ENTERPRISE RISK

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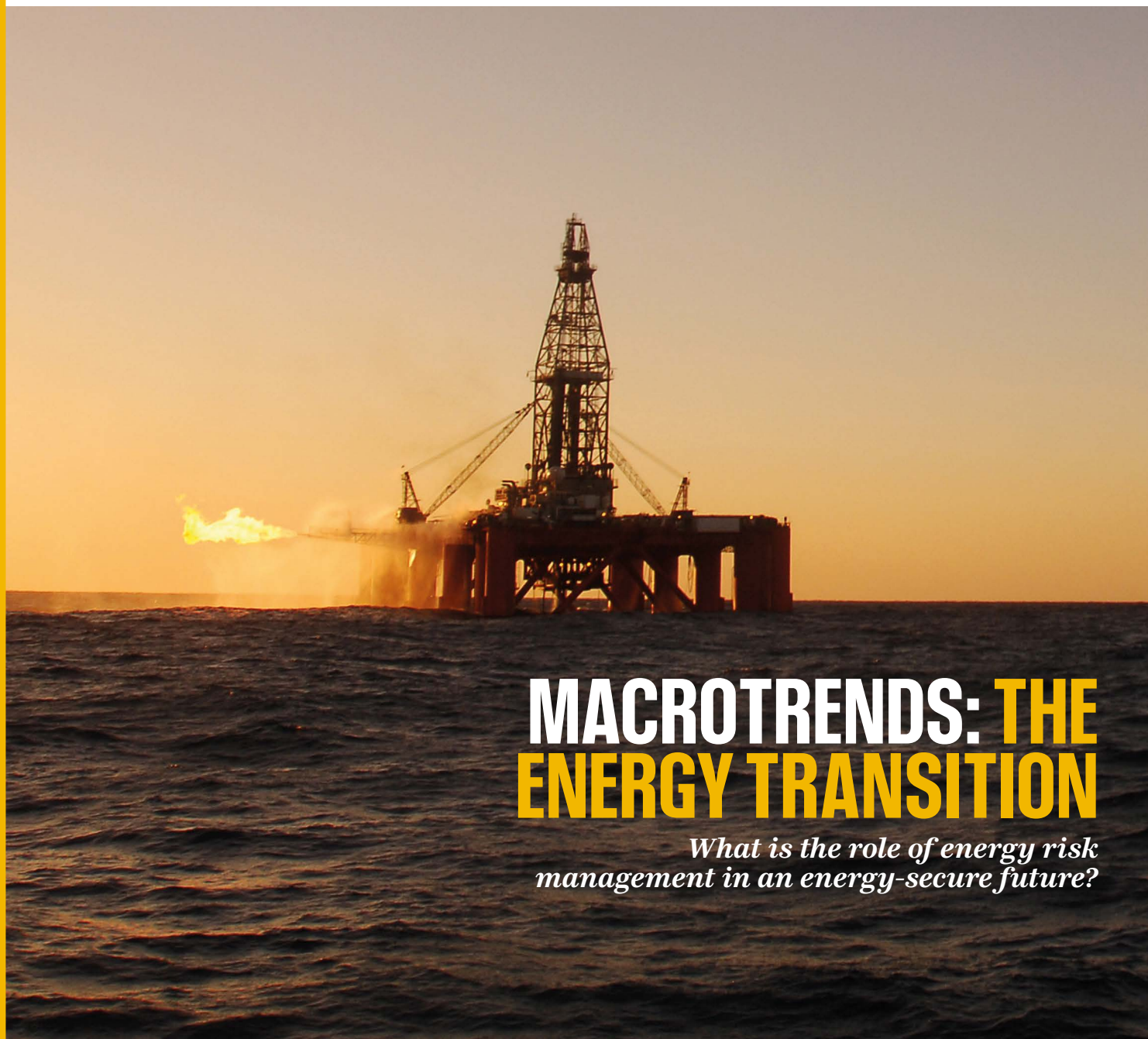

MACROTRENDS: THE ENERGY TRANSITION

What is the role of energy risk management in an energy-secure future?

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*Source: Septifani et al, Journal of Management, Economics & Industrial Organization (2019)

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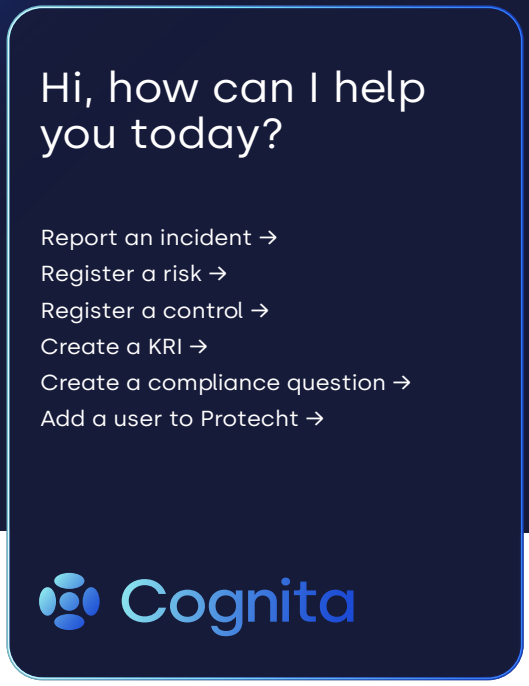
Yet manual processes and disconnected systems can slow decision-making and cloud visibility.



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ENTERPRISE RISK

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About the IRM
The IRM is the leading professional body for Enterprise Risk Management (ERM). We drive excellence in managing risk to ensure organisations are ready for the opportunities and threats of the future. We do this by providing internationally recognised qualifications and training, publishing research and guidance, and setting professional standards.

For over 30 years our qualifications have been the global choice of qualification for risk professionals and their employers. We are a not-for-profit body, with members working in all industries, in all risk disciplines and in all sectors around the world.

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A NOTE FROM THE EDITORIAL DESK. THE CURRENTS OF ENERGY RISK ARE CHANGING

Energy has emerged as one of the most dynamic frontiers for enterprise risk management. From geopolitical instability and climate imperatives, to the rapid evolution of renewable technologies and volatile commodity prices, the global energy landscape is transforming at unprecedented speed. This transformation brings both immense opportunity and significant challenges not only for those in the energy sector, but also for organisations across multiple sectors that rely on energy as an essential part of their value chain.

Issue 3 of *Enterprise Risk* magazine explores the complexities of energy risk management – the strategies, tools and insights that enable businesses to anticipate, mitigate and adapt to the shifting currents of the energy economy. As sustainability pressures reshape corporate priorities, and as digitalisation redefines how we produce and consume energy, risk professionals are called on to play a key role in striking the balance needed to successfully implement and embed resilient business models which balance market demands with innovation and long-term performance.

The IRM Energy & Renewables Special Interest Group takes lead in this issue and delves into topics such as energy market volatility, supply chain dependencies, transition risk, regulatory frameworks and the growing role of data analytics in forecasting and hedging. Through expert perspectives, case studies and forward-looking analysis, we aim to illuminate how organisations can secure stability while pursuing sustainable growth in an uncertain energy future.

Energy risk is no longer confined to the boardrooms of oil majors or utility providers – it touches every enterprise that depends on power, mobility and environmental stewardship. Managing it effectively has become a cornerstone of strategic resilience.

Andrew Demetriou
Content Manager | The Institute of Risk Management

Viewpoint

BOARD OF DIRECTORS ELECTION RESULTS

Following a robust nomination and election process, Catherine Nyaga-Mbithi GradIRM and Colin McCrorey SIRM have been duly elected to the IRM Board.

Their appointments will be formally confirmed at the Annual General Meeting on Thursday 4 December 2025, after which their terms will take effect.

This year's election saw a strong field of candidates, reflecting the depth and diversity of experience across the IRM membership. Seven nominations were received and validated, with voting conducted between 1 September and 1 October 2025.

The independent election provider Mi-Voice managed the process to ensure fairness and transparency. IRM thanks all nominees for their commitment to advancing the profession and all members who participated in the vote.

NEW OFFICE

IRM launches Asia-Pacific subsidiary

The Institute of Risk Management (IRM) is proud to announce that its group board has formally approved the establishment of a new Asia-Pacific subsidiary office in Kuala Lumpur, Malaysia. This strategic development marks a significant milestone in IRM's global growth strategy and will position Kuala Lumpur as the organisation's regional hub, supporting expansion and engagement across Australia, Hong Kong, Indonesia, Malaysia, New Zealand, Singapore, Vietnam and beyond.

The decision reflects IRM's long-standing commitment to advancing enterprise risk management education and professional development in international markets. It will make membership in the regions more accessible to senior and middle managers with a role or involvement in risk management.

The new entity, provisionally called 'IRM Asia', will aim to operate as a certified Human Resource Development Corporation training provider, delivering funded, internationally recognised qualifications and awards, training programmes, events and tailored learning solutions. These offerings will support organisations in building risk-resilient cultures while elevating risk competency, capability and leadership through lifelong learning.

IRM Asia will serve as a regional hub, bringing together IRM's global experts, members and regional group leaders to shape its strategic direction and ensure local relevance in each country. This collaborative leadership model reflects IRM's belief that regional insight and shared expertise are essential to sustainable growth and effective risk governance.

ENERGY RISK IN NUMBERS

86%
of risk practitioners feel it is difficult to recruit professionals within the energy sector

33%
of energy risk practitioners believe they will see significant regulatory changes in risk management by 2026

40%
of energy risk practitioners believe cybersecurity threats will be the biggest emerging risk of 2026

GLOBAL RISK LANDSCAPE

Be a part of the IRM Risk Trends Report 2026

We are excited to announce the launch of work on the IRM Risk Trends Report 2026 – one of our flagship pieces of research that provides crucial insights into the evolving global risk landscape.

This annual report is built on the shared expertise and perspectives of our global membership, and it would not be possible without the invaluable contributions of our Special and Regional Interest Groups, as well as IRM members like you.

To ensure that the 2026 edition reflects the most accurate and up-to-date picture of emerging risks and industry challenges, we are inviting you to take part in our survey. This survey has been designed in close collaboration with our Interest Groups, ensuring it addresses the issues that matter most to the risk community worldwide.

Your input will help us capture a truly representative view of what is happening in the world of risk – from shifting global priorities to sector-specific challenges and new opportunities for risk professionals. We invite you to complete the survey below and add your voice to this important research project. By sharing your experience and perspectives, you will be directly shaping the insights and recommendations that will inform risk leaders across the globe.

Take our survey >>

IRM AWARD IN MANAGING AI RISKS

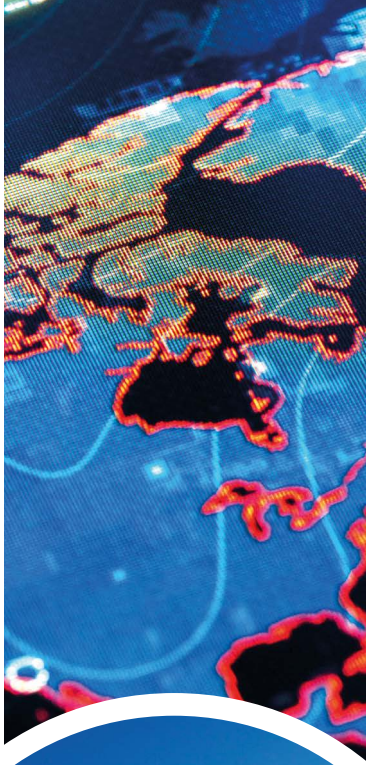
The Institute of Risk Management (IRM) is proud to introduce the first of its new short, focused qualifications designed to make professional learning more flexible, practical and relevant. The IRM Award in Managing AI Risks marks an exciting step in opening up access to the skills and knowledge that underpin good risk management across sectors and industries.

The award addresses one of the most transformative forces in modern business. As AI reshapes industries, the award equips learners to identify, evaluate and manage the new risks and opportunities it brings. This is a one-unit award, with an MCQ exam at the end.

Compact, accessible and globally relevant, the IRM Awards show the institute's ongoing commitment to developing practical, high-quality education for a changing world.

Launching soon, please register your interest here.

Images: iStock



GEOPOLITICS AS A STRATEGIC VARIABLE: FROM 'WHAT IF' TO 'NOW WHAT'

We explore the key practitioner areas of geopolitical risk management given its role in today's continuing uncertainty

In boardrooms across the world, one word is reshaping risk discussions: geopolitics. What was once considered a distant backdrop (trade disputes, regional conflicts, diplomatic tensions) has now become a central force shaping corporate strategy. The world's operating environment is now marked by persistent uncertainty, fragmented alliances, and competing technological and energy interests. According to the US National Intelligence Council's Global Trends 2040 report, competition for global influence is likely to reach its highest level since the Cold War, resulting in a more volatile and confrontational geopolitical landscape.

For international enterprises, this means the traditional boundaries between politics and economics have dissolved. Geopolitical dynamics now directly affect the cost of capital, the stability of supply chains, and even the security of assets. The risk function must therefore evolve accordingly – from forecasting to foresight and resilience.

The energy sector, given its traditional connections with nations situated at the crossroads of geopolitical tensions, has often been both a barometer of geopolitical tensions and the industry which, arguably, is the single most impacted by geopolitical events.

From awareness to integration

Corporate exposure to geopolitical risks is no longer hypothetical. The past decade has tested the resilience of global business models: Brexit, the US-China trade war, Russia's invasion of Ukraine, Red Sea shipping disruptions, and rapid regulatory changes linked to energy and climate. Each event demonstrated that geopolitical shocks could permeate through industries, cutting across financial, operational, and reputational dimensions.

Yet, many companies still treat geopolitics as a macro risk – something to monitor, not manage. The evolution of geopolitical risk management within international enterprises requires a fundamental mindset shift: integrating geopolitical analysis into everyday decision-making. This involves three complementary practices:

1. Geopolitical monitoring: Establishing structured scanning systems to track policy, trade, and security developments. Modern tools (AI-driven analytics, real-time intelligence dashboards) help translate complex geopolitical signals into business-relevant insights.

2. Scenario planning: Moving beyond static country risk ratings toward dynamic scenario testing. For example, what happens if critical materials from a sanctioned region become unavailable? How would your logistics model adapt to a maritime blockade or regional decoupling?

> Geopolitics is no longer a backdrop; it has become the stage upon which global business must perform

3. Resilience frameworks: Building adaptive capacity into the organisation. This includes stress-testing supply chains, developing dual sourcing strategies, aligning corporate risk appetite with evolving political realities, and embedding crisis management frameworks to ensure rapid response and recovery during disruptive events.

When these elements converge, geopolitical awareness becomes institutionalised – not as a one-off assessment, but as part of the company's strategic rhythm.

Geopolitical risk management principles

Based on current corporate practice and synthesised from leading frameworks, effective geopolitical risk management rests on the following key principles:

1. Top-down and bottom-up integration. Usually, most risks are identified through a bottom-up approach. Geopolitical risk management can be complemented with a top-down perspective to incorporate leadership viewpoints into the risk profile.

2. Process integration. Instead of creating an additional process for geopolitical risk management, which could potentially increase the workload for participants, the new process should be integrated as an add-on to the existing risk management process. This will ensure a seamless transition and efficient utilisation of resources as well as familiarity with using the existing tools and techniques and reporting lines.

3. Business relevance. The geopolitical risk management must be tailored to align with the specific business context of the company. This will ensure that the identified risks are pertinent, and the mitigation strategies are effective in safeguarding the company's interests.

These principles reflect a pragmatic synthesis of best practices: they translate high-level geopolitical awareness into structured corporate action.

Looking ahead

Geopolitics is no longer a backdrop; it has become the stage upon which global business must perform. The journey from what if to so what to now what is not an abstract model – it is the architecture of decision-making in uncertainty.

In an era of intensifying geopolitical rifts, the distance between failure and opportunity lies in how promptly and deliberately organisations shift from passive observation to intentional adaptation. The time for geopolitics as an afterthought is over.

Later in 2025, at the Risk Kuwait Summit, supported by the Institute of Risk Management, the topic will be further elaborated with a session, "Geopolitical Instability: Bringing Risk Back to the Strategy Table."

Dr Mykhailo Rushkovskyi is Enterprise Risk Manager at Qatar Chemical Company (Q-Chem) and the author of a research monograph on corporate risk management and governance. He was awarded the European Risk Management Award (2022) for Business Continuity Programme of the Year.

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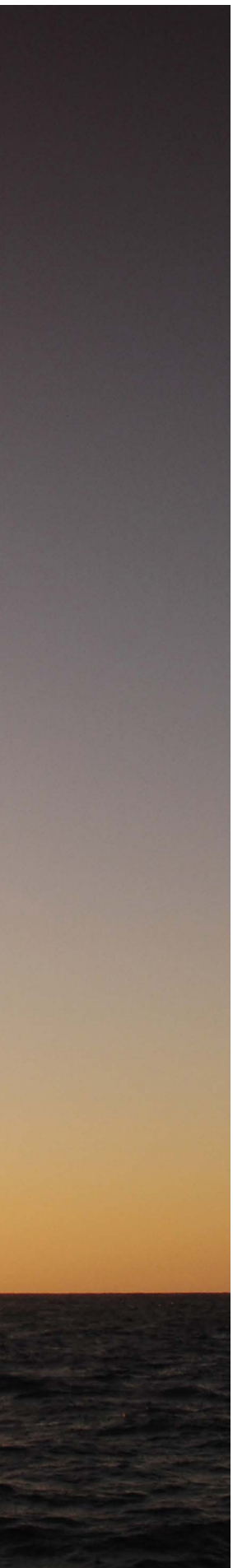
TOWARDS NET ZERO

MACROTRENDS, THE ENERGY TRANSITION & GLOBAL RISKS

The role of risk management in an energy-secure future



The world continues in its quest to decarbonise, meet net-zero targets and transform our energy sources, mix and consumption. For more than 100 years, energy has, for the most part, consisted of fossil fuels and other natural mineral resources as the primary means of powering our industry and everyday lives.

In recent years we have seen renewed aspiration to move away from traditional and reliable sources of energy, transitioning into new resources and ways of powering our lives and our ever-changing world. And in a globalised world, the impetus towards a low-carbon future brings increased complexity and greater challenges – unlike anything we have seen in the history of mankind.

Changes in consumer preferences, societal attitudes to energy and the way energy is consumed and used; the transformation of industries such as the automotive sector, which is transitioning from producing internal combustion engine vehicles to electric vehicles; the power sector's move towards renewable generation and creation; the rapid growth of new and emerging industries; the increasing imposition of regulations and directives aiming to reduce consumption of and reliance on carbon-based fuels – all of these create challenges and higher levels of complexity for industry.

Why energy matters

The energy value chain is a crucial component of the global economy, encompassing a wide range of players, from hydrocarbon exploration to refining, distribution and shipping to energy consumers. Given the sector's scale and complexity, managing risk and uncertainty isn't optional – it's an important component in keeping the lights on and supporting economic prosperity.

For some, the concept of energy brings to mind electricity for homes or gas for cooking; others may think of the fuel powering cars and transport systems, while many will see it as an important element in producing the essential products and services needed to maintain economic prosperity. These wide perspectives give us pause to consider the energy's role and the risks it poses, as well as the risks and challenges faced by the sector as it undergoes significant change, reinventing and transforming itself.

The energy industry provides the resources for growth, productivity and prosperity, and its complexity and high degree of interconnectedness with other economic sectors make it unique.

> **Managing risk and uncertainty is an important component in keeping the lights on and supporting economic prosperity**

Our civilisation is built on a bedrock of abundant, affordable energy. Energy and development are deeply connected – access to affordable, reliable and sustainable energy is fundamental to both economic and social advances. Energy powers nearly every sector, from agriculture and manufacturing to transport and communication. As such, the availability of clean, dependable and cost-effective energy is pivotal in shaping a civilisation's growth trajectory. However, the vision of universal energy abundance remains unrealised. In many regions, energy continues to be unreliable, scarce, expensive and environmentally harmful. Viewed through this lens, the way energy is used becomes a critical factor in determining the pace and quality of development.

With the advent of new and exciting technologies such as small modular reactors (SMRs), continuing advances in battery technologies, the rise of high-performance computing (HPC) data centres, the growing application of AI and expectation for energy security, and the drive towards organisational and

MANAGING ENERGY RISK

Energy is at the centre of nearly every aspect of modern life. It powers our homes, fuels transport, drives industrial production, powers cities and enables digital infrastructure. Energy is not just a utility – it's a strategic asset, a climate lever and a source of both opportunity and vulnerability.

Managing risks in a way that ensures the world has access to secure and affordable energy is a challenge for energy organisations, governments and regulators.

Images: iStock/Shutterstock/Getty

> Over the next three years, electricity demand is expected to increase at the fastest pace in years

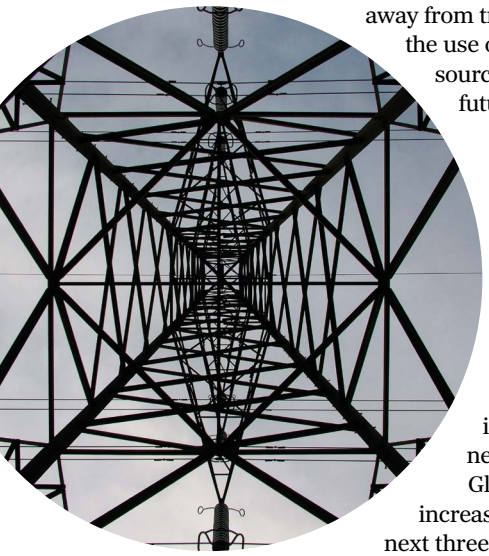
systemic resilience, we face ever-higher levels of uncertainty and complexity. This, in turn, leads to new and changing risks, often requiring innovative or even unorthodox approaches to risk management and response.

Meeting global expectations

For decades, oil has underpinned energy use by providing the primary fuels for transport and, in many markets, power production, with sensitivity to supply shocks and demand spikes determining prices. With liquid markets and price transparency, managing the financial risks associated with much of the world's energy activity and consumption was well understood and widely practised, and gave investors a reasonable level of confidence when making decisions. The risk–return ratio was far easier to assess, enabling the right balance between energy security and returns to be struck.

Much has been published about net zero and the pathways to achieving 2050 targets for greenhouse gas and CO_2 emissions. The continuing debate over how targets can be achieved realistically are consuming headlines and, some would argue, creating more questions than answers.

The path towards meeting Paris Agreement targets is becoming increasingly complex, given the realities of wide-ranging external factors, from geopolitics and macro-economics to variances in regulations and shifting demographics. At the forefront of all this is the energy transition, which is forcing a move away from traditional energy sources and towards the use of cleaner, greener renewable energy sources, all in pursuit of a low-carbon future. And it comes at a cost.



Electrification is a cornerstone of the future energy mix. Its promotion as one of the most effective ways to wean ourselves off fossil fuels means it is considered by many to be the panacea for a range of energy and environmental dilemmas. But, as we have come to realise, it is not a silver bullet. And with the energy transition and the investments in electrification come new and emerging risks.

Global electricity consumption increased by 4.3% in 2024 and, over the next three years, electricity demand is expected to rise at the fastest pace in years, highlighting the need for robust risk management practices to support investment and support long-term value.

Looking at this from a geographical perspective, more than half of global electricity demand growth in 2024 came from China, with India and south-east Asian countries also recording strong growth for the year. Many reports proudly highlight that renewables overtook coal as the world's leading source of electricity in the first half of 2025, with headlines espousing the abundance of renewable electricity alongside data indicating lower wholesale electricity costs as a result of wind power replacing coal, to cite numerous UK datasets as an example. But if electrification is, indeed, the great saviour, why is it that reliance on fossil fuels remains relatively high, despite large-scale investments in windfarms and other renewable electricity sources?

Most predictions and forecasts indicate the world will fall short of the planned 2050 CO_2 emissions reduction targets, and current rates of abatement and emissions decline are far too slow. While we are witnessing a reduction in the use of fossil fuels, particularly oil and coal, the adoption of alternative fuels is unlikely to reach significant scale until at least 2040. The debate over hydrocarbons' future role therefore becomes one of the most interesting, yet least understood, areas of the future energy mix.

Current projections indicate that fossil fuels – especially natural gas – will retain their large share of the energy mix into the future, extending beyond the 2050 horizon. Key areas of increased electricity demand indicate the continued growth from industrial production, the increased use of air conditioning, the acceleration of electrification (including transport) and the growth of data centres. Some estimates forecast that global electricity consumption will rise by an unprecedented 3,500TWh over three years (until the end of 2027) – the equivalent of adding the annual demand of the EU each year. Worldwide, electricity demand is estimated to increase by 140% between 2025 and 2060.

China's electricity demand is forecast to increase by an average of 6% annually to 2027, India's by 6.3%. South-east Asian countries and other emerging markets are also expected to record strong demand growth, supported by economic expansion and rising ownership of air conditioning. It is noteworthy to consider the sources of the majority of emissions growth in the power sector in 2024. Reduced power sector emissions in the US (-0.3%) and the EU (-12%) were offset by increases

ELECTRICITY SNAP SHOT

Clean energy sources in global power generation are on track to break new records over the 2025-2027 forecast period. Low-emission sources – renewables and nuclear – are expected to meet all global demand growth to 2027. Solar PV is set to become the second largest low-emissions source of electricity generation in the world by 2027, after hydropower. Renewables, collectively, will surpass coal-fired generation in 2025 and coal's share will decline below 33% for the first time in 100 years. Nuclear generation will reach a new record high in 2025, driven by a recovery in output in France and Japan, and new reactors entering operation in China, India, Korea and other countries. Nuclear energy will continue to set a new record every year thereafter. The share of low-emissions sources is forecast to increase from 41% in 2024 to 47% in 2027. **(Source: IEA, Electricity 2025 Report)**

in both China, where emissions rose 1.3% – driven by a 2% growth in fossil fuel-based electricity generation – and India, which saw a 5% year-on-year rise in emissions, driven by an increase of around 5% in fossil-fired generation.

The accelerated demand for electricity is being fulfilled by renewables, with 700GW of new installed capacity being added in 2024, followed by gas, which showed the strongest increase in demand among fossil fuels in 2024, as demand rose by 115 billion cubic metres.

Challenges

The energy sector is inherently highly complex, interconnected and capital-intensive in nature, and faces a wider range of challenges and risks than most other sectors.

The traditional areas of risk for a typical energy enterprise include: identifying, securing and accessing new sources of supply; developing, operating and maintaining assets and critical infrastructure; dealing with operational challenges, technological advances, regulation, supply chains and market dynamics. However, add to these the demands of environmental, social and governance (ESG) and the energy transition, changing customer preferences, uncertainty around taxation, trade policy and tariffs, and shifting geopolitical tensions, and the challenges may, for many, seem insurmountable.

Continuing with the theme of electrification, a range of systemic challenges are hindering progress in renewables deployment and realisation. Central is ageing or inadequate grid infrastructure, a common concern in many parts of the world.

Installed capacity is one thing, but whether that installed capacity is dispatchable to meet electricity demand when and where it is needed is another matter. Grid constraint is one of the single biggest impediments to effective renewable energy transmission and consumption.

Most parts of the world have grids that were designed for centralised generation, to meet demand profiles based on the industrial, commercial and domestic locations of consumers many years ago – not of consumers today. As industries move away or close down and populations relocate, the demand profile changes, meaning that getting electricity from A to B might not necessarily involve transmitting and distributing the electricity from where it's produced to where it's needed.

While renewables development is happening at scale, their location is often too far away from the main grid infrastructure to support dispatch when and where needed, at a cost that is economically viable. And many of the regulatory frameworks underpinning current market structures are out of date and ineffective at combining efficiency, security of supply, sound economics and the attainment of environmental ambitions such as net-zero targets.

Governments have typically lacked the foresight and planning impetus needed to ensure grid development is taking place in a co-ordinated, economically viable way that aligns with meeting net-zero targets.

> China's electricity demand is forecast to increase by an average of 6% annually to 2027

In many parts of the world, this failure to act is resulting in curtailment of renewables when capacity cannot be transmitted to where it's needed.

In extreme cases, inadequate grid infrastructure leads to extensive and regular outages aimed at shedding load and reducing stress on the system – such as in South Africa, where extensive outages have become a fact of life, and Nigeria, where 79% of Nigerians with electricity access report that it is available only half the time. Research indicates that load shedding and outages reduce Africa's annual GDP by approximately 2%.

The need to curtail the dispatch of greener and cleaner energy incurs costs, such as those associated with curtailment payments and capacity payments to producers to ensure alternative higher-cost capacity is available when needed.

We mentioned the continuing need for hydrocarbons, particularly gas and oil, as a crucial part of the energy mix. Despite ESG drivers, net-zero initiatives and Paris Agreement goals, oil is expected to continue to play a pivotal role on a global basis, in both the energy mix and the global economy. For many, this may seem an unacceptable situation that requires drastic and immediate action to bring demand and consumption down to within the levels agreed under the Paris Agreemen.

Table 1 shows the general consensus on oil's short-term future. What is creating this situation when the world seems to be transitioning away from fossil fuel use, particularly oil? Among the many factors are:

- **Inability to meet increasing demand with renewables capacity** – caused by either delays in bringing new renewables projects to realisation and/or outdated infrastructure.
- **Regulatory uncertainty** – changing or mixed signals on net-zero implementation dates, hydrocarbon policies and taxation incentives.
- **Supply chain challenges** – global supply chains under stress due to inadequate capacity, logistical challenges, and geopolitical (including trade and tariff policy) uncertainties and changes.
- **A forecasted oversupply of oil in 2026** by both OPEC+ and non-OPEC nations. (Although this is short-term, the financial considerations are significant.)

One other major factor is the reality of economics and the socio-economic needs of developing nations, which are driven by fundamentals such as the scarcity or abundance of primary energy sources and accessibility to energy infrastructure.

The things that many of us take for granted, such as having electricity for our homes and industry, and fuels for our vehicles, are a pipe dream for many people in underdeveloped and developing nations.

On the flipside, the oil industry, in particular, has been subjected to many successful legal challenges, where courts have overturned planning decisions allowing exploration and production. Notable recent cases in the UK include the Rosebank oil field – the UK's largest undeveloped field – and the Jackdaw gas field. Both were blocked by environmental interest groups claiming that regulators ignored the impacts of emissions from burning extracted oil and gas. In the case of Rosebank, estimated oil production is up to 500 million barrels of oil equivalent from 2026 to 2051. When burned, this will produce up to 200 million tonnes of CO_2.

The climate impacts of those combustion emissions will now need to be taken into account when preparing or supplementing environmental impact assessments, and in both cases, the operators will have to resubmit environmental impact assessments for approval before drilling can begin.

In late 2024, South Korea's Constitutional Court ruled that the country's climate policies fell short of the constitutional responsibility to protect future generations, finding that current measures to tackle climate change were insufficient, infringing on the future generations' rights to a safe and healthy environment. South Korea is the second-largest provider of international public finance for fossil fuels globally, investing an average of US$10 billion

TABLE 1: FORECASTED OIL DAILY DEMAND GROWTH IN BARRELS PER DAY (BPD)

Year	Total daily demand growth	OECD countries	Non-OECD countries
2025	1.3m bpd	0.1m bpd	1.2m bpd
2026	1.4m bpd	0.2m bpd	1.2m bpd
2027	1.5m bpd	0.1m bpd	1.4m bpd

per year in overseas fossil fuel projects. Legal challenges to hydrocarbon developments such as these add further complications and costs for investors, operators and governments.

These and many other similar rulings around the world stem from the International Court of Justice ruling[1] affirming the longstanding principle that countries have a duty 'to prevent significant harm to the environment by acting with due diligence' – including by controlling private actors' harmful activities. The Court also recognised that developed countries must satisfy a more demanding standard of due diligence. The reality of these international laws adds complexity and cost to the energy value chain at a time when global inflation is on consumers' minds, begging the question: "Will energy ever be truly affordable again?".

These all represent risks that need to be actively managed in ways that align the long-term needs, objectives and desired future outcomes of a highly diverse stakeholder landscape with investors' expectations.

Note: The UK government has released guidance (June 2025: *Environmental Impact Assessment (EIA) – Assessing effects of downstream scope 3 emissions on climate*, UK Government Department for Energy Security and Net Zero). See 'UK government guidance: Scope 3', *overleaf*.

Potential solutions

Hydrogen is the planet's most abundant element and is touted as a natural gas replacement for industrial and residential purposes, as well as an option for transport. Is it the panacea to the oil and gas question, or another solution with far greater complexity than we can envisage?

Hydrogen is rarely found in isolation. Usually part of a compound such as water (H_2O) or methane (CH_4), pure hydrogen can be derived only by separating it from other elements, requiring substantial amounts of energy. It's a vicious circle, because about 95 percent of the hydrogen produced today is separated in an intensive and expensive process powered by fossil fuels. For example, the electrolysis process for green hydrogen requires large amounts of 'green' electricity and places more stress on the available supply of renewable electricity – in turn, creating more demand.

Using hydrogen as a replacement for gas and for refined products in the transport sector could help to solve much of the energy dilemma, but it would take commitment from all parties – and only if we can first get to grips with the nine different colours of hydrogen.

The hydrogen innovation pipeline statistics are troubling; at the time of going to press, only 15% of announced hydrogen projects have reached final investment decision and, according to various discussions with industry stakeholders, the risks are still high, with costs and government support cited as key concerns and barriers.

Carbon capture, utilisation and storage (CCUS), and its cousin carbon capture and storage (CCS), could play a significant role in reducing greenhouse gas emissions and the transition to a more sustainable energy future. CCS focuses on capturing and storing CO_2 emissions underground, while CCUS also uses the captured carbon for a range of purposes, such as enhanced oil recovery and production of synthetic fuels. However, 90% of Europe's carbon capture project pipeline is pending regulatory approval, with these processes typically taking anywhere from three to five years, despite demands to accelerate carbon reduction.

The International Energy Agency (IEA) predicts that global renewable capacity will more than

[1] The ICJ's ruling is non-binding in nature.

double by 2030, increasing by 4,600 GW despite concerns around supply chains, grid integration, finance and policy uncertainty. Unless these risks are adequately addressed, questions remain over the reality of achieving this increase in capacity.

Key risks – a snapshot

It is critical to understand the risks that the world faces in moving towards a low-carbon, clean-energy future while ensuring energy security. It would be easy to simply list the range of risks faced by the energy sector in this age of energy transition, net zero, ESG initiatives and global geopolitical concerns; the following is a snapshot of some of the key risks for energy market participants, consumers and policymakers.

At the start of 2025, the IRM Energy and Renewables Special Interest Group published insights for the IRM Risk Trends 2025 annual publication. The report identified the most likely factors that would shape 2025 and beyond as:

1. Geopolitical instability
2. Energy transition
3. HPC and energy grids
4. Economic instability's role in the supply chain
5. Concentration of AI in energy systems
6. Offshore wind sector.

Many of these have played out as anticipated, with some exceptions and variations. Some of these are referenced here to provide perspectives on the current energy sector risks.

1. Persistent geopolitical factors continue to shape energy trade and investment. The need to enhance risk management capabilities around geopolitical and supply chains are a priority for the sector.

2. Uneven transition progress reflects disparities in policy readiness, financing and supply chain resilience. A move towards greater resilience and future readiness is becoming the new norm.

3. Digital dependency through AI and HPC introduces both efficiency and new systemic risks, which will, in turn, require investment in risk management skills and technologies.

Geopolitical risks

- Considerations around global energy security vulnerability and rare earth minerals production.
- Trade policy and tariffs on energy products.
- Physical conflict risks and their impact on activities within the energy value chain – these range from exploration and production interruptions to global shipping and transport concerns.

> The International Energy Agency predicts that global renewable capacity will more than double by 2030, despite concerns around supply chains, grid integration, finance and policy uncertainty

UK GOVERNMENT GUIDANCE: SCOPE 3

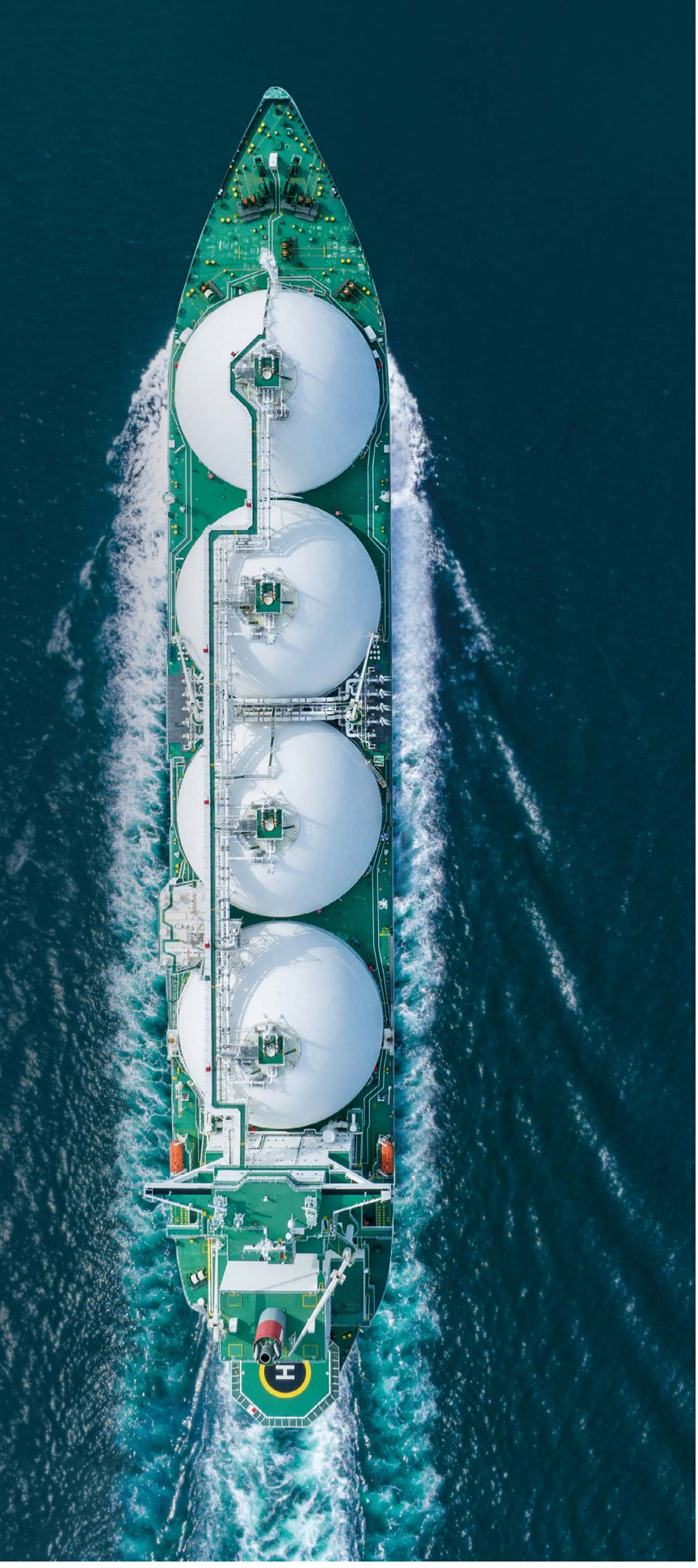
Noteworthy features of the new guidance: Proponents of projects must calculate their project's Scope 3 (combustion) emissions on the presumption that they will be combusted by end users.

If a project's combustion emissions occur overseas and are subject to other countries' climate mitigation laws, that does not preclude the need to assess the climate impacts arising from those emissions in the UK's environmental assessment process.

The impact of the project's emissions must be assessed in light of internationally agreed climate goals, including remaining global carbon budgets and emissions reduction pathways, consistent with achieving the temperature goal of the Paris Agreement.

The project's emissions must be assessed in light of cumulative impacts, not only from historical emissions sources but also emissions from 'existing and planned' future projects globally.

The impact of the project's gross emissions must be assessed without netting off emissions that the proponent may claim would be avoided thanks to market substitution effects (any purported substitution can be documented separately but must be substantiated with evidence).
(Source: EI Magazine, October 2025)



ENVIRONMENTAL SNAP SHOT

CO_2 emissions in advanced economies fell by 1.1% to 10.9 billion tonnes in 2024 – a level last seen 50 years ago, even though the cumulative GDP of these countries is now three times as large. The majority of emissions growth in 2024 came from emerging and developing economies other than China. Though emissions growth in China slowed in 2024, the country's per-capita emissions are now 16% above those of advanced economies and nearly twice the global average. **(Source: IEA, October 2025).**

Supply chain risks

This remains one of the key concerns for energy sector stakeholders. The race for renewables has exposed vulnerabilities in global supply chains, with bottlenecks for clean energy technology hindering the energy transition. These are reflected in the extended lead times for both renewables and traditional fossil fuel-powered technologies.

The interplay of geopolitics with supply chains shouldn't be ignored as these continue to overlap and merge, with current approaches to modelling failing to capture key attributes and data.

Regulatory risks

Regulatory divergence around the world plays a disproportionate role in the risk profile of energy enterprises. Addressing current regulatory shortfalls requires a more co-ordinated approach – starting with a rethink in many cases, such as those related to electrification, the energy mix and grids.

Market and commodity price risks

These are driven by commodity prices and availability, combined with the challenges of regulation, decarbonisation and the drive towards net zero. Geopolitical events such as the Russia-Ukraine war, localised political actions, government support for new technologies such as hydrogen, and global taxation policies all affect pricing and commodity scarcity. And commodity prices have both knock-on and cyclical effects on economies and industries.

ESG frameworks and systemic risks

It's not unusual for solutions to cause new risks; wicked problems have been a challenge for as long as we can remember. Many are asking: is ESG creating the systemic risks it was designed to prevent?

The rapid growth of ESG investing, while driven by legitimate sustainability imperatives, has inadvertently created new systemic risk categories that traditional financial stability frameworks fail to capture. For example, ESG mutual fund assets have grown tenfold in five years to approximately $2 trillion, with the Bank for International Settlements identifying concerning parallels with the private-label mortgage-backed securities markets prior to the 2008 global financial crisis. Price-to-earnings ratios for clean energy companies remain well above highly valued growth stocks, even having declined from their 2021 peaks, suggesting a potential bubble. BIS research has found that ESG markets are developing "more elaborate instruments", similar to the complex financial products that amplified the effects of the 2008 crisis. Are we witnessing the precursor to another financial crisis, this time sparked by the energy sector?

Developing markets face particular ESG-related systemic risks; for example, Brazil's experience shows how ESG frameworks designed for developed markets can conflict with development priorities, and studies have found negative relationships between environmental practices and the operational performance of Latin American companies, suggesting that ESG compliance creates cost burdens that reduce competitiveness without bringing proportional benefits. In Pakistan, the National Electric Power Regulatory Authority's ESG requirements create financing difficulties for energy projects, with the environmental standards sometimes being more strict than those for petrochemical industries. This asymmetry creates competitive disadvantages for renewables projects.

The bottom line is that consumers – domestic or industrial – demand and need economical sources of energy that are reliable, address their environmental and societal concerns and are, most importantly, affordable on a world-competitive basis.

Risk management's role

Risk management is a critical enabler for the energy sector, ensuring resilience by helping organisations and stakeholders to navigate a rapidly evolving landscape. When well implemented and continually improved, it should:

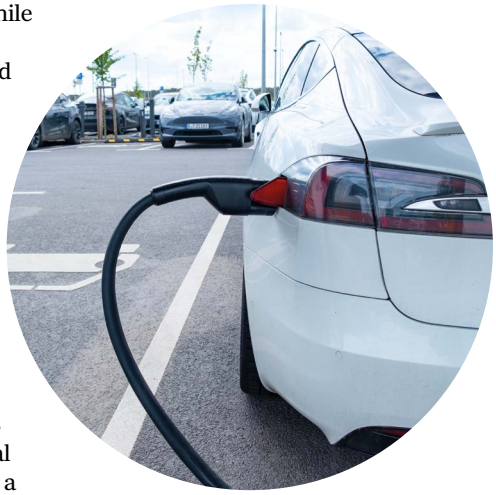
- Enable companies to anticipate and prepare for geopolitical disruptions and supply chain shocks.
- Use scenario planning and stress testing as a way to develop contingency plans for events such as regional conflicts or critical mineral shortages.
- Enable better-informed decisions to be made, such as diversifying suppliers and logistics routes to further reduce vulnerability to shocks.
- Support assessment of the actions needed to meet shifting regulations and policy divergence, ensuring compliance and strategic alignment.
- Provide decision support in a wide range of situations for all types of organisations.
- Assist with the evaluation of the readiness and risks of emerging technologies, such as hydrogen, SMRs and advanced photovoltaics – helping to prioritise investments and avoid costly missteps.

Organisations that have an effective and forward-thinking risk management approach, focusing on resilience, are able to assess and adapt to shifting regulations and policy divergence, ensuring compliance and strategic alignment while supporting decision-making for organisations, investors and governments alike.

Economic instability and supply chain disruptions are also addressed through effective financial risk modelling and supply chain mapping, allowing organisations to hedge against inflation, interest rate shifts and trade wars while identifying and mitigating bottlenecks in critical components such as photovoltaic panels and wind turbines.

Moving towards resilience

The path to clean, reliable and resilient energy sources and infrastructure isn't easy and won't come cheaply. While 'resilience' has become a buzzword, organisations and entire industries need to adopt resilient frameworks as a logical next step in enhancing and advancing risk management.



The following provides a helpful insight into the UK's preparation and resilience measures for critical infrastructure as we enter winter 2025. Great Britain is expected to see its largest electricity operational margins since 2019/20, with a

> Industries need to adopt resilient frameworks as a logical next step in enhancing and advancing risk management

projected surplus of 6.1 GW – nearly 1GW higher than last year and equivalent to 10% of average peak demand. This elevated margin is attributed to several developments:

- Expansion of battery storage capacity
- A net increase in gas-fired power generation
- The addition of Ireland's Greenlink Interconnector
- Continued growth in renewable energy sources

The Winter Outlook presents the most favourable margins in six years, yet the National Energy System Operator's (NESO) Director of Resilience and Emergency Management, Dr Deborah Petterson, still warns of the importance of maintaining vigilance. As the UK undergoes a once-in-a-generation electricity supply and infrastructure expansion, NESO highlights the growing importance of innovation to manage system complexity and support broader economic goals.

In this context, risk management remains central. System operators must uphold agile contingency planning, maintain transparent communication with market participants and closely monitor cross-border energy flows. The combination of surplus capacity and strategic foresight offers reassurance but demands continued diligence as the UK prepares for another winter of energy uncertainty.

On the surface, the UK's measures appear adequate, well thought through, and aligned with many of the UK electricity market's concerns and risks. But question marks hang over the cost and affordability of these measures – and success or failure can only be evaluated after the event.

More broadly, what does the energy mix look like going forward? There is no doubt that fossil fuels will continue to play a critical role to ensure the right balance of supply, affordability and efficiency.

Despite geopolitical tensions and supply chain challenges, investments in liquefied natural gas will cement its role in the energy value chain, while hydrogen will most likely find a role in supporting the transition while addressing the need for new sources of clean energy in high-growth sectors such as transport.

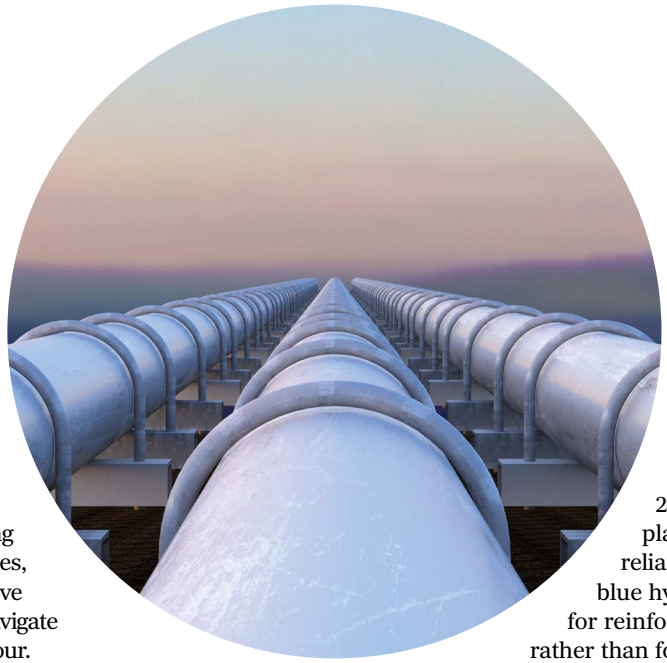
As for gas, will we see its role becoming one of supporting power generation, given the need for combined-cycle gas turbines to support global power needs? Or will it also continue to play a role as a primary energy source for industry and domestic consumers?

Getting it right on risk and resilience

For many, solving the energy dilemma may seem simple on the surface, with addressing the changing risk landscape an afterthought. However, the global energy transition has exposed fundamental flaws in traditional risk management frameworks and approaches, revealing how well-intentioned regulations can stifle innovation, ESG mandates can create new systemic vulnerabilities, and geopolitical models can miss critical supply chain interdependencies. This institutional blindness threatens both organisational resilience and societal progress.

From a regulatory and legislative perspective, a whole-systems approach, including rigorous testing

> The combination of surplus capacity and strategic foresight offers reassurance but demands continued diligence



and validation of the risks and strategic options, is needed to ensure that ESG goals, the energy transition and a resilient infrastructure and industry framework can be achieved. Yet rather than the wholesale abandonment of existing frameworks, the evidence points towards a need for urgent but constructive evolution – integrating dynamic assessment methodologies, network-based models and adaptive governance structures that can navigate complexity without sacrificing rigour.

From a risk practice perspective, advanced risk management techniques should be integrated into the decision-making process. These include:

- Extending the horizon into the medium and long-term to capture significant risks down the road, and considering how these might evolve and change.
- Investing in enhancing models, data and approaches to capture the dynamics of the energy transition and its unique characteristics.
- Closer collaboration with regulators and policymakers to influence policy, regulations and market development – key to shaping future prosperity and energy security.

> Closer collaboration is the key to shaping future prosperity and energy security

Leaders need to consider the enterprise's role in the energy value chain and objectively address questions such as:

- What are our relative strengths and weaknesses, and do our current capabilities support where we want to play?
- What do we need to change, and is the change (or changes) achievable and sustainable?
- Are we adequately funded to execute on our vision and strategy?
- Do the methods and techniques we use for identifying medium to long-term strategic and emerging risks fit with market dynamics and key trends?
- How agile and adaptable are we?
- What sort of culture do we have? How future-ready and effective is our organisational and risk culture?

Has net zero failed?

The UK and Germany are becoming poster children for how bad energy policy can have far-reaching effects and introduce a raft of risks. The UK, once hailed as a climate policy trailblazer, is now grappling with a credibility crisis in its net-zero strategy. Despite ambitious targets, only a fraction of the required emissions cuts for 2030 are backed by actionable plans. The government's heavy reliance on carbon capture and blue hydrogen has drawn criticism for reinforcing old dependencies rather than fostering innovation. Legal challenges from environmental groups underscore the lack of transparency and accountability, while political instability and mixed messaging have eroded public and investor trust. All the while, its citizens carry some of the highest energy costs in the world.

Germany's climate agenda, long considered a model for Europe, is also faltering under political strain and sectoral stagnation. The country is significantly off-track in key areas such as transport and buildings, with projected emissions overshooting targets by millions of tonnes. Legislative gridlock following coalition breakdowns has stalled critical reforms, including the controversial Building Energy Act. Meanwhile, a political shift toward conservative energy policies, with green subsidies cut, signals a retreat from unrealistic climate commitments and perhaps a push to shore up its faltering industrial base. This may be too little, too late.

Both nations reveal a troubling pattern: ambitious net-zero goals undermined by fragmented execution, overreliance on future technologies and insufficient integration across sectors. The UK and Germany face mounting pressure to recalibrate their strategies in a way that balances innovation with realism and public engagement. As their economies struggle, the need for coherent, transparent and inclusive policy frameworks has never been more urgent. Their experiences offer a cautionary tale – and a call to action – for other countries navigating the complex path to 'decarbonisation at all costs'. Maybe new paths, rooted in pragmatism and avoiding single-issue dogmatism, are now required?

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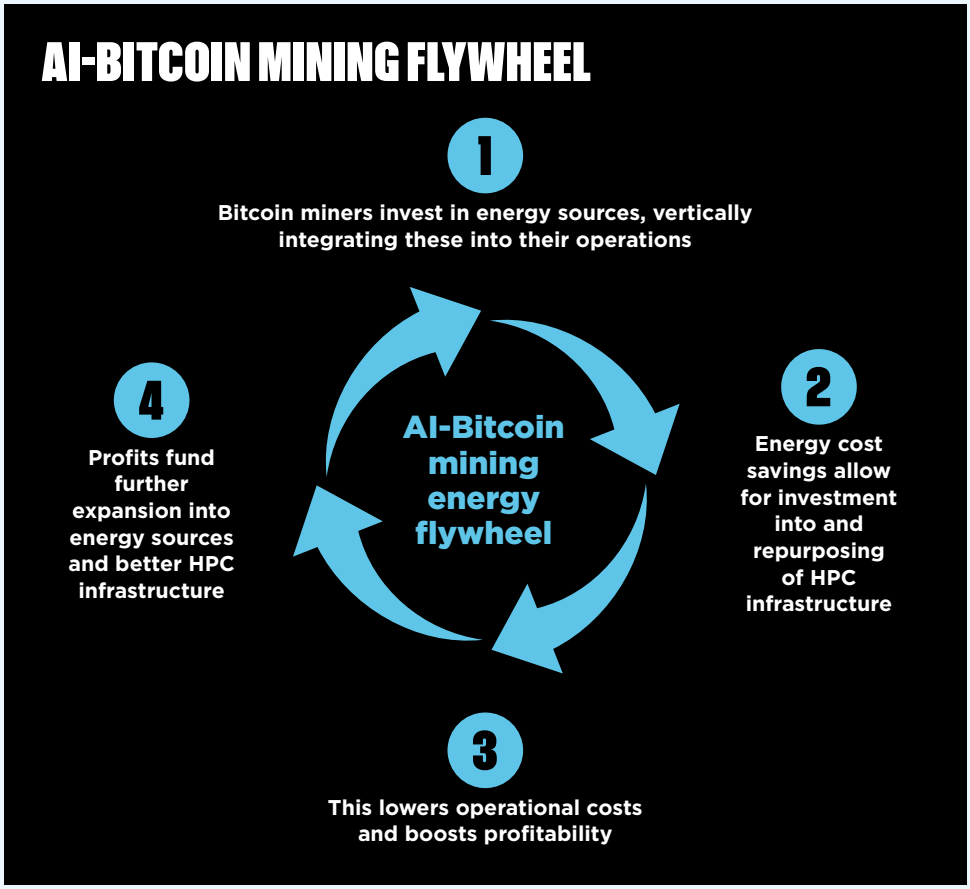
CATALYSTS TO A NEW ERA FOR ENERGY INFRASTRUCTURE:

BITCOIN MINING AND ARTIFICIAL INTELLIGENCE DATA CENTRES

With both being reliant on high-performance computing. **Dylan Campbell** explains how AI and Bitcoin could transform global energy systems via a 'flywheel' effect

In the IRM's 2025 Risk Trends[1] report, published earlier this year, the Energy and Renewables Special Interest Group noted the growing impact of high-performance computing (HPC) on the global energy generation, distribution and consumption landscape. We noted in particular that two of the most energy-intensive HPC applications – Bitcoin mining and artificial intelligence (AI) data centres – are driving a transformation in global energy systems. In this article we explore this subject in a little more detail, with reference to the work being done by two companies that are pioneers in this space: Marathon Digital Holdings and IREN Ltd. They are leading this shift by leveraging renewable energy, advanced cooling technologies and strategic



The flywheel is based on the following four principles.

1. Energy optimisation: Renewable energy powers both mining and artificial intelligence (AI), reducing marginal costs and carbon footprints.

2. Infrastructure repurposing: Bitcoin mining facilities evolve into dual-purpose centres, serving both Bitcoin and AI workloads.

3. Revenue diversification: AI provides stable, long-term income, offsetting Bitcoin's volatility and encouraging further investment.

4. Innovation acceleration: Profits fund better high-performance computing (HPC) hardware, smarter cooling systems and more efficient energy use – fueling the next loop of the flywheel.

infrastructure investments to redefine how energy is produced, distributed and consumed. This is creating a 'flywheel' effect that is accelerating growth in this area (*shown above*). In essence, the flywheel works as follows: low-cost renewable energy reduces operational costs, enabling competitive pricing for mining and AI services, which in turn funds further energy and HPC infrastructure expansion.

The energy demands of Bitcoin and AI data processing

Bitcoin mining and AI data centres share a common trait: massive energy consumption. Bitcoin's proof-of-work consensus process requires high-performance computing to validate transactions, while AI workloads – especially training and deploying large language models – demand even more power and cooling.

The International Energy Agency projects that global electricity demand from data centres will double by 2030, reaching levels comparable to Japan's current consumption. This surge is driven by the exponential growth of AI applications and the continued expansion of Bitcoin mining networks. In the IRM's 2023 publication[2] on Bitcoin and Energy, it is noted that, counterintuitively, Bitcoin's need for energy is what makes it such a good partner to the energy industry. The same thesis holds true for AI data centres. These facilities can act as a buyer of first resort, allowing marginal or high-risk energy infrastructure projects to get off the ground by providing an immediate revenue source for them. As energy markets initially bootstrapped by these HPC facilities become more mature, with other consumers competing for supply, the energy prices invariably become unattractive compared to other potential stranded or untapped sources, so HPC businesses are incentivised to move on.

These facilities also act as the buyer of last resort for all electricity, creating a price floor that incentivises the continued use of mature facilities that are less efficient to operate than newer, larger ones. Were it not for the HPC consumers, these energy sources would be decommissioned or wasted, remain untapped or left stranded.

> "Were it not for high-performance computing consumers, certain energy sources would be stranded

The AI–Bitcoin mining energy flywheel: a new era of digital energy infrastructure

It is clear that a powerful synergy is emerging between two of the most energy-hungry technologies of our time: AI and Bitcoin mining.

CASE STUDY 1: MARATHON DIGITAL
FROM BITCOIN MINING TO EDGE INFRASTRUCTURE

Texas wind farm integration

US based Marathon Digital (MARA) has made significant strides in integrating renewable energy into its operations. In 2025, the company acquired a 240MW Texas wind farm, aiming for full operational status by Q4. The facility will deploy previous-generation application-specific integrated circuits mining equipment that might otherwise have been discarded or sold on the secondary market. By repurposing these machines and powering them with 100% renewable energy at zero marginal cost, MARA is harnessing computing resources that would have been underused, with energy resources that would otherwise have been curtailed (in other words, wasted). This approach lowers Bitcoin's production expenses through vertical integration of energy resources into the business value chain, and underscores MARA's dedication to environmental responsibility by lowering potential areas of waste.

Methane capture and gas-to-power operations

Marathon's gas-to-power operations in North Dakota and Texas are two more examples of energy innovation. These sites monetise stranded natural gas and mitigate methane emissions by using the gas to generate electricity. Using the gas in this way contributes to a lower unit cost per Bitcoin mined, and also aligns with Marathon's strategy to become a vertically integrated digital energy company.

European expansion and AI integration

In a strategic move, Marathon announced plans to acquire a 64% stake in Exaion in August this year. Exaion is a subsidiary of EDF, one of the world's largest low-carbon energy producers. This joint venture will integrate Marathon's technology stack with AI infrastructure, supporting edge computing and lowering processing costs.

Marathon has established its European headquarters in Paris, showing a commitment to international growth and energy partnerships focused on grid stabilisation and repurposing of unused energy.

CASE STUDY 2: IREN LIMITED
PIVOTING FROM BITCOIN TO AI INFRASTRUCTURE

Strategic reallocation of capital

IREN, formerly Iris Energy, has made a bold pivot from Bitcoin mining to AI-ready data centres. In March 2025, it paused mining expansion, reallocating capital into liquid-cooled AI halls.

The flagship Horizon 1 project in Childress, Texas, is a $300–350 million investment that will deploy 1,896 NVIDIA graphics processing units, including H100 and H200 models. The facility is designed for high-performance AI workloads and is supported by $550 million in convertible notes, reflecting strong institutional backing.

Dual-revenue model

IREN's business now spans three pillars:

- Bitcoin mining – still profitable, with a breakeven cost of $36,000/Bitcoin.
- AI cloud services – forecasting $250 million in annual revenue.
- High-density data centre campuses – designed for next-generation systems.

This dual-revenue model creates the flywheel effect.

Renewable energy as a competitive moat

IREN has secured 2.9GW of grid-connected renewable energy across North America, including hydroelectric, wind and solar sources. With energy costs as low as $0.028/kWh, IREN is uniquely positioned to meet the demands of energy-intensive AI operations.

IREN Ltd's Sweetwater campus in Texas represents a significant leap in infrastructure, tailored for the demands of modern AI workloads. Designed as a 2GW multi-phase site, it is purpose-built to support liquid-cooled systems that are optimised for AI training and inference. This approach not only enhances energy efficiency, but also allows for higher-density computing, which is critical for handling the massive datasets and complex models used in generative AI and machine learning. The Sweetwater facility's scale and specialisation position it as a cornerstone in IREN's strategy to deliver cutting-edge computing capabilities to enterprise and cloud customers.

Meanwhile, IREN is transforming its Prince George facility in British Columbia into a high-performance computing (HPC) hub – a strategic repurposing of existing assets to meet evolving market needs. Originally designed for other industrial applications, the site is being retrofitted to support intensive computational workloads, such as scientific simulations, financial modelling and advanced analytics. This move reflects IREN's broader commitment to sustainability and operational efficiency, leveraging existing infrastructure to expand its footprint in the HPC space while minimising environmental impact.

Together, these facilities underscore IREN's ambition to be a leader in next-generation computing infrastructure across North America.

This convergence is giving rise to the flywheel mentioned earlier – a self-reinforcing cycle that is reshaping how data centres operate, how energy is consumed and how companies monetise computational power.

Dual demand, shared DNA

At first glance, AI and Bitcoin mining may seem like distant cousins. One powers generative models and intelligent systems; the other secures the world's first decentralised censorship-resistant, permissionless monetary system. But under the hood, both rely on HPC, massive data centres and access to cheap, reliable energy. This shared DNA is the flywheel's foundation.

Bitcoin miners, long accustomed to optimising for energy efficiency and uptime, are now repurposing their infrastructure to support AI workloads. The same facilities that once ran application-specific integrated circuits to mine Bitcoin are being retrofitted with graphics processing units to train large language models and run inference tasks. This pivot allows companies to diversify revenue streams while maximising the value of their existing assets.

The flywheel in motion

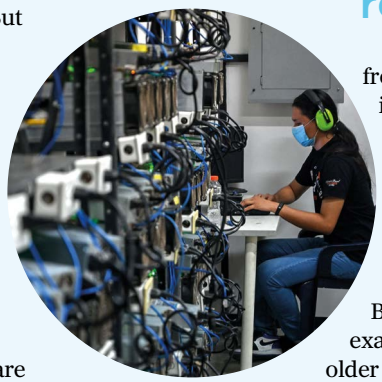
The flywheel effect begins with energy. Bitcoin miners have historically sought out stranded or renewable energy sources – hydroelectric dams, solar farms and wind installations in remote areas – where power is abundant but underused. By tapping into these resources, miners reduce operational costs and improve sustainability.

Now, as AI demand surges, these same energy strategies are being applied to AI data centres. The result is a virtuous cycle, or flywheel.

Environmental stewardship meets economic incentive

Critics have long criticised Bitcoin's environmental toll, but the flywheel offers a compelling counter-narrative: by integrating AI and Bitcoin mining under a renewable-first energy strategy, companies can turn what was once a liability into a strength. In support of this assertion, Cambridge University's Centre for Alternative Finance reported that in 2025, 52% of Bitcoin mining was powered by renewable or low-carbon energy, rising sharply from just 38% in 2022. Vertical integration – owning the energy source, the data centre and the compute workload – enables tighter control over emissions, costs and scalability.

> **Both AI and Bitcoin mining rely on high-performance computing, massive data centres and cheap, reliable energy**



Firms such as Marathon Digital Holdings, IREN Ltd, Hive Blockchain and Crusoe Energy are examples of this. By repurposing older Bitcoin mining machines and energising them with zero-marginal-cost renewables, they're not only reducing waste, but also proving that sustainability and profitability can coexist. A closer look at Marathon and IREN's recent activity in this area illustrates the point.

Building the rails for the digital future

As AI continues to permeate every industry, from healthcare to finance to entertainment, the demand for computing will only grow. Bitcoin mining, with its global footprint and energy-savvy operations, is uniquely positioned to meet this demand. The flywheel is spinning faster, and its momentum could redefine the future of digital infrastructure.

In this new paradigm, energy isn't just a cost – it's a catalyst. The fusion of AI and Bitcoin mining may be the key to unlocking a more efficient, resilient and sustainable digital economy. The question is no longer whether AI and Bitcoin will dominate the 2030s – it's who will profit from building the infrastructure that powers them. In that race, energy innovation is the ultimate competitive advantage.

References

[1] Download at: www.theirm.org/news/irm-risk-trends-2025-report

[2] For more detail on this topic, see: issuu.com/irmglobal/docs/irm_risk_trends_2025_final_?fr=xKAE9_zMzMw

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GEOPOLITICS AND CORPORATE RISK: THRIVING IN A TURBULENT WORLD

The state of geopolitics today and recent shifts

The war in Ukraine, the crises in the Middle East – most visibly Israel and Gaza – increasing tensions in Latin America and emerging conflicts across Africa illustrate how geopolitics has emerged as a central topic of global discourse, particularly since Russia's invasion of Ukraine. The risks, impacts and potential opportunities arising from these developments can be analysed through multiple lenses, including physical security and economic stability.

From a humanitarian standpoint, these events represent profound tragedies, while from a business perspective, they're substantial financial losses that can disrupt a company's continuity. This environment has forced many organisations, especially global corporations, to operate amid increasing uncertainty: how might an evolving regional conflict or diplomatic breakdown affect operations? What would be the implications for sourcing and procurement? Could access to critical raw materials be maintained, or would disruptions trigger bottlenecks across production and supply chains?

It is always easy, in retrospect, to identify what would have been the optimal course of action for a company – but in practice, hindsight is not a viable strategy. Actively monitoring geopolitical developments and understanding their cause-and-effect dynamics has become essential for every global corporation, and its importance continues to grow. In previous decades, relative global stability made this need appear less urgent. That era, however, has ended. The international landscape is now characterised by accelerating turbulence, where conflicts emerge faster, expand more broadly and exert deeper impacts. Furthermore, a fundamental shift toward a multipolar world is underway. For example, China is increasingly challenging US influence, and other actors, such as India, Brazil and regional blocs, are playing a more prominent role, making the business environment even more challenging to understand. Even if current wars and crises were to end abruptly, neither a return to stability nor a reduction in complexity is anticipated in the foreseeable future.

In addition, technological advances and the unprecedented availability of information continue to accelerate. This expansion enables companies to strengthen their ability to proactively understand geopolitical developments, their underlying cause-and-effect relationships and their implications for business operations. However, it also generates overwhelming amounts of data, often causing organisations to drown in noise and making it increasingly difficult to identify meaningful signals and indicators.

The organisational challenge of understanding geopolitical impacts

The impacts of geopolitical events can differ significantly across industries, even when the underlying event is the same. For instance, damage to energy infrastructure – such as pipelines or liquefied natural gas and oil terminals – can disrupt energy availability and create supply constraints. Producing nations may impose export restrictions, while wide-ranging economic sanctions can further heighten market volatility. Beyond managing risks, companies must also identify emerging opportunities, such as regional energy investments, enhanced reliability in energy transportation or favourable conditions for entering new markets.

1 Russia's war in Ukraine

Russia's invasion of Ukraine has had a significant impact on energy markets, affecting oil and gas prices and, beyond operational effects, driving states and companies to make strategic changes. It has profoundly affected global energy markets, influencing oil and gas prices and prompting strategic shifts among both governments and corporations.

Although the transition from fossil fuels to renewable energy continues to gain momentum, it also introduces new risks – particularly concerning the availability of critical raw materials. These resources are essential to expanding renewable energy technologies, components and infrastructure. Various assessments suggest that copper, nickel, cobalt and lithium will be among the most affected by the global energy transition, facing geopolitical risks from resource nationalism to tariffs and export controls.

2 The Middle East

Although escalating tensions and hostilities between Israel and Iran – along with attacks on Iran's energy infrastructure – have not yet had a major impact on global energy supply, the situation remains volatile. Should it escalate further, the consequences could be considerable and far-reaching.

3 South China Sea and the Taiwan Strait

From a global economic standpoint – regardless of industry – closely monitoring and understanding developments in the South China Sea, particularly evolving China–Taiwan dynamics, is of critical importance. While the potential direct and indirect impacts of a worst-case scenario are nearly limitless, companies can still monitor, assess and manage the effects on production, procurement and supply chains.

Whatever the perspective, understanding geopolitical developments and their potential impacts is now an essential component of global corporate operations, enabling organisations to respond proactively to changing conditions.

Supporting organisations to understand geopolitical risk

It is 'easier' to avoid considering the effects of a large-scale, significant event and simply hope for the best if there are no tools to guide that thinking. Today and in the future, organisations simply cannot afford to ignore this issue or fail to build the capability to address it. Building a structured capability to anticipate, analyse and respond to geopolitical developments is no longer optional – it is essential.

News, notifications and alerts provide timely information, but companies are often overwhelmed by a flood of data, lacking a clear understanding of its implications or how situations are likely to develop. Moreover, discussions of these issues and their effects rarely reach all parts of an organisation. In many cases, insights remain isolated within a single department or silo, leaving senior management or even the board misaligned on the depth of understanding across the company. This is why solutions such as Finland-based Clock & Cloud's platform – designed to help organisations anticipate likely geopolitical developments and understand their impacts – are increasingly relevant.

When Russia launched its invasion of Ukraine, numerous organisations only began planning their operational withdrawal at that very moment. For experts and analysts closely tracking the situation, the developments had been foreseeable, yet a key question arises: how effectively was that cause-and-effect understanding communicated across departments and up to leadership?

Images: iStock

Data transfer from existing solutions into riskHive ERM

riskHive's ERM system is designed to meet evolving client needs, specialising in transitioning from spreadsheets to databases. It offers fast deployment on secure private cloud hosting or on-premises, operational and ready for configuration within 24 hours. Configuration typically takes one to six weeks. By replicating customers' practices, we reduce training and deployment time, accelerating return on investment and confidence in the new system. The riskHive ERM includes Monte Carlo simulation and analysis, covering costs, schedules and carbon emissions.

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