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Energy sector risks:

A strategic view

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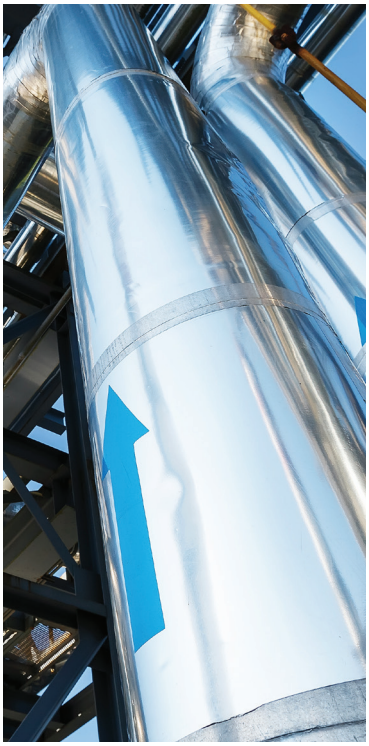
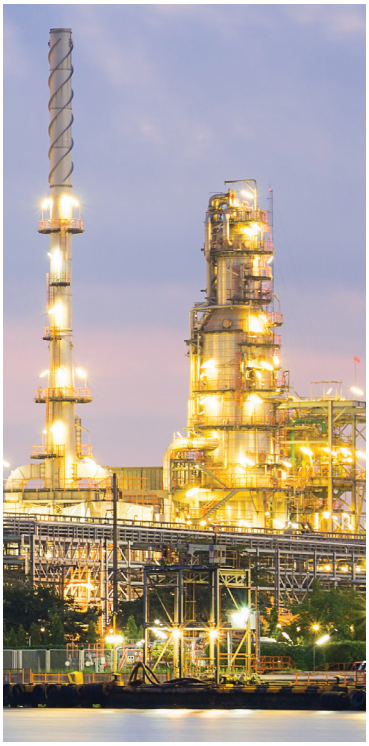




Volatility and risk are nothing new for the U.S. energy industry. Throughout their history, energy companies have dealt with a variety of internal and external factors – from boom-and-bust commodity price cycles and competitive pressures to shifts in regulatory priorities and the inherent uncertainties associated with any business that involves the development of natural resources.

In addition to these longstanding intrinsic risks, today's energy industry faces many contemporary challenges and issues, including societal pressures to transition from fossil fuels to alternative energy sources with a lower carbon footprint, such as wind and solar power, as well as increasing focus from investors and other groups on environmental, social, and governance (ESG) issues. In this environment, energy industry businesses should be prepared to respond to several specific, high-level risks, including the following:

Geopolitical risk

Uncertainty around the world is affecting commodity prices, inflation, and supply chain reliability. The Russia-Ukraine war is causing particular disruption in petrochemical supply and shortages of several other key commodities globally. At the same time, continuing and growing tensions between China and Taiwan are causing companies around the world to reevaluate other supply chain and tariff outlooks, along with the possibility of further increases in U.S. government spending. Longstanding suppliers such as Saudi Arabia are not as amenable to moderating oil and gas production cycles, while less consistent suppliers such as Iran are building cash reserves due to currently higher oil and gas prices. These myriad global uncertainties directly affect energy industry businesses' long-term planning and financing concerns.

Customer behavior risk

A closely related component of reputation and regulatory risk issues is the more fundamental risk of customers eventually migrating away from fossil fuel products. Although this risk is moving slowly at present, it nevertheless must be recognized as a long-term risk for the energy industry at large.

Cyberthreats

The inevitability of cyberattacks continues to be one of the highest risks in the energy industry. The risk of malevolent actors gaining control of assets or outright theft of cash – and the impact such attacks would have on business operations – are of critical concern to any business but are particularly applicable to the resource-intensive energy industry.

Increased regulatory risk

Federal, state, and local laws, regulations, and taxes continue to evolve as legislators and executive agencies revisit and revise their priorities. Beyond immediate compliance concerns, some proposed regulatory changes – such as permit requirements for drilling wells, restrictions on hydro-fracking, and increased regulations surrounding methane emissions and flaring – could fundamentally alter the business models of companies in all subsectors of the energy industry.

Human capital risk

Workforce disruption affecting various groups such as facility employees, oilfield crews, and corporate employees is expected to continue as energy companies experience a long-running scarcity of workers with skills that align with hiring managers' needs. Work-from-home and return-to-office policies also remain unsettled as companies work out their post-pandemic approaches to human resources issues for management and administrative positions that do not require physical presence on a work site. In addition, growing societal attention to diversity, equity, and inclusion (DE&I) issues also must be considered. The anticipation of a recession in 2023 will challenge companies to balance the potential need for staff reductions against the imperative of retaining desired employees.

Digital transformation and automation risk

The risk of failing to keep up with the fast pace of information technology change might not be quite as acute in some energy businesses as it is in other industries. Nevertheless, changes in company processes and the use of technology by third parties (particularly in the banking industry and with the increased use of blockchain technology to clear commodity transactions) certainly will have an impact on energy companies that do not keep up with these changes.

Reputation risk

Activist groups are expected to continue their focus on reductions in the use of fossil fuels. As they do, establishing, managing, and advancing an effective ESG strategy will become increasingly important for energy businesses. A successful ESG strategy not only will share the company's vision and priorities with investors, but also will deliver on that vision with other interest groups and regulatory bodies as an essential component of effective risk management. Major companies in the energy industry long have taken leading roles in establishing best practices to address environmental concerns and now are demonstrating comparable leadership in addressing global warming questions. Their public relations teams must continue to advocate on behalf of these companies by spreading word of the achievements and goals that resonate with activists.

In response to these dynamic risks, leading companies in the energy industry are focusing increased attention on their enterprise risk management (ERM) programs. Some are more closely scrutinizing the compositions of their boards of directors, with an eye toward skills and competencies that are particularly applicable in today's ever-changing environment. Another critical priority for the most successful companies is developing well-thought-out, robust, and tested crisis management response policies and procedures.

Following are specific analyses of strategic issues, risks, and mitigation responses to those risks within the following energy industry subsectors:

1. **Upstream: Exploration and production**
2. **Midstream: Pipeline and storage**
3. **Downstream: Refineries, plants, and retail**
4. **Oilfield services**
5. **Electric and gas utilities**
6. **Alternative energy businesses**

Exploration and production: Upstream issues

Strategic issues and concerns

Exploration and production (E&P) companies provide the impetus for most of the rest of the energy sector, in that they are the actual owners of the resources that will be extracted, transported, refined, and ultimately sold. In this position, the ability to obtain financing is always a strategic issue, making the ability to attract investors or other financing sources an important priority for E&P businesses.

The issue of financing has become increasingly challenging in recent years as some banks have begun to scale back their energy lending practices in response to pricing volatility, pressure from activists for a transition away from fossil fuels, and other risks. In many instances, E&P companies will work with venture capital investors, arrange joint ventures, or pursue other alternative sources, all of which generate the need for specialized contracting, accounting, and auditing expertise.

E&P companies also must address some fundamental strategic questions as they determine the most viable path forward. For example, some companies might determine their best course is to develop fields with known reserves, which present relatively modest risk and stable returns, while others might choose to explore and develop unproven fields, an approach that involves considerable risk but also holds the promise of greater reward if successful. Still others might focus on the investment side of the business, buying participation in wells that are already producing.

In the same way, there are significant differences between E&P companies that focus on land, shallow-water, and deep-water operations. Although the actual drilling and extraction largely is performed by oilfield services contractors, the E&P company that owns the resource must have sufficient technological expertise to oversee and monitor operations as E&P personnel remain directly involved in many aspects of drilling and completing the wells.

Another consistent strategic concern relates to the industry's historic price volatility – a characteristic that continues today with no sign of ending. Recent years' increases in crude oil and gas prices obviously benefited many E&P companies, but the picture is not exclusively positive as production costs also have increased. Nevertheless, many energy companies currently are maintaining sizable cash reserves, which they have been careful to conserve due to current regulatory uncertainty and the historic likelihood of future price reversals.

Critical risks and mitigation

One of the most high-profile risks facing many E&P companies today is uncertainty surrounding the availability of oil and gas leases on federal lands. Shifts in U.S. energy policy have upended many companies' longstanding strategic plans, and ongoing volatility in the political environment continues to present significant risks.

A closely related concern is regulatory risk, as various agencies explore the idea of additional constraints on widely used technologies such as fracking (hydraulic fracturing of shale rock formations that increase the flow of oil and gas). Prohibitions against specific extraction techniques can have obvious negative effects on the value of resources.

In addition to such specific risks, of course, compliance with Department of Energy (DOE), Environmental Protection Agency (EPA), and other federal, state, and local regulatory requirements is a constant and ongoing priority, requiring significant operational, risk management, and auditing expertise.

E&P companies also must address a number of technical risks and control issues. For example, management must monitor and evaluate the accuracy of seismic tests and other geological activities and analyze the performance of its leasing operations.

Other critical control points include contract controls and supervision of seismic specialists and the oilfield services companies that handle the actual production, accounting processes involving royalty production reports and payments, and metering controls as the product leaves the wellhead and is transferred to a midstream transportation or storage facility. Indeed, metering issues sometimes can generate discrepancies that range in the millions of dollars.

Finally, as a well's life approaches maturity, the E&P company must address an entirely new array of environmental and safety controls as it prepares to shut down and cap the well. Knowing the process and understanding how to test if the control environment will lower the risk are essential capabilities for a successful E&P company.

Pipeline and storage: Midstream issues

Strategic issues and concerns

Because midstream companies do not own the resources they transport, oil and natural gas prices are of less direct concern than they are to the E&P subsector. A greater strategic issue for midstream companies is volume, rather than price, since their revenue is fee-based, as measured in cost per gallon or cost per metric cubic foot. Nevertheless, price volatility does have an indirect impact on the midstream in that it can affect the overall volume of product they transport, and thus can lead to excess capacity when production slows.

Midstream companies share other similarities with the E&P subsector in terms of strategic risks. For example, just as E&P companies must negotiate lease rights and royalties, pipeline companies must negotiate for access and rights of way, a topic that has generated considerable controversy in some locations. Companies in both subsectors also must address the area of environmental risks and concerns, along with the investor and community relations challenges associated with ESG issues.

Among the more complex challenges facing midstream companies are the less visible ramifications of the United States' shift from net energy importer to net energy exporter – and more recently a shift back in the other direction. Such shifts in demand trigger changes in product usage, which can mean pipeline companies must rethink their routing strategies.

Finally, like almost all other energy-related businesses, midstream companies typically incur sizable capital expenditure requirements – sometimes in the hundreds of millions of dollars – as they acquire and install highly specialized and heavy equipment and components. Their extensive infrastructure networks also impose significant construction, maintenance, and operational budgets, all of which require specialized management and auditing expertise.

Critical risks and mitigation

Similar to companies in the E&P subsector, petroleum pipeline and storage businesses require considerable specialized contract management expertise and controls. In addition, facilities in some jurisdictions can be subject to piracy, which imposes the need for specialized security and monitoring capabilities.

The high-profile environmental and reputational risks associated with the rest of the energy industry apply equally to the midstream sector, with the added complication of the need for specialized technical capabilities to handle the necessary cleaning and maintenance requirements of pipelines and storage facilities. Likewise, accurate metering controls are as critical to midstream companies as they are to the E&P companies that feed them product for transport via pipeline, truck, rail, or ship.

More specific to the midstream sector are controls necessary for monitoring the quality and composition of the product being transported, particularly by pipeline. Because rerouting of feedstock is a common occurrence, midstream companies must have nimble and highly responsive routing capabilities that enable them to redirect product quickly to meet changing end-user demands and logistical requirements. Complex invoicing and accounting controls are also essential to such fast-changing operational systems.

Refineries, plants, and retail: Downstream issues

Strategic issues and concerns

Because most petroleum product refineries operate on multiyear contracts, developing and maintaining consistent revenue strategies can be particularly challenging, especially in view of rapid and dramatic price swings for both raw feedstock and finished products. Price escalation clauses and other complex contract terms can help mitigate pricing risk, as do hedging and derivative strategies that many contractors employ to help offset fluctuations in commodity prices.

As raw feedstock generally is fungible, downstream processors must apply sophisticated metering and tracking technologies in order to keep track of ownership and compliance with contract terms. Most successful downstream processors also apply aggressive utilization strategies to make full use of all components of the raw feedstock as well as the various byproducts of their refining processes.

Millions of dollars are at stake on both the revenue and expense sides, making efficient maintenance capabilities critical to any downstream facility. Broadly speaking, refineries and other downstream processors generally perform two distinct types of maintenance: scheduled or "turnaround" maintenance and emergency or "crisis" maintenance.

Scheduled, preventive maintenance at refineries and other processors is a highly organized and tightly scheduled series of activities, comparable in some ways to an auto racing pit stop. Dedicated crews perform carefully planned steps in a rigorously controlled sequence, with the objective of completing a plant's turnaround in the shortest time possible without compromising safety or effectiveness. A single day's delay can potentially cut revenues by millions of dollars – an impact that is certain to attract board attention. In addition, even slight delays can cascade through the rest of the process. Many steps are contracted out to third-party vendors, which means the costs of a turnaround can quickly escalate.

Crisis maintenance presents a separate set of risks. Because much of the equipment and machinery in downstream facilities is very large and costly, it is often impractical – and sometimes downright impossible – for refineries to keep complete reserve stocks of every piece of machinery that could conceivably fail. To help mitigate the risk of prolonged emergency shutdowns, competing refiners sometimes collaborate to maintain centrally located reserves of major mission-critical plant components.

Critical risks and mitigation

The strategic issues noted previously require refiners and other downstream processors to apply numerous controls and tests as part of a comprehensive ERM program. Among the many critical components are extensive financial controls to support effective management of capital expenditures, as well as sophisticated accounting systems for tracking ownership, pricing, and compliance with highly complex contract and delivery terms. Accurate metering, measurement, and product quality monitoring are also essential, as they are in other energy industry subsectors.

Managing the strategic risks associated with both crisis and turnaround maintenance also requires a broad array of controls to track both timely performance and cost-effectiveness, as well as the availability of critical spare parts. Effective vendor management systems are also critical in this area.

that requires consistent monitoring and auditing expertise, not only in the downstream subsectors but in almost all aspects of the industry. Other critical controls that are also consistent with other subsectors include compliance with all relevant employee safety requirements from the Occupational Safety and Health Administration (OSHA) and other federal, state, and local workplace safety regulators, as well as environmental safety requirements from the EPA and other agencies.

Finally, it should also be noted that, in addition to the tax impacts of research and development (R&D) expenditures, refineries, natural gas plants, and other downstream processors can encounter a number of other tax issues that are unique to the industry, particularly as U.S. and state tax codes are adjusted to encourage long-term behavioral shifts in the nation's energy sourcing and usage patterns. Federal excise taxes and fuel taxes are a significant issue in this subsector.

Oilfield services

Strategic issues and concerns

Oilfield services companies are naturally sensitive to volatility in oil prices. When E&P companies scale back in response to adverse price fluctuations, the effects quickly ripple through to the numerous oilfield services companies that support them. In fact, many of these companies' very survival depends on consistent demand.

Substantial changes in the basic structure and strategies of producers also directly affect this subsector. Fracking and other recent advances in extraction methods have reshaped the oilfield services subsector, while shifting priorities in energy policies and regulatory approaches continue to inject further uncertainty into the industry. In such an environment, demand forecasting and project planning are particularly difficult challenges.

Oilfield services companies are also susceptible to inflationary pressures that can be particularly challenging to anticipate due to their reliance on large, expensive, and highly specialized equipment that can be difficult to access and replace once it is deployed.

Critical risks and mitigation

Like their peers in the E&P, midstream, and downstream subsectors, oilfield services companies are particularly sensitive to employee health and safety issues, as well as the impact of their activities on the environment. Most companies in all subsectors – and oilfield services companies in particular – have made extensive and longstanding commitments to their health, safety, and environmental (HSE) departments, building on decades of experience that long predates the more recent ESG movement.

Oilfield services companies also encounter many of the risks that are common to most manufacturing or production businesses. As a result, supply chain and inventory management controls, customer relationship management, and other contemporary ERM controls must be applied in order to effectively mitigate risks.

Utilities: Electricity and gas

Strategic issues and concerns

As public utilities, both electricity and natural gas providers are highly regulated in terms of the prices they can charge customers, as well as the construction and maintenance of the infrastructure necessary for delivery of their product. For many electric utilities, repair, upgrading, and hardening of the grid to better withstand storms and other natural disasters is also a strategic imperative. As with all other energy industry subsectors, safety issues are also a consistent concern for electric and gas utilities.

For decades, many electric utilities have relied largely on hydrocarbon energy sources such as coal and natural gas to power the turbines that generate electricity. In some instances, non-carbon sources such as hydroelectric, geothermal, and nuclear energy were also major factors. Today, many utilities are in the midst of multiyear plans to rework their power generation strategies, responding first to pressures to evolve from coal-driven plants to natural gas, and more recently making significant investments in solar and wind-powered generating capabilities. This shift in energy usage and sourcing preferences is expected to continue, and will significantly affect utilities' R&D, construction, and operational priorities over the long term.

Critical risks and mitigation

Regulatory compliance is always a priority in utility companies' ERM programs. Rate-setting bodies obviously have a direct impact on revenue projections, while interactions with safety and environmental regulatory agencies are of concern for both regulatory and community relations reasons. Metering issues are also a consistent area of focus.

As they migrate from conventional fuel sources to more reliance on renewables, electric utilities' R&D budgets can be considerable. These initiatives also require extensive capital expenditures for design and construction. Effective financial management reporting and controls are therefore critical for reasons related to both compliance and investor relations.

Effective enterprise risk management also requires utilities to maintain extensive repair and recovery crews and capabilities. The costs and logistical challenges of these efforts can be mitigated somewhat through cooperative aid agreements with utilities in neighboring jurisdictions as well as other regions of the country.

Alternative and renewable energy

Strategic issues and concerns

Although the development of alternative energy sources has a long history within the overall energy industry, public interest in clean or renewable energy has clearly intensified in recent years. The most recent manifestation of this interest can be found in the attention that investors, governments, and the public at large are currently devoting to the subject of ESG issues and reporting, particularly as they relate to reducing greenhouse (GHG) gas emissions. The ability to address investors' and other interested groups' ESG concerns is an important element in many alternative energy companies' long-term strategies.

Government subsidies, particularly tax incentives, play a major role in this subsector. Indeed, they are central to many companies' business plans. Often, they are essential to both the near-term survival of the enterprise as well as its long-term success.

From a technical standpoint, the most significant strategic challenges involve issues related to energy storage and transmission. Wind and solar energy are subject to natural variations that do not coincide with peak demand periods – indeed, they often conflict with them. This makes battery storage technology a critical limiting factor that alternative energy companies must consider as part of their strategic thinking.

Furthermore, the largest deposits of essential rare earth minerals for battery storage systems are generally located in remote areas – and often in countries where mining and exports are under government control. As a result, supply chain and geopolitical issues must also be factored into alternative energy companies' strategies.

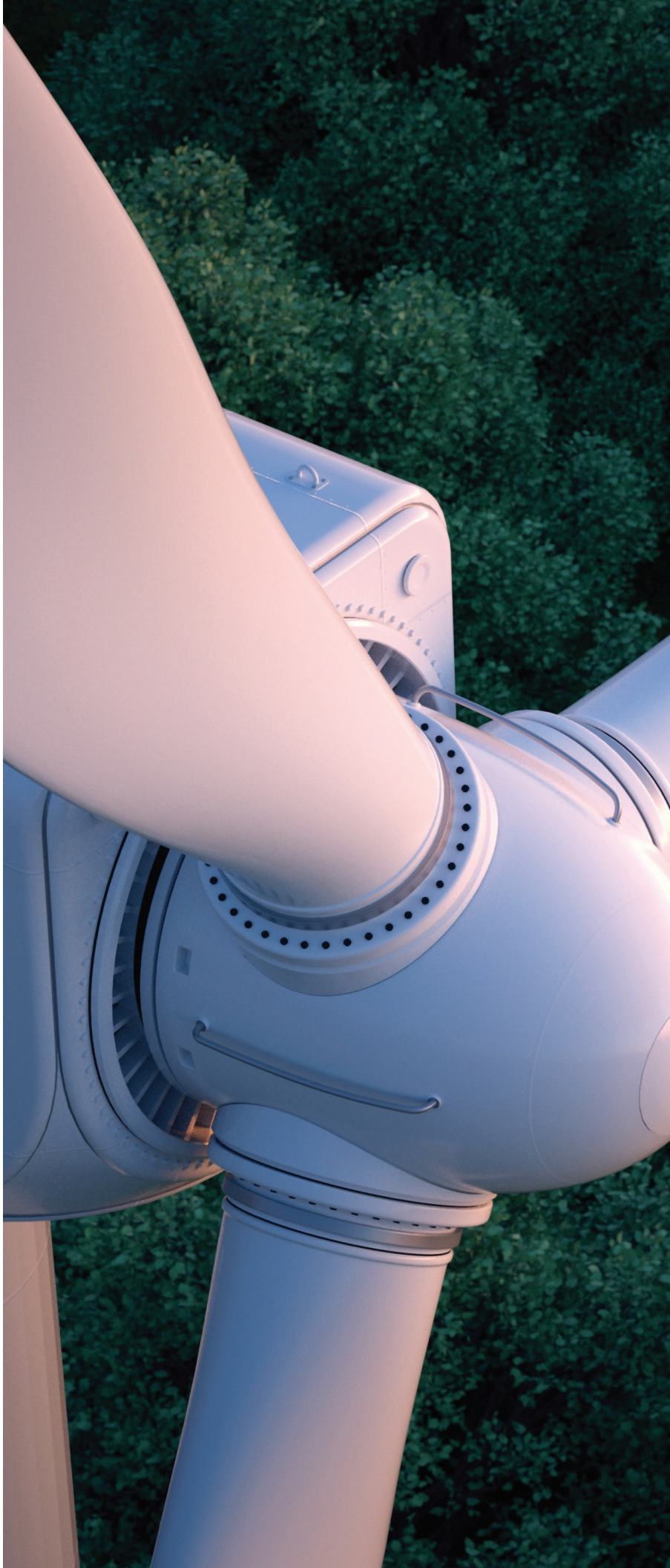
Energy transmission concerns can also affect strategy. Because areas of geothermal activity, hydroelectric dams, and large windfarms are often located in areas that are distant from the markets where electricity is consumed, construction and upgrading of transmission facilities and the overall electrical grid is another strategic concern for this subsector, along with the continuing search for more efficient technological solutions for converting solar or wind energy into electricity.

Critical risks and mitigation

Although innovation and experimentation are intrinsic to alternative energy development, companies in this subsector nevertheless require effective risk management systems and controls. In fact, it could be argued that conventional business controls – including comprehensive and consistent management, accounting, and financial reporting protocols – are even more necessary in an industry where rapid change and transformative technologies are recurring features.

As noted earlier, most alternative energy companies' business strategies depend on maximizing the use of government tax incentives and other subsidies. As a result, an effective ERM program must include extensive monitoring and controls to be sure no viable and applicable program is overlooked, and that R&D initiatives are structured properly to enable compliance.

Finally, because the ability to help investors reduce their GHG emissions and overall carbon footprint is important to many alternative energy companies' long-term strategies, financial reporting controls and protocols should be designed to provide investors with maximum visibility into the applicable metrics.



A strategic approach to energy sector risk

As they cope with today's continually expanding risk management challenges, companies in all subsectors of the energy industry should regularly review and reassess their ERM programs. In addition to maximizing their ability to respond promptly and effectively to rapidly developing risks and concerns, the most successful companies also will work to recognize and anticipate future issues in order to develop proactive mitigation programs.

Strong audit committee and board leadership will be essential to this effort. It is particularly important that board members – both individually and as a group – stay actively informed about critical risk management issues affecting the industry in general and their specific subsector in particular.

At a strategic level, boards should engage directly with management to verify the company is addressing the most consequential risks discussed earlier. Priority concerns include:

- Anticipating and preparing for continued geopolitical uncertainty, including price fluctuations and supply chain challenges
- Staying ahead of rapidly evolving cybersecurity concerns, recognizing the ever-increasing sophistication of hackers and other bad actors
- Adapting to evolving workforce issues and practices as worker expectations shift with a changing economy
- Proactively addressing reputation risk, particularly in the areas of environmental concerns and ESG strategies
- Staying abreast of the evolving regulatory environment, going beyond compliance alone to recognize and anticipate future potential regulatory risks
- Addressing changing customer expectations as a long-term strategic issue
- Keeping pace with today's rapidly changing information technology, digital transformation, and process automation trends
- Refreshing the corporate fraud risk assessment to address the post-pandemic environment, which involves shifts in risks and control responses to align with the hybrid workforce and business processes

In practical terms, such a strategic approach will involve working closely with the audit and compliance functions to be sure they are aligned with the identified risks, engaging in regular risk assessment and audit plan development efforts, and continually evaluating audit and risk management priorities to be sure they are addressing the most relevant risks and providing an effective return.

In support of these efforts, Crowe industry professionals offer access to a broad array of consulting experience and practice views including internal audit, Sarbanes-Oxley compliance, enterprise risk management, and fraud risk assessments tailored to assist companies in their risk mitigation endeavors. Crowe also provides traditional tax services and audit services to all sectors in the energy industry.

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