such as Vietnam and India to loosen restrictive Power Purchase Agreements (PPAs) and reduce purchasing barriers. When combined with domestic supply-chain initiatives that lower U.S. coal production costs, this approach could help American producers compete more effectively against entrenched regional suppliers and make U.S. coal a more financially attractive component of long-term fuel supply portfolios.

Enhance technology

- Adopt international standards to accelerate the creation of new technologies for miners and original equipment manufacturers (OEMs). This includes the full adoption of International Electrotechnical Commission (IEC) standards that would streamline technology availability to U.S. mines, reduce administrative burden for the government, and eliminate unnecessary duplication of certification efforts.
- Evaluate and pursue tax credits for mine operators that trial new technologies focused on improving productivity and operator safety. Federal grants or tax incentives should also support U.S. based companies seeking to develop advanced mining technologies and working to accelerate innovation that can translate into a more competitive U.S. coal-mining industry.
- Seek to extend U.S. technological leadership by advancing U.S.-led innovations such as high-efficiency boilers, advanced mining equipment, and rare earth element (REE) extraction technologies. Establish a coordinated analytical function, drawing on the capabilities of the U.S. Energy Information Administration, National Energy Technology Laboratory, International Trade Administration, U.S. Geological Survey, the Department of Transportation, and the U.S. Army Corps of Engineers to assess U.S. coal export competitiveness across global markets.

United States coal export landscape

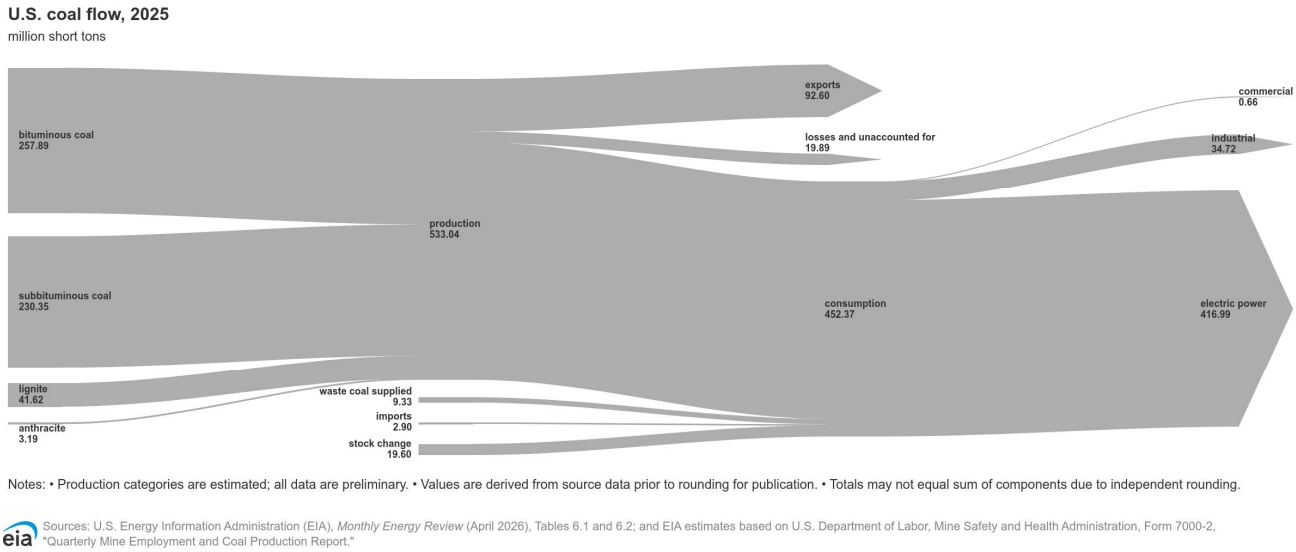
Summary of key findings

The U.S. coal export industry plays a vital role in the U.S. economy. It is a role that can be significantly expanded through improved trade agreements, better port access, and reduced cost structures.

- Export volume volatility: U.S. coal exports totalled 93 million short tons (mst) in 2025, representing a decrease from the 108 mst exported in 2024. Over the past decade, U.S. coal export volumes have ranged from a low of 60 mst in 2016 to a high of 116 mst in 2018, demonstrating the ability of U.S. coal to respond to the global marketplace. This is notable considering coal's importance as an energy security hedge during times of international conflict.
- Export composition: The market is driven by two distinct products. In 2025, thermal (steam) coal exports were 42.5 mst while metallurgical (steelmaking) coal exports were 50.1 mst.
- Economic impact: The value of U.S. coal exports reached $10.0 billion in 2025, supporting over 36,000 direct and indirect jobs. This revenue underscores the economic importance of coal's export sector, including the premium commanded by exported metallurgical coal. In the West, the PRB provides a powerful economic boost to the region. In Appalachia, coal production and transportation accounts for a large percentage of commerce and jobs. Maximizing coal exports will infuse additional dollars into these areas, improving the quality of life and helping reduce poverty.
- Strategic Export Potential: The U.S. is a significant net coal exporter. In 2025, the U.S. exported 93 mst compared to imports of 2.3 mst. These coal exports are beneficial in addressing the U.S. trade deficit.
- Infrastructure dominance: Coal's export supply chain is highly concentrated. East Coast ports, primarily Hampton Roads and Baltimore, remain the critical arteries for the industry, handling approximately 62% of all U.S. coal exports over the last five years. The remaining ports are in the Gulf with only three small terminals capable of handling western U.S. coal located in California as well as Westshore Terminals in British Columbia.
- Logistical bottlenecks: A major historical barrier to competitiveness has been draft limits at major U.S. ports, which have traditionally prevented the fully efficient loading of larger Capesize vessels (>120,000 metric tons), increasing per-ton transportation costs relative to international competitors. This becomes an increasing issue when shipping coal to the growth regions in Asia.
- West Coast constraints: The lack of dedicated, high-volume coal terminal capacity on the U.S. West Coast effectively locks western producers out of U.S.-controlled direct trans-Pacific routes, forcing a heavy reliance on cross-border logistics through Canadian ports to reach Asian markets. Limited volumes have also been handled at the Port of Guaymas in Mexico. The proposed port in Oakland is part of the solution, but isn't sufficient in isolation to unlock the full potential of U.S. western coal exports.

Coal in the United States

The U.S. produced approximately 530 million tons of coal in 2025, mostly for domestic power generation with 93 million tons exported. The following EIA diagram shows the "coal flow" (source to use) in 2025[4]:

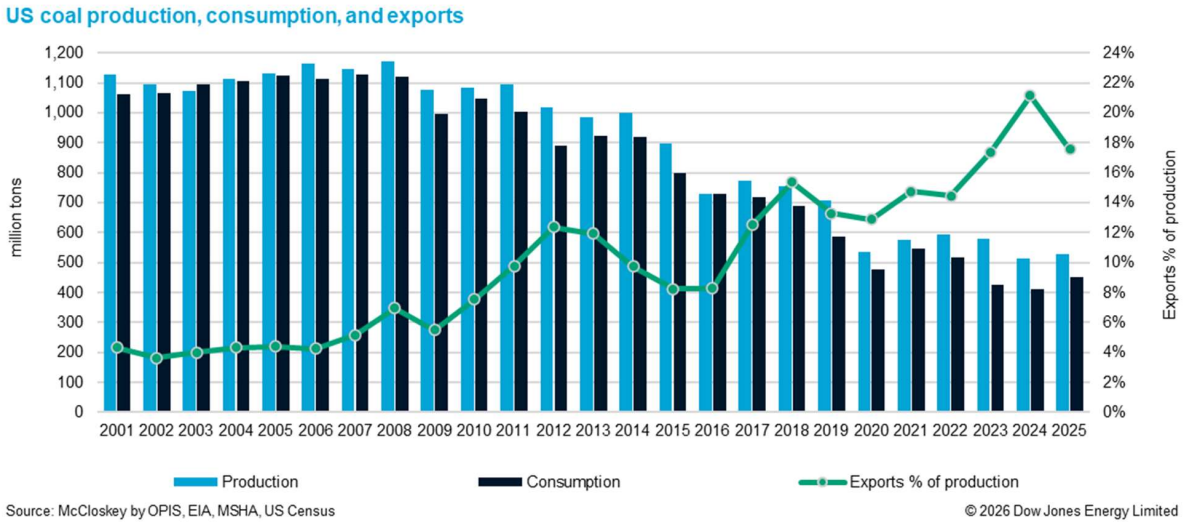


Historically, U.S. coal production has been closely aligned with domestic power generation. However, the importance of U.S. coal exports has steadily increased over the last decade and a half.

Domestic coal consumption reached a peak of 1.128 billion tons in 2007, while total production reached an annual high of 1.172 billion tons in 2008. Exports represented 7% of total domestic production by volume in 2008, rising to as high as 21% of production in 2024.

Exports of U.S. coal have become a critical revenue stream for U.S. producers. Maintaining robust export channels is now essential to sustaining baseload operational volumes for domestic mines, particularly in the Appalachian and Illinois basins. Furthermore, recognizing its strategic importance, both the DOE5 and DOI officially designated metallurgical coal as a "critical material" and "critical mineral" in 2025.

[4] https://www.eia.gov/totalenergy/data/flow-graphs/coal.php
[5] https://www.energy.gov/articles/energy-department-designates-coal-used-steelmaking-critical-material-strengthening-us



Economic benefits of U.S. coal exports

In 2025, U.S. coal exports generated an estimated $10.0 billion in revenue, serving as an economic engine for domestic mining communities, inland logistics networks, and coastal ports. Beyond direct revenue, the economic benefits cascade through several tiers of the U.S. economy.

The U.S. coal mining industry significantly contributes to the national economy through substantial job creation and a positive impact on the trade balance. The National Mining Association estimates that every direct mining jobs underpins an additional 2.2 indirect and induced jobs[6].

According to a 2021 National Mining Association study: "The coal sector of U.S. mining accounted for 291,943 total jobs, $22.0 billion in total labor income and $45.8 billion in total contribution to GDP. Annual wages and salaries in coal mining operations (excluding support activities and transportation) averaged approximately $93,700 in 2021.1 Overall, the total jobs attributed to coal mining were responsible for approximately 23 percent of U.S. mining's total employment, 27 percent of total labor income and 24 percent of mining's total contribution to GDP."7

With exports accounting for 18% of all U.S. coal production in 2025, this portion of the industry is responsible for roughly 36,200 U.S. jobs spanning mining, rail transport, barge operation, and port logistics. Of course, the importance of export sales exceeds even this figure, given that they help provide the revenue streams and production economies of scale that enable U.S. coal mines to remain viable and competitive. Expanding U.S. coal exports would create numerous jobs across the mining and transportation sector.

Economically, the U.S. generated $10 billion of foreign capital from coal exports in 2025, according to the U.S. Census Bureau.[8] Reliable and repeatable U.S. coal exports act as a significant counterbalance to the national trade deficit in physical goods.

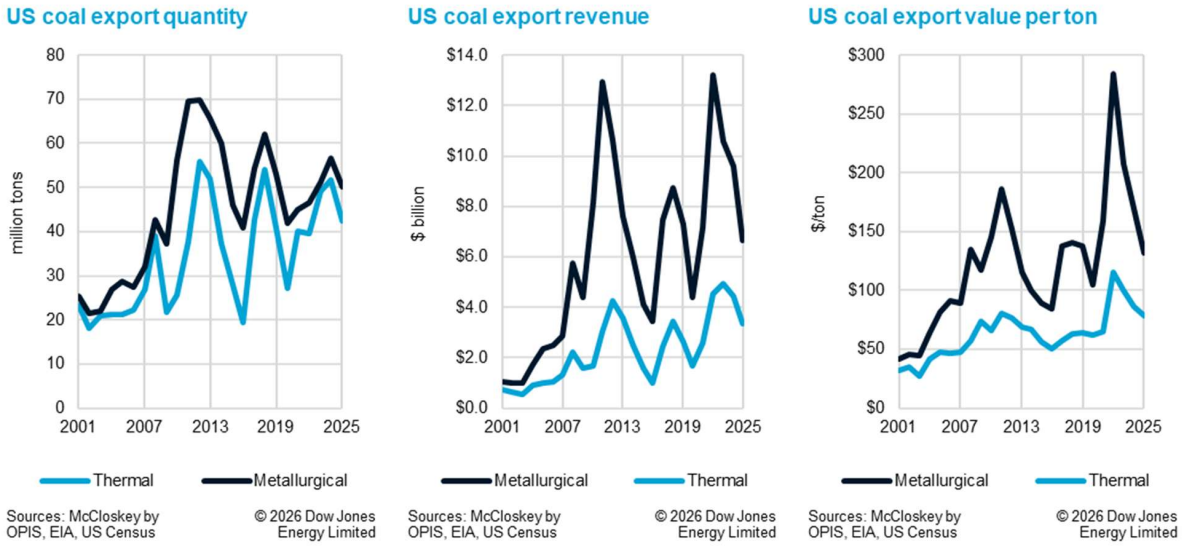
[6] https://nma.org/wp-content/uploads/2021/02/Economic-Contributions-of-Mining-in-2021.pdf
[7] https://nma.org/wp-content/uploads/2021/02/Economic-Contributions-of-Mining-in-2021.pdf
[8] NMA International Coal Review, February 2026 (data from U.S. Census Bureau)

The economic benefit of U.S. coal exports is weighted toward metallurgical coal, which is essential for global steel production. The United States is currently the second-largest seaborne exporter of metallurgical coal globally behind Australia and the third largest global exporter behind both Australia and Mongolia, accounting for 12% of global met coal exports in 2025. Export-bound metallurgical coal originates mostly from operations in West Virginia, Alabama, Virginia, and Pennsylvania. Smaller volumes come from Kentucky and Maryland.

Because it requires specific chemical properties, metallurgical coal trades at a significant premium compared to thermal coal used for electricity generation. In the fourth quarter of 2025, the average price of U.S. metallurgical coal exports – free on board (FOB) the vessel – was $130 per short ton. This revenue injects billions of dollars into regional economies, supports high-wage mining jobs, and sustains massive rail and port infrastructure networks.

While metallurgical coal drives revenue through high price premiums, thermal coal exports provide a critical, volume-based economic foundation. In 2025, the U.S. exported 52 million tons of thermal coal. Although valued lower than metallurgical coal, averaging roughly $86 per short ton – FOB the vessel – in 2025, the steady volume provides an essential backbone that supports the inland waterway barge operators and railroads. For regions like the Illinois Basin and Northern Appalachia, the international thermal market serves as a vital economic lifeline, behind the domestic power and industrial markets.

The charts below show that while export volumes between thermal and met coal are relatively close, metallurgical coal generates significantly more total revenue due to its price premium.



Even though metallurgical coal is typically priced at a premium to thermal in the export market, there are times when the value of thermal coal moves higher, and this allows for some metallurgical coal to be sold as a thermal product – so called "crossover coal." There are also cases where some grades of thermal coal can be used to blend with other metallurgical coal, which has proven useful during times when metallurgical coal is in short supply. This allows for a useful balancing mechanism when markets become distorted.

U.S. coal exports overview

Over the past 10 years (2016–2026), U.S. coal exports have experienced notable volatility given changes in international competition and geopolitical events including:

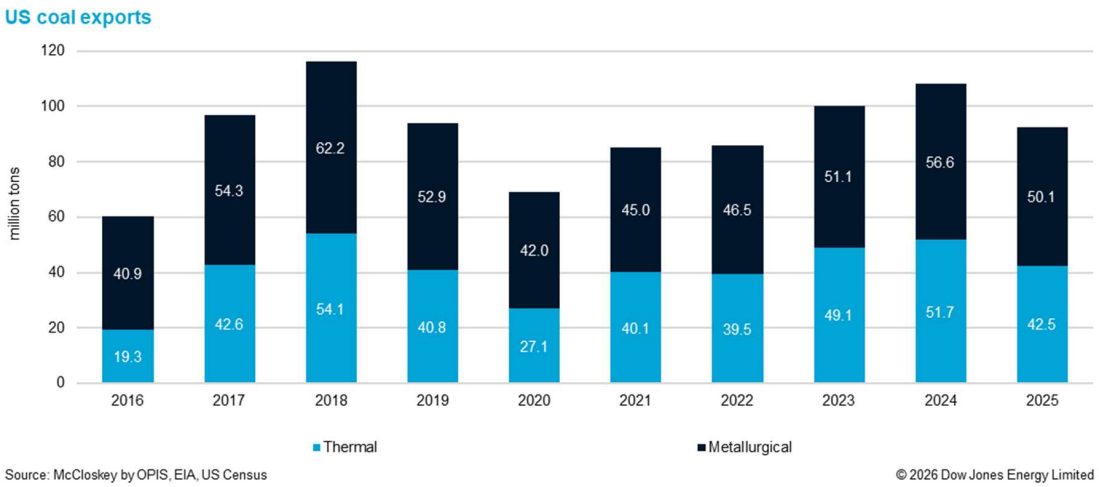
The 2010s peak & trough: Following a historic peak of 125.7 mst in 2012, exports dipped throughout the late 2010s due to global oversupply and aggressive pricing from competitors like Australia and Indonesia.

Post-pandemic rebound (2021-2024): The market experienced a strong post-pandemic rebound, peaking at 108 mst in 2024. This was driven by a combination of European energy security concerns following the Russian invasion of Ukraine, and strong Asian metallurgical demand led by China and India. Constrained global supply coupled with surging demand drove a sharp increase in international prices, allowing U.S. producers to capitalize on favorable market conditions.

2025 market correction: The U.S. market for export coal experienced a retrenchment in 2025 as exports declined to 93 mst (a drop of 15 mst) mostly attributed to geopolitics. China cut its purchases of U.S. coal by 92% in 2025 after Beijing imposed a 15% retaliatory tariff on U.S. coal in February 2025, followed by an additional 34% retaliation tariff in April 2025 in response to the escalating U.S. levies. Because of the displacement in China, the U.S. successfully increased sales to other Asian countries, including India (up 0.5 mst), Indonesia (up 1.2 mst), Vietnam (up 0.6 mst), and Malaysia (up 0.3 mst). Reversing the dramatic decline in Chinese purchases of U.S. coal by eliminating the Chinese tariffs would be a significant boost to U.S. coal exports.

Export composition (met vs. thermal): Over the last decade, metallurgical coal has remained the higher-volume and more consistent export product, historically providing a baseline of 40 to 60 mst annually, insulated somewhat by steady global steel demand. Conversely, thermal coal exports have exhibited much higher volatility. Thermal coal has acted as a "swing" variable in total export numbers, fluctuating based on international natural gas prices and global weather patterns, but that role could evolve over time as global market dynamics evolve.

This 10-year trend highlights that U.S. export volumes are highly sensitive to external factors, including global steel production rates, international shipping costs, and foreign trade policies.



U.S. Coal Exports by State of Origin, 2019-2024 (Thousand Short Tons)

State	2019	2020	2021	2022	2023 r/	2024 r/
East:						
Alabama	13,127	11,385	9,044	8,172	11,421	13,059
Illinois	8,580	6,958	9,637	8,578	13,526	14,005
Indiana	2,147	285	1,042	1,115	1,879	2,348
Kentucky	3,925	1,091	4,064	4,132	2,835	3,295
Eastern	3,083	1,064	3,237	3,461	2,835	3,287
Western	843	27	827	671	0	8
Maryland	232	313	53	133	0	20
Mississippi	0	0	0	0	0	0
Ohio	0	119	36	83	666	2,013
Pennsylvania	13,802	11,890	14,153	14,148	10,137	8,767
Bituminous	9,415	11,565	14,098	13,616	9,362	8,073
Anthracite	4,387	325	55	532	775	694
Tennessee	167	89	0	0	0	0
Virginia	7,958	7,052	6,935	7,332	8,757	9,468
West Virginia	33,018	23,099	30,191	33,068	30,072	44,097
Total East	**82,957**	**62,281**	**75,155**	**76,761**	**79,293**	**97,072**
West:						
Alaska	0	0	0	0	0	0
Arizona	0	0	0	0	0	0
Arkansas	0	0	0	0	0	0
Colorado	520	687	1,707	2,235	114	114
Louisiana	0	0	0	0	0	55
Missouri	0	0	0	0	0	0
Montana	4,769	4,264	5,151	2,972	15,928	9,521
New Mexico	0	0	0	0	0	1
North Dakota	0	0	0	0	0	0
Oklahoma	0	0	0	0	0	0
Texas	1,554	224	0	0	0	0
Utah	3,964	1,554	2,292	2,803	2,940	937
Washington	0	0	0	0	0	0
Wyoming	0	59	810	1,185	1,934	627
Total West	**10,807**	**6,788**	**9,960**	**9,195**	**20,916**	**11,255**
Total - U.S.	**93,764**	**69,068**	**85,115**	**85,956**	**100,208**	**108,327**
Regional Exports:						
Appalachian	71,385	55,010	63,650	66,397	63,888	80,711
Interior	13,127	7,494	11,506	10,364	15,405	16,416
Western	9,253	6,563	9,960	9,195	20,916	11,200

Source: U.S. Department of Energy / Energy Information Administration, Annual Coal Distribution Report 2024
Includes mine exports and exports by brokers and traders. Note - data for 2023 and 2024 were revised by EIA.
r/ revised.

Updated: Dec. 2025

U.S. coal export regions

U.S. coal exports originate from several distinct geological basins, each offering unique coal characteristics, targeting specific international markets, and relying on dedicated logistical corridors.

Northern Appalachia (NAPP): Produces high-heat thermal coal and metallurgical coal. Exports from this region are primarily routed through the Port of Baltimore for global exports. NAPP coal is also exported via the northern border to Canadian coke makers, in addition to smaller amounts of anthracite coal –the highest rank high heat "hard" coal - exported through Baltimore.

Central Appalachia (CAPP): Produces premium low-volatility metallurgical coal destined for Asian, South American, and European steelmakers. This region drives the bulk of its export volume through terminals in Hampton Roads, Virginia. CAPP exports roughly 60% of its coal production, highlighting again the critical role exports play in maintaining a strong and vital U.S. coal industry.

Southern Appalachia (SAPP): Centered in Alabama, this region produces high-quality metallurgical coal. SAPP exports are shipped through Gulf Coast facilities, primarily the Port of Mobile, Alabama, via both railroad and barge, which provides redundancy that has proven critical in the past.

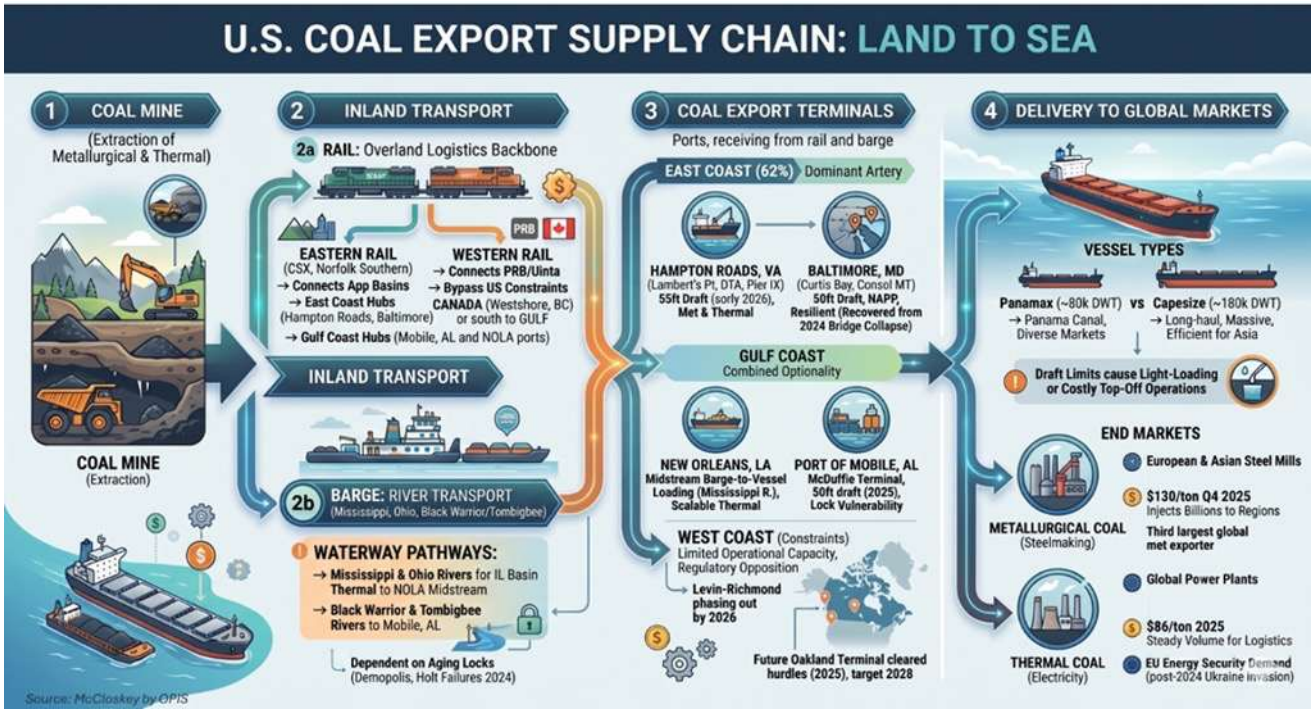
Illinois Basin (ILB): Produces high-heat thermal coal, utilizing inland rail and the Mississippi and Ohio River systems to barge coal southward to Gulf Coast transfer facilities.

Powder River Basin (PRB): Produces lower-sulfur thermal coal. While PRB coal is abundant, it faces significant rail freight costs to reach international seaborne markets. Despite this logistics obstacle, the thickness of the PRB coal seam and its low-cost mining profile create the opportunity for a considerable expansion of exports in a scenario in which strategically located new port capacity is added. Most basin (or basin-adjacent) coal for exports currently originates in Montana and is transported to Westshore Terminals in Delta (near Vancouver), British Columbia, Canada, where throughput capacity for U.S. coals is limited.

Uinta Basin (Utah and Colorado): Produces high-Btu bituminous thermal coal. Exports from this region are typically routed westward via long-haul rail to California ports (such as Stockton, Richmond, and Long Beach) to reach Asian markets. However, the options to ship coal off the U.S. West Coast face frequent opposition. In the case of the Levin-Richmond Terminal, the Terminal settled with the City of Richmond to cease transloading coal and petroleum coke after 2026. Recently, with the help of the Trump Administration, some U.S. coal has been shipped through the Port of Guaymas. Some Uinta Basin coal has also been exported through ports in Houston, New Orleans, Mobile, and Lake Superior, but these options do not provide an efficient pathway to the growth markets in Asia.

Transportation of U.S. coal for export

Moving bulk commodities from landlocked mines to international buyers requires a highly integrated, capital-intensive logistics network.



Railroads

Class I railroads are the backbone of the export supply chain, specifically the CSX and Norfolk Southern in the East, the BNSF and the Union Pacific in the West, and the CSX, Norfolk Southern, and the CN (former Illinois Central) to the Gulf coast.

Most of the Appalachian metallurgical coal reaches coastal terminals via rail. Railroad pricing, crew/equipment availability, and velocity directly affect the global competitiveness of U.S. coal given the various cost factors. Included in this mix are the direct costs of producing coal, costs for moving the coal from the mines to the ports, and port fees to cover loading the coal onto ocean vessels. There are other fees including taxes and royalties that also add to the total cost of placing coal into an ocean vessel. This is before the vessel chartering and operating costs to move the coal across the ocean.

In the East, the CSX and Norfolk Southern railway networks are critical to the export supply chain. These railroads maintain extensive rail networks throughout the Northern, Central, and Southern Appalachian coal basins. They provide direct, high-capacity routes connecting metallurgical and thermal coal producers to the export terminals in Hampton Roads, Virginia, Baltimore, Maryland, and Mobile, Alabama. The efficiency of these rail networks is a major factor in the global competitiveness of Appalachian coal.

In the West, the Union Pacific (UP) and BNSF Railway networks are similarly critical to the movement of coal originating from the PRB and the Uinta Basin. The BNSF rail network is frequently used to transport Montana coal to the Westshore Terminals in British Columbia.

The cost of moving coal from western U.S. mines to a port are significant and can be more than the cost of mining the coal. The longer distance this coal must travel as well as the lack of an efficient, Pacific deep-water port have been major constraints limiting U.S. coal exports of western coal. The cost of rail transportation

should also be explored in light of export economics. This includes an evaluation of taxes and regulatory burdens bore by the railroads and how these barriers may be reduced to improve the economics of exporting U.S. coal.

Historically, some PRB coal has been shipped through the Trigon Terminal in northwest British Columbia but given its remote location (an additional 1,000 rail miles *vs*. Westshore), it only becomes viable when coal prices are relatively high. Also, to take advantage of the shortest rail distance requires three different railroads: the BNSF, CPKC, and the CN. The port does have two distinct advantages: the capability of loading any size vessel, and excess capacity with room to expand.

Inland waterways

The U.S. inland waterway system provides a cost-effective and fuel-efficient supply chain, particularly for thermal coal originating in the interior of the country. The U.S. Army Corps of Engineers (USACE) maintains the commercially navigable river network spanning 12,000 miles of inland rivers and intercoastal channels with 237 lock chambers at 191 sites[9].

Coal has historically been the largest single commodity by volume moved on this system, leveraging the immense scale of barge transport. The USACE estimates a single standard river barge can carry the equivalent tonnage of roughly 15 to 16 rail cars, with a typical 15-barge tow moving 22,500 tons of cargo, equivalent to 225 rail cars or 870 tractor trailers.

The Mississippi/Ohio rivers serve as the central artery for waterborne coal exports.

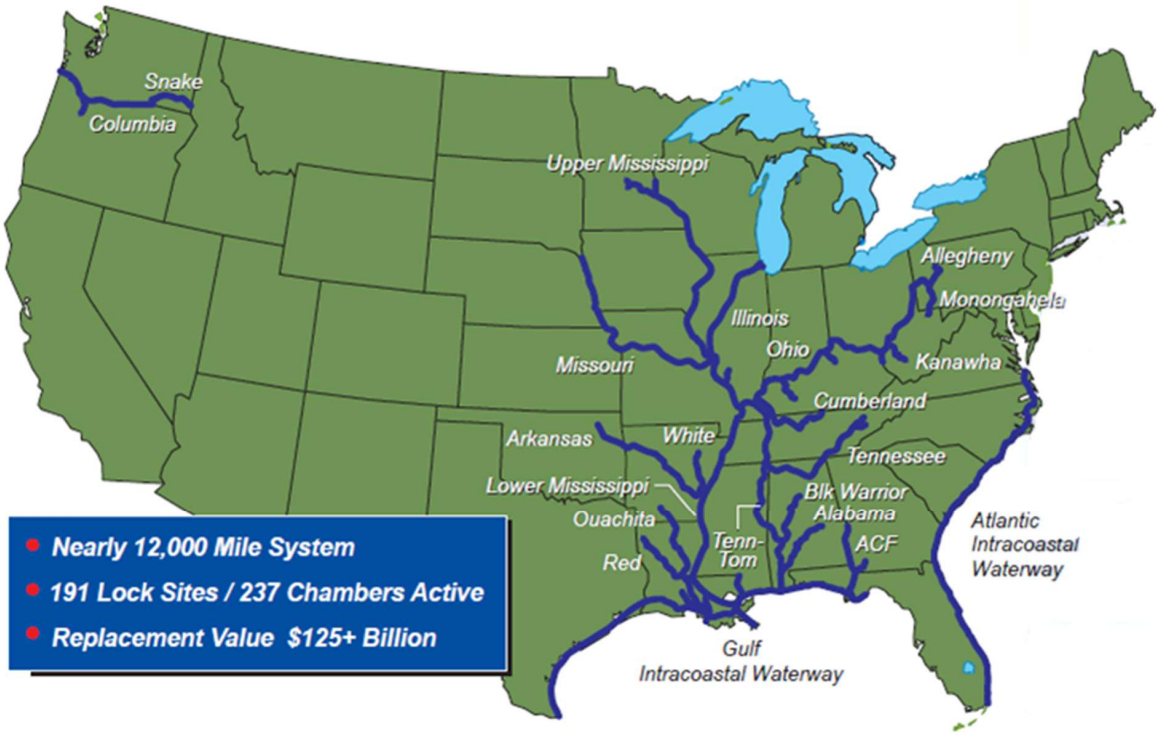
- Illinois Basin coal relies on barges as a low-cost, high-volume mode to transport thermal coal southward to Gulf Coast ports. Some Illinois Basin coal producers also deliver coal by rail to SunCoke's Convent Terminal north of New Orleans. The Mississippi River also provides options for ship loading, either through a land-based terminal or "midstreaming" directly from the barge to an ocean vessel.
- Central and Northern Appalachia coal regions can also access the Ohio River and its tributaries, providing an alternate route to East Coast export terminals. Given the greater distance and time required to barge coal from Appalachia to New Orleans, this is not considered the optimal pathway.

In the south, the Black Warrior and Tombigbee River systems provide a direct water route from the SAPP coal region near Birmingham to the Port of Mobile's McDuffie Coal Terminal.

While barge transport offers superior freight economics, its viability is entirely dependent on the continuous maintenance and operational reliability of aging lock and dam infrastructure along these specific river corridors. It is also affected by water levels in the river which can be constrained during periods of drought or flooding.

[9] https://www.iwr.usace.army.mil/Missions/Value-to-the-Nation/

U.S. Inland & Intracoastal Waterways



Source: U.S. Army Corps of Engineers

Ports

The export of U.S. coal is heavily concentrated among a select group of port districts. Over the last five years, the East Coast has served as the dominant artery, handling 62% of all U.S. coal exports. When parsed into specific customs districts, the five-year volume distribution highlights this concentration: Hampton Roads, Virginia, handles roughly 37% of exports, followed by Baltimore at 25%, New Orleans at 13%, Mobile at 12%, and West Coast ports accounting for approximately 8%.

East Coast

The East Coast is the primary gateway for the nation's metallurgical coal, relying on two main shipping hubs: Hampton Roads, Virginia, and Baltimore, Maryland. It is a critical avenue for coal exports which requires expanded capacity and investment to enhance the opportunity for coal exports.

Hampton Roads is the single largest coal export district in the United States. It utilizes three primary terminals: Norfolk Southern's Lambert's Point Pier in Norfolk (Pier 6,); the CSX-served Dominion Terminal Associates (owned by Alpha Metallurgical (65%) and Core Natural Resources (35%)); and the CSX-served Kinder Morgan Pier IX coal terminals located in Newport News, Virginia.

These facilities are best located to receive CAPP metallurgical coal via the extensive CSX and Norfolk Southern rail networks. As of early 2026, the competitive positioning of Hampton Roads was significantly improved by the completion of the Norfolk Harbor Deepening Project, which increased the channel depth to 55 feet, making it the deepest commercial shipping channel on the East Coast.

Total coal exports through Hampton Roads reached 33.8 mst in 2025, consisting of 85% metallurgical coal. Total shipments through the port dropped by 8.0 mt in 2025 which can be partially attributed to 2024 shipment levels being inflated by emergency rerouting during the Baltimore port outage due to the Francis Scott Key Bridge collapse.

Baltimore is the second-largest export hub, with two coal export terminals: CSX's Curtis Bay Terminal and the Consol Marine Terminal, operating at a standard 50-foot channel depth. Baltimore is the primary outlet for Northern Appalachian (NAPP) thermal and metallurgical coal.

Thermal coal exports through Baltimore reached record levels in 2025, recovering sharply from the 2024 bridge collapse, which temporarily blocked vessel access and forced shippers to delay or reroute tonnage. Total coal exports in 2025 reached 26.4 mst.

Gulf Coast

The Gulf Coast serves as both a primary outlet for ILB thermal coal and SAPP metallurgical coal. Operations here are uniquely tied to the inland waterway system, with two terminals capable of receiving coal by rail: Convent Marine in Louisiana and McDuffie Terminal in Alabama. If the growth in Gulf Coast port exports continues, they could exceed Baltimore in the future.

These Gulf ports have become more active given the growth of metallurgical coal exports from Southern Appalachia.

The New Orleans district includes several coal handling facilities along the Lower Mississippi River. The combined optionality of land-based facilities, such as the Convent Marine Terminal and United Bulk Terminal, alongside direct midstream barge-to-vessel loading on the Mississippi River, provides the New Orleans region with the greatest scalable capacity among U.S. ports. While this provides significant upside during high-demand cycles, low water levels can limit barge transport and seasonal weather events, such as hurricanes add operational risk for coal exporters. Further, competition for barge tows increase sharply during grain harvest season, which sometimes delays coal movements.

The Port of Mobile in Alabama operates the McDuffie Coal Terminal. This state-owned facility handles both metallurgical and thermal coal. Previously, the port handled thermal coal imports, primarily from Colombia, but has transitioned to exporting primarily metallurgical coal. Mobile's export capacity was enhanced by the 2025 dredging project that deepened its channel to 50 feet, bringing it to parity with New Orleans and Baltimore. Mobile's exports will exceed New Orleans in 2026. Mobile has proven to be an increasingly important alternative to other eastern ports, given it is also served by most of the Class I railroads – the exception being the Union Pacific.

Transporting coal to Mobile via the river system was disrupted in 2024 because of problems with two of the locks on the Black Warrior River. The 70-year-old Demopolis and Holt locks experienced structural failures that closed the river to barges from the coal mining region to the McDuffie Terminal for most of the year. Mines that had the capability to load coal on railcars were able to mostly avert cancelling shipments while river transportation was impaired, while metallurgical operations that did not have this capacity endured significant delays and costs. These outages highlight the critical importance of maintaining and systematically modernizing the inland waterways system to keep these critical transportation routes open and available.

Two terminals in Texas are capable of shipping coal to export markets. The Kinder Morgan Deepwater Terminal (located on the Houston Ship Channel) has an authorized draft of 40 feet. The Port of Corpus Christi's Dry Bulk terminal (Bulk Dock #2) has an authorized draft of 45 feet.

West Coast

The West Coast of the United States currently has very limited operational coal export capacity. Unlike the East and Gulf Coasts, which feature dedicated, high-volume bulk terminals, West Coast capacity has been constrained by a lack of an available large capacity bulk terminal with deep-water access. Previous attempts to develop such a port were thwarted by regional opposition mostly on environmental concerns.

California has two small coal export ports: Stockton/Levin-Richmond on San Francisco Bay and the Port of Long Beach.

The Port of Stockton is connected to San Francisco Bay by a 78-mile inland channel via the San Joaquin River. This route is draft-limited and bulk vessels are partially loaded in Stockton then "topped off" at the Levin-Richmond terminal on San Francisco Bay. Levin-Richmond is a small terminal that has been the focus of considerable opposition from Richmond's town council. Following a 2021 legal settlement, the terminal will cease handling coal by the end of 2026, leaving Stockton as the only bulk port presently able to load coal in the San Francisco Bay region – which means that such moves will be limited to small vessels or vessels not loaded to their full capacity, which will likely prove to be inefficient.

The Port of Long Beach continues to export small volumes of U.S. western coal, primarily from the Uinta Basin in Colorado and Utah. The Port of Long Beach features a natural 76-foot draft, the deepest of any U.S. coal berth. However, because of limited space, the terminal cannot load Capesize vessels. The coal terminal has limited covered ground storage, and it also handles other bulk commodities, namely petroleum coke. The port receives constant scrutiny – primarily related to concerns from environmental organizations who are concerned about the export of hydrocarbons – but has been an effective outlet for bituminous coal exports for decades.

The Pacific Northwest presents a large geographical and regulatory barrier for U.S. coal exports. Ports in Oregon and Washington, such as Portland and Longview, are constrained by the Columbia River's 43-foot draft but could still represent a significant and pivotal outlet for Panamax-sized vessels. However, intense state and local opposition has thus far halted new coal-related infrastructure development in the region, most notably demonstrated by the termination of the proposed 44-million-ton Millennium Bulk Terminal project in Washington in 2020.

Another promising project announced during the past 15 years was the Pacific Gateway Terminal at Cherry Point, Washington. This proposed deepwater terminal was to be built on a site between an oil refinery and an aluminum smelter, just to the north of Bellingham, Washington. The original plan was a port with an annual throughput capacity of 48 million metric tons per year. The project was cancelled following a series of permitting disputes with the USACE/Lummi Nation regarding fishing rights and opposition from Whatcom County

This site offers deep water access which would allow Capesize vessels to be loaded and single-line rail access from the PRB.

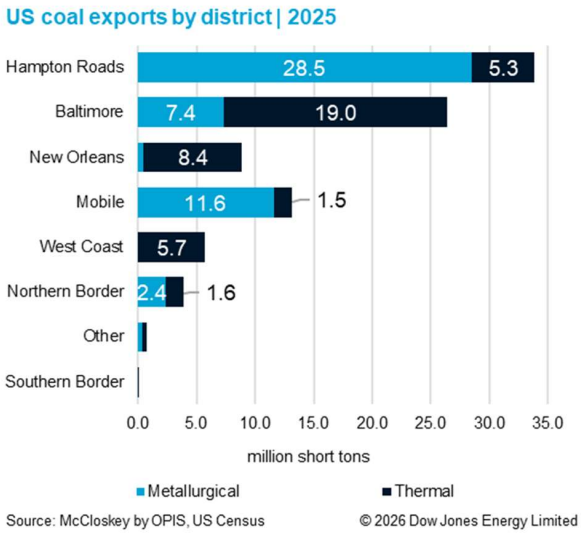
One of the adjacent industrial sites, ALCOA's Intalco Aluminum smelter, ceased operations in 2020. Demolition of the smelter as well as environmental remediation is underway, but the timeline is uncertain. Canadian-based AltaGas has signed an agreement to acquire the property to produce hydrogen, however given uncertainty surrounding the hydrogen markets and the federally funded Pacific Northwest Hydrogen Hub, those plans are on hold[10]. The Intalco site also appears to have potential for the siting of a high-volume port for PRB coal, given

[10] https://washingtonstatestandard.com/2026/03/06/demolition-of-last-northwest-aluminum-smelter-signals-end-of-an-industrial-era/

it is a brownfield site with rail access. The property also has a pier structure which could be modified for loading bulk carriers.

The bottleneck created by the lack of an efficient, high-volume deep-water port in the U.S. Pacific Northwest means that producers in western U.S. coal basins, such as the PRB and Uinta in CO and UT, are generally forced to bypass U.S. West Coast ports entirely. Instead, these producers rely on extensive rail networks to route their exports north to deep-water Canadian facilities, such as the Westshore Terminals in British Columbia, which boasts a draft of over 65 feet but has limited capacity available to U.S. shippers.

Looking forward, the domestic landscape may shift somewhat with the proposed Western Gateway Terminal. Having cleared major legal hurdles in late 2025, developers are targeting 2028 for initial operational cargo shipments. Until that projected, moderately sized facility comes online, the U.S. West Coast remains a highly constrained environment that forces western producers to rely heavily on cross-border logistics to reach the Asian market.



Another facility that is under consideration is in Mexico. Recently, a major PRB coal producer announced it is performing a "Proof of Concept" loading of PRB coal at the Port of Guaymas in the State of Sonora, Mexico. This port has been used previously for U.S. coal exports but not for PRB coal. While the rail haul from PRB to Guaymas is approximately 2,200 miles, it is an underutilized port that should be viewed as part of the complex solution to address the limited port capacity on North America's West Coast.

Guaymas is served by the Ferromex railroad via a route that requires interchange from the Union Pacific railroad. Union Pacific could explore ways to collaborate with Ferromex to streamline border crossings and administrative processes.

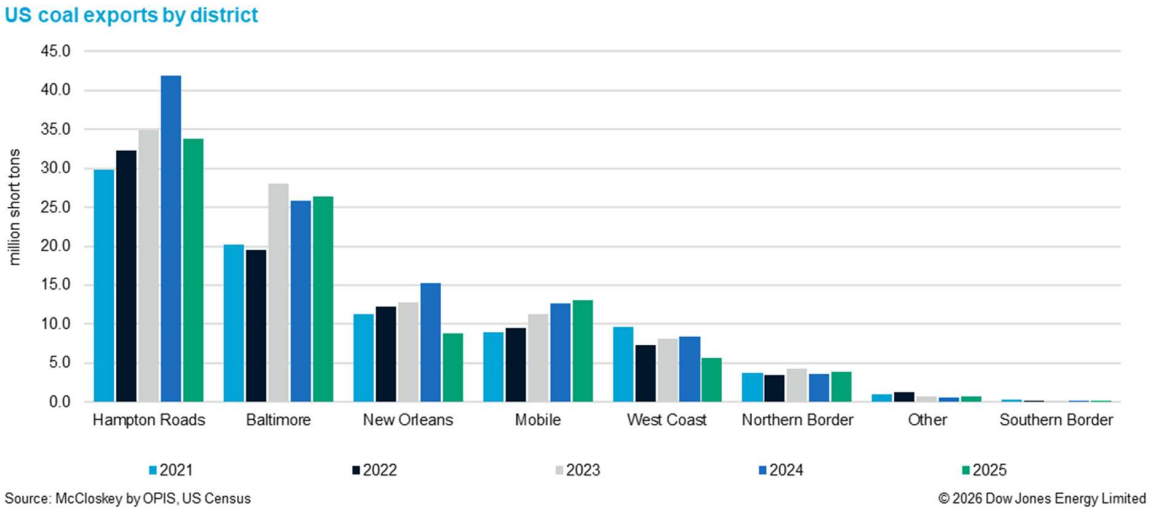
The Canadian port, Trigon Pacific Terminals in Prince Rupert, British Columbia, is another option, however it is disadvantaged by a longer rail distance for U.S. coal producers as mentioned previously.

Infrastructure resilience

The 2024 Baltimore bridge collapse: The reliance on a few key terminals highlights a vulnerability in the U.S. export chain. In March 2024, the collapse of the Francis Scott Key Bridge temporarily halted all shipping traffic into the Port of Baltimore—the nation's second-largest coal export hub (historically handling roughly 25% of all U.S. coal exports). The closure temporarily halted Northern Appalachian coal exports. Even then, the supply chain demonstrated a level of resilience; volumes were diverted to Hampton Roads, VA, and once the Baltimore channel reopened in late May 2024, terminals successfully cleared the backlog, with a normal cadence of shipping returning by June.

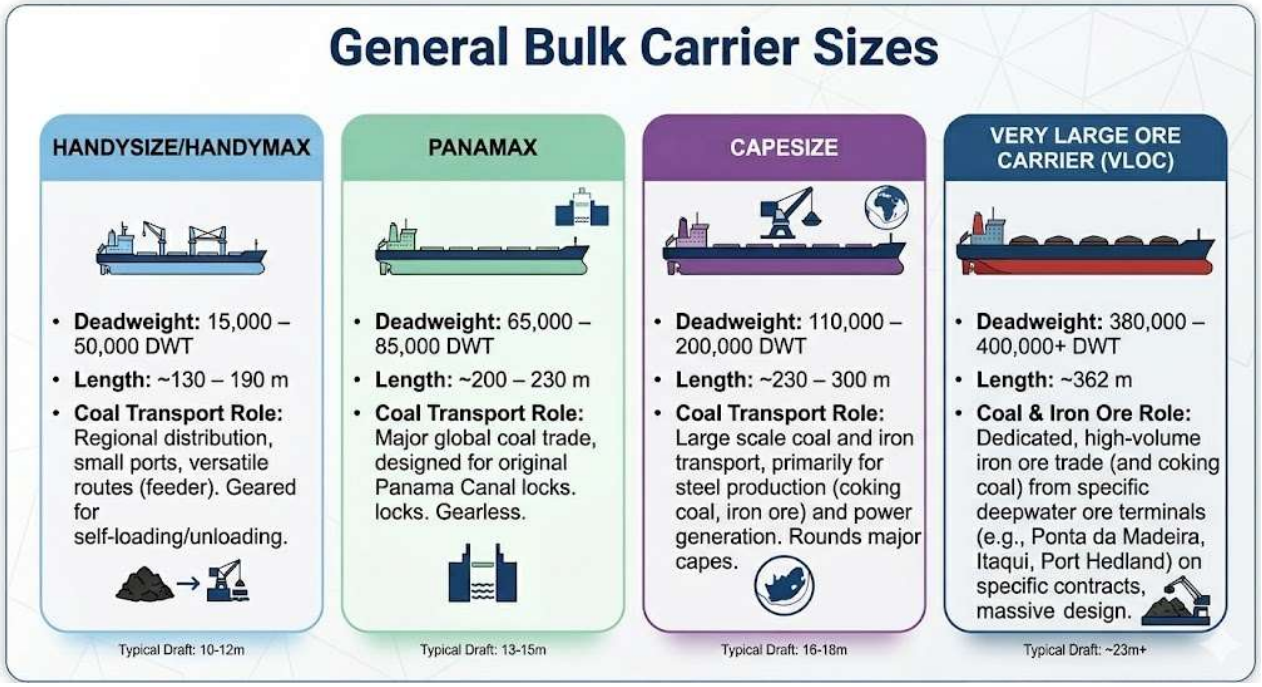
Waterway draft restrictions: Another crucial aspect of infrastructure resilience is the persistent challenge of waterway draft restrictions. Port channel depth is a major logistical constraint for U.S. coal exports. Major East Coast hubs like Baltimore and Norfolk, along with many Gulf Coast terminals, have historically maintained 50-foot channel depths, which is insufficient to fully load large Capesize vessels requiring 60 feet or more of

clearance. This structural limitation compels exporters to "light-load" ships or conduct costly mid-stream "top-off" operations in deeper offshore waters. The resulting inability to maximize vessel capacity severely limits economies of scale, increases the per-ton transportation cost, and places U.S. coal at a competitive disadvantage on long-haul Asian routes against rival nations (like Australia) that possess naturally deeper harbors. Increased funding for critical and strategic dredging activities will continue to be important in order to optimize coal export opportunities given that larger vessels can help counterbalance the disadvantage U.S. producers have in competing in markets on the other side of the world.



Vessels and shipping considerations

Once at port, coal is loaded onto specialized bulk carriers. The two primary vessel classes used are Panamax and larger Capesize vessels The following illustration shows the various sizes for ocean bulk carriers:



Source: McCloskey

Panamax vessels carrying between 65,000 and 80,000 deadweight tons are the workhorses of international coal trade due to their ability to traverse the Panama Canal, offering flexibility for reaching diverse global markets. In contrast, Capesize vessels are designed for massive long-haul shipments to Asia, carrying upwards of 150,000 deadweight tons to maximize efficiency.

Draft limits

Improving the capabilities of the major U.S. export ports is necessary to both maintain and grow coal exports. The Norfolk Harbor Deepening Project is testament to this effort as larger vessels have been able to reach Hampton Roads for loading.

These logistical advancements directly impact the economic viability of U.S. coal on the world stage. By facilitating the potential utilization of Cape-size vessels for long-haul routes, ports like the ones in Hampton Roads are better positioned to compete with nations like Australia, which benefit from naturally deep harbors.

Increased investment in deepening projects at other locations, such as the ongoing efforts to expand capacity in the Gulf via Mobile and Houston (currently 40-45 feet), will be critical for the long-term sustainability of the U.S. export sector. In particular, the deepening of the draft in Houston – which has strong rail interconnections – could open more economic opportunities for the movement of western coals into both Atlantic and Pacific Basin markets, even if Pacific movements via Gulf Coast ports are less optimal than might be afforded by a West Coast port.

Comparative port drafts

Port	Terminals	Draft	Comments
Norfolk, VA	Lambert's Point Pier 6 (NS), Pier IX (Kinder Morgan), DTA	55 ft	Deepest on East Coast. Dredging completed Feb 2026.
Baltimore, MD	Curtis Bay (CSX), Core Marine Terminal (CMT)	50 ft	Standard maintenance dredging (FY26) maintains 50ft depth.
Mobile, AL	McDuffie Coal Terminal	50 ft	Deepening from 45ft to 50ft completed in late 2025.
New Orleans, LA	United Bulk, International Marine, Convent Marine, Burnside	50 ft	River-stage dependent; typically maintained at 50ft.
Houston, TX	Houston Bulk Terminal (Kinder Morgan)	45 ft	Ongoing "Project 11" aims for 46.5ft.
Long Beach, CA	Oxbow/Metro Ports	76 ft	Deepest naturally occurring coal berth in the U.S.
Philadelphia, PA	Fairless Hills (Kinder Morgan)	45 ft	Lacks infrastructure
Savannah, GA	—	47 ft	Optimized for container traffic; lacks bulk coal terminals.
Charleston, SC	—	52 ft	Deep but dedicated to containerized cargo; lacks rail for coal.
Oakland, CA	—	50 ft	Terminal in planning; Administration funding announced.
Portland, OR	—	43 ft	Limited by Columbia River.
Seattle/Tacoma	—	65+ ft	Western U.S. coal often routes through deep Canadian terminals.
Longview, WA	—	43 ft	Millennium Bulk Terminal project terminated in 2021-2022.

Midstream operations on the Lower Mississippi River

On the Gulf Coast, particularly along the Lower Mississippi River near New Orleans, the industry utilizes "midstream" vessel loading. Unlike traditional land-based piers, midstream operations involve anchoring an ocean-going vessel to permanent buoys in the river (such as those located between New Orleans and Baton

Rouge). Direct barge-to-ship transfer uses floating cranes to move coal directly from river barges into the holds of the ocean vessel.

Midstream operations can also be used as a "top-off" strategy to supplement Capesize vessels that were only partially loaded at shallower terminals. By moving the vessel to deep-water anchorages, exporters can add thousands of tons to maximize the ship's capacity before it departs for its destination. The midstreaming approach offers some operational advantages, including flexibility and lower infrastructure overhead compared to fixed docks.

Top-off options are, however, restricted because of the Merchant Marine Act of 1920, better known as the "Jones Act." This law requires all vessels moving goods between American points to be U.S.-built, U.S.-owned, registered under the U.S. flag, and crewed by American citizens. Given there are few U.S. vessels that can meet the Jones Act requirements, any top-off activity must take place outside of U.S. waterway jurisdiction, adding time and expense.

The Trump Administration has suspended the Jones Act[11], more to address coastwise oil shipments, but it is not yet a permanent solution.

Comparative distance of U.S. ports to major end-users

The U.S. is farther away from Asian growth markets than most other coal-producing regions. Indonesia has a distinct geographical advantage but, as noted later in this report, Indonesia may be limited by its domestic needs and aggressive regulatory environment which could make it difficult to meaningfully increase its export volume.

The table below shows ocean voyage distance and days from numerous ports including U.S. East and Gulf coast ports. This table does not show a specific line for a port located on the Washington coast, but sailing distances would be very similar to the Canadian/Westshore terminal.

[11] https://content.govdelivery.com/accounts/USDHSCBP/bulletins/41471dc

Shipping Distances and Times

Origin Country/Port	Destination Country/Port (Nautical Miles / Days)			
	Japan/ Tokyo	S. Korea/ Inchon	China/ Guangzhou	India/ Mumbai
Australia/Newcastle	4,284/14.9	4,752/16.5	4,552/15.7	6,072/21.1
Canada/Westshore	4,272/14.8	5,027/17.5	5,839/20.5	9,513/33.0
Colombia/Barranquilla (via CGH)	14,449/50.2	14,103/14.9	13,086/45.5	10,685/37.1
Colombia/Barranquilla (via PC)	8,076/28.0	8,865/30.8	9,656/33.5	13,307/46.2
Indonesia/Balikpapan	2,657/9.2	2,493/8.7	1,736/6.0	3,463/12.0
Mexico/Guaymas	5,935/20.6	6,722/23.3	7,520/26.1	11,152/38.7
South Africa/Richards Bay	7,679/26.7	5,630/19.5	6,446/22.9	8,309/35.1
US/Long Beach (via CGH)	15,637/54.3	15,291/53.1	14,274/49.6	11,873/41.2
US/New Orleans (via PC)	9,141/31.8	9,930/34.5	10,721/37.2	14,372/49.9
US/San Francisco-Oakland	4,559/15.8	5,322/18.5	6,127/21.3	9,791/34.0

PC = Panama Canal
CGH = Cape of Good Hope
Days Calculated at Average Speed of 12 knots

Source: McCloskey

Secondary ports and the infrastructure gap

As shown in the table above, the concentration of coal exports in primary ports is largely due to the infrastructure gap at secondary ports. Locations such as Houston and Corpus Christi are restricted by 45-foot drafts, which limits them to Panamax-sized vessels or significantly under-loaded Capesize ships. Similarly, West Coast ports like Portland and Longview face a barrier of shallow river drafts, reducing somewhat their advantages relative to deeper Pacific terminals, although it's important to note that many Asian buyers are restricted to – or simply prefer – Panamax-sized vessels and loads. The continued logistical improvements at primary hubs directly impact the economic viability of U.S. coal, allowing the U.S. to better compete with nations like Australia that benefit from naturally deeper harbors and strategic locations closer to the world's fastest growing markets for coal.

301 shipping fees

The Administration's Section 301 maritime actions are intended to address China's unfair shipbuilding practices, but as currently contemplated come at the expense of U.S. coal exporters. Coal producers rely almost entirely on internationally available bulk vessels to reach overseas markets. The original proposal to impose port fees on Chinese-built vessels would have significantly increased transportation costs, reduced vessel availability, and undermined the competitiveness of U.S. coal exports already disadvantaged by long transit times. The one-year delay in implementing these fees, currently set to expire in November, provided important relief while recognizing that commercially viable alternatives to Chinese owned or built vessels do not currently exist for many bulk commodity exporters. There is growing concern that new proposals, including a universal fee on foreign-built commercial vessels, could recreate many of the same challenges.

U.S. coal and its position in the global seaborne market

Global supply and demand outlook

The prospects for both U.S. thermal coal and metallurgical coal are vast and have improved considerably in recent years. As noted previously, the U.S. has the largest coal reserves globally. Moreover, the U.S. has seven times the proven coal reserves of Indonesia, yet Indonesia exports five times the amount of coal that the U.S. does each year.

Indonesia has the geographic advantage to serve markets in Asia which is home to 85% of global seaborne demand, but Indonesia has its own requirements, and it may be constrained to meet its own future needs.

This is where U.S. coal steps in. Given its abundance and quality characteristics, the U.S. has the opportunity to help these economies to grow. With more than 1,200 units of new coal generation under development around the world, especially in Asia, there is a compelling reason to support the U.S. coal industry to address the imbalance in global demand.

In thermal coal, demand expectations are primarily driven by strong power demand growth expectations. And the metallurgical coal market is forecast looks set to be structurally tight in coming years, meaning that whatever U.S. coal can be mined and exported should both find a home and supportive pricing.

Thermal coal

Global power demand

Most global thermal coal consumption is for power generation, with industrial applications (such as cement/lime, fertilizers, brickmaking, and paper manufacture) second, albeit still a significant and potentially growing market for high-heat-content U.S. coals. Because of the boom in data centers (partly a function of the current AI boom), electric vehicles, and an increase in the electrification of industry, power demand growth is expected to be strong over the next 25 years. Globally, power demand is projected to increase "more than 3.5% per year" according to the International Energy Agency[12]. This could buoy coal demand still further in the years ahead.

McCloskey estimates that global power demand was 28,000 TWh in 2025 and will be 46,000 TWh by 2050; the International Energy Agency expects 54,000 TWh by 2050; and the U.S. Energy Information Administration expects 43,000 TWh.

Thermal coal import demand

Global thermal coal import demand is driven by individual countries' electrical generation sourcing strategies. Expectations for thermal coal demand have greatly strengthened.

Global power markets were trending towards lower carbon generation technologies such as renewables and hydro at the expense of fossil fuels. Now, however, soaring power demand growth expectations are forcing most power markets globally to adopt an "all of the above" strategy for their generation technologies.

[12] https://www.iea.org/news/global-electricity-demand-is-set-to-grow-strongly-to-2030-underscoring-need-for-investments-in-grids-and-flexibility

The industrial sector also looks positive for U.S. coal exports. Much potential exists for U.S. coal that can be exported, including higher heating value coal from NAPP and ILB. Industrial users tend to place the highest value on energy content and, as a result, U.S. high sulfur coal from these regions has established a strong foothold in India and North Africa in industries such as cement and brickmaking. U.S. coal is replacing higher-sulfur, higher-priced petroleum coke in many cases. Highlighting the unique quality and energy density of certain U.S. coals, NAPP coal has been going as far afield as Indonesia, the world's largest seaborne thermal coal producer, where it is used in nickel smelting.

Some forecasts expect thermal coal imports globally to remain close to current levels until the early 2030s, followed by a slow decline thereafter. However, there are many scenarios where imports could remain stronger for longer and even climb markedly – and many power markets will likely extend coal use beyond current plans owing to power supply tightness. Regardless, the seaborne thermal coal market is large, offering significant opportunities for U.S. coals in a scenario in which existing barriers are reduced or eliminated.

Thermal coal export supply

Indonesia is by far the world's largest exporter of seaborne thermal coal, supplying around half of the world's seaborne exports. Australia is the second largest, providing another 20%, with the remaining 30% being delivered from Russia, South Africa, Colombia, and the United States. While very impactful for U.S. suppliers, U.S. exports are relatively small in the seaborne market – generally amounting to 4 or 5% of total trade – again underscoring the vast opportunity available for future growth and increased market penetration.

McCloskey's base case expectation is that U.S. thermal coal exports will decline slightly over the next 25 years absent steps to enhance U.S. competitiveness. The PRB, in particular, offers significant potential for future growth if existing barriers are addressed.

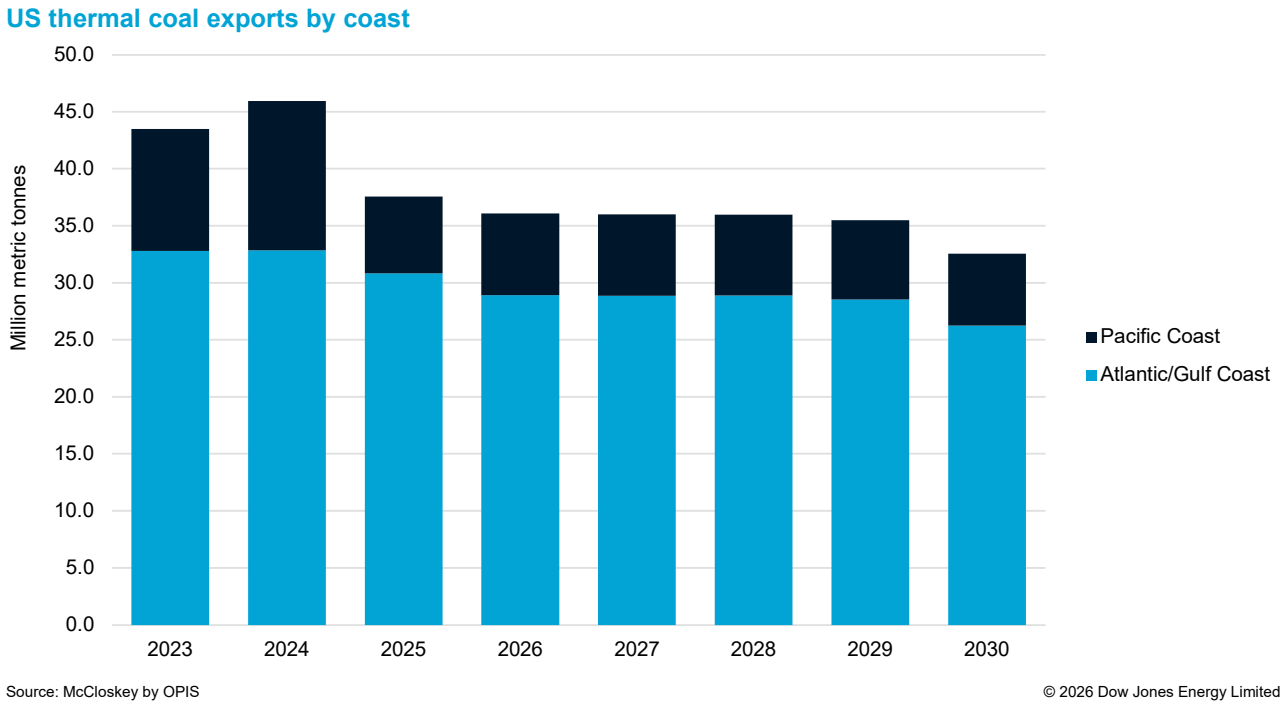
U.S. thermal coal flows

The largest portion of U.S. thermal coal goes to India, where it is primarily used in cement production and brickmaking – two uses that place considerable value on the high heating values and do not discount the higher sulfur content of the coal (and in the case of brickmaking value it).

The next largest destination is North Africa – primarily Morocco and Egypt. In Morocco the coal is mainly used in power generation, while cement is the importing industry in Egypt.

Once the largest destination, Europe-bound coal exports now only comprise a small portion of U.S. thermal coal exports.

Most U.S. thermal coal exports exit through the Atlantic coast of the U.S. This is primarily a function of the large port capacity on that coast, compared to the small capacity on the West Coast.



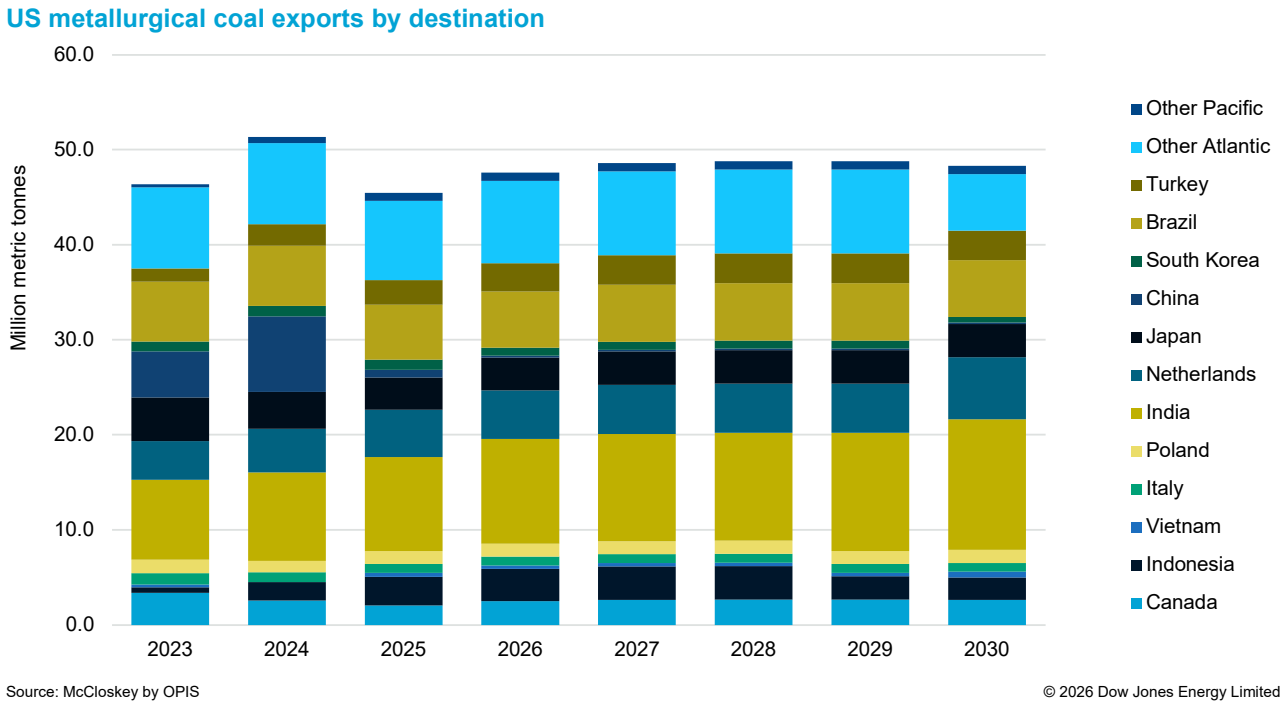
Metallurgical coal

Global metallurgical coal import demand is expected to stay strong. Furthermore, the "center of gravity" of import demand is moving towards the Indian Ocean. This in turn will help U.S. exports that compete better into India than in some more distant markets. As we discuss in the competitiveness section, below, met coal is likely to be structurally tight in the 2030s, meaning there is significant growth potential for U.S. coal if barriers can be eliminated.

Indian and Southeast Asian demand are expected to grow significantly over the next decade. Plans for new blast furnace capacity in Malaysia, Vietnam, Indonesia, and the rest of Southeast Asia – in aggregate – rival India; Vietnam and Malaysia added 12 mm tons of new blast furnace capacity in 2025 alone. Demand in most European blast furnace regions is projected to slowly decline.

U.S. met coal flows

India is the biggest destination for U.S. met coal, amounting around 30% of exports, and is expected to grow in the longer term. Europe collectively is the second largest destination with Brazil a close third. Japan is a sizeable destination, amounting to around 10% of U.S. exports.



Opportunities to expand U.S. coal exports

Opportunities for U.S. coal exports have recently strengthened.

For thermal coal, Indonesia has been indicating that it desires to cap its exports. Indonesia was a major oil exporter and OPEC member in the later part of the last century, depleted much of its supply, and now is only able to serve around 60% of its domestic need – meaning it now is a significant oil importer. Indonesia has no interest in repeating history with its coal reserves. Driven by strong Chinese import demand, Indonesian exports have boomed. And now the Indonesian government is focused on two things: (1) ensuring that there is adequate coal for its domestic market, not only today but in 2050 and 2060, and (2) ensuring an adequate return on its export sales.

With the former (ensuring availability for its domestic needs) in mind, Indonesia has recently been making changes to its "Rencana Kerja dan Anggaran Biaya" (RKAB) system of quotas[13] that define how much producers can produce. Quotas have been shortened from 3-years to 1-year, and for most producers quotas have been significantly reduced. Indonesia is also in the process of raising the amount of coal that producers are forced to sell to the domestic market for a fixed and discounted price from the current 25% to 30%.

With the aim of ensuring an adequate return in mind, Indonesia has been steadily raising royalties, and has announced both additional upcoming royalty increases, along with a new export levy.

These policy changes have recently reached a climax, with Indonesian President Probowo Subianto on May 20, 2026, announcing nationalization of coal exports in Indonesia. Citing improved administrative oversight, eliminating under-invoicing (a way to cheat on royalties), and stronger national control over pricing and

[13] https://minerba.esdm.go.id/erkab/

destination market, the move is also aimed at ensuring coal availability in future decades. Indonesia will create a government entity that will do all of the country's coal selling, with transfer of data starting June 1, and full government control starting September 1. While the timeline could slip, the strong support of the Indonesian president increases the likelihood that it will ultimately move forward.

Tellingly, Prabowo stated: "We will determine our selling price and if they do not want to buy, so be it. It's okay if they do not want to buy it, we'll leave it in the ground for our future generations." The message is clear that Indonesian availability will hinge on higher prices – opening a window of opportunity for competitors.

This development could create meaningful upside for U.S. coals – particularly those from the PRB. Indonesian coals typically have lower heat content (see following Figure) – with about three quarters of Indonesian supply being 5,000 kcal/kg, net-as-received (NAR) or lower. With Southern PRB 8,800 btu/lb, gross-as-received (GAR) coal equating to the top end of this range (~4,720 kcal/kg, NAR), PRB coal is generally attractive to Asian utility buyers as an Indonesian alternative. Importantly, it is also much closer in quality to what Indonesian buyers are used to consuming when compared to coals from Australia, South Africa, and Colombia. And Northern PRB coal has even higher energy content. PRB coal already has a foothold in northern Asia but could potentially expand this footprint to other parts of Asia – particularly the still growing Southeast Asian market.

PRB has one other advantage relative to Indonesian coal. Where PRB coal has maintained consistent qualities for decades, owing to its massive and consistent coal seams, Indonesian qualities have been declining. McCloskey estimates that Indonesia's individual mines usually lose around 10-15 kcal/kg, NAR per year. In addition, the multiple seams being mined in Indonesia – coupled with challenging weather conditions including heavy rainfall – lead to highly inconsistent coal qualities. In comparison, the PRB has more consistent operating conditions and very consistent and reliable product qualities.

To quantify the potential market size, Indonesia is currently pushing for quota reductions of 100mt or more. Even if the government ends up relaxing that level of cut, the market opportunity for PRB coal could be substantial.

Lastly, with Indonesia steadily raising its Domestic Market Obligation, it is likely to be raised again in the future, further limiting Indonesian exports.

Indonesia has been exporting more than 500mt per year recently, so even a small reduction in those exports would create a significant opportunity for a new port on the West Coast of the U.S.

This creates a real and unique opportunity for PRB coal into Asian markets. This sentiment has been echoed by utilities in Japan and South Korea. However, the ability for PRB to reach this market is severely constrained by the absence of U.S. West Coast terminal capacity. If a new deepwater terminal were to be built on the West Coast, PRB coal exports could expand dramatically.

For metallurgical coal, the market is moving towards structural tightness, with McCloskey forecasting that it will be short ~50mt by 2035 in a market that is around 350mt at present. This suggests that U.S. met coal exports have the potential to expand significantly. Facilitating new production via governmental support mechanisms and the removal of friction-related costs can help maximize this growth potential.

Feedback from customers

McCloskey recently surveyed companies in Asia about the steps the U.S. government could potentially take to assist them in importing U.S. coal. Respondents included:

- Multiple utility companies in Japan
- A utility company in Korea
- A cement maker in Thailand
- A utility in Thailand
- A utility in the Philippines
- A utility in Malaysia

Almost all these companies said "more capacity to export coal through the West Coast" is the key to unlocking the opportunity for U.S. western coals in Asian growth markets. Many cited issues with getting throughput capacity in British Columbia. These potential customers had a favorable view of the coal given its generally higher energy content than Indonesian coal. Furthermore, with Indonesia raising both royalties and adding an export levy, the ability of PRB to compete against Indonesia into APAC will only improve. Coal from the Rocky Mountains region, which is generally more energy dense, has significant upside, too.

Competitiveness of U.S. coal

As previously noted, the competitiveness of U.S. coal in the export market is driven by two primary factors: (1) quality, and (2) cost.

U.S. thermal coal qualities and how they affect competitiveness

On the coal quality side, U.S. coal encompasses a range of energy contents, from exceptionally high Btu NAPP coal, in Pennsylvania and northern West Virginia, to subbituminous coal from the PRB, mostly in Wyoming. The U.S. produces lignite coal too, which is the lowest quality of coal, but even though lignite is exported from Indonesia to Southeast Asia and India, lignite is not an export coal for the U.S.

The high energy content of eastern U.S. coal – primarily Northern and Central Appalachian coal but also Illinois Basin coal – ranks among the highest in the world. This makes it very attractive to both power consumers and industrial users.

The high sulfur content of Northern Appalachian and Illinois Basin coal – generally a function of high sulfur seawater (vs low sulfur fresh water) flooding the depositional environment of the coal as it was originally formed – presents a challenge for its use in the power sector. While many coal-fired power plants are equipped with flue-gas desulfurization (FGD) and can "scrub" the sulfur from the coal, some jurisdictions (primarily Europe) do not allow the use of high sulfur coal. To counter this, U.S. higher sulfur coal is generally sold at a discount into the European market. Still, these very high energy content coals are in significant demand around the world.

Industrial users generally do not have an issue with high sulfur content.

Other chemical aspects generally do not have a meaningful impact on the coal's competitiveness, though the high chlorine content of Illinois Basin coal can be a challenge for boilers and may need management, including blending.

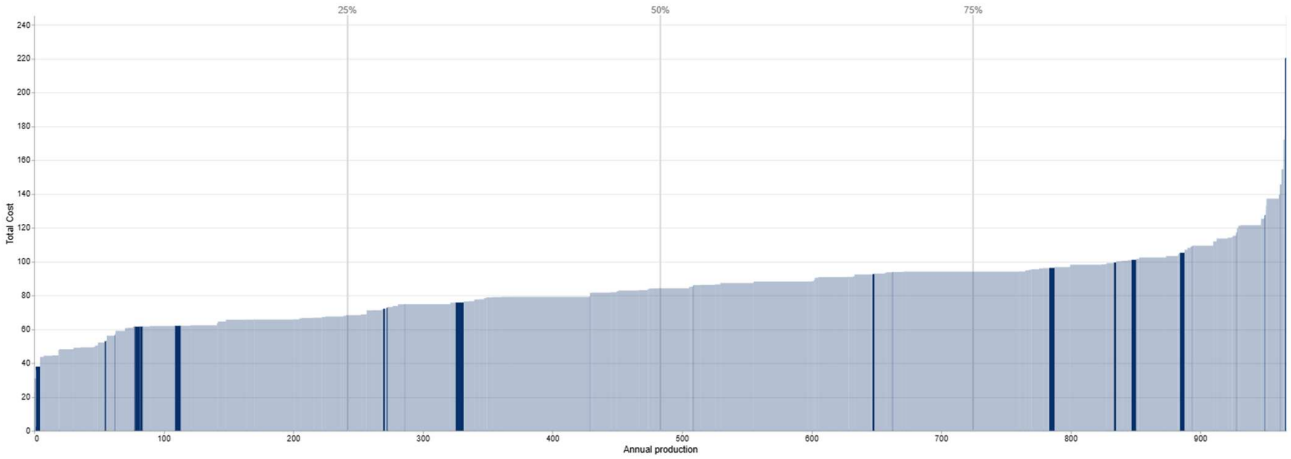
Coal Basin	Energy Content	Sulfur Content	Other factors	Export port/coast
Northern Appalachian thermal coal	Extremely high	High	High energy content makes it very attractive to industrial users who have no issue with sulfur content.	Baltimore, MD/Atlantic
Central Appalachian coal	High	Low	Limited current production and exports.	Hampton Roads, VA/Atlantic Baltimore, MD/Atlantic
Illinois Basin thermal coal	High	High	High chlorine content and low ash fusion temperature can create production challenges	New Orleans, LA/Atlantic
Powder River Basin thermal coal	Medium	Low	Roughly equivalent to higher energy content Indonesian thermal coal	Delta, BC, Canada/Pacific
Rocky Mountains thermal coal	High	Low-medium		San Francisco and Los Angeles areas, CA/Pacific
Northern Appalachian Anthracite	Very high	Low	U.S. anthracites are able to come in a range of carbon contents, allowing up to high- and ultra-high grade anthracite. They can also be produced in all size classes that are used by anthracite buyers.	Baltimore, MD/Atlantic
Metallurgical coal	High	Mostly low	Regarded as good quality.	Baltimore, MD/Atlantic Hampton Roads, VA/Atlantic Mobile, AL/Atlantic

Cost competitiveness of U.S. thermal coal

The U.S. has some of the lowest mining costs in the world in both the West, the Interior, and select areas of the East.

The cost of coal at an FOB port includes the coal, transportation, and port fees plus any applicable taxes and royalties. The FOB port costs of U.S. coal are highlighted in blue in the following chart. Note that this chart shows costs of coal that *are* exported, not the cost of coal that *could* be exported but currently isn't.

Global thermal coal cost curve



Thermal coal cost curve with U.S. mines highlighted in blue. Source: MineSpans by McCloskey and McKinsey & Co.

The biggest challenge with U.S. delivered coal costs isn't the mining cost, it's logistics – including the fact that U.S. coals are typically a longer distance from growth markets. Historically the U.S. was a key supplier for European power markets, but European coal demand has declined. Further, the ability for some European utilities to use high sulfur coal has also suffered from the absence of Russian coal as a blend pair – something that mitigated the high sulfur content of U.S. coal prior to the Russia-Ukraine War.

Today, the bulk of global coal demand is in the Asia-Pacific (APAC) region, and the U.S. (along with nearby coal exporting neighbor Colombia) faces cost barriers competing effectively in these distant markets. For eastern U.S. coal, this is a function of distance and for some ports also maximum vessel size. For western U.S. coal (PRB and Rockies), the overland distance to reach an ocean port is also an issue.

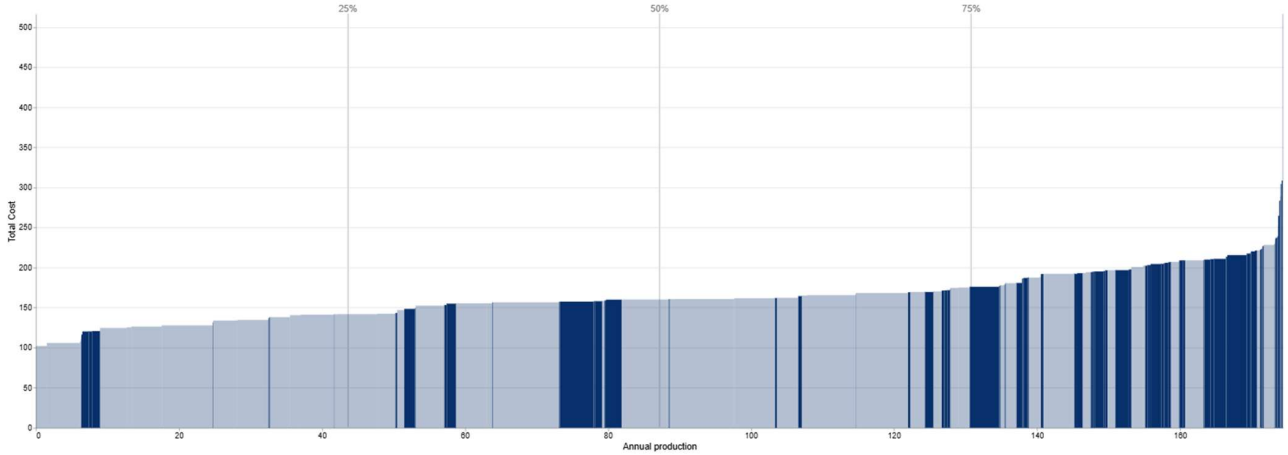
Competitiveness of U.S. metallurgical coal

U.S. metallurgical coal has a wide spread of FOB Port costs, as the following figure shows, ranging from low cost (mostly) longwall mines to higher cost continuous miner or surface strip operations. And costs skew towards the latter higher cost operations. This creates issues in times of weak markets.

On a delivered basis, the competitiveness of U.S. coals depends on which markets are being targeted. Into reasonably local countries/regions like Europe and Brazil, delivered costs tend to be competitive. To India, U.S. coal has a $20 to $25 per ton – and at times higher – freight disadvantage relative to Australian coal.

The key to enhancing competitiveness in the most distant markets – as indicated – hinges on the removal of the barriers we have discussed previously, including addressing freight costs, including taxes and fees and investing in more advanced, efficient port infrastructure.

Global hard coking coal cost curve



Global hard coking coal cost curve, with U.S. mines highlighted. Source: MineSpans by McCloskey and McKinsey & Co.

Opportunities for – and barriers to – expanded U.S. coal exports

Summary of key findings

U.S. coal exports are essential to the well-being of numerous communities that rely on coal mining, transportation, and maritime activities; driving value for the U.S. economy as a whole; and as a constructive way for the U.S. to advance its economic interests globally.

U.S. coal competes globally in a dynamic marketplace that includes coal producers, coal production outside the U.S. as well as other forms of energy used to produce power, steel, cement, and a host of other critical products.

Embedded in U.S. mining costs are numerous regulatory and compliance-related expenses that diminish the competitive position of U.S. coal. Indeed, the U.S. coal industry is arguably one of the most regulated industries in the world. Some of these are not direct costs, but rather cumbersome regulatory hurdles that increase costs and reduce the competitiveness of U.S. coal producers on the global stage.

Some of the burdens include leasing/permitting coal mines, bonding requirements, litigation delays, and obtaining rights-of-way for transportation.

Federal lands issues

The volume of recoverable coal controlled by the U.S. government is estimated to exceed 80 billion tons, which is roughly one third of the known coal reserves in the U.S. According to the U.S. Geological Survey (USGS), the federal government is considered the single largest owner of coal resources in the world, with the largest U.S. owned coal located in the PRB in Wyoming and Montana.

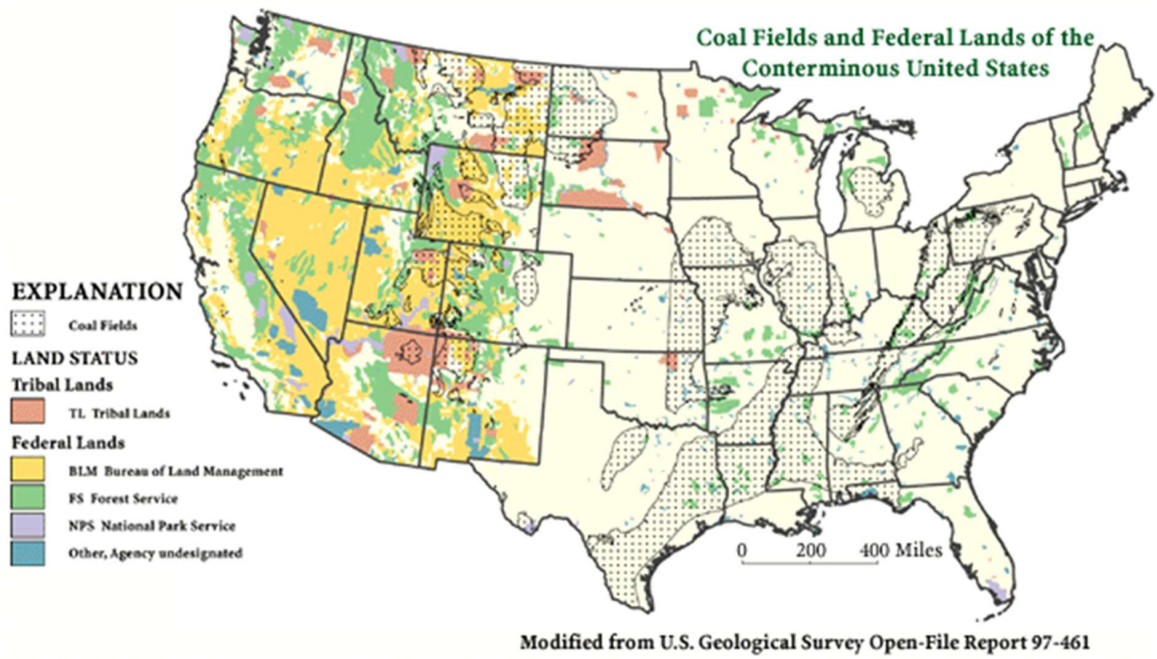


Figure 2. Coal fields are found throughout the United States. Large portions of the coal fields in the Western States occur on Federally owned lands. This map is the first digital compilation showing the Nation's coal fields combined with the distribution of Federally managed lands. (This map is available separately as USGS Open-File Report 97-461; see Biewick, 1997.)

Source: USGS[14]

Extracting coal from federal lands is achieved through a complex process that has become both expensive and laborious over the past 50 years. Oftentimes control of mineral rights can be interspersed with private ownership, especially in the case of former railroad land grant properties in the West. This mix of federal, state, Native American and private lands increases the complexity and expense of development, especially if one of the mineral or surface owners is averse to the project.

Continually changing policies regarding coal leasing have created considerable risk for coal operators. The process to identify, apply, review, assign value, and ultimately permit federal coal property can take years and cost millions of dollars – in some cases with no guarantee that a lease will be granted.

Passage of the One Big Beautiful Bill Act, which lowered royalty rates while opening more federal lands to coal leasing and creating new tax incentives for metallurgical coal, was an important step in the right direction. Additional efforts to lower the cost profile for U.S. coal mined on federal, as well as state lands, could further help bridge the cost-gap for U.S. coal destined for Asian and other markets.

One opportunity exists with bonus bids. Bonus bids must be paid in installments over the first five years of the lease. Historically, these payments have often exceeded $100 mm in the PRB. This represents an enormous cash outlay, and it often comes well ahead of any revenue generation from the property. Stretching out such payments and revisiting fair market value modeling, taking into consideration the need for a highly competitive capex and cost structure in order to compete globally, would help the economics of coal.

[14] https://pubs.usgs.gov/fs/1998/fs012-98/

Furthermore, once a lease is awarded, there are performance guarantees, state and local taxes, rent, federal royalties and reclamation bonding requirements. Again, these friction costs, in aggregate, can act as a further drag on the competitiveness of U.S. coal in the global marketplace.

The process and cost of obtaining a lease have been a meaningful barrier for U.S. coal producers over the years. The Trump Administration has modified the program, first by opening federal lands once again to coal development[15] and second, by shortening the environmental review process required by the National Environmental Policy Act (NEPA)[16]. The Administration, as mentioned above, has also capped federal production royalties to no more than 7% (this reverts to a maximum of 12.5% in 2034). This was a positive development for the competitiveness of potential future U.S. coal exports. The fact that 7% represents a cap – which is to say the DOI cannot assess a royalty rate higher than 7% but can assign a lower royalty rate if deemed appropriate – creates another potential lever for reducing costs and increasing the competitiveness of U.S. coals in seaborne markets.

Recommendations for federal coal leasing

Prior to issuing a federal coal lease, the U.S. Government must determine that the bonus bid represents fair market value. The process for determining fair market value needs to be updated to reflect the current economics of coal mining on federal lands. Often there has been a single entity providing an unsuccessful bonus bid in a non-competitive offering due to the ambiguous fair market value determination process. Consideration of a transparent fair market valuation will improve confidence in the process. This will also prevent unnecessary failures of single-entity lease offerings while enhancing the potential in competitive multi-party bid offerings.

Streamlining permitting and environmental review

The elimination of redundant and unnecessary environmental reviews and permitting for federal coal would also increase the competitiveness of U.S. exports. Coal operators should not be required to perform three redundant environmental reviews prior to being authorized to extract federal coal. Requiring both the local State and federal government to issue a mining authorization permit – when the federal government has already previously determined leasing was in its best interest – is unnecessary, time consuming, and negatively impacts U.S. coal competitiveness.

Continuity in federal coal leasing and permitting policies would afford coal operators a stable and predictable regulatory environment, which would further bolster the competitiveness of U.S. Coal on the global market.

Federal law and policy should be modified to allow federal coal lease bonus bids to be paid over longer periods of time when federal coal is produced and generating revenue. The decision to invest in new leases (or any transaction to add reserves) is predicated on expectations that a future market exists. The decision to commit considerable upfront capital to new reserves must match market expectations and improving overall access to the export markets would address many of these concerns.

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[15] https://www.doi.gov/pressreleases/interior-unleashes-american-coal-power-bold-move-advance-trump-administration

[16] https://www.doi.gov/pressreleases/trump-administration-delivers-historic-nepa-reform-unleashing-resources-americas

Improving reclamation bonding

The Surface Mining Control and Reclamation Act (SMCRA) requires that coal mining operations are adequately bonded as a prerequisite for obtaining a SMCRA permit. While reclamation bonding often faces scrutiny from regulators concerned with the financial viability of a coal-producing company, the fact is that reclamation is being achieved in all states in an exemplary fashion. The Office of Surface Mining Reclamation and Enforcement's (OSMRE) annual evaluation reports for state regulatory programs routinely show that states have an outstanding record of ensuring reclamation success and avoiding offsite impacts. These results demonstrate the importance of flexibility in the use of bonding mechanisms, including self-bonding. Self-bonding is specifically allowed under SMCRA and states should continue to allow its use for companies that meet the eligibility criteria to take pressure off the limited commercial bonding options available for reclamation obligations. Prompt bond release by state and OSMRE would also free up capital for additional investments and mine expansions.

Other land issues

Developing coal infrastructure has often been met with obstacles erected by regional and local governments, especially those opposed to any natural resource and/or hydrocarbon development of all kinds. This includes rights-of-way for transportation and especially ports.

The web of interests aligned against coal infrastructure, especially along the West Coast of the U.S., has virtually closed off port development despite guarantees that address nearly all local environmental issues. The one bulk port that has thus far survived rounds of litigation is the Western Gateway project in Oakland. Even after multiple rounds of litigation and 10 years of delays, this project continues to move forward and recently received the news that the Trump Administration would be providing $75 million in funding towards the project's completion.

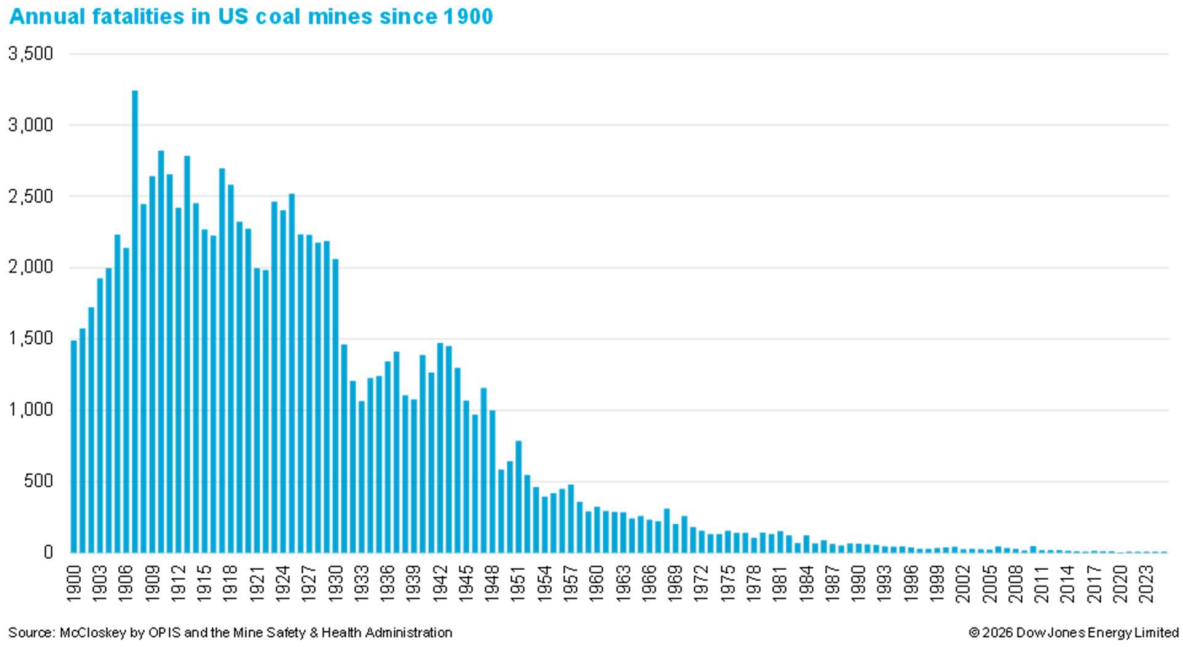
Other port developments over the past 15 years were shelved as state and local opponents mounted every conceivable obstruction including, but not limited to, required studies on fugitive dust, effects on local traffic, potential impairment of native fishing rights or other aquatic impacts, excessive noise, and the effects of using the coal to generate electric power outside the U.S. Addressing and overcoming these obstacles and delay tactics will be essential in unlocking the vast export potential of Western coal.

Mining regulations

Excessive mining regulations place constraints on operating coal mines in several ways. Environmental regulations such as the Clean Water Act, Clean Air Act, and Endangered Species Act among others often pose significant costs when siting a coal mine. There are also issues regarding surface and mineral ownership and other interests which might have title to various parts of a given property. Bonding requirements and excessively rigid, and at times, counterproductive, reclamation standards also add to the cost of production. In addition to these environmental rules, there are considerable regulations covering miner health and safety including respirable silica dust, ventilation requirements, emergency training and programs, required inspections and monitoring/reporting. This is in addition to broad industry standards covering employment rights and responsibilities.

The U.S. coal industry's performance in these areas has been exemplary. The safety record of the U.S. coal industry is among the best globally, and environmental performance has been generally exceptional.

In 2025, there were eight miner fatalities[17] in U.S. coal mines which tied for the second lowest annual number since at least 1900. The coal industry strives for zero fatalities.



The industry prides itself on continuous improvements. Miner safety and environmental performance are core metrics for all U.S. producers and are central to corporate governance.

While the performance has been exceptional, there is nevertheless room for regulatory reform as many rules are redundant, archaic or require considerable reporting across numerous agencies, all of which add time and costs. Coal producers generally recognize that their business interests and miner safety and environmental record are intrinsically aligned.

Governmental support mechanisms

Coal mining oftentimes is the engine for regional economies that support schools, retail and other community programs.

Streamlining the regulatory regime has the potential to improve the overall financial stability for coal communities and provide some certainty that is necessary for these communities to thrive.

The federal government currently finances funding for infrastructure investments that improve both mining efficiency and safety as well as a foundational investment in various coal communities. This includes upgrades in roads, bridges, navigation systems and structures on rivers and tidewater regions (locks and dams), cyber security, and communications (including high-speed internet and GPS). Strong continued funding on this front is essential to maintaining and expanding the flow of coal into the seaborne market.

[17] https://www.msha.gov/coal-fatalities

Government should actively review and systematically update the permitting process with the goal of upholding environmental and safety standards while constructively streamlining it.

The government could also assist by addressing issues surrounding eminent domain, and conflicts between various agencies, thus aiding in the development of new avenues that would allow U.S. coal to compete more effectively in the seaborne market. These include expanding dredging activities at ports and relocating infrastructure that impedes the movement of larger vessels including underwater pipes and cables and bridges that do not provide adequate channel width or height.

The government could also assist in the permitting process for port projects that have the potential to open up new markets and to improve the overall logistics for moving coal to a port, as well as vessel handling in the port itself. This can happen through the U.S. Army Corps of Engineers or through other subsidy mechanisms.

Transportation and shipping considerations

While the U.S. possesses a very robust domestic rail and inland river transportation infrastructure, the movement of coal from land to sea continues to face port capacity barriers that impede strategic opportunities for expansion. Compounding this challenge is the fact that coal producers in other countries generally benefit from superior port access and port infrastructure.

Key barriers to expansion

Barriers include the lack of a deep-water bulk port that can handle PRB coal off the U.S. West Coast, water-depth at ports, congestion along primary export routes, and the reliability of the inland waterways given its aging infrastructure. It also includes regulatory burdens and a tax/fee system that is uneven and costly. These have been summarized above.

Strategic opportunities for growth

Despite these barriers, the completion of the Norfolk Harbor Deepening Project in February 2026 represents significant progress and has increased the opportunity for U.S. East Coast coal exports. By achieving a 55-foot channel depth, Norfolk has established itself as the deepest commercial port on the East Coast, providing a significant strategic advantage. Similar efforts should be pursued.

Recent infrastructure investments in the Gulf are also expanding export optionality. The late 2025 deepening of the Port of Mobile to 50 feet brings it to parity with New Orleans, offering greater capacity for ILB thermal coal and SAPP metallurgical coal. In addition, ongoing initiatives like "Project 11" in Houston aim to incrementally improve channel depths, increasing the viability of secondary Gulf terminals.

As discussed, a significant potential breakthrough for West Coast exports is the proposed Western Gateway Terminal in Oakland. In late 2025, developers cleared a key legal hurdle that could facilitate obtaining a permit. Although environmental opposition persists, this judicial clearance secures the terminal's right to operate.

This port should serve as a vital long-term capacity replacement for western coal producers, particularly considering the impending Levin-Richmond closure. Developers currently project at least two and a half years of remaining permitting and site work and are targeting 2028 for the first operational cargo shipments. Additional legal challenges are expected. Maintaining this schedule in the face of any additional legal challenges will be imperative in the effort to unlock the potential of U.S. coal exports.

Crucially, the maintenance, dredging, and upgrading of both deep-water shipping channels and inland river locks falls largely under the responsibility of the U.S. Army Corps of Engineers (USACE). Securing greater and

more consistent funding for USACE civil works and infrastructure projects represents a systemic opportunity to support the coal export sector.

Reliable and efficient inland waterways are essential to maintaining the competitiveness of U.S. coal exports in global markets. In 2024, multiple unplanned lock outages and failures—largely due to aging infrastructure—significantly disrupted coal transportation to key export terminals. These disruptions led to shipment delays, increased costs, and challenges in meeting international customer commitments.

To address these issues, increased funding for USACE is critical. Adequate investment is needed to support both routine operations and maintenance that have been deferred over time, as well as the modernization of locks and dams along major freight corridors. Without these improvements, system reliability will continue to decline, placing U.S. exporters at a competitive disadvantage.

Coordinating efforts with the Department of Transportation, the states and the USACE through the creation of an interagency framework aimed at improving coal export transportation systems and support. This can be accomplished through shared data and analytical tools, including AI where appropriate.

Additionally, targeted funding for port and channel deepening projects is essential to accommodate larger, modern vessels. Enhancing port capacity and efficiency will improve throughput, reduce bottlenecks, and ensure that U.S. coal producers can reliably access international markets. Sustained federal investment in inland waterways infrastructure and port modernization is vital to preserving supply chain efficiency, supporting export growth, and strengthening the overall competitiveness of U.S. energy exports.

Outlook

To fully capitalize on international demand, the U.S. should continue to invest in port deepening initiatives, the modernization of aging inland river locks, and the expansion of high-efficiency midstream loading capabilities. Closing the infrastructure and depth gaps—and realizing the potential of new West Coast capacity—are direct methods to lower supply chain costs and improve the global competitiveness of U.S. coal.

Institutional and regulatory factors

Facilitating coal export terminal development

Since the 2019 report of the National Coal Council[18] on advancing coal exports, there have been some distinct port modernization programs including deepening the draft at numerous facilities in the Gulf and the Chesapeake Bay, as well as upgrades of some of the coal handling equipment and additional environmental controls.

Unfortunately, there has not been a new coal export port constructed in the U.S., and the changes to capacity at existing ports have been mostly nominal.

The lack of a large coal export facility on the West Coast of the U.S. has been a limiting factor for decades. Attempts within the past 15 years to construct a new facility have mostly been abandoned. The announced $75 million DOE funding for the Western Gateway Terminal in Oakland is a positive step towards addressing the West Coast port issues as it will broaden the export capabilities. This is a welcome and strategic addition to the

[18] https://nationalcoalcouncil.energy.gov/ncc/sites/default/files/studies/2018/NCC-US-Coal-Exports-2018.pdf

U.S. export capacity. As part of a multi-port enhancement strategy, the Oakland port can play a critical role in unlocking the vast potential of western U.S. coal exports. It is worth pointing out that U.S. coal producers do have access to ports located in British Columbia, Canada and this is where the bulk of western coal exports are currently loaded. However, the closest port, Westshore Terminals, is still a long rail distance from U.S. mines. Two mines in Montana are actively and consistently exporting coal out of the Canadian port. Moreover, U.S. coal mining companies must compete with often more proximately located mines in Alberta and British Columbia for space at Westshore. New metallurgical coal mines proposed in Canada[19][20] as well as a new potash handling facility[21] at Westshore are likely to limit still further the volume of U.S. coal that can move through that facility.

This serves to underscore yet again the need for a high-volume, deep-water port capable of handling PRB coal in the U.S. Northwest.

International financing for coal-based power plants, blast furnaces and industrial facilities

The absence of U.S. development finance support for coal-related projects has weakened American commercial positioning in key developing markets.

Trade missions to India, Southeast Asia, and sub-Saharan Africa have revealed that counterparts, such as China, are aware of U.S. financing restrictions and have adjusted their procurement and partnership strategies accordingly. Foreign officials are turning to Chinese financiers who face no comparable constraints. The Trump Administration's restoration of coal-related project in the list of qualifying projects for the Ex-Im Bank and U.S. International Development Finance Corporation should help rebuild commercial relationships that have atrophied.

Beyond financing, states support active U.S. government engagement through embassies, trade missions, and bilateral energy frameworks to promote American coal commercially in target markets. The commercial attaché network of U.S. embassies in key coal-consuming countries should be directed to support coal export market development as an explicit priority.

Addressing trade barriers and utilizing trade agreements

States with active coal export industries have found that tariff and non-tariff barriers in key markets create meaningful friction and, in some cases, tip purchasing decisions toward competitors with preferential trade agreement access.

Taxation is also a barrier, particularly the patchwork of severance taxes across multiple states and the federal government. Coal producers in one state could be suffering a material disadvantage compared to a neighboring state, especially when selling coal into the international market.

The following table shows the coal severance taxes across the major coal producing states.

[19] https://northback.ca/grassy-mountain-project/
[20] https://projects.eao.gov.bc.ca/p/588511f9aaecd9001b828bf0/project-details
[21] https://westshore.com/new-cargo

State	Metallurgial	Thermal	Notes
Alabama	$0.20/ton	$0.20/ton	
Colorado	$0.36/ton	$0.36/ton	
Illinois	0%	0%	Illinois does not collect a coal severance tax, but the state has a use tax on coal
Indiana	0%	0%	
Kentucky	4.50%	4.50%	
Maryland	$0.30/ton	$0.30/ton	
Montana	3%-15%	3%-15%	Min 50,000 tons/year, assessed after 20,000 tons. Surface: 10% when BTU<7000, 15% >7000; Underground, 3% <7000 Btu, 4%>7000 Btu
Tennessee	$1/ton	$1/ton	Division of Mines
Utah	0%	0%	Utah does not have a coal severance tax per se, but has a property tax based on the value of the coal sold at 0.9%
Virginia	1% - 2%	1% - 2%	Usually imposed at the county level as a license and/or road improvement tax
West Virginia	5%	3%	Met severance tax relief proposal (failed to pass) 4.5% in 2026, 4% in 2027, 3.5% in 2028, returns to 5% after 2031) . For thermal coal mined underground with average seam thickness of 27-45 inches, tax is 2% and less than 37 inches, 1%. Also, tax on thermal coal mined in WV and used in WV will be exempt from severance tax.
Wyoming	3%-7%	3%-7%	Surface: 7%, Underground: 3.75%
Federal	Max 7%	Max 7%	Temporary, will return to 12.5% for surface and 8% for underground on September 30, 2034

The additional tax burden oftentimes is the difference between success and failure on a particular transaction. Reducing or eliminating tax schemes would enhance the competitive position of U.S. coal to international competition.

Over the last several years, we've seen a bifurcation in trade policy when it comes to coal exports. Some countries have focused on limiting coal trade in an effort to limit carbon emissions, while others have gravitated towards the important role coal can play in increasing energy security.

The European Union (EU)

After "Liberation Day" tariffs were imposed by the U.S. in the spring of 2025; the EU and U.S. in July agreed to the Transatlantic Trade & Energy Agreement. As part of the agreement, the EU agreed to import $750b worth of energy products. While coal was included under the "energy products" umbrella, the deal focused on LNG imports; agreements with an explicit coal focus have the potential to spur increased coal exports as well.

Two EU barriers that make increasing EU imports of U.S. coal more difficult. First, the EU Methane Regulation (EUMR), enacted in late summer 2024, is designed to track and cut methane, with a phased approach to implementation that will include requirements on importers to meet measurement, reporting, and verification (MRV) standards and a methane intensity threshold on imported coal in 2030,

Secondly, the "Cross Border Adjustment Mechanism" or CBAM. CBAM is, in essence, a tariff on coal-intensive imports, requiring importers to produce "CBAM certificates" to cover carbon emissions. Unlike the old "cap and trade" model, CBAM certificates are unlimited, but the pricing structure is hefty: when CBAM was announced on April 7, 2026, the CBAM certificate price was 75.36 euros per metric ton of CO_2 emissions. While thermal and metallurgical coal is not directly taxed by CBAM at the border and metallurgical coal is excluded from CBAM import certificates, the EU has made clear a desire to expand CBAM in the future. This could threaten metallurgical coal imports and BOF steelmaking while removing incentives for new investment over stranded asset fears.

India

As one of the fastest growing major economies in the world and the largest-populated democracy with the on earth, India presents a myriad of opportunities for U.S. coal exports. Despite being the largest destination (by tonnage) of U.S. exports in the world, with a roughly 25% share of the total, U.S. coal still accounts for well under 10% of India's total imports. With the proper trade agreements, India could grow significantly as a major U.S. coal importer.

The Administration has already taken steps in this area. In the U.S.-India Strategic Energy Partnership of February 2026, India made a commitment to purchase $500b worth of U.S. energy products in the next five years. The deal specifically highlighted metallurgical coal purchases. In exchange, the U.S. agreed to cut a 25% tariff on Indian goods to 18% and agreed to explore easing its investigations into Indian trade practices using Section 301 once purchase targets were met.

Not only does this afford a powerful opportunity for U.S. coal exporters, but it also showcases geopolitical value of coal exports. Through the fall of 2025 Russia accounted for more than 12.1% of India's coal imports. Increasing U.S. coal exports to India could serve to displace those Russian volumes.

Further expanding into India's energy and steel supply chains could also act to replicate in some respects China's "belt and road" strategy.

China

China is the largest coal consumer in the world by a wide margin and was a top three importer of U.S. coal in 2024. However, amid trade tensions in early 2025 Chinese imports of U.S. coal plummeted. Despite a relative truce in trade between the U.S. and China currently, most Chinese trade barriers on U.S. coal – namely duties of 28-31% -- remain in place. Many U.S. coal products represent a good fit for the Chinese market and furnish coal qualities that China lacks domestically.

Reexamining trade policy with China that allows for more U.S. coal imports would greatly enhance the prospects for domestic coal producers, transportation companies and equipment manufacturers.

Targets for increased coal trade

Overall, efforts should be made for the EU to relax its policy objectives when it comes to coal imports. The EU has already lost meaningful hydrocarbon imports from Russia, is strengthening its military at record rates in anticipation of future conflicts and has been economically weakened due to high energy input costs. Carveouts for U.S. coal imports would not only provide Europe with cheaper energy inputs but would also provide energy

security in a world where supply disruptions through trade chokepoints are of growing concern.. Rapprochement with the EU could prove constructive, with U.S. energy as a cornerstone.

India remains arguably the single largest strategic opportunity for U.S. coal exports, in terms of both market size and global national security goals. Indian coal demand – particularly on the coking coal front – continues to increase robustly. Other Southeast Asia countries are also developing their electricity and steelmaking capabilities and further diplomatic and trade efforts could serve to increase imports of U.S. coal to this region.

Technological considerations

U.S. coal producers and the industries that support coal production face growing concerns about production costs, which could impair their ability to compete in the international marketplace. Technology offers potential solutions to several pressing challenges.

Mining companies are having difficulty attracting labor, especially those in the trades including engineers, electricians and mechanics. In addition, access to capital has been challenging for many coal producers in recent years stemming from ESG-related pressures. These constraints have put U.S. coal producers at a distinct disadvantage, especially given the rapid rollout of new technologies overseas.

Further, U.S. regulators take too long to approve new mining-related technologies that can improve safety and reducing costs.

- Equipment manufacturers (Original Equipment Manufacturers or OEMs) are also affected because of duplicate certification efforts with different standards for U.S. relative to the rest of the world.
- The U.S. lacks government incentives to trial new technologies and mitigate mining risk. Regulatory approval for new mining equipment often takes up to 10 years, which is a disincentive to make these investments, especially considering some of the electronics become "obsolete" during the development period requiring additional testing and approval for upgrades.

The overall effect of the lengthy and expensive regulatory framework for equipment is that U.S. coal miners have unnecessary added production costs and are not capturing opportunities to improve coal mine safety.

Part of the improved regulatory environment would be to adopt International Electrotechnical Commission (IEC) standards which are international standards that apply to electrical and related technologies. The objective is the ensuring safety, reliability, and international standards for operations.

The effect would be substantial as it would eliminate duplicative regulatory efforts and build standards for OEMs and mining companies. The other outcome would be to make the U.S. a technology leader, allowing equipment developed in the U.S. to be exported for mining and other industries overseas. Streamlining the regulations and encouraging the adoption and creation of new technology by mine operators and OEMs will increase efficiency, operator safety, and U.S. coal market competitiveness.

Exports of U.S. advanced coal technologies

U.S. engineering, construction and equipment manufacturers seek to expand and having access to overseas markets would not only benefit their business, but it would help industries improve their performance, including lowering emissions.

This includes advanced combustion and gasification technologies, along with related emissions management systems. Many of these have been developed and demonstrated domestically and therefore create exportable intellectual property and engineering services.

International buyers who are engaged in constructing new coal capacity in developing markets have expressed interest in American technology partnerships in trade missions.

Development of coal-to-products and advanced manufacturing applications is likely to occur through regional clusters where infrastructure, workforce, and industrial demand can be coordinated.

New markets for coal

U.S. coal is primarily used to generate electricity and produce coke, a necessary part of integrated steel production. But coal properties have other uses, especially as a chemical feedstock which can substitute or augment petrochemicals, and a heat provider for various industrial processes (e.g. cement, brickmaking, paper production).

China's more advanced coal-to-chemicals sector was already paying dividends prior to the Iran War but has proven to be a strategic advantage for the country. China has been notably successful in using its coal-to-chemicals sector to backfill losses from the lack of oil and gas imports.

The U.S. is considerably behind China in developing a coal-based chemical program, perhaps because of an abundance of petroleum. However, the U.S. still imports many of these chemicals and is now subject to supply concerns as well as higher prices.

The cost and availability of ammonia, for example, is raising concerns about agriculture and food prices and security. Wabash Valley Resources,[22] who has received assistance from the DOE, is building the first coal and petroleum coke plant in Indiana that will produce anhydrous ammonia fertilizer.

More projects like Wabash Valley that use U.S. coal resources could eventually create a viable export market and enhance national security as it would reduce dependence on foreign sources for these chemical feedstocks.

Certain uses of coal cannot be repeated using petroleum. After China restricted graphite exports in 2025, the Oak Ridge National Laboratory (ORNL) method for coal-derived synthetic graphite came to the fore. Graphite is the primary material used in most anodes in lithium-ion batteries. The U.S. produces virtually zero natural graphite, instead it relies on China which produces 77% of the world's total production. Synthetic graphite from coal would replace natural graphite in these industry needs. Currently, a U.S. coal producer[23] is exploring the commercialization of synthetic graphite from coal.

Traditional carbon fibers are also petroleum-based (Polyacrylonitrile or PAN) and are used in a variety of settings. The aerospace and defense industry makes up over 40% of total carbon fiber market share, making carbon fiber production a national security concern. Coal-based carbon fiber is estimated to be 50-60% less expensive than traditional PAN carbon fiber. With roughly 5% of the U.S. carbon fiber market, coal-based carbon fiber has considerable room to expand. The DOE currently leads research into coal-based carbon fiber.

While these are the most promising uses of coal for the development of advanced materials, several other areas of research are underway. Carbon dots are semiconducting tiny nanoparticles derived from coal that can be

[22] https://www.wvresc.com/
[23] https://ramacoresources.com/carbon-operations/

used in things like medical imaging and as a lower-power alternative for LED displays. Research is ongoing into carbon nanotubes which have applications in aerospace, electronics, and biomedicine.

Finally, efforts have been ongoing for decades to advance uses of coal ash in products like carbon foam – a lightweight, fire-resistant insulation material – and coal-based bricks (see more examples below). However, such research is very much in its infancy.

Overall, developments of other uses of coal (dubbed the "Coal-to-X" market) remain in development. Several show great promise in reducing costs and/or reducing U.S. reliance on foreign sources of critical imports and enhancing national security.

Rare earth elements from coal and coal byproducts

Over the last few years, the extraction of rare earth elements (REEs) from coal reserves and their surrounding clays – particularly in the PRB – has gone from a scientific theory to a vital strategic national interest. While rare earths are not exceptionally rare, developing and deploying technology to economically extract the material is much more difficult.

Post-WW2, the United States was by far the leader in rare earths production. Molycorp's Mountain Pass mine in California fulfilled the global demand for rare earths. In the 1980s, however, China's Deng Xiaoping famously said: "The Middle East has oil, China has rare earths" and the transition began. Amidst significant state subsidies, lax environmental regulations and low labor costs, China quickly became the world leader in REE production and Mountain Pass was idled in 2002. An attempt to resurrect Mountain Pass in 2015 failed amidst relatively low global REE prices and today, China controls roughly 90% of global processing[24].

In March 2025 President Trump used the Defense Production Act to reshore REE production in the United States for national security reasons. From government subsidized loans to a government-subsidized floor in many REE prices, a renaissance in domestic REE production is planned.

Numerous academic studies have shown that there are commercially viable concentrations of REEs in coal production and coal byproducts including in adjacent shales, mudstones and siltstones. REEs can also be extracted from coal mine tailings, residual material from coal processing and from coal ash. Examples of these studies include the University of Utah[25], the University of Wyoming[26] and the University of Texas[27].

Commercial mining is not the only way to extract REEs in coal. During mining, water interacts with various minerals like sulfides and produces highly acidic sulfuric acid. As the water flows through the mines, it also dissolves surrounding metals including rare earths. Called Acid Mine Drainage (AMD), such acidic water has been a persistent environmental problem. However, companies in Appalachia and Montana are attempting to extract REEs from AMD. While REE concentrations are low, such efforts have the added benefit of addressing vexing environmental issues.

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[24] https://sites.lsa.umich.edu/mje/2026/01/09/market-concentration-of-rare-earth-elements-chinas-dominance-and-the-global-response/

[25] https://attheu.utah.edu/research/can-coal-mines-be-tapped-for-rare-earth-elements/

[26] https://www.uwyo.edu/news/2026/03/uw-ser-researchers-release-publication-on-rare-earth-elements-in-wyoming-and-montana-coal.html

[27] https://www.jsg.utexas.edu/news/2026/06/gulf-coast-coal-holds-billions-in-critical-minerals-but-the-economics-are-tricky/

Coal waste piles or tailings have been found to contain relatively high concentrations of rare earths as well. Using existing piles of coal waste, no new mining is needed. While most projects are bench studies or early pilot stages, a few commercial pilots have begun research into coal waste piles as a potential source of REEs.

Finally, the fly ash produced after coal combustion may also contain REEs. In April 2026, the DOE launched the "Critical Minerals and Materials Accelerator[28]," a $69mm attempt to move such research from laboratory-based to commercial reality. The University of Pennsylvania[29] believes that the 284mm cubic yards of coal ash scattered in landfills around the state could become a critical source of REEs. The concentrations of REEs in the coal ash are decidedly lower than mined ores, but like AMDs and coal waste, it addresses environmental concerns.

Ultimately, REE development in the U.S. will be difficult and require significant government subsidization. REE extraction comes with environmental challenges but production within the U.S. would come with established regulatory review and permitting to ensure compliance with applicable environmental requirements. Refining REEs is also cost-intensive, and REE concentrations in the U.S. remain on the low end. Even with an "all of the above" approach for REE production within the U.S., such production will take significant time, money and effort. Regardless, coal could be a critical part of the U.S. domestic supply of REEs in the future.

Carbon-based engineering using coal

Coal is primarily a carbon material which makes it an abundant, low-cost source for advanced materials such as carbon fiber precursors, graphene, and activated carbon. The use of the products spans from high-durability medical devices to filter material for water treatment.

Wyoming's advancement of critical minerals from coal is working alongside REE recovery at its International Centre of Advanced Materials (ICAM) site near Sheridan[30]. The prospect of producing high-value engineered materials from an abundant feedstock is compelling from both an economic development and a national security perspective: domestically produced carbon fiber from American coal reduces dependence on both petroleum-derived precursors and Chinese processing capacity.

Federal procurement commitments for coal-derived carbon fiber in defense applications would provide a demand anchor and a step towards viable commercial investment.

Coal-based building materials

The U.S. utilization of coal-based materials for construction has a long and successful history that can be duplicated by countries where U.S. coal is imported. Coal has economic value beyond power generation as technologies developed in the U.S. to extract residual mineral components are also an important factor in the economics of using coal.

The mineral byproducts from coal combustion residuals have multiple commercial uses. The mineral compounds are captured as fly ash or bottom ash or a third byproduct, gypsum, from emission control equipment, otherwise known as scrubbers.

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[28] https://www.energy.gov/cmei/ammto/critical-minerals-and-materials-accelerator-0
[29] https://kleinmanenergy.upenn.edu/research/publications/unlocking-rare-earth-elements-from-coal-waste-pennsylvanias-opportunity/
[30] https://www.icam-online.org/

Fly ash is the most valuable byproduct, and it is typically used as a substitute for cement in concrete production. Fly ash has been traditionally used as a 15-25% replacement for cement in concrete mix designs in the U.S. market. Using fly ash increases the long-term strength of concrete, enhancing durability, and improving workability while reducing costs and environmental impact.

Bottom ash is typically used as an aggregate in construction materials or can be ground to fly ash particle size and utilized as a replacement for Portland cement.

Gypsum is typically used in wallboard manufacturing and adds value to this part of the construction materials industry.

State transportation agencies have adopted specifications allowing or encouraging fly ash concrete in highway and bridge construction, with documented performance benefits including improved durability and reduced long-term maintenance costs.

While current coal combustion byproducts are sometimes utilized in foreign concrete and cement-based products, the U.S. coal byproducts offer some unique properties. For example, PRB coal offers higher replacement ratios for cement substitution in foreign manufactured concrete. The Class C type fly ash generated from PRB coal brings a more reactive component to the concrete mix, and this allows higher mix ratios and therefore improved economics.

In addition to the overall value offered by using coal combustion byproducts, export economies such the EU have stringent rules related to CO_2 emissions associated with cement production. Use of PRB Class C fly ash can reduce the clinker ratio of Portland cement and allow manufacturers to use a coal byproduct to offset the costs related to CO_2 emissions.

Depending on the regulatory rules in some countries, this can provide a meaningful economic benefit of using U.S. based coal and when coupled with U.S. technologies, this could lower the overall production cost for cement.

Advanced power generation technologies

States are supporting a range of initiatives to expand the potential uses of coal and strengthen the long-term competitiveness of coal-related industries. In addition to coal-to-products and critical mineral recovery efforts, continued advancement in coal-based power generation technologies will influence both domestic utilization and international demand for U.S. coal.

Advanced coal generation technologies include high-efficiency combustion systems such as ultra-supercritical and advanced ultra-supercritical units, integrated gasification systems including IGCC and emerging IGFC configurations, advanced fluidized bed and pressurized fluidized bed systems, and enhanced combustion approaches such as oxy-combustion and oxygen-enriched combustion. Emerging technologies, including chemical looping combustion and supercritical CO_2 power cycles, represent additional pathways for improving efficiency and system performance over time.

Global deployment of these technologies, particularly in Asia and other developing markets, continues to shape demand for higher-quality thermal coal and metallurgical coal. As international markets adopt higher-efficiency and lower-emissions generation systems, the performance characteristics of U.S. coal, including energy content and consistency, remain important competitive factors.

These technology trends also have implications for U.S. export infrastructure and market positioning. Aligning domestic production, transportation systems, and export capabilities with evolving international technology adoption can support long-term demand for U.S. coal. Federal engagement that supports technology development, monitors global deployment trends, and aligns research priorities with market-relevant applications can help ensure that U.S. coal producers remain competitive in evolving global markets.

Other

The full range of potential non-combustion applications for coal collectively represent a portfolio of diversification opportunities that, developed in concert through regional innovation hubs, can broaden the economic base of the coal sector.

These applications include activated carbon for water and air treatment, humic acid extraction for agricultural use, coal-to-hydrogen pathways, and pyrolysis-derived char.

North Dakota's Lignite Research, Development and Marketing Program demonstrates the value of sustained state investment in expanding coal end uses by supporting technologies that improve combustion efficiency, reduce emissions, and expand new product applications. These measures maintain production sector viability through difficult market cycles. Sustained federal investment in research and commercializing emerging coal applications would strengthen these efforts.

Conclusion

America's coal export industry supports tens of thousands of high-paying jobs, generates billions of dollars in export revenue, improves the nation's trade balance, and provides allies with a reliable source of energy and steelmaking materials during periods of global uncertainty. With global electricity demand trends, expanding steel production—particularly in Asia—and recent geopolitical disruptions, demand is poised to grow significantly. Given its rich, high-quality thermal and metallurgical coal reserves coupled with its skilled mining workforce, The U.S. is well positioned to meet new demand, if certain policy changes are made and logistical challenges addressed.

The greatest obstacle to expanding U.S. coal exports is not a lack of supply but is a combination of mostly self-imposed factors. The absence of sufficient large-scale West Coast export terminals, transportation costs and challenges including port draft limitations, lengthy permitting processes and other regulatory barriers reduce the competitiveness of U.S. coal compared to producers in Australia, Indonesia, and other exporting nations.

Global market conditions are favorable for U.S. exporters. To capitalize on this moment, policy reforms including: accelerating construction of new West Coast export terminals; modernizing ports, locks and shipping channels; streamlining federal and state permitting; modernizing taxes, royalties, and regulatory costs associated with coal production and transportation; and incorporating coal exports into future trade agreements would help level the playing field for U.S. coal, creating a significant economic opportunity for all Americans.

Appendix

National Coal Council Members

- **Thomas H. Adams –** *Executive Director, American Coal Ash Association*
- **Adam Anderson –** *Chief Executive Officer, Western Fuels Association*
- **Shannon M. Angielski –** *Executive Director, Carbon Utilization Research Council*
- **Ana Amicarella –** *Chief Executive Officer, EthosEnergy*
- **Emily Arthun –** *Chief Executive Officer, American Coal Council*
- **Randall W. Atkins –** *Chairman of the Board and Chief Executive Officer, Ramaco Resources*
- **Dr. Richard A. Bajura –** *Director Emeritus, National Research Center for Coal and Energy, West Virginia University*
- **Brent Bilsland –** *Chairman of the Board, President, and Chief Executive Officer, Hallador Energy Company*
- **Michelle Bloodworth –** *President and CEO, America's Power*
- **Todd Brickhouse –** *Chief Executive Officer and General Manager, Basin Electric Cooperative*
- **James A. Brock –** *Executive Chairman, Core Natural Resources, Inc.*
- **James Bunn –** *President and Chief Executive Officer, Central Coal Company*
- **John C. Butler, Jr. –** *President and Chief Executive Officer, NACCO Industries, Inc.*
- **Angela Caddell –** *Vice President of Agricultural Products, BNSF Railway*
- **Joseph Craft III –** *President, Chief Executive Officer, and Director, Alliance Resource Partners, L.P.*
- **Rob Creager –** *Executive Director, Wyoming Energy Authority*
- **Michael Day –** *Chief Executive Officer, Eagle Summit Resources*
- **Claude E. Elkins –** *Executive Vice President and Chief Commercial Officer, Norfolk Southern Corporation*
- **William J. Fehrman –** *President, Chairman of the Board, & Chief Executive Officer, American Electric Power*
- **Jonathan Fortner –** *President and Chief Executive Officer, Lignite Energy Council*
- **Katherine T. Gates –** *President and Chief Executive Officer, SunCoke Energy, Inc.*
- **Charles D. Gorecki –** *Chief Executive Officer, Energy and Environmental Research Center, University of North Dakota*
- **Michael Goryzynski –** *Chairman, Alpha Metallurgical Resources*
- **Daniel L. Gray –** *Executive Vice President-Strategy and Business Operations, Green Cement, LLC*
- **James Grech –** *President and Chief Executive Officer, Peabody Energy*
- **Donald Gulley –** *President & Chief Executive Officer, Big Rivers Electric Corporation*
- **Chris Hamilton –** *President, West Virginia Coal Association*
- **Buddy Hasten –** *President & Chief Executive Officer, Arkansas Electric Cooperative Corporation*
- **Jason Hess –** *Senior Vice President-Marketing and Sales, Union Pacific Railroad*
- **Douglas Kimmelman –** *Executive Chairman/Founder, Energy Capital Partners*
- **Matthew Z. Leopold –** *Environmental Partner, Holland & Knight*

- **Vern Lund –** *Chief Executive Officer, Navajo Transitional Energy Company, LLC*
- **Charles MacFarlane –** *President & Chief Executive Officer, Otter Tail Corporation*
- **James Matheson –** *Chief Executive Officer, National Rural Electric Cooperative Association*
- **Samuel McKown –** *President and Executive Director, Kentucky Coal Association*
- **Karl Moor –** *President and Chief Executive Officer, Powerscape Global*
- **Robert D. Moore –** *President and Chief Executive Officer, American Consolidated Natural Resources, Inc.*
- **Jason Motyka –** *Co-Founder and Director of Business Development, Terra Energy Center Corporation*
- **Michael J. Nasi –** *Partner, Jackson Walker, LLP*
- **Stephen Nelson –** *Chief Executive Officer, Mountain State Energy Holdings/Longview Power, LLC*
- **Kenneth J. Nemeth –** *Secretary and Executive Director, Southern States Energy Board*
- **Rich Nolan –** *President and Chief Executive Officer, National Mining Association*
- **James Pfeifer –** *General Counsel, JENNMAR*
- **Carson Pollastro –** *Chief Executive Officer, Wolverine Fuels*
- **Martin Purvis –** *Chief Executive Officer, Westmoreland Mining*
- **Robert Rasmus –** *Chief Executive Officer, Arq*
- **Steven J. Read –** *President, Signal Peak Global Markets, LLC*
- **Tom Rice –** *Executive Vice President and Chief Financial Officer, Tennessee Valley Authority*
- **Brian R. Rich, Sr. –** *President, Reading Anthracite*
- **Corbin J. Robertson, Jr. –** *Chief Executive Officer & Chairman of the Board, Natural Resource Partners LP*
- **Walter J. Scheller III –** *Chief Executive Officer, Warrior Met Coal*
- **Robert Shields –** *Senior Director-Rates & Regulation, Arkansas Electric Cooperative Corporation*
- **Randy Short –** *President & Chief Executive Officer, Prairie State Generating Company*
- **Eric Skrmetta –** *Commissioner, Louisiana Public Service Commission*
- **Conrad J. Stewart –** *Energy Director, Crow Nation*
- **Brian Thompson –** *President, Soft Rock Mining Division, Komatsu Mining Corporation*
- **Justin F. Thompson –** *Owner & Chief Executive Officer, Iron Senergy*
- **Brian X. Tierney –** *Chairman of the Board, President, and Chief Executive Officer, FirstEnergy Corporation*
- **Stacy Tschider –** *Chief Executive Officer, Rainbow Energy Center*
- **Joseph Usibelli Jr. –** *President, Usibelli Coal Mine*
- **John N. Ward –** *Executive Director, National Coal Transportation Association*
- **Jeffrey H. Wood –** *Partner, Baker Botts LLP*
- **Charles Zeringue –** *Vice President for Generation, Big Rivers Electric Corporation*

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- **James A. Brock –** *Executive Chairman, Core Natural Resources, Inc.*
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