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Future Forces 2023:

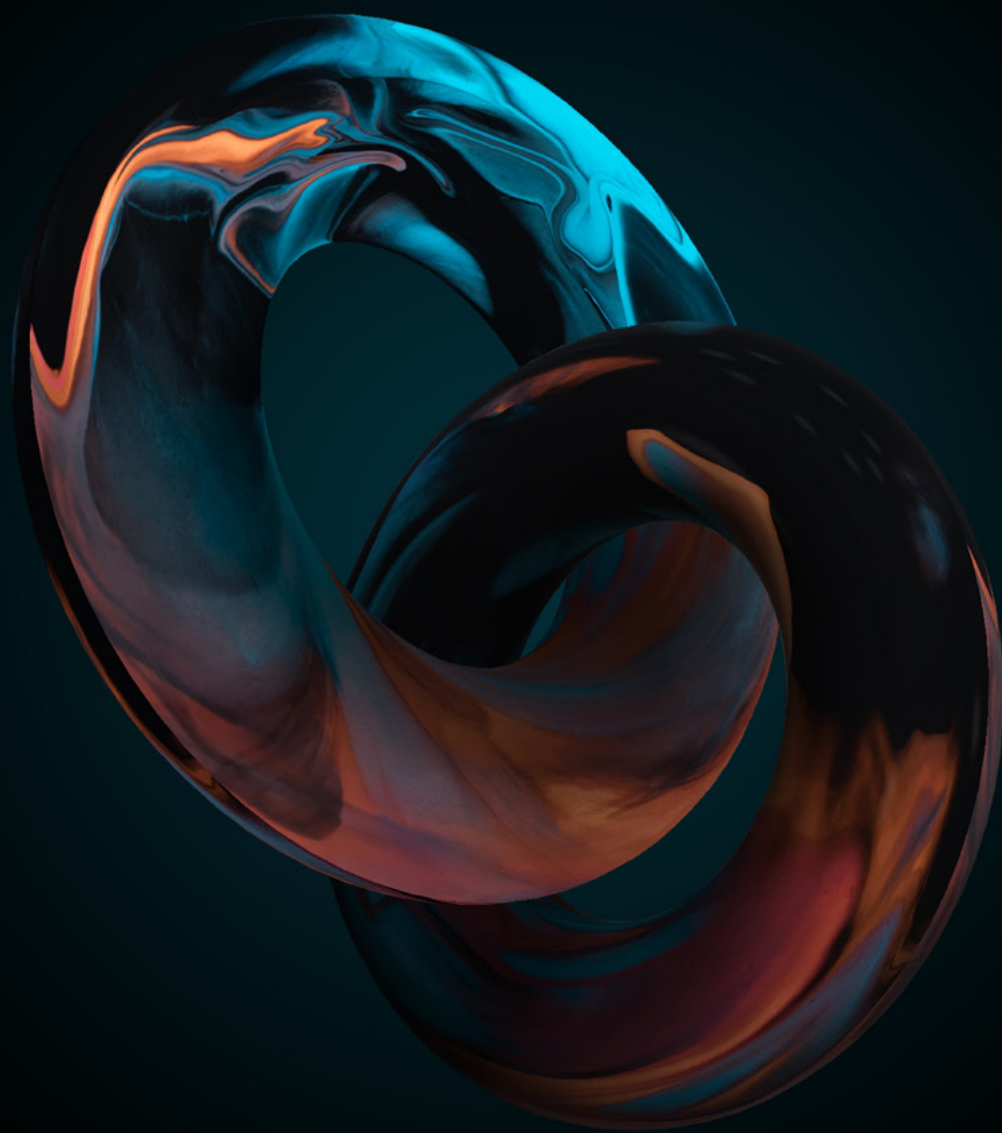
The megatrends shaping
the energy industry



Outpacing change

Based on research by

**ECONOMIST
IMPACT**



Key takeaways

This article is part of the Future Forces 2023 report series which explores the impact of six megatrends on businesses in the coming decade. The findings of this article are drawn from a global survey of 60 executives from the energy and natural resources sector. Key takeaways include the following:

Recent geopolitical factors have renewed energy security concerns globally. The surveyed executives say that national security is the topmost geopolitical and macroeconomic concern facing their businesses.

Depletion or obsolescence of existing energy assets will have the biggest impact (45%) on these businesses as they strive to maintain a fine balance between energy security and energy sustainability in the shorter term.

Nevertheless, businesses see significant gains from the worldwide transition to net zero emissions, which is also linked to achieving energy security in the longer term. Technological advances, such as battery storage and renewable energy technologies (43%), are already key enablers of the net zero transition.

Gaining access to and leveraging advanced energy and enterprise technologies is vital to delivering on energy firms' growth objectives, as is securing the requisite engineering talent (32%) for these goals. Securing necessary skills presents the third biggest challenge for surveyed executives.

Energy executives see the largest business opportunity coming from fast-changing cities (48%), due in part to rising urban demand for energy and associated innovative solutions.



The energy supply and demand shifts of recent years have posed new challenges to the energy sector.

Russia's war in Ukraine proved a particularly sizeable shock to the industry, accelerating the changes in the global structure of markets, particularly the natural gas market. Geopolitical and geoeconomic factors—for example, deglobalisation, economic sanctions and a renewed emphasis in many countries on achieving energy security—have changed markets for the foreseeable future.

The more immediate changes arise in the context of an increasing push behind the energy transition from fossil fuels to renewables. Industry executives know their businesses need to enable and preferably lead that transition while ensuring they can meet existing energy needs in developed and developing countries alike.

Energy firms' ability to achieve that, and to deliver on their top- and bottom-line growth objectives over the long term, hinges on a number of factors. These include making investment decisions about technologies that will help reduce carbon emissions and secure the talent needed to work effectively with those technologies.

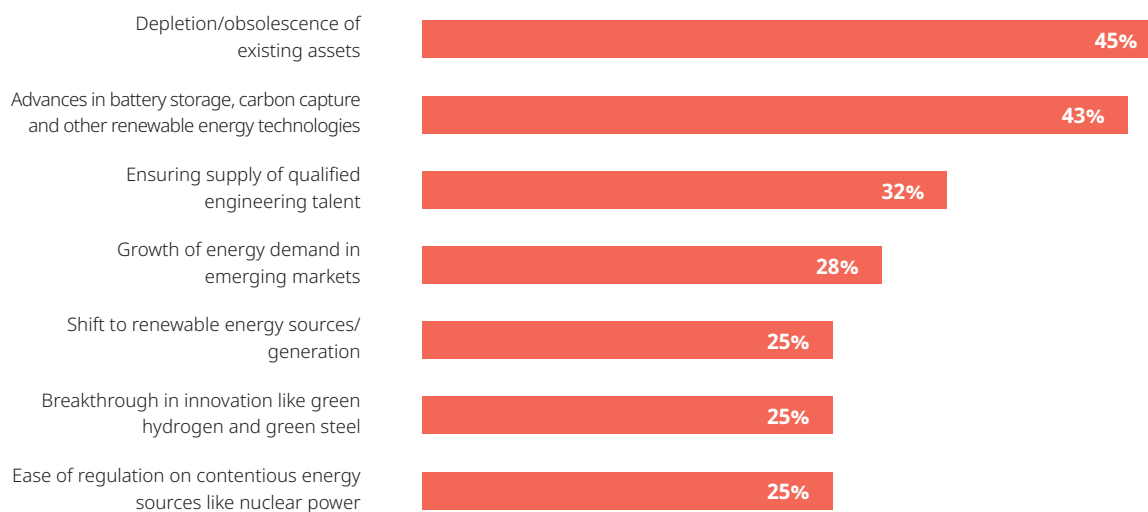
In the flagship report of this programme, *Future Forces 2023 report: the megatrends shaping business over the next decade*,¹ we explored the opportunities and challenges that six megatrends pose to businesses in the decade to come, which are presented in the table below. This article draws on the results of Economist Impact's global survey of 60 executives from the energy and natural resources sector.

Megatrend	Implications for Business
Changing global dynamics	Organisations must develop their risk management capabilities and build resilience to adapt to the growing frequency of political, macroeconomic and public health shocks, among others
Net zero transition	Organisations will need to decarbonise their operations and mitigate their climate risk
Digitalisation	Businesses will fall behind if they fail to derive greater value, efficiency and convenience from technological innovation and the digitalisation of their products and services
Demographic change	Remaining competitive requires businesses to adapt their products and services to meet the needs of diverse groups of customers while accommodating workforce ageing, the younger generations' changing preferences and a growing focus on social sustainability
Skills for the future	Amid workforce ageing and continued shortfalls of critical skills, organisations will need to prioritise reskilling and upskilling to fill the gaps
Resilient cities	When cities become denser, more congested and increasingly impacted by climate change, organisations can help them remain productive and able to cater to the community's diverse needs; cities must also be safe and affordable places for people to live and work

Balancing energy security and sustainability

When asked about what is the biggest geopolitical and macroeconomic risk for their business, national security was the leading concern for businesses in the sector (30%). Growing geopolitical tensions following the war in Ukraine have led to renewed energy security challenges, not least in Europe where Russian supplies have historically played a significant role in energy imports. A prolonged Israel-Hamas war will also likely have significant impacts on global oil and gas markets. Due to this, governments across the world are seeking new energy sources that can meet their immediate demands. The concern of energy security is also top of mind for surveyed businesses. Nearly half (45%) point to the depletion or obsolescence of existing energy assets as one of the developments they expect to have the biggest impact on their businesses in the next decade.


Figure 1: Indicators of an energy transition to come
Market developments likely to have the biggest impact on energy and natural resources businesses over the next decade



Source: Economist Impact survey

Achieving energy security will ultimately be driven by ensuring both a secure supply and a secure climate. For instance, in 2022 the European Commission announced its energy strategy that envisages independence from Russia by 2030 by doing both: finding new sources of gas and also doubling down on renewables, which are critical for reducing the impacts of climate change.² Graeme York, chief operating officer of Thermal Australia (which is part of Engie, a global energy provider), reinforces the complexity of achieving this balancing act. "If the renewables come faster than the capacity of the grid or if the coal plants and the gas-fired power plants closed down earlier, then you've got a real energy security issue," he says.

Despite these challenges, businesses in the sector see multiple opportunities from the clean energy transition. When asked to select the top three net zero opportunities, the largest share of executives selected improving attractiveness to customers (37%), showing industry leadership in addressing climate change (35%), and improving attractiveness to investors (35%) and talent (30%). Converting ambitious plans into action will, however, require stable infrastructure, including smart and resilient grids, along with investments in scalable technologies that can make the energy transition swift and safe. The International Energy Agency (IEA) reckons that over 80 million kilometres of grids will have to be built or refurbished by 2040 requiring annual investments to double to US\$600bn by 2030.³



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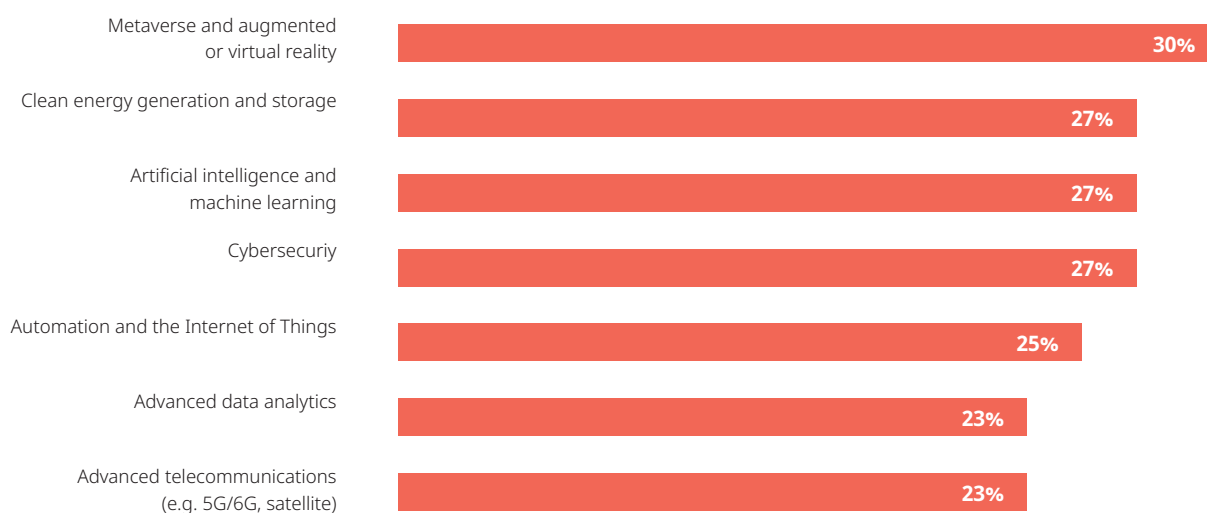


AR/VR is used today to improve site safety, aid remote maintenance of offshore structures, and help design new products and sites more efficiently.

Embracing the technology challenge

To contribute to and benefit from the net zero transition, energy companies will need to invest in and deploy a variety of technologies. The investment case is clearer today when it comes to the types of smart, digital technologies that organisations in many industries are using to secure improvements in operational efficiency and develop new products and services. Over the next decade, energy industry executives see gains to be made by investing in augmented and virtual reality (AR/VR), in artificial intelligence (AI) and machine learning (ML), and in automation and the Internet of Things (IoT).

Figure 2: Mastering advanced technology capabilities
Technology investments likely to make the biggest positive difference to energy and natural resources businesses in the next decade



Source: Economist Impact survey

AI and IoT will likely play a prominent role in the energy transition. Utilities, for example, will use AI models to forecast demand and capacity levels as grids shift between renewable and fossil fuel sources. It will also increasingly be used for predictive maintenance, where AI-powered remote monitoring systems assess the risk of energy production failure and allow planning for necessary preventive action. AR/VR is used today to improve site safety, aid remote maintenance of offshore structures, and help design new products and sites more efficiently.

Respondents see a major challenge in gaining access to these fundamental technologies or infrastructure that will enable the transition. There is a role here, however, for governments to take a lead in incentivising and making it easy to innovate in the sector. In many parts of the world, including in the US and Europe, delays in permits, at times owing to red tape and a lack of clarity with jurisdictional laws, continue to throttle progress, slowing down innovation and investment in technologies.⁴ Mr York, who has worked extensively in South-east Asia, holds Singapore up as a model for setting and communicating long-term plans for installing electric vehicle infrastructure, for example. "Such clarity helps energy providers plan with more confidence," he says.

Other countries could also follow Singapore's strategy and simplify policies and regulations. Doing so could result in businesses providing solutions to the energy demands and challenges facing cities. This will be critical, as cities account for two-thirds of global energy consumption and are expected to host 70% of the world's population in the next decade, according to the IEA. In the developed cities of Europe and North America, renewables will be a prime source of energy supply growth and are also likely to feature in new energy infrastructure investment in emerging market cities. Nearly half of energy businesses (48%) find meeting the needs of fast-changing cities an attractive opportunity for their businesses in the next decade.

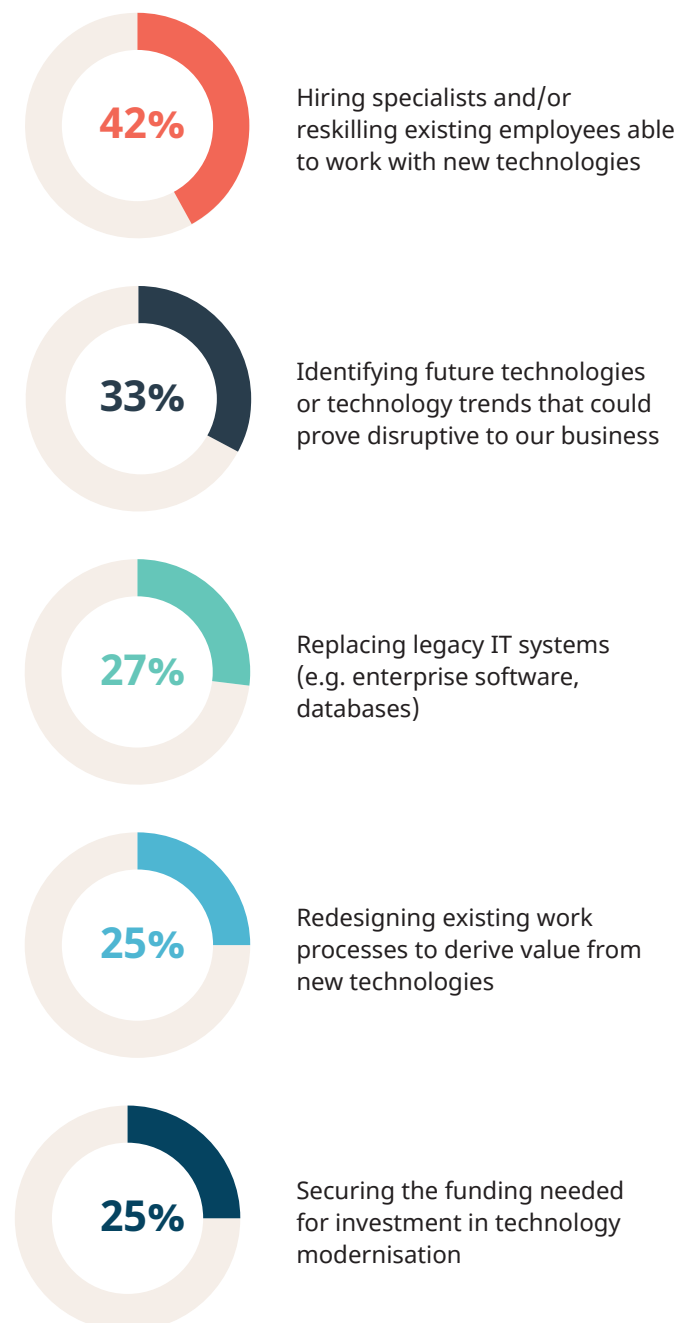
But when to invest in such technologies remains a dilemma facing all energy industry executives, says Mr York. "You've got to time your investments right. If you go in too early, you may back a losing technology or invest too much in one whose economics improve greatly down the track. If you invest too late, you're left behind and everyone else has surged ahead."

But where to secure talent?

The biggest challenge that energy industry firms face in leveraging such technologies, according to 42% of the surveyed executives, is securing the skilled talent able to work with them. This applies to renewable energy technologies as well as advanced enterprise technologies.

Figure 3: Mastering advanced technology capabilities

The toughest challenges posed to energy and natural resources businesses by technology transformation and further digitalisation



Source: Economist Impact survey

Acquiring the skills to support the growth of renewables is among the foremost challenges that companies in this industry face. According to the International Renewable Energy Agency, the number of jobs in renewables will rise to 38m by 2030, increasing by over threefold from the preceding decade.⁵ Such growth will mean intense competition for talent in this industry, particularly in areas driven by net zero goals and opportunities. For instance, in the US, the number of renewables and environment jobs posted on LinkedIn increased by more than 200% between 2018 and 2022. This outnumbered job postings in conventional energy sectors like oil and gas, which rose by 19%. In the five years to 2021, the fastest-growing green jobs globally included sustainability manager, wind turbine technician, solar consultant, ecologist, and environmental health and safety specialist.⁶

“There is a huge skills shortage in our industry, and it’s not likely to ease in the near future,” says Mr York. “We’re looking to build a large amount of battery storage and hydrogen assets globally, and we need skilled people to do that, but such specialists are difficult to find,” he says. “As an industry we’ve got to help train them, but there are no easy answers.” When asked about the types of skills needed to meet growth objectives, energy and natural resources executives most often point to engineering and other industry-specific occupational skills, as well as to skills in working with AI and ML. These shortages are already visible. For instance, the EU would require an additional 50,000 trained staff by 2030 to meet the goals of the European wind energy industry.⁷







Looking ahead

The term “transition” neatly encapsulates the next decade of challenges and opportunities facing the energy industry.

Notwithstanding political concerns about energy security, the industry will remain under enormous public pressure to make progress on the energy transition, and the growing, visible manifestations of climate change will sustain that pressure. Businesses in this industry must also drive change. Clear communication of governments’ long-term transition strategies will provide direction and support to private business investments.

The technology landscape and workforce realities familiar to this industry will also continue to evolve, and in the case of technology fields such as AI, at an accelerated pace. That change, embodied in the adoption of both advanced enterprise and green energy technologies, is in turn creating the need for skillsets that have not hitherto been prominent in the industry’s workforce. Energy companies globally must identify new pools of talent to source the skills they will need to master those technologies.

However, the energy transition is not solely a concern for the energy industry, rather it is a global issue that necessitates all industries to ramp up investments in energy-efficient sources, train talent, and adopt sustainable modes of operation. Industry players would also gain from partnering on R&D and the development of new technologies in order to realise their shared goal.

Partner Perspective



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There is an enormous amount of work to be done to transition to net zero for a broad range of industries, and some of the most exciting work we are involved in is happening in sectors traditionally regarded as the hardest to transition.

Economist Impact's research highlights the continued recognition of the importance of the energy transition. But what the research also demonstrates is the interconnected nature of the megatrends discussed in our Future Forces report. Changing global dynamics, confidence associated with developing technologies and inflationary pressures are all linked to the ability to progress the energy transition.

One of the key evolutions of the energy transition has been the broadening of the understanding that it's not just a problem for the energy industry. The energy transition is a trend that impacts everyone who, directly or indirectly, consumes energy. A successful transition won't just involve new businesses building renewable energy generation. There is an enormous amount of work to be done to transition to net zero for a broad range of industries, and some of the most exciting work we are involved in is happening in sectors traditionally regarded as the hardest to transition.

While the size of the task can seem daunting, the energy transition also presents an enormous opportunity. Around the world, we're seeing significant investment from the public and private sector in support of the rapidly maturing technologies, such as solar power, that underpin the transition.



Endnotes

- ¹ The megatrends are: the net zero transition, demographic change, digitalisation, skills for the future, resilient cities and changing global dynamics. See [Future Forces 2023 Report: The megatrends shaping business over the next decade](#)
- ² <https://www.economist.com/leaders/2022/03/26/why-energy-insecurity-is-here-to-stay>
- ³ <https://www.iea.org/news/lack-of-ambition-and-attention-risks-making-electricity-grids-the-weak-link-in-clean-energy-transitions>
- ⁴ <https://www.economist.com/leaders/2023/02/16/the-world-wont-decarbonise-fast-enough-unless-renewables-make-real-money>
- ⁵ International Renewable Energy Agency. World Energy Transitions Outlook: 1.5°C Pathway. 2021. <https://www.irena.org/publications/2021/Jun/World-Energy-Transitions-Outlook>
- ⁶ https://economicgraph.linkedin.com/content/dam/me/economicgraph/en-us/global-green-skills-report/global-green-skills-report-pdf/li-green-economy-report-2022-annex.pdf?trk=eg_fow_grn_nav
- ⁷ <https://etipwind.eu/files/reports/TPWind-Workers-Wanted.pdf>



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