

Winning in a downward market
Global coal study



Executive summary

U.S. coal producers are beginning to shift their gaze abroad as a combination of low natural gas prices, increasing environmental regulations, and flattening electricity demand contribute to a glut of domestic coal supplies. Once viewed as a “swing” option for excess coal, some select international markets are now ripe for expansion, particularly in pockets of the developing world where populations are booming and economies are growing at a healthy pace.

Tapping these emerging opportunities will require U.S. coal companies to alter their approach to managing coal marketing and trading, as well as risk management practices across their portfolio of commercial activities. The immediate need for many U.S. producers is to adopt an integrated commercial strategy to expand capabilities across four key areas:

- **Marketing** of equity coal in international seaborne markets
- Expanding **origination** activities – or the buying and selling of third-party coal supplies – to satisfy international buyer requirements
- Optimizing **logistics** and freight operations to reduce costs and better compete on price
- Strengthening **trading** operations by establishing a proprietary trading book

These are the findings of an in-depth study Deloitte recently conducted of the global coal market, which has significant ramifications for the way U.S. coal producers assess and allocate risk across their organization. Rather than expose producers to heightened risks, we believe that further penetration into international markets can provide new revenue opportunities, while keeping the overall level of risk constant. To realize this potential, coal companies may need to develop new capabilities that deliver valuable market intelligence and insights for every facet of the organization to use in their decision-making processes.

About our study

Deloitte’s eight-week study spanned the United States, South America, parts of Europe, Asia (including China, India, Indonesia, and South Korea), Australia, and South Africa. We conducted more than 60 interviews of coal producers, coal traders/originators, electric utilities, steel producers, freight brokers/consultants, and other market participants. We supplemented these findings with an online survey of our interview subjects and others in the industry.

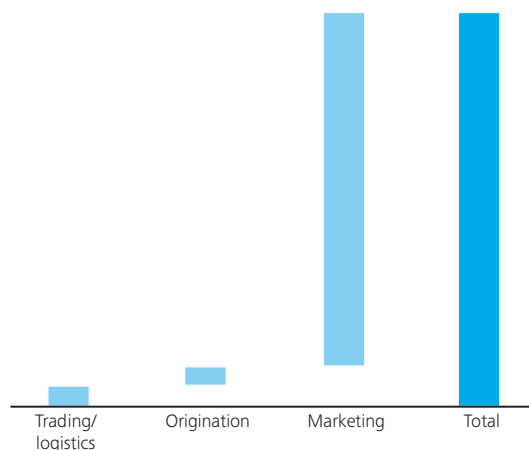
A new model for risk allocation

U.S. coal producers are increasingly turning their attention abroad as they grapple with growing competition from cheaper and more plentiful natural gas, stricter environmental regulations, and flattening electricity demand at home. To compete effectively in international markets, they should use multiple revenue channels at their disposal, including coal origination, logistics/freight origination and trading, and coal trading. As this represents a market shift from the traditional focus on domestic equity coal sales and related marketing risk, coal producers will need to fundamentally reassess their appetite for risk in each of these channels and strengthen their risk management capabilities to give each area optimal weight.

Current risk allocation

Companies embarking on this process need to first understand their implied market price risk appetite and formalize it within the management team and the board. In the past, most U.S. coal producers focused almost exclusively on marketing of their equity coal. Origination, logistics, and trading have accounted for a small portion of producers' revenue, and thus few resources were dedicated to those activities.

Exhibit 1. Coal producer's typical distribution of risk



Source: Deloitte analysis

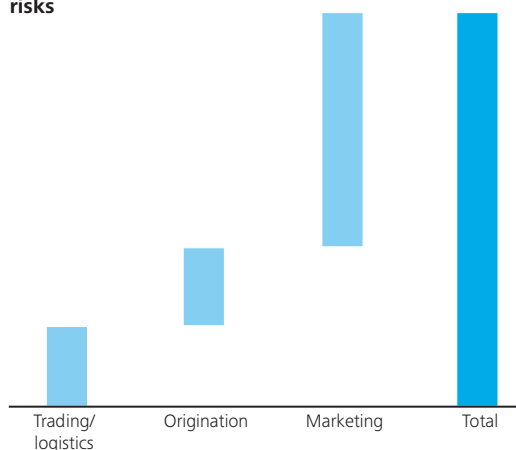
Consequently, in-house risk management capabilities were mainly focused on the selective implementation of hedging programs, usually designed to protect from major fluctuations in future fuel and equity coal prices. As expected, the typical risk allocation profile of a nondiversified coal producer shows major exposure to equity coal marketing. Risk allocation to the other revenue channels is by default quite limited (see Exhibit 1).

Although the risks from trading and origination with other commodities are typically well understood, this does not seem to be the case with equity coal production and marketing. For example, in trading, formalized risk policies and a large number of relevant controls guide day-to-day activities and awareness is quite high regarding how much risk to assume. In contrast, far less emphasis has been placed on understanding the market risk that comes with having large uncommitted volumes of equity coal. This can potentially lead producers to underestimate how much of their market risk is allocated to marketing.

Alternate risk allocation

Reallocating more of their market risk appetite to origination, logistics, and trading activities can enable producers to tap new revenue streams, while holding constant or even reducing their overall risk profile (see Exhibit 2).

Exhibit 2. Potential reallocation of coal producer's risks



Source: Deloitte analysis

A key to this transition is adopting an integrated commercial strategy that manages risk from a high level, across all four business activities. As producers reduce their marketing risk by shifting their focus to meet demand from international markets, they can decrease their logistics costs and tap new revenues through freight management; supplement their marketing, enable a quicker entry into international markets, and diversify their sources of supply through origination and aggregation; and manage market risk and gain new market insights through proprietary trading.

Being an active market participant across all four dimensions of such an integrated commercial strategy will naturally provide access to a constant stream of valuable information. As discussed later in this paper, winning companies will need to have the capabilities, processes, and systems in place to act fast and monetize information coming in from physical or financial markets.



Equity coal marketing

U.S. coal producers have traditionally looked at international markets as a “swing” option for selling coal after domestic needs were met. But with the slowdown in demand in North America, and the rapid growth of emerging economies resulting in new energy needs abroad, U.S. producers adopt a different stance.

Producers could begin shifting more of their attention abroad by seeking to build customer relationships, market intelligence, and capabilities needed to develop international markets and compete against entrenched players. Some U.S. producers are already involved in

familiar U.S. exports markets, such as Western Europe and Latin America. Still others have begun to tap growing demand centers in Asia. But many have not carved out an adequate portion of their portfolio – or their attention and internal resources – to commit to these markets.

Metallurgical met coal

Our analysis of the key export destinations for U.S. met coal incorporated the size of the market, growth rate, and current import levels, among other factors affecting purchasing decisions (see Exhibits 3 and 4).

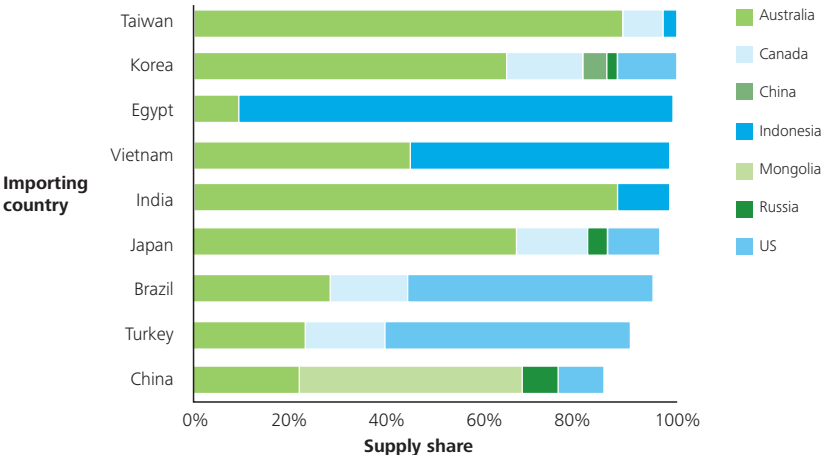
Exhibit 3. Market attractiveness for met coal imports*

Country	Total consumption (Mt)	Total imports (Mt)	Percentage of Imports from United States	Market growth rate
Brazil	16	16	51%	3%
China	444	48	10%	15%
Egypt	1	1	91%	0%
India	45	30	6%	11%
Japan	49	49	11%	2%
Korea	31	29	3%	1%
Taiwan	6	6	5%	5%
Turkey	4	4	51%	0%
Vietnam	0	0	1%	0%

Source: Deloitte analysis based on data compiled from various sources including: Reuters, EIA, Morgan Stanley, Korea Energy Statistics Information System, Korea Coal Association, Korea Iron and Steel Association, Economic Intelligence Unit, Bureau of Energy – MOEA

*Western Europe has been the traditional market for U.S. producers; hence, was not evaluated as part of this coal study.

Exhibit 4. Current levels of met coal imports by producer country



Source: Deloitte analysis based on data compiled from various sources including Korea Energy Statistics Information System, Korea Coal Association

It is not surprising that Egypt and Brazil rose to the top due to their history as U.S. met coal destinations, familiarity with coke-oven batteries, and logistical advantages over other met coal varieties from Australia. Although growing at a slower rate than some of the emerging markets in Asia, these regions have direct and far less expensive routes from U.S. ports. This allows U.S. coal to be competitive compared to exports from Australia or Canada. In addition, many of these markets offer attractive growth rates.

Despite its geographic disadvantage, though, the Asian region should not be ignored, as it is an important demand center of global met coal. Building relationships and establishing a toehold in growing markets such as China and India will pay dividends in the future, particularly once additional port capacity on the U.S. West Coast comes into play. This could increase U.S. coal's competitiveness in Asia. Based on primary interview discussions, it is expected that the gap between met

coal supply and demand in China, for instance, may reach 180Mt by 2020, offering opportunity for U.S. producers to expand on their current 10% market share in the country. Meantime, customers in India are beginning to recognize the drawbacks of relying on Australia for 88% of met coal imports – concerns which came to a head when cyclones devastated Australia's coastal ports in 2011 and disrupted coal exports to India.

While Asian markets may be ripe for the picking, U.S. coal producers will have to account for and cater to specific buyer preferences within each country (see Exhibit 5). Buyers in many countries in the region – particularly Japan, Korea, Taiwan, and India – generally prefer true mid-volatility coal, but some also have the blending facilities to accept low- and high-volatility coal. Understanding these nuances in preferences can be critical for producers to gain influence with buyers in these regions.

Exhibit 5. Importance of different buyer preferences

Country	Price	Quality	Relationship	Supplier diversity	Reliability of service
Brazil	High	High	Medium	High	Medium
China	High	Neutral	Neutral	Medium	Neutral
Egypt	High	Medium	Low	Medium	Medium
India	High	Neutral	High	Neutral	Medium
Japan	High	High	Neutral	High	High
Korea	High	High	High	Medium	High
Taiwan	High	High	Neutral	High	High

Source: Deloitte analysis

Thermal coal

Turning to thermal coal export markets, an analysis similar to the met coal analysis above, also performed by Deloitte, showed select Asian countries competing at the top with well-entrenched European nations, such as Germany, France, and the U.K. For years, Europe has enjoyed low logistics costs and established customer-supplier relationships, and these markets will continue to be foundational demand sources for U.S. thermal coal. Still, Asian countries, such as Japan and Korea, are beginning to benefit from their proximity to West Coast ports and preferred growth rates. Japan, which is only 3,800 miles from Ridley terminal, will likely see 2% CAGR in its thermal coal market; Korea, just 4,262 miles away, is in line for 5% CAGR.

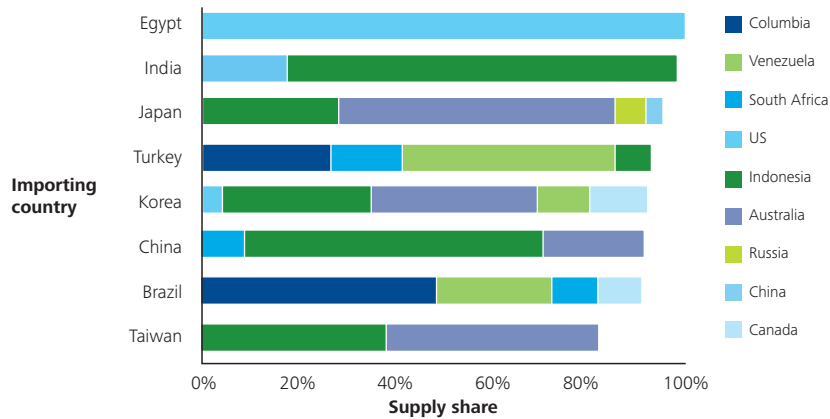
As in the case of met coal, buyers in both Japan and Korea are very particular about the specifications and quality of the thermal coal they import. Even so, buying preferences are much more uniform, with thermal coal buyers focusing on price and burning rate. Fortunately, U.S. producers have the specific coal needed to serve these markets. U.S. coal from the Powder River Basin (PRB) is well suited to the Korean market, while coal from the Western Bituminous region can serve the Japanese market. The PRB coal can eventually make its way to the Asian markets through the Ridley terminal, depending on the competitiveness of the rail transportation cost to the ports.

Exhibit 6. Market attractiveness for thermal coal imports

Country	Total consumption (Mt)	Total imports (Mt)	Percentage of Imports from United States	Market growth rate
Brazil	10	4	9%	7%
China	3437	103	1%	7%
Egypt	<1	<1	100%	8%
India	609	91	2%	10%
Japan	126	126	1%	2%
Korea	93	93	5%	5%
Taiwan	56	56	2%	2%
Turkey	20	20	2%	5%
Vietnam	1	1	0%	0%

Source: Deloitte analysis based on data compiled from various sources including: EIA, Economic Intelligence Unit, World Energy, Morgan Stanley, BNP Paribas, China Coal Resource, Bureau of Energy – MOEA, Vietnam Coal Plan 2020, Morocco Ministry of Energy and Mining.

Exhibit 7. Current levels of thermal coal imports by producer country



Source: Deloitte analysis based on data compiled from various sources including Electricity Generation & Market in Turkey, Korea Energy Statistics Information System, Korea Coal Association

Building market awareness

Regardless of the type of coal being shipped, U.S. producers could work to increase their awareness of the varying buyer preferences among export markets. Customers differ by region and country when it comes to the type of customer relationship they are seeking (high-touch versus low-touch), as well as in other issues, such as contract duration, delivery method, and coal specifications.

To help develop this awareness and manage new relationships, U.S. producers will need to build organizations with “boots on the ground” in select new markets. One option may be blending longtime company employees with local hires that have deep market knowledge and access to customers, suppliers, and logistics providers. Joint ventures and partnerships with local players can also help accelerate the time required to enter new markets.



Origination

As U.S. producers look to expand their global market presence, origination will play an important role in helping to address specific customer demands in a cost-competitive manner. Third-party purchases on the spot market – via off-take agreements or as a market aggregator in certain geographies – can help producers penetrate new markets, enrich their product offerings, and dramatically reduce start-up costs. Entering new markets through acquisition can be extremely capital intensive, and current balance sheets will most likely not be able to support such an approach. Origination, by contrast, can be an “asset light” approach to gaining access to new supplies that meet complex customer needs.

Access to new supplies

Because of the disadvantage the United States has in reaching growing demand centers on the other side of the world, it is difficult to wring profits from direct exports. This makes it important for companies to gain access to other international sources of supply. Companies who have already taken these steps have benefited as domestic demand for coal has declined, both in terms of finding new revenue streams and new buyers for excess production.

Traditional international expansion strategies – such as asset deals, acquisitions, and joint ventures – are worth considering to access new supply markets and meet this growing demand. However, we believe origination offers a better path in select markets, particularly those that feature a substantial number of small coal producers that, added together, comprise a sizeable portion of the market. These companies are often capital-starved, lack operational and maintenance capability for their mines, and may need logistics help to get their coal to desired markets.

Large U.S. producers are well suited to address these needs, especially when it comes to managing logistics and infrastructure. Producers already supplying coal to some growing regions of the world are often inexperienced and lack the capital to remedy underdeveloped infrastructure in local markets. Although this would require significant investment, U.S. producers that are in a position to help upgrade this infrastructure would be at a significant advantage when it comes to aggregating production in these countries.

Mozambique provides an illustrative example of the power of aggregation in developing markets. Coal production in the country was negligible up until 2010, when potentially massive reserves were discovered. Since then, development has been led by two companies, which could likely control the vast majority of domestic coal production and related infrastructure for the foreseeable future. Much of their success has to do with infrastructure investments they have made to date. One of these players has invested more than \$150 million in transloading facilities with a capacity of more than 12 Mtpa. The two producers are now so entrenched in the market that they exert enormous influence over the country’s coal production, accounting for more than 90% of the market.

Aggregation is at least partly underway in a handful of other nations, including Colombia, Australia, and Indonesia (see Exhibit 8). Of these markets, the highly fragmented Indonesian coal market may represent the leading opportunity for aggregation, considering its proximity to Asian demand centers.

Exhibit 8. Potential for coal aggregation in key supply markets

Country	Total exported (Mt)	Fragmented vs. Concentrated	Aggregation occurring?
Australia	322	Medium	Yes
Colombia	77	N/A	Yes
Indonesia	300	Fragmented	Yes
Mongolia	18	Concentrated	No
South Africa	75	Medium	No

Source: Deloitte analysis based on data compiled from various sources including: BNP Paribas, Deutsche Bank, Reuters, RBS, Bloomberg, Mining Weekly

Logistics

Logistics and handling costs account for almost 60% of the delivered price for both domestic and international coal. While owning this part of the value chain has always been a critical capability, it is becoming even more important in an increasingly commoditized global coal market. Having access to key international ports at competitive costs, or selecting the proper ship size to reach higher value growth markets, can provide significant cost savings and flexibility when expanding into new international markets and meeting delivery demands.

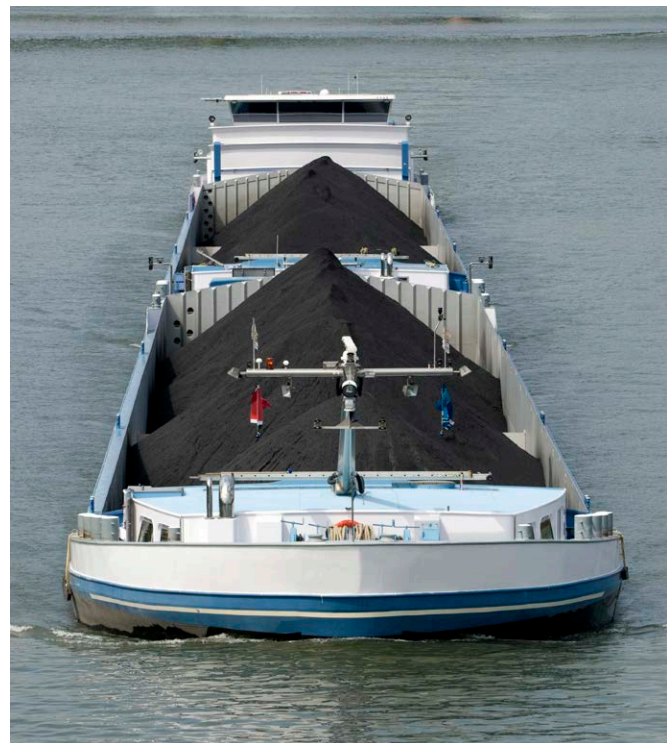
Freight desk

Producers need to build the capabilities required to manage their freight costs, specifically through the creation of a freight/logistics desk. A freight desk looks at owning a portfolio of rail, barge, and terminal contracts, as well as time and voyage charters. When a producer has a dedicated freight desk, it enables them to compete on a “delivered cost” basis by more efficiently managing their freight commitments.

A freight desk can employ different tactics to achieve this kind of cost optimization. One of these is backhauling, which involves shipping other dry-bulk cargo, such as iron ore, cement, and clinker, between markets on the return trip after delivering coal. Remarketing ship capacity is another beneficial use of the freight desk. This strategy involves identifying excess capacity on ship charters, and remarketing that capacity to other producers. Such contracts are typically negotiated directly between parties or through brokers, and can add significant revenue to help defray coal-related freight costs.

These revenue opportunities add up when a freight desk is properly staffed and managed. As an example, in order to manage a healthy freight book and generate 15% to 20% margins, a freight desk should budget approximately \$15 million to \$20 million in working capital. The working capital or float is required to manage the cash flows needed to front the costs of the charters, cargo, and other operational expenses.

U.S. producers will want to ensure they staff their freight desk with team members who are knowledgeable about international freight markets and exhibit a penchant for creative problem solving. Those manning the desk will need to be able to employ sophisticated models for freight optimization, enhanced risk, and options pricing.



Trading

Having a clear trading strategy aligned with the organization’s overall risk appetite can help coal producers not only gain additional revenue, but also support international diversification efforts by managing risk more effectively. In the not-so-distant past, many U.S. coal producers employed trading as a hedge against market movements in the price of coal. But the illiquid nature of the coal market, and the relative dearth of market participants, limited trading’s appeal.

Today, coal is much more widely traded, creating opportunities for producers to employ proprietary trading strategies to book additional profits and not just mitigate losses. Furthermore, our analysis of recent market data shows that opportunities exist for proprietary trading in related commodities, such as electricity and oil.

Liquid and volatile markets

Coal trading is mostly based on thermal coal, for which well-established price indices exist across the globe (e.g., API 2, API 4, and CAPP NYMEX). For met coal, despite the obvious market appetite for further commoditization and the launch of various indices and financial instruments in this direction, markets still require more momentum to reach meaningful levels of participation and liquidity. Nevertheless, by analyzing pricing information and other market data over a 12-month period, we were able to conclude that significant trading opportunities exist in preferred physical ports and financial indices.

Among physical ports, we found that FOB Richards Bay and FOB Kalimantan offer the best blend of liquidity and volatility in coal trading activity (see Exhibit 9). Of note, the highest levels of physical trading were seen outside the United States. In the U.S., the CAPP NYMEX FOB Barge was identified as the leading opportunity, even though trading volumes there have decreased over the last 12 months.

Exhibit 9. Liquidity and volatility across key ports

	Trading strategy	Liquidity	Volatility
Physical trading	FOB Richards Bay	●	◐
	FOB Kalimantan	●	◐
	DES ARA	◐	◐
	FOB Newcastle	◐	◐
	FOB Puerto Bolivar	◐	◐
	CFR India East	◐	◐
	CAPP NYMEX Spec	◐	◐

Low trading fit ○ ◐ ◑ ◒ ◓ High trading fit

Source: Deloitte Estimates, EIA, and Argus Media

Among financial indices, API 2 was rated as the most liquid, with API 4 a close second (see Exhibit 10). Volatility levels were somewhat uniform among the indices studied, except for the newly created API 5 and API 8 indices. Amongst U.S. instruments, the CAPP NYMEX Spec showed a reasonable level of liquidity.

Exhibit 10. Liquidity and volatility across key financial indices

	Trading strategy	Liquidity	Volatility
Financial trading	API 2	●	◐
	API 4	◐	◐
	API 6	◐	◐
	API 5	○	○
	API 8	◐	○
	CAPP NYMEX Spec	◐	◐

Low trading fit ○ ◐ ◑ ◒ ◓ High trading fit

Source: Deloitte Estimates, EIA, and Argus Media

Trading benefits

Producers could likely take advantage of emerging opportunities in physical ports and financial indices by enhancing their trading capabilities. Actively participating in these markets would allow producers not only to benefit from incremental revenue gains and hedge their equity coal positions, but also through market intelligence that can be incorporated into decision-making in marketing, origination, and logistics activities. Having a clear and commonly shared understanding of market price movements is the starting point for an integrated commercial strategy.

For instance, a review of the past 12 months showed significant trading opportunities in API 2 and API 4 spreads. Trading in those markets may reveal instances where spreads are likely to widen. This information might be used by the marketing desk to book coal sales in South Africa in the near future, or it might prevent the logistics team from agreeing to ship coal from South Africa to Europe since that would entail buying coal at higher prices from other suppliers.

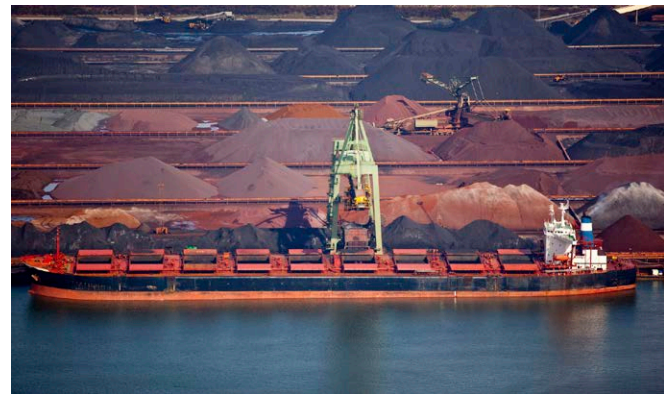
Other examples where trading insights could affect strategic decisions include:

- By providing marketing with pricing signals that can help better position equity coal in new markets;
- By identifying arbitrage opportunities between physical and financial markets;
- By combining physical contracts with freight-forward agreements, thereby optimizing transportation costs; and
- By determining when cross-commodity hedging is required.

Setting up a trading book

Only by actively participating in these trading markets do these insights come to light. Producers need to be able to understand who is trading, what they are trading, and how price movements are happening. This requires the creation of a proprietary trading book, which would call on capabilities that some producers may not currently have in-house. The trading organization would need not just traders with deep knowledge of and experience in commodity markets, but also the front-office staff to support them and the back-office personnel to handle financial settlements.

The trading operation would also likely be heavily involved in helping the board determine the company's appropriate risk allocation, as traders will be actively managing and monitoring risk in many forms on a daily basis. Company management will want to be sure to involve trading in setting a clear risk policy and controls to enable risk monitoring and ensure compliance with the board's risk allocation. Such a policy should set defined parameters around OTC trades, exchange trades, and broker trades, as well as issues, such as duration and volume limits.



Conclusion

Faced with flattening demand and increasing regulatory pressures at home, U.S. coal producers need to have an integrated commercial strategy to help expand their reach and thrive in an export-driven market. Such a strategy may necessarily force them to reassess the risks they are taking as an organization, and reallocate more of their risk-taking away from core marketing operations and into other areas of the business to position them for growth in international markets.

As our global study reveals, this rebalancing does not mean that producers must increase overall appetite for risk. In many ways, adding more emphasis to activities, such as origination, logistics, and trading, can help the organization as a whole make better decisions, operate more efficiently, and hold constant or even reduce the total level of risk.

Market intelligence will be a critical enabler of this strategic shift. The information gathered from being on the ground in emerging markets, trading in physical supplies or financial indices, and strengthening ties to freight companies and third-party suppliers will give U.S. producers the insights they need to compete with entrenched players and make overseas inroads in the most efficient way possible.



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