



A convergence of acute and urgent threats

Global Trends 2022–2027

Five significant trends will profoundly shape the global outlook and business operating environment.

Trend #1		Trend #4	
A pivotal race to climate change adaptation	3	A nuclear renaissance?	16
How governments are tackling adaptation needs	4	Expansion is imminent, but obstacles endure	17
Adaptation as a business imperative	5	Geopolitical implications	18
Outlook	7	Outlook	20
Business implications	7	Business implications	20
Trend #2		Trend #5	
Protracted stagnation	8	Post-truth goes beyond politics	21
Sustained stagnation will impact advanced and developing economies alike	8	Recent post-truth technology gains are impacting business and government alike	21
Mechanisms to improve global growth prospects	11	Trajectory of deepfakes: turbulence ahead	24
Outlook	11	Outlook	24
Business implications	11	Implications for business	25
Trend #3		Assessing the status of Global Trends 2021-2026	
A digital iron curtain	12		26
Data as the next front in geopolitics	12		
Nations and businesses drowning in the alphabet soup of data localization laws	14		
Outlook	15		
Business implications	15		

Just two years ago, the world was in the throes of COVID-19. Lockdowns were still commonplace, vaccines had not been rolled out, and economic contractions were severe in most countries. Today, ostensibly, we are in a better position. In advanced economies, vaccination programs are established, and with a few notable exceptions, lockdowns are comparatively rare.

Indeed, public health has rebounded over the past year—though there is admittedly still much work to be done. An equitable recovery for the nations and vulnerable populations who have been impacted most seriously by the economic, social, and political ramifications of the pandemic remains elusive. However, while some progress has been made in the health arena, geopolitics have become increasingly turbulent. The Ukraine crisis has taken a severe toll on human lives and created ripple effects across the global economy—and it shows little sign of abating.

The conflict has accelerated many risks to the global operating environment that were already brewing. It is for that reason we have entitled this Global Trends 2022–2027 report *A convergence of acute and urgent threats*. These threats, discussed individually in the pages that follow, range from environmental to economic, energy-related to technological. We examine the broader impact of climate change on governments and businesses and how adaptation to environmental crises such as rising temperatures and flooding is becoming just as important as mitigation efforts. We look at the implications of a protracted global economic stagnation, ranging from monetary policy volatility to labor market imbalances and the resultant political fallout. On the energy front, we explore whether nuclear will become a larger part of the energy mix and the subsequent geopolitical implications.

Our remaining trends explore the technological dimension—focusing first on data. Indeed, with the proliferation of data privacy and localization regulations throughout the world, we could be headed into a world of data spheres of influence that risks culminating in a digital iron curtain. And, in our final trend, we examine the rise of deepfakes and how they could damage the credibility of governments and businesses alike.

Businesses will be impacted by each of these trends and will need to prepare to respond accordingly. From investing in climate change adaptation technologies to firm up their supply chains, to ensuring compliance with data localization regulations, to protecting against deepfake reputational damage, the private sector will face an evolving threat landscape over the next five years. The good news is those who recognize these risks and act on them now will gain first-mover advantage in a world characterized by hyper-transformation.



Erik R. Peterson
Partner and managing director,
Global Business Policy Council

Executive summary

- **A pivotal race to climate change adaptation.** As the impacts of climate change are increasingly felt around the world, governments, companies, and populations face growing pressure to adapt to the planet's changing environmental conditions. While awareness of the need to create climate adaptation solutions is growing, government and business investments remain low. As adaptation needs grow across the world, companies have an opportunity to fill this deficit—helping the planet and driving value in an emerging climate adaptation market.
- **Protracted stagnation.** Over the next five years, converging forces such as the Ukraine crisis, continued supply chain disruptions, increasing protectionism, and a rise in global inequality will contribute to a sustained period of low global growth. A stagnant economic environment could have far-reaching implications for advanced and developing economies alike, ranging from persistent labor market imbalances to political instability and rising authoritarianism.
- **Digital iron curtain.** Data privacy laws are proliferating, in some cases to protect consumer information and in others to gain information hegemony. The lack of harmonization of data laws is proving a minefield for companies, which must continuously adapt to ever-evolving standards.
- **A nuclear renaissance?** With high oil and gas prices and supply chain bottlenecks slowing deployment of renewable energy sources, interest in nuclear energy is growing. Although nuclear energy is a low-carbon energy source, numerous barriers could slow its deployment, namely cost and labor shortages. But the geopolitical implications of new nuclear developments may prove more significant than their capacity to serve as a meaningful stopgap in the broader energy transition.
- **Post-truth goes beyond politics.** Rapid advancements in synthetic media, notably AI-powered deepfakes, threaten to worsen the already alarming spread of false information around the world. Soon, such technologies are likely to improve to the point where ordinary Internet users can quickly and cheaply produce near-perfect synthetic audio, video, and photographic content. Companies must brace for a period in which they are the direct targets of deepfake and other AI-assisted attacks—by criminal, state, and other malign actors.

Trend #1

A pivotal race to climate change adaptation

As the impacts of climate change are increasingly felt around the world, governments, companies, and populations are facing more pressure to focus on adapting to the planet's changing environmental conditions. While mitigating the man-made contribution to climate change has long been a global priority—and a paramount one—there is a clear deficit around funding and support for adaptation. More than 90 percent of the \$632 billion in [global climate financial flows](#) in 2019 went toward mitigation, leaving only around \$60 billion for adaptation. Yet, the demand for adaptation stands to rise considerably. Annual [adaptation costs](#) in the developing world alone are projected to increase from \$56 billion to \$73 billion today to \$160 billion to \$340 billion in 2030. Further, adaptation finance flows to the developing world reached only [\\$29 billion](#) in 2020, a slight 4 percent increase from 2019. The UN Intergovernmental Panel on Climate Change finds this gap between adaptation funding and costs is on pace to widen as climate-related disruptions proliferate.

Of particular importance is support for climate change adaptation in developing countries, which, despite being responsible for just a fraction of global emissions, are disproportionately impacted by the changing climate. Wealthier countries, long slow to back the funding needed for adaptation in developing parts of the world, have recently shown a stronger prioritization of the issue. Climate change appeared at the forefront of the International Monetary Fund and World Bank 2022 annual fall meetings. In addition to the launch of a \$650 billion long-term [lending facility](#) to support climate resilience, 10 major economies, including the United States and Germany, called for a [restructuring](#) of the World Bank to more strongly focus on the impacts of climate change. While momentum is building among wealthier countries to act on climate resilience in developing parts of the world, whether these countries can significantly boost spending in the coming years remains to be seen. Political hurdles as well as lasting economic headwinds may slow these ambitions in the near term.

In addition to the moral imperative of helping populations cope with climate-related disruptions, the economic benefits of embracing climate change adaptation are clear. Research from the Global Commission on Adaptation found that investing \$1.8 trillion in adaptation globally from 2020 to 2030 could generate \$7.1 trillion in [net economic benefits](#). Businesses that do adapt will better protect themselves against the risks that climate-related disruptions pose to their operations while simultaneously benefiting society and demonstrating the [ESG leadership](#) that consumers value. Moreover, the private sector covers only a fraction—less than 2 percent—of total global adaptation financial flows, a deficit that presents a strong opportunity if filled.

Ten major economies, including the United States and Germany, called for a restructuring of the World Bank to focus more on the impacts of climate change.

How governments are tackling adaptation needs

Recent years have seen a rise in national climate adaptation plans and strategies across developed and developing countries. Canada's proposed [adaptation strategy](#), to be released by fall 2022, focuses on infrastructure, disaster resilience, natural environments, and citizen well-being. The US Bipartisan Infrastructure Law allocates [\\$50 billion](#) to protect against droughts, floods, wildfires, and high temperatures over the next five years. And adaptation strategies proposed by the [EU](#), [Australia](#), and [New Zealand](#) similarly recognize the need to build climate-resilient futures. Additionally, 10 developing countries, including South Africa, Tonga, and Nepal, [submitted](#) national adaptation plans to the United Nations Framework Convention on Climate Change in 2021, double the submissions in 2019. Notably, 129 developing countries have also initiated national adaptation planning processes. As governments' interest in national adaptation plans grows, the extent of funding and the ability to implement—which at the moment remain unclear—will be key drivers of adaptation success.

Adaptation needs are location-unique; each region must devise [specific strategies](#) that address challenges posed by various climate-related disruptions. In London, the [Thames Barrier](#) has held back rising storm surges and tides since 1982, protecting 1.3 million people and £275 billion in property and infrastructure. Several US cities, including Washington, D.C. and Baltimore, have also joined the [Smart Surfaces Coalition](#), a group of more than 40 leading non-profits and foundations, to cover roads with heat-blocking surfaces that could cool peak temperatures in cities by 2.5°F. And as more frequent [heatwaves](#) grip cities around the world, several local governments have appointed "chief heat officers" to devise cooling solutions. The [C40 network](#) of mayors from more than 100 cities around the world shares best practices and data on managing rising temperatures. And across the United States, state governments are allocating significant funds toward climate-resilient infrastructure: Florida announced a \$1 billion bond program for adaptation infrastructure, and California plans to spend \$4.1 billion on climate-resilient infrastructure.

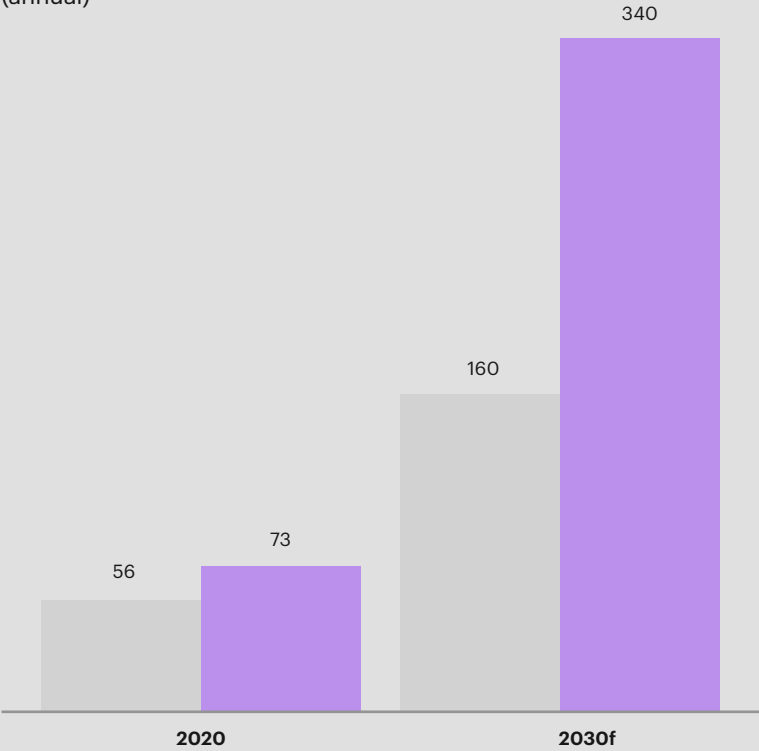
In developing countries, where the impacts of climate change are often disproportionately felt, governments are collaborating regionally and globally to leverage the resources and know-how needed for adaptive capacity. The [African Adaptation Initiative](#), for example, was launched by African heads of states at the Paris COP21 and aims to ensure \$1 billion is invested in early-warning systems across the continent and to double adaptation finance by 2025. France, in coordination with partners including Germany, Australia, and Canada, has also led on the Climate Risk and Early Warning Systems ([CREWS](#)) initiative to provide up to \$100 million in support for improvements in early warning systems in the least developed countries. Early warning systems, which are often underdeveloped in less wealthy countries, forecast weather that can bring climate-related disasters, helping regions plan for and avoid the worst impacts of droughts, floods, heatwaves, and similar adverse events.

While these measures show an enhanced focus from governments around the world on climate change adaptation in recent years, the financial support and innovation required to meet adaptation needs remain lacking (see figure 1 on page 5). The private sector in particular remains far behind in filling this gap in adaptation needs, with current investment flows around just \$500 million. As recent and increasingly severe climate-related disruptions suggest—from record [heatwaves](#) in Europe, to [droughts](#) in the Horn of Africa, to deadly and unusual [flooding](#) in Seoul—the world is vastly underprepared for a future of worsening climate change and the changes to infrastructure, technology, and ways of living that will be needed. As the next section explores, strategic businesses will seek avenues to complement government efforts to fill the deficit of support for climate adaptation.

Figure 1
Even in a low-cost scenario, climate change adaptation costs in the developing world will rise exponentially over the next decade

\$ billion
(annual)

- Adaptation costs (low-cost scenario)
- Adaptation costs (high-cost scenario)



Sources: United Nations; Kearney analysis

Adaptation as a business imperative

Businesses are growing more aware of both the opportunities around embracing adaptation as well as the risks of failing to act. Bank of America [estimates](#) the climate change adaptation market could double to \$2 trillion per year by 2026. Investment firm Wellington Management Co. [expects](#) a similar rise in demand for adaptation solutions and notes the world “remains underprepared for the potentially devastating human, environmental, and financial toll of climate change.” This blind spot suggests that there are significant opportunities for businesses that forward-position themselves with sufficient adaptation solutions and innovations.

While the opportunities are immense, the costs of inaction also stand to be considerable. In 2018, for example, 215 of the world’s largest companies [reported](#) a total of nearly \$1 trillion in climate-related financial risks. California utility PG&E, widely considered one of the world’s first “[climate bankruptcies](#)”, faced an estimated \$30 billion in liabilities and 750 lawsuits from wildfires potentially caused by its power lines amid drought conditions. Further, the UN identifies physical, price, regulation,

reputation, and liability as the [key risks](#) of climate change to businesses. Companies that fail to account for the impact of climate change on their operations and adapt appropriately face significant potential losses. Moreover, companies that can offer new adaptation solutions could gain substantially as first movers in the fast-growing climate adaptation market.

The various risks posed by climate change present compelling adaptation opportunities for businesses. Rising temperatures and wildfire risks, for example, drive the need for adaptation solutions in cooling and air conditioning, electric grid resiliency, and fire-resistant materials. Water resources, increasingly threatened by climatic changes, also require creative management solutions to mitigate supply disruptions. These include desalination, wastewater treatment, and IoT-based smart metering to control water use. Some innovative companies are already taking the lead in devising and implementing the adaptation solutions needed to cope with climate change, though significant opportunities for further innovation and growth in this area remain (see figure 2 on page 6).

Figure 2
Climate risks present opportunities to develop new adaptation capacity

Non-exhaustive

Heat The Rocky Mountain Institute's Global Cooling Initiative identified eight finalists comprised of both large corporations and start-ups with residential cooling technologies, including vapor-compression, evaporative cooling, and solid-state cooling, that achieve higher efficiency and use little to no global warming refrigerants. 	Water scarcity Microsoft has begun cooling its data-center servers with boiling fluid, a liquid cooling waterless technology that will help the company meet its commitment to replenish more water than it consumes by 2030. 	Water scarcity IoT-based start-up Smarter Homes uses smart metering and automated leakage prevention technologies in its WaterOn device, allowing roughly 40,000 households in India to reduce their water consumption by an average of 35 percent. 
Water scarcity Start-up incubator Imagine H2O's portfolio, which includes Smart Homes and dozens of other companies offering innovative water management solutions in developed and emerging markets, has raised more than \$800 million in total capital and maintains an 85 percent start-up survival rate. 	Extreme weather 3D printing company ICON's Vulcan construction system can deliver homes and structures up to 3,000 sq. ft. that are expected to last as long or longer than standard concrete masonry units, making them more resilient to extreme weather. The system can also build homes with more speed, precision, and less waste than conventional methods. ICON is valued at \$2 billion. 	Flooding Google uses machine learning to better model and alert communities about flooding risks in India and Bangladesh. 

Note: IoT is the Internet of Things.
Source: Kearney analysis

Outlook

Over the next five years, governments and businesses will face mounting challenges to address increasingly severe climate-related disruptions. In the fight to mitigate the manmade impact on the climate, the world has so far fallen well short of the measures needed. Ensuring adaptation efforts avoid similar shortcomings will require significant buy-in and cooperation from governments as well as deep engagement with the private sector. The path to addressing the adaptation deficit could face additional headwinds from political polarization, geopolitical tensions, and worsening misinformation (see Trend #5). Nevertheless, businesses that act now to brace for and adapt to a future where climatic hazards threaten both the bottom line and societal well-being will be best positioned. This will require longer-term thinking on adaptation, recognizing that investments today will show the best returns in decades to come.

Businesses that brace for a future where climatic hazards threaten both the bottom line and societal well-being will be best positioned.

Business implications

- **Companies that act first in climate adaptation stand to gain as early movers in a fast-evolving area.** Businesses can take advantage of rising demand and new markets for adaptation solutions, protect their own operations from climate impacts, and get ahead of increasing pressure from regulators and investors—who increasingly use [Task Force on Climate-related Financial Disclosures](#) standards—to disclose exposure to climate-related risks. For example, the European Bank for Reconstruction and Development, supported by BNP Paribas and Goldman Sachs, raised \$700 million through the world's first dedicated climate resilience bond, capitalizing on an emerging market for climate resilient projects.
- **Supply chains could be drastically reshaped by climate risks.** A recent [study](#) from the University of Maryland and supply chain mapping firm Resilinc found that only 11 percent of 12,000 supplier sites in the United States, China, and Taiwan that predominantly serve original equipment manufacturers were fully prepared for climate-related disruptions. In another striking example of failure to anticipate the risk of climate on core operations, California utility PG&E entered bankruptcy after accumulating nearly \$30 billion in liabilities from wildfires that its power lines may have caused amid drought conditions. Strategic businesses will prioritize developing climate-resilient infrastructure, diversifying supply sources, increasing inventory, and upgrading insurance policies.
- **Adaptation needs to become a central component of a business's operations.** Strategic companies will increase environmental focus across the C-suite and consider new adaptation-facing roles. Such roles, whether expanded from existing positions or newly created, can help companies better understand climate-related risks, adapt their operations, and ultimately avoid costly climate-related disruptions.

Trend #2

Protracted stagnation

Converging forces such as the Ukraine crisis, continued supply chain disruptions, increasing protectionism, and a rise in global inequality are leading the world into a sustained period of low growth. [Global growth](#) in 2022 will be roughly half of last year's annualized rate, forecasted to land at 3.0 percent. This will be the sharpest slump after an initial post-recession rebound that the global economy has suffered in more than 80 years. And it is expected to show little improvement in 2023, remaining weak at 1.3 percent before rebounding marginally to 2.9 percent in 2024. This raises the risk of stagflation, a combination of low growth with high levels of inflation, which could be especially harmful for developing economies.

According to the [World Bank](#), the current state of play in the economy resembles the 1970s in three key aspects: persistent supply-side disturbances fueling inflation, preceded by a protracted period of highly accommodative monetary policy in major advanced economies; prospects for weakening growth; and vulnerabilities that emerging market and developing economies face with respect to the monetary policy tightening that will be needed to rein in inflation. Sustained global low growth would have far-reaching implications for advanced and developing economies alike. Labor market imbalances could persist, inequality within and among nations could grow as high debt levels mount, and opportunistic politicians could capitalize on fear of resultant crises. However, it is not too late to improve growth prospects by using [mechanisms](#) such as monetary policy to protect the vulnerable, promoting free trade to combat protectionism, and on the geopolitical front, pushing for a swift resolution to the conflict in Ukraine.

Sustained stagnation will impact advanced and developing economies alike

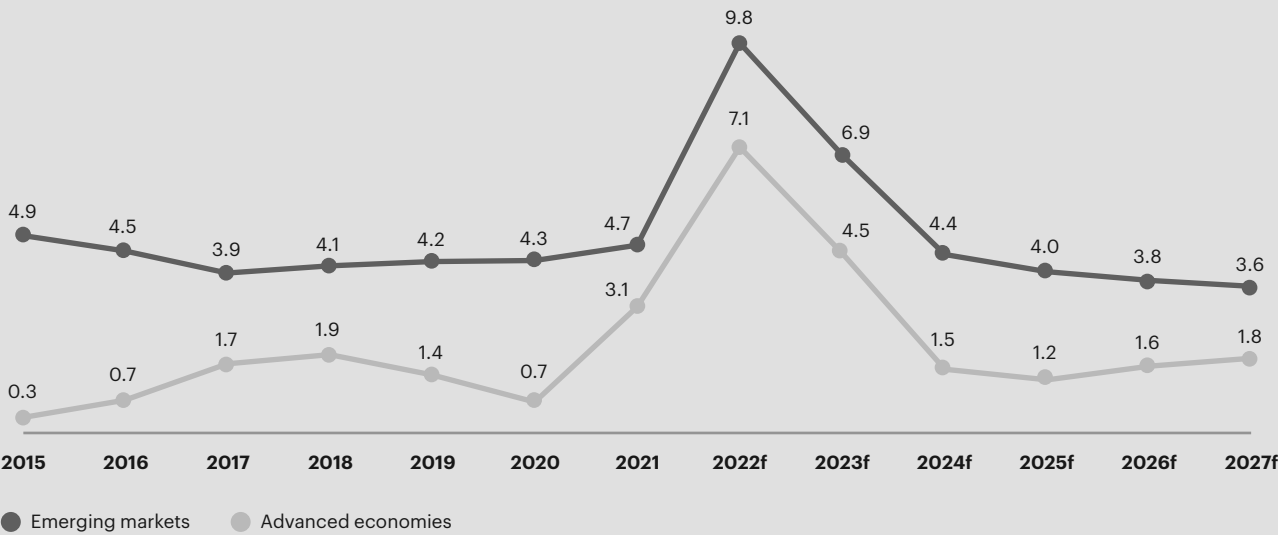
Economic stagnation is a global phenomenon. Inflation is hitting advanced and developing economies alike, with advanced economies forecast to peak at a staggering 7.1 percent in 2022 and emerging markets at 9.8 percent (see figure 3 on page 9). Average inflation over the next five years for advanced economies is expected to be 3.0 percent—a sharp increase from the previous five-year average of 1.6 percent. In emerging markets, the picture is similar, with average inflation forecasts to reach 5.4 percent versus the 2016–2021 average of 4.3 percent. The implications of this persistent higher inflation will mean higher consumer prices in advanced and emerging economies, and—even more detrimental to the latter markets—[increased borrowing costs](#).

Advanced economies are particularly vulnerable to the energy crisis brought on by the conflict in Ukraine. A [halt](#) of Russian gas supplies to the European Union could reduce its gross domestic product by as much as 1.5 percent if the coming winter is cold and the region fails to take preventive measures to save energy. Gas prices in Europe already surged 15 percent in late August amid the announcement that the Nord Stream pipeline will be [temporarily closed](#). To make matters worse, as of July 2022, the euro and the dollar were [trading](#) at a one-to-one ratio. This currency devaluation has [far-reaching implications](#), such as contributing to worsening inflation and increasing costs for European consumers.

In the United States, economists and business leaders alike are increasingly concerned about a recession. The worries among small business owners, consumers, and others are illustrated by so-called misery indexes, which blend unemployment and inflation rates. The figure for the United States is already 12.2 percent, similar to levels witnessed at the start of the pandemic and in the wake of the 2008 financial crisis, according to Bloomberg Economics. In Canada, the country's housing agency believes there is a chance it will [enter a recession](#) by the end of the year as the central bank hikes interest rates to control inflation. And in Japan, the sharply rising cost of imports and logistics is causing costs to go up for consumers, especially for [food](#).

Figure 3
Inflation is hitting emerging markets even harder than their advanced counterparts

Consumer Price Index
(% change year over year)



Sources: Oxford Economics; Kearney analysis

Labor market imbalances in advanced economies are also impacting growth. Most labor markets in advanced economies are **tighter** than they were prior to COVID-19, particularly in English-speaking countries such as Australia, Canada, the United Kingdom, and the United States. Tightness can be seen in a sharp rise in vacancies and vacancies-to-unemployment ratios. Vacancies have risen across all sectors, especially among lower-skilled jobs that are more contact-intensive and do not allow for telework.

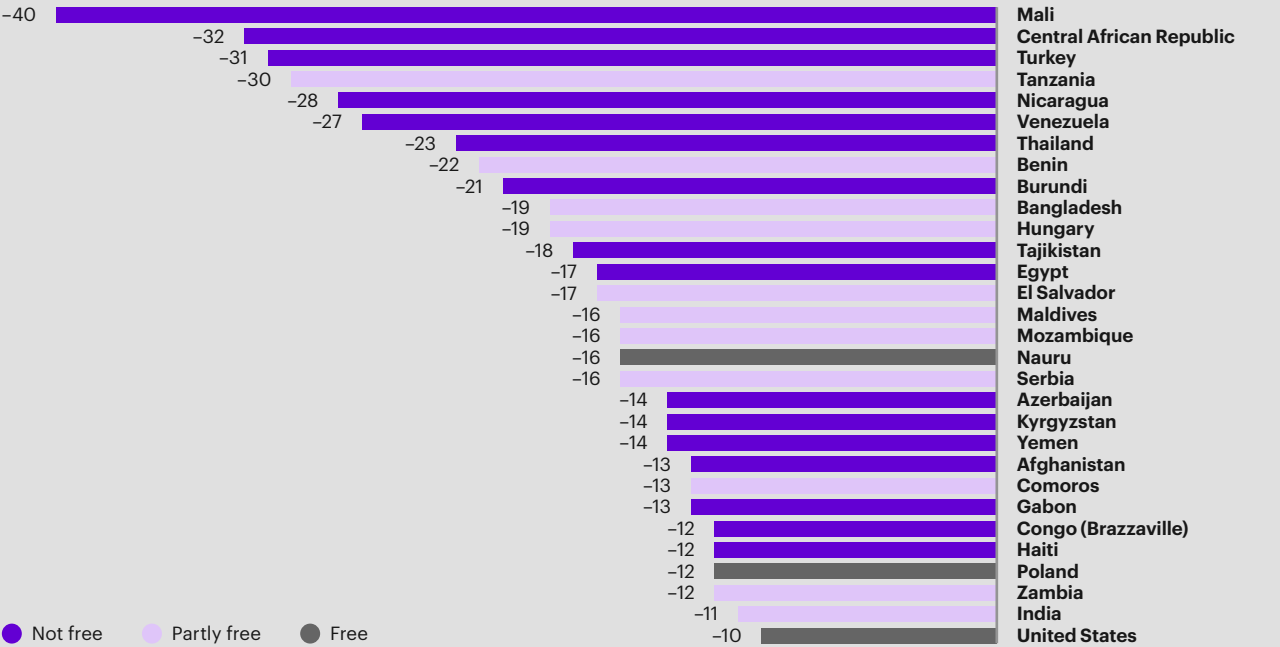
The developing world is arguably being battered even more by the low growth environment. In the second quarter of 2022, China's economy **grew** by just 0.4 percent—its slowest pace since the outbreak of COVID-19 and its second weakest quarter ever recorded. This slow growth can be attributed to continued, damaging COVID lockdowns, as well as a slump in the country's property investment and **supply chain disruptions**. And China is far from the only developing economy suffering from low growth. From the Philippines to Chile, developing countries around the world have been contending with forces depressing growth, from low demand for goods to growing inequality. The notable deceleration in large economies—including the United States and China—is already reducing external demand for goods and services from many emerging markets. And significant increases in between-country inequality are looming given the two-track pandemic recovery, in which developed markets disproportionately benefit from greater access to quality vaccines. There are also signs of rising **within-country inequality** reflecting the severe income losses and employment disruptions experienced by vulnerable groups, namely lower-income households, low-skilled and informal workers, and women.

Stagnation in advanced and developing markets will have far-reaching implications. For example, the significance of “too tight” labor markets in the developed world are worker shortages that stop production and cause wages to spiral, fueling record inflation. In the [United States](#), for example, a July 2022 resurgence of COVID-19 resulted in a spike in worker sick leave, exacerbating the continuing labor shortage. Put simply, employers are stretched thinner than usual and struggling to keep operations going.

Economic asymmetries in emerging markets go beyond employment. Food insecurity will continue to grow over the near term. [Dislocations in global commodity markets](#) due to the pandemic, and amplified by the conflict in Ukraine, have led to food, fertilizer, and fuel shortages and to surging prices of staple consumer goods. And though food prices have recently fallen, low growth and stretched public finances are hampering the ability of governments to cushion vulnerable populations from higher overall prices. Insufficient access to agricultural inputs could lead to a state of widespread, low-productivity subsistence farming in the developing world.

Discontent due to low growth, hunger, and employment issues risks fostering authoritarianism throughout the world, especially in emerging markets where these issues are more pronounced. Indeed, the 2022 [Freedom in the World](#) report suggests that authoritarianism has grown significantly throughout the world over the past 10 years (see figure 4). The 2022 uprisings in [Sri Lanka](#) are a prime recent example of how a convergence of crises such as the pandemic, food shortages, and leadership ill-equipped to manage such challenges led to protests and a government being overthrown. Nicaragua also represents a cautionary tale for authoritarianism in our time. In 2021, Nicaragua’s incumbent president won a new term in a tightly orchestrated election after his security forces arrested opposition candidates and deregistered civil society organizations following widespread civil upheaval. As economic issues continue to strain governments, political unrest will grow, and authoritarian leaders are poised to strengthen their control.

Figure 4
Significant decreases in freedom have touched every region of the world over the past decade



Sources: Freedom House, *Freedom in the World 2022: the Global Expansion of Authoritarian Rule*; Kearney analysis

Mechanisms to improve global growth prospects

There are a few policy levers that governments throughout the world can use to help improve a persistent weak growth environment. Central banks have a large role to play in this endeavor. Carefully managing the [pace of interest rate hikes](#) will be essential. Raising them too quickly has the power to bring an economy to a standstill—but implementing them too slowly means inflation could snowball. Such monetary policy is a balancing act that needs to be handled with care. Indeed, a senior economist at the GBPC's [2022 CEO Retreat](#) noted that central banks have “not prepared the public for what may be required to get inflation under control.”

Promoting free trade and investment is another lever that can be pulled to stimulate growth. The World Trade Organization (WTO) has a big part to play in this, with its remit more important now than ever. And the birth of new trade agreements such as Asia's Regional Comprehensive Economic Partnership (RCEP), which came into effect in January 2022, will ensure that countries do not look too far inward from an economic standpoint. Further, governments themselves can ensure that they [reduce trade barriers](#), such as administration and compliance costs, for both large and small businesses.

All countries will also have to manage the fallout from the conflict in Ukraine to improve growth prospects. The main [risks](#) of the war to advanced economies, especially those in Europe, arise from the supply shock and price increases in oil and gas and from the impact of geopolitical threats on household confidence and investor sentiment. Western nations that depend on Russian commodities will be challenged to find alternative supplies. Many countries, for example, are already looking to nuclear in order to fill their energy deficit (see Trend #4 on page 16).

According to [Brookings](#), governments in developing economies can best mitigate the economic impact of geopolitical instability by building foreign exchange reserves, improving financial risk monitoring, and strengthening macroprudential policies. Emerging markets in Asia already did this in 2021, [accumulating](#) their highest level of foreign exchange reserves since 2014 to protect against volatility. This is especially important in a global operating environment where Turkey, for example, has [sold](#) so many foreign exchange reserves to prop up its currency over the past few years that it risks default. In tandem, policymakers are facing challenges to replenish fiscal policy buffers depleted by COVID-19. Further, a strengthening of social safety nets will serve to support the most vulnerable. Such adjustments will be challenging but necessary to dig out of a low growth environment.

Outlook

If weak growth persists, the world is in for a combination of political, economic, and social challenges that may prove enduring—especially if countries become even more autocratic. Growing nationalism and protectionist policies could exacerbate issues of low growth, compound geopolitical challenges, and exacerbate inequality between and within nations. [Mechanisms](#) such as carefully managing interest rate hikes, promoting free trade, and building foreign exchange reserves could help to overcome some of these issues. Further, implementing policies to ensure women, racial minorities, and other oppressed groups are represented properly in government decision-making could alleviate some inequality challenges. Setting up legal standards to better protect workers could also help combat labor market imbalances. If these issues are not tackled, the world could land in a state of asymmetry that further strains governments, businesses, and populations alike.

Business implications

- **Prioritize consumer and employee needs in periods of economic uncertainty.** To mitigate consumer discomfort that comes with inflation, companies can use strategies such as price bundling to draw customers to lower monthly versus individual price points. Further, given the current labor market imbalances, businesses should ensure that they are implementing strong policies to both attract and retain talent, which starts with a robust HR department.
- **Reassess procurement policies as asymmetries mount.** Procuring from countries that are better positioned to withstand a sustained low growth environment will be crucial over the next five years. These might include markets that have strong foreign currency reserves and that have high labor productivity.
- **Keep an eye on the dollar.** Given the current and upcoming monetary volatility, especially with regard to the US dollar, strategic companies will closely monitor their levels of transaction in dollars, particularly in and among developing countries with high levels of debt. [Some companies](#), such as Burberry, have seen sales bolstered by the strong currency, but American companies with large international operations, such as Microsoft and Nike, have taken a hit when converting foreign sales back into dollars. Trimming back costs to prepare for this volatility might be necessary.

Trend #3

A digital iron curtain

In the Council's [Year-Ahead Predictions 2020](#) report, we predicted that data privacy regulations would proliferate as EU regulations set the global standard. This indeed has occurred, and the trend toward data privacy and localization is only growing. According to the [United Nations Conference on Trade and Development](#), 71 percent of countries already have data privacy legislation in place, and an additional 9 percent have draft legislation on the table. Data privacy laws are often intended to protect the personal information of citizens and customers. However, such legislation—especially in authoritarian countries—is increasingly being used to promote information hegemony and can have implications for global cybersecurity, as has been [evidenced](#) amid the hostilities in Ukraine. Legislation on data flows will continue to proliferate over the next five years, culminating in the onset of data economy spheres of influence. Countries such as China and India will continue to compel companies to data warehouse on their territory, giving rise to potential data manipulation and misuse. Even actors with broad cultural alignment such as the United States and European Union may struggle to come to an agreement how best to handle international data flows and data privacy issues. As a result, both domestic and foreign-operating businesses will be forced to keep up with changing laws. Prepare for a splinternet, with fragmented architectures and higher economic costs for businesses and governments alike.

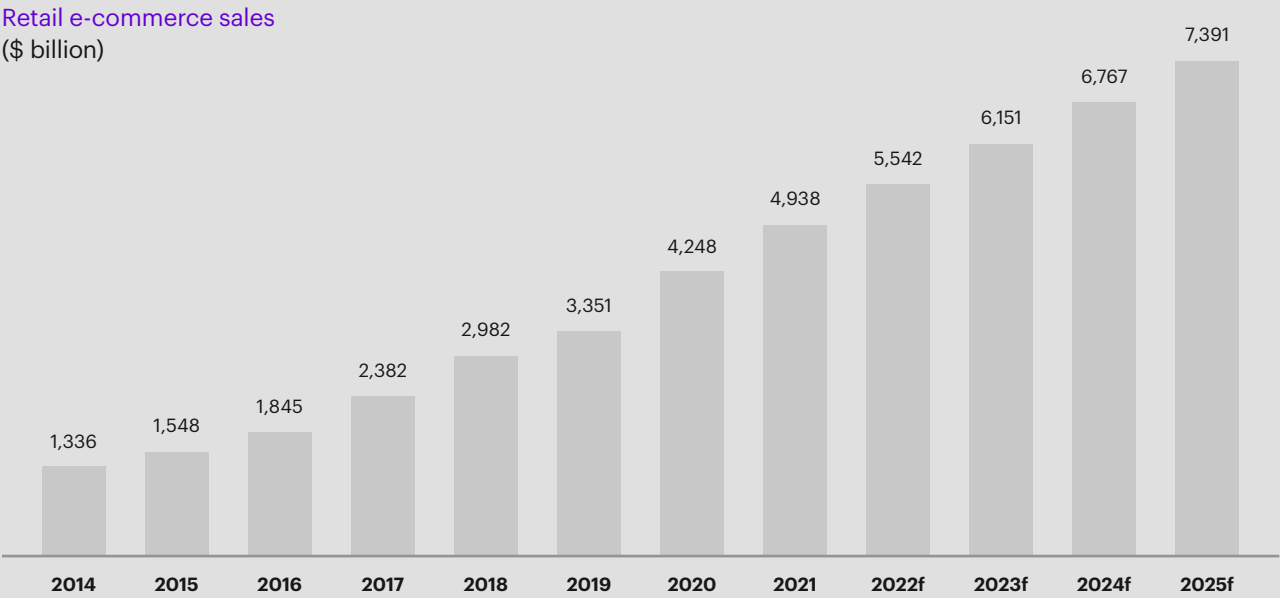
**Prepare for
a splinternet,
with fragmented
architectures and
higher economic costs
for businesses and
governments alike.**

Data as the next front in geopolitics

In a world where e-commerce is growing with unprecedented speed, it is no surprise that countries are jumping to protect consumer data and privacy (see figure 5 on page 13). But [governing data](#) highlights the differences in ideological visions of the Internet and fundamental cultural divides. China's commitment to [Internet sovereignty](#), for example, is aimed at building cybersecurity capabilities and, according to critics, is also an attempt to maintain control over political rhetoric. Western countries, on the other hand, tend to espouse the tenet of an Internet free of government control, with "net neutrality" frequently advocated for in the United States in particular. In the European Union, the advent of the General Data Protection Regulation (GDPR) aims to protect individual consumer data while making sure that it is not improperly surveilled. With data privacy regulations popping up in both autocratic and democratic countries alike, the Internet seems to be transitioning into a splinternet defined by walled-off access and different standards. This dynamic is all but certain to exacerbate the economic and geopolitical fragmentation that has been growing for years (see Trend #2 on page 8).

The [national security implications](#) of data localization are also becoming more visible and contributing to this geopolitical divide. Data localization mandates affect a variety of national security interests, including the ability of security actors to share information, promote cybersecurity, and combat extremism. For instance, data localization can limit international collaboration between military, law enforcement, intelligence, and other security actors by creating obstacles to accessing information across borders. For businesses, mandates about data localization introduce risk and complexity to cybersecurity operations by increasing the number and locations of data centers that must be staffed and maintained.

Figure 5
Retail e-commerce sales have been growing non-stop and show no signs of decelerating—adding to the volume of consumer data being transmitted



Sources: Tidio, *Online Shopping Statistics: Ecommerce Trends for 2022*; Kearney analysis

Beyond security concerns, data localization mandates, especially by autocratic regimes, are complicating the operating environment for businesses throughout the world and are consequently contributing to intensifying [islandization](#). China’s new data privacy law, the [Personal Information Protection Law \(PIPL\)](#), went into effect in November 2021 and is designed to protect the personal data of individuals and increase data security in China. The law requires companies to [implement](#) adequate safeguards and security measures to protect personal information. However, overseas companies that are deemed noncompliant with PIPL may be [placed on a blacklist](#), which could effectively ban them from processing Chinese personal data, opening the door to international tit-for-tat retaliation against foreign businesses. The penalties can be harsh. Companies operating in China that fail to employ a data protection officer or are found in breach of PIPL can be fined up to 50 million yuan (\$7.8 million) or 5 percent of its annual revenue. And in Europe, Russia is [coming after US tech firms](#) for purportedly breaching its data privacy laws. Twitch, Pinterest, Google, and Airbnb were all fined by a Moscow court in June 2022 for allegedly failing to store the data they had on Russian citizens within the

country. As critics pointed out when the data privacy laws were introduced in 2014, storing data locally serves a practical purpose for Russian authorities by opening doors to extrajudicial access to any information stored on those servers.

Data privacy requirements have caused challenges for businesses even in democratic countries. In 2018, multiple payments companies were [impacted](#) by an Indian letter that required them to store payment card data onshore. Though [lifted in June 2022](#), India’s ban on Mastercard’s issuing of new cards over noncompliance with the local data storage rules sent a strong message to foreign companies seeking to operate in the country.

Regardless of whether the motives of implementing data privacy and localization laws are to gain authoritarian control or protect consumer information, the implications are clear. The free flow of cross-border data is increasingly being curbed—for better or for worse—and the economic consequences are already being felt.

Nations and businesses drowning in the alphabet soup of data localization laws

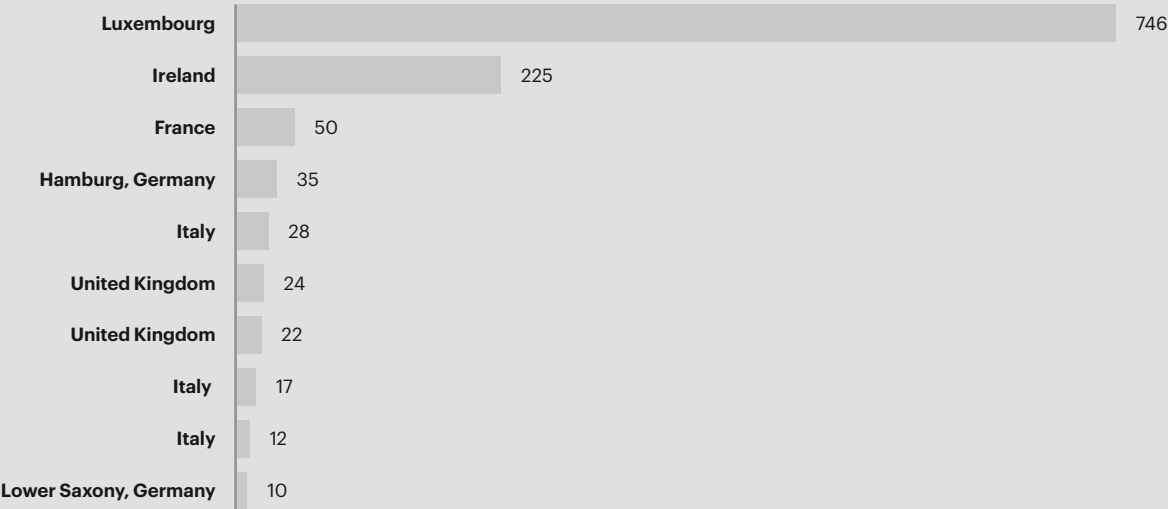
On a macro level, weak implementation of data privacy laws could reduce the protection provided by them and [stifle innovation](#) that supports economic growth and development—especially in developing economies. Paradoxically, in developing countries, policymakers frequently cite economic considerations—technology transfers and job creation—as a reason for introducing data localization requirements. For example, Nigeria’s guidelines for information and communication technology (ICT) companies require them to host all consumer and government data locally within the country to fight a “negative trade balance” of goods and services in the ICT sector. However, data storage requirements tend to offer little in terms of jobs or innovation. In fact, in 2018, the [Council on Foreign Relations](#) pointed out that Kenya’s booming digital economy could be hurt by proposed government legislation (which came into effect in 2019) with data localization provisions. Although the legislation outlines several scenarios where data transfers outside the country will be allowed, small companies generally lack the teams of legal and policy experts necessary to comply. That is likely to favor incumbents and choke Kenyan tech start-ups. The [World Bank](#) also states that the burden associated with mandatory localization requirements is greater for small and developing economies because the cost of the infrastructure investment is higher in relative terms. Additionally, the opportunity cost of restricting trade in services may be higher in countries that do not have a large domestic market of their own.

On the micro level, there is growing evidence that data privacy laws are impacting businesses’ revenue and profit. EU countries and cities have already imposed heavy fines on companies that breach GDPR regulations (see figure 6 on page 15). And data localization that explicitly [aims](#) to limit flows across borders by requiring companies to store and process data within national borders could be seen as a non-tariff barrier, reducing efficiency by increasing costs and decreasing scale—effects that spill over into the entire global supply chain. A [Vox EU study](#) has found that companies exposed to the GDPR have seen an 8 percent reduction in profits and a 2 percent decrease in sales. The [Information Technology and Innovation Foundation](#) (ITIF) posits that the costs of a patchwork of state data privacy laws instead of a unified federal law in the United States could exceed \$1 trillion over 10 years, with at least \$200 billion hitting small businesses. In fact, since 2018, 34 US states have passed or introduced 72 privacy bills regulating the commercial collection and use of personal data. These laws create significant compliance costs for in-state businesses and confusion for consumers while also raising costs for out-of-state businesses that increasingly find themselves subject to multiple, duplicative rules. [State privacy laws](#) could impose out-of-state costs of between \$98 billion and \$112 billion annually.

Without globally harmonized data privacy laws that aim to, first and foremost, protect consumer information, this patchwork of legislation will continue to cause headaches, especially for smaller businesses and emerging markets.

Figure 6
Countries and cities are levying hefty fines—sometimes repeatedly—for GDPR noncompliance

Top 10 largest fines levied by EU countries on GDPR breachers (May 2018–January 2022)
(€ million)



Notes: GDPR is General Data Protection Regulation. Repeated country listings reflect multiple occasions that businesses operating on their soil were fined.
Sources: DLA Piper, *GDPR fines and data breach survey: January 2022*; Kearney analysis

Outlook

Regulatory hurdles and additional costs aside, the world could be headed into an era of data nationalism in which authoritarian countries use data localization laws to justify civilian surveillance and carry out human rights abuses. Harmonization of data privacy laws on a global scale could simplify regulatory complexity while protecting consumer data at the same time. The GDPR can serve as an example for multi-state nations such as the United States of how to harmonize rules across state lines. This suggests a crucial opportunity for countries to work together to drive toward such harmonization measures, thus avoiding data spheres of influence while reducing regulatory costs. Such an effort could also provide ancillary benefits, including new avenues for economic growth and increased cybersecurity (see Trend #5 on page 21). Should such an effort fail to materialize, the emergence of a digital iron curtain, underpinned by growing nationalism and protectionism, is more likely.

Business implications

- **Employ chief data officers.** CDOs are increasingly necessary to monitor the ever-changing field of data privacy and ensure compliance with all existing and emerging data localization laws. From an optics perspective, consumers also may be more attracted to companies that employ CDOs.
- **Practice innovation in data stewardship methods.** Data privacy laws will continue to proliferate over the next five years. Tech leaders who deploy creative solutions—such as provider-less tech in the fraud prevention industry to further protect data—can make regulations a boost for both their tech infrastructure and their customer experience. Further, strategically viewing data law compliance as an opportunity rather than a cost can reduce the fatigue that comes along with it.
- **Transparency is the name of the game.** In a world of growing “techlash,” it is important for companies—no matter how complex the data privacy arena might be—to inform customers about how their data is being used. This will have a positive reputational impact on businesses that seek to grow customer loyalty and trust.

As policymakers move to address energy shortages, is nuclear power poised for a comeback?

Trend #4

A nuclear renaissance?

Disruptions in the global energy market driven by the conflict in Ukraine and broader supply chain issues have led to record-high energy prices and challenged the clean energy goals of many countries. For both developed and developing parts of the world, the urgency to secure all available energy supplies, including [coal](#) and other less-clean fuels, has risen markedly in the past year. While the head of the International Renewable Agency Francesco La Camera recently [estimated](#) that fossil fuel use could rise in the short term, the Ukraine crisis will likely accelerate the energy transition mid- and long-term as renewables become more cost attractive and enhance energy security. To facilitate both these short- and longer-term goals, many governments have renewed their focus on nuclear power amid the energy crisis and hurdles to the energy transition. International Energy Agency (IEA) Executive Director Fatih Birol recently [noted](#) that “in today’s context of the global energy crisis, skyrocketing fossil fuel prices, energy security challenges, and ambitious climate commitments, I believe nuclear power has a unique opportunity to stage a comeback.”

As policymakers move to address energy shortages without losing sight of their emissions reduction goals, could such a nuclear comeback be imminent? In Europe, [Poland](#), [Sweden](#), and the [United Kingdom](#) are pushing ahead with nuclear projects. [Germany](#), long averse to nuclear power, also extended the lifeline of its three remaining nuclear power stations into 2023 amid the continent’s energy crisis. And, marking a historic turn after the Fukushima disaster in 2011, [Japan’s](#) prime minister said he was open to new nuclear projects in response to the current energy crisis. Emerging markets, from [Argentina](#) to [Rwanda](#) and Pakistan, are also investing in nuclear power, often with help from larger countries such as the [United States](#), China, or Russia. Though more projects are being announced, the high cost of building nuclear plants suggests that production challenges and delays are likely in the short and medium term. And the fate of nuclear production will vary greatly by region, with emerging markets accounting for much of its growth. Yet while the extent to which nuclear may change the energy mix—or serve as an effective stopgap to the energy transition to renewables—is in doubt, anticipate geopolitical ramifications stemming from changes to the geographic distribution of nuclear projects.

Expansion is imminent, but obstacles endure

Globally, the nuclear power market is expected to grow at [1.5 percent](#) annually, driven by advances in emerging markets such as Turkey, China, and Russia. In total, installed production will increase 10 percent from current levels by 2027 (see figure 7). However, building a nuclear reactor is a lengthy and costly process. In [Australia](#), for instance, building a new nuclear power plant is more expensive than building one for coal, and a plant under construction in the US state of Georgia is projected to cost more than [\\$30 billion](#). China’s plans to build six nuclear power reactors will total [\\$18.7 billion](#), according to government estimates, while its broader strategy to ramp up production within the next 15 years will total [\\$440 billion](#). Construction delays are also common, and plants routinely take years longer than anticipated to build. [Kenya’s](#) first nuclear power plant, for instance, will take 10 years longer to build than originally expected, while a Finnish facility took more than [15 years](#) to build and cost €8 billion more than expected. Further, global [nuclear prices](#) are more expensive than those of renewables, meaning that expanding nuclear power is unlikely to result in significant drops in energy prices—particularly if the supply of other sources such as oil remains tight.

Nuclear power costs are unlikely to drop significantly in the next five years. The reasons for high costs include strict safety regulations and high prices of [uranium](#) and other inputs. New technology is advancing to address this, including small modular reactors (SMRs), which are safer, cheaper, and easier to operate than large power plants. Nuclear fusion, another innovative method, promises to eliminate radioactive waste and increase energy output. Given the potential of this technology, funding is increasing, with global private-sector investment flows totaling almost [\\$3 billion](#) from June 2021 to July 2022. However, the method is still early in its development and some experts predict it will [take decades](#) to operate at a commercial scale.

Figure 7
Nuclear energy projects are under way in several countries, some of which are exploring nuclear for the first time

Country	Nuclear power projects and policies
Egypt	El Dabaa nuclear power plant (€25 billion estimated cost; capacity of four 1,200 megawatt reactors) Construction is under way, with significant help from Russia’s Rosatom, which will also provide fuels.
Turkey	Akkuyu nuclear power plant Construction is under way for a plant comprised of four reactors, also with assistance from Russia. The plant is expected to be operational around 2023.
South Korea	Shin Hanul 3 and 4 Under a new industrial policy, South Korea has abandoned plans to phase out nuclear energy and is now increasing investments to ₩130 billion. Two reactors are being built and are expected to operate in 2023.
United Kingdom	Sizewell C The UK government approved plans for a 3.2 gigawatt, £20 billion nuclear power plant. The UK also plans to build 24 gigawatts of nuclear generation capacity by 2050.
Pakistan	Karachi Nuclear Power Plant With help from China, Pakistan recently completed two nuclear reactor units, each with a capacity of 1,100 megawatts.
China	China plans to build 150 reactors in 15 years, averaging up to 8 annually, with expected costs of \$440 billion. Roughly 2.28 gigawatts of nuclear capacity were added in the first half of 2022.
United States	Plant Vogtle Though the United States has seen significant plant shutdowns in recent years, two reactors are under construction in Georgia, each with a capacity of 1,117 megawatts. Service is expected to begin in 2023.

Note: List not exhaustive
Sources: Bloomberg, *Financial Times*, Reuters, Voice of America, World Nuclear Association; Kearney analysis

Costs, delays, and other challenges associated with starting nuclear production will continue to hinder the resource serving as a stopgap for renewable energy in the next five years, though a growing number of [countries](#) have announced recent plans to invest in or delay the phaseout of nuclear amid rising energy prices and supply concerns driven by the conflict in Ukraine. Nonetheless, production in advanced economies is projected to fall in the short term, and rising production in emerging markets will not be enough to overcome this gap. While the policy landscape in many countries vis-à-vis nuclear is beginning to change, significant hurdles will remain, likely keeping it from becoming a viable supplement to renewables in the medium term. Nevertheless, the geopolitics surrounding nuclear energy are likely to intensify.

Geopolitical implications

The geopolitics surrounding nuclear power will intensify in the next five years as existing players struggle to adapt to new conditions and emerging markets implement nuclear energy plans for the first time. In general, nuclear production in advanced economies is trending down. For instance, though the United States remains the world's largest producer of nuclear power, output fell [1.5 percent](#) from 2020 to 2021, leaving production [4 percent](#) lower than pre-pandemic levels. And by 2026, US nuclear capacity will be [7 percent](#) lower than 2021 production. Similarly, [European production](#) is projected to fall by more than 10 percent this year and an additional 3 percent in 2023 as a number of reactors experience technical issues across the continent. This decline is likely to hold despite recent renewed interest in nuclear, particularly in Germany, as infrastructure and [workforce improvements](#) needed to boost production will take years to materialize.

There are many reasons for the limited investment in developed markets, including not only high costs but also public backlash to nuclear power. Only 35 percent of US adults say the government should encourage nuclear, according to [Pew data](#), and [European](#) support for nuclear power is also tepid. Labor shortages are also a key challenge for advanced economies. In the United States, the number of nuclear engineers is projected to drop by an additional [8 percent](#) from 2020 to 2030, while a [shortage](#) of nuclear technicians is already halting French production. Though new [private](#) and [public](#) programs exist to develop the next generation of nuclear engineering talent, reversing this trend will be no easy feat, and significant changes are unlikely within a five-year timeframe.

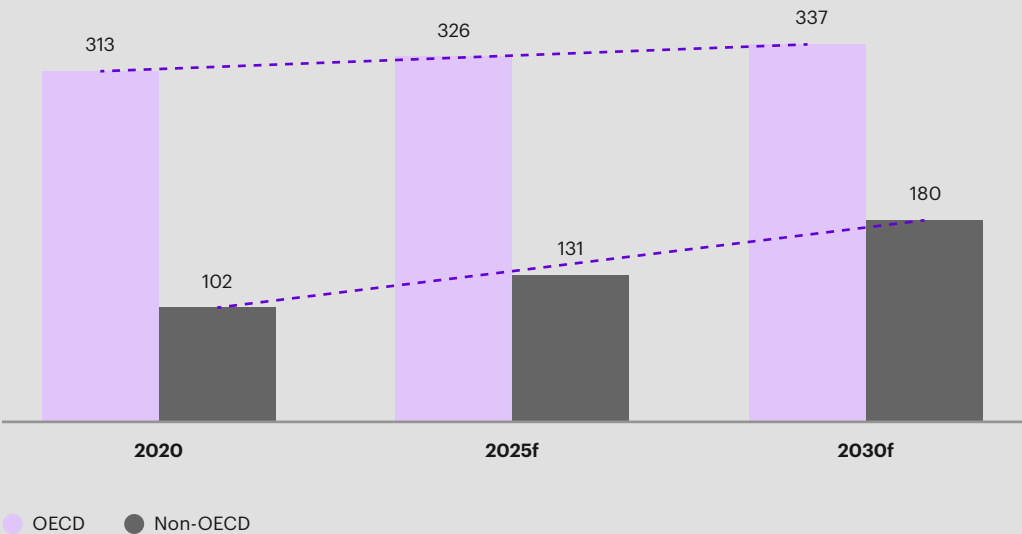
The geopolitics surrounding nuclear energy are likely to intensify.

The nuclear outlook is in many ways trending in the opposite direction in emerging markets, particularly as the world takes more ambitious steps to reach net-zero emissions by 2050. According to [IEA](#) data, nuclear production in Organization for Economic Co-operation and Development (OECD) countries was more than double non-OECD countries in 2020—yet, by 2030, this could shrink as OECD production stalls while that of other economies grows. In fact, non-OECD 2030 production may be 75 percent greater than 2020 levels, while OECD production will only be 8 percent higher (see figure 8). India’s nuclear production, for instance, reached record levels in 2022 after growing more than [10 percent](#) in two years. And annual nuclear production in China is expected to grow at [7 percent](#) annually in the next five years. In fact, China accounts for roughly [one-quarter](#) of newly commissioned nuclear reactors and may become the world’s largest producer of nuclear power by 2030. Of course, Iran’s nuclear program is also well-known, with civilian projects receiving sanctions [waivers](#) as attempts to restart the 2015 nuclear [deal talks](#) coalesce. In the next five years, this issue will likely remain a source of diplomatic engagement and global tension.

Russia is also a significant producer, as almost [20 percent](#) of the world’s nuclear reactors use Russian technology. Both Beijing and Moscow are actively assisting other countries to build nuclear reactors, including Turkey, Pakistan, African countries such as Rwanda and Egypt, and even EU member states such as [Hungary](#). As Russia and China invest in nuclear power plants in emerging markets, Western nations will likely worry that such operations will expand their reach and spheres of influence while potentially contributing to hostilities between countries such as India and Pakistan and among African states. Tensions between the United States and Russia and between the United States and China may mount as nuclear plans expand, risking a new era of nuclear investment and potential rearmament as each side suspects the other of building new military capabilities. As nuclear power expands globally, the potential for tensions to reach new heights will likely grow in tandem.

Figure 8
If emissions reduction plans continue, emerging markets will drive nuclear energy’s growth

[Installed nuclear capacity, IEA Net Zero Scenario](#)
OECD and non-OECD economies



Notes: IEA is International Energy Agency; OECD is the Organisation for Economic Co-operation and Development.
Sources: International Energy Agency; Kearney analysis

Outlook

The outlook for nuclear power is mixed in the next five years. Though emerging markets will drive nuclear expansion worldwide, this growth is unlikely to serve as a sufficient stopgap in the energy transition because of high input costs and challenges in scaling up production. Global nuclear output will largely remain static as advanced economies scramble to keep production up while emerging markets invest in expansion. Since many announced projects will not be fully operational by 2027, new gains will likely be limited, especially as plants can take decades to complete and unforeseen challenges often arise. And in a low-growth environment, investment in nuclear technologies like fusion energy could falter (see Trend #4). Nonetheless, the renewed appeal of nuclear power as countries aim to enhance energy security and meet emissions targets presents an opportunity for governments and businesses to make the investments needed to realize the resource's potential. Policies conducive to reliable and investment-friendly regulatory environments, particularly those that extend plant lifetimes and make financing options more attractive for the private sector, will be crucial for the sector's revitalization. Yet, as more countries seek to increase their nuclear capabilities, the geopolitical implications of the sector will grow. The potential for a renewed nuclear arms race may increase as more countries invest in production. In the next five years, nuclear will likely become an even more important political consideration—but not necessarily a resurgent energy source.

Business implications

- **Demand, not nuclear production, will impact energy prices.** As low growth defines the medium-term operating environment, energy demand will likely drop. Prices may soften as a result. However, energy supplies can only rise so much amid strained renewables supply chains, limited spare oil capacity, and slowing nuclear production in advanced economies. For companies, this means that, globally, energy prices can only fall so low.
- **Regardless, expanded nuclear production in certain emerging markets could stimulate local economies.** Even though nuclear production globally will remain mostly flat in the next five years, in certain countries—such as Turkey, Pakistan, and China, where new reactors are already coming online—nuclear output will rise. This could stimulate local economies, and businesses in the region could benefit if energy prices fall—even if the global impact of these projects will be minimal.
- **Competition between rivaling countries in emerging markets' nuclear sectors will increase.** Amid heightened geopolitical tensions, countries such as the United States, China, and Russia will vie for leading positions in the nuclear sectors of emerging markets. Since 2020, the United States has moved aggressively to enhance its nuclear [leadership](#), removing prohibitions on public financing for nuclear projects and abroad and supporting US companies in countries such as South Africa. For businesses, new nuclear-related export or investment opportunities could emerge amid this heightened competition.

The potential for a renewed nuclear arms race may increase as more countries invest in production.

Trend #5

Post-truth goes beyond politics

Rapid advancements in AI-backed technologies in recent years threaten to worsen the already alarming state of misinformation and disinformation around the world. While false information has long been a challenge for societies, the breakneck speed of technological improvements, notably in [deepfakes](#)—synthetic video, audio, or photographic content produced with AI—could bring the scale of the challenge to new heights. The potential political and social ramifications are significant, from actors leveraging new technologies to manipulate information flows during elections—possibly skewing results—to the spread of misinformation to support political violence (see figure 9). The public’s ability to discern true from false information has consequently suffered. The [Pew Research Center](#), for example, found that of 5,000 US adults asked to identify five factual statements and five opinion statements, roughly a quarter got most or all wrong. But the threat of deepfakes extends beyond just the public sector. In addition to destabilizing the political and social environments in which businesses operate, the spread of false or misleading information through improved AI technologies can directly impact companies’ reputations, operations, and financial well-being.

Businesses must prepare for a period in which they are direct targets of deepfakes and similar AI-enabled disinformation attacks by malicious actors.

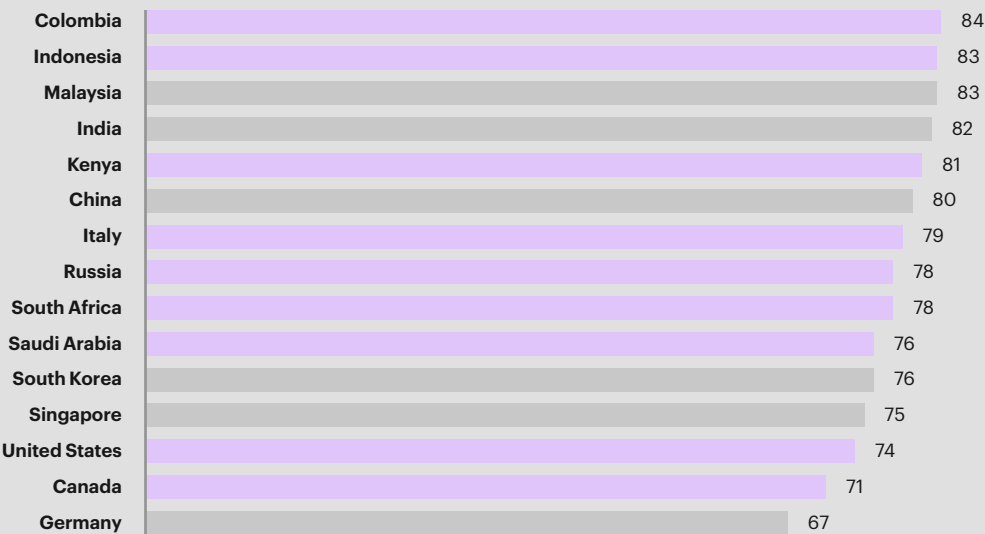
Recent post-truth technology gains are impacting business and government alike

Advances in technology have enabled the rise of deepfakes. Improvements in machine learning methods have reduced the cost, time, and skill needed to create synthetic material. Wider availability and access to datasets needed to produce deepfakes have also improved accuracy and ease of production. These gains have also allowed for the incorporation of more accurate audio content in synthetic media. While the most accurate and sophisticated deepfakes still largely require the expertise of programmers well-versed in AI—a striking example of which are the Tom Cruise [deepfakes](#) developed by AI start-up Metaphysic—recent years have seen a rise in easy-to-use apps and software that yield remarkably realistic deepfake content. For a small fee, [Deepfakesweb.com](#) can create realistic deepfake videos in a matter of hours—the user must simply upload source and target videos. Further, online text-to-image generator [DALL-E mini](#), based on OpenAI’s powerful DALL-E machine learning models, produces synthetic images based on a user’s text inputs for free within two minutes.

Figure 9

Fake news concerns hit all-time highs in 2022

Percent of people who worry false information or fake news could be used as a weapon



All-time high

Sources: 2022 Edelman Trust Barometer; Kearney analysis

Further, the recent use of generative adversarial networks (GANs), which create synthetic material by pitting a “discriminator” against a “generator” to minimize discrepancies between original and synthetic content, stands to bring deepfakes to new levels of accuracy (see figure 10). GANs remain [highly complex](#) with large amounts of computational power required. The technology, which Meta’s chief AI scientist Yann LeCun has [referred](#) to as “the most interesting idea in the last 10 years in machine learning,” shows strong promise. While the most sophisticated and accurate deepfakes still require hours, if not days, of expert-level programming to generate, [consensus](#) is emerging that any ordinary Internet user could be able to make near-perfect deepfakes within several years.

AI-generated text, another notable emerging area of deepfakes, is capable of creating artificial yet convincing approximations of human speech by using natural language computer models. A 2020 AI-generated [op-ed](#) in *The Guardian* captures how far this technology has come. While generated text could bring numerous benefits to the way information is produced and shared, malicious actors could better spread mass-produced misinformation as the technology improves. As one expert at Kearney’s [2022 CEO Retreat](#) warned, “by 2024, most fake news will be spread with artificial intelligence and bots, creating an exponential force multiplier.”

Figure 10
Advances in technology risk a post-truth ecosystem dominated by synthetic media

Key terms

Deepfake Synthetic video, audio, or photography created using machine-learning technology	Generative adversarial networks (GANs) Competing neural networks that work against each other to reduce discrepancies between original and synthetic content in deepfakes	Misinformation False or misleading information	AI-generated text Artificial text created through algorithmic language prediction models and text inputs
Artificial intelligence The simulation or approximation of human intelligence in machines	Machine learning A branch of artificial intelligence that focuses on the use of data and algorithms to mimic the way humans learn	Disinformation Misinformation that is deliberately deceptive	Neural networks A subset of machine learning that uses interconnected nodes to process and draw patterns between data inputs

Source: Kearney analysis

Advances in deepfake technology have already resulted in painful setbacks for the private sector. In the first high-profile instance of deepfake theft, illicit actors in 2019 used [deepfake audio](#) of a German energy firm's CEO to demand its UK subsidiary to complete a fraudulent transfer of \$243,000 to a supplier. The UK subsidiary reportedly believed the voice to be real given the likeness to the CEO's tone and slight German accent. In 2021, fraudsters managed to swindle [\\$35 million](#) from a bank manager in Hong Kong after using deepfake audio to approve an acquisition. Also, the [Better Business Bureau](#) in June warned about a deepfake video depicting Tesla CEO Elon Musk promoting a cryptocurrency sham. While Musk was quickly able to refute the video, such incidents could create reputational and financial risks for companies as deepfake technologies improve and become more widely used.

Recognizing the threats to business and broader societal well-being, companies have launched deepfake detection and other content verification initiatives. Begun by Adobe in 2019, the [Content Authentication Initiative](#) includes more than 700 companies, researchers, technologists, and NGOs across technology and media who seek to address misinformation and content authenticity at scale. The initiative is working to create a secure end-to-end system to verify content provenance through open-source development and cross-industry collaboration. Meta's \$10 million [Deepfake Detection Challenge](#) drew more than 2,000 participants, with its top-performing model achieving 65 percent accuracy in deepfake detection. The results provided helpful insights for future deepfake detection models, though much work remains to improve the detection accuracy.

Governments around the world, alert to the growing threat of deepfakes, are devising ways to mitigate these challenges. The US Department of Defense's Defense Advanced Research Projects Agency (DARPA) is engaged in research to improve deep fake detection, notably through its multimillion-dollar [SemaFor](#) initiative to develop technologies that can detect semantic discrepancies in deepfakes, such as mismatched earrings and eye-blinking irregularities. State legislatures in California and Texas have passed laws restricting the use of synthetic media during election campaigns. In 2019, Congress introduced the [DEEP FAKES Accountability Act](#) to require mandatory watermarks and clear labeling on all deepfakes, though the legislation failed to advance. In the EU, recently updated [regulations](#), which are set to be bolstered by the Digital Services Act, now require notable companies, including Meta, Google, and Twitter, to strengthen controls around malicious deepfakes. China is also moving to regulate deepfakes, issuing [draft rules](#) in January that would require any platform or company that uses synthetic media to "respect social morality and ethics and adhere to the correct political direction." The draft also would require creators of synthetic content to obtain individual consent on the subject whose information is being edited and stipulates civil and criminal prosecutions for repeat offenders. Regulating the use and spread of deepfakes, however, will remain a challenge. It is difficult and often impossible to prosecute illicit actors in other countries, and legalities around freedom of expression add further complications.

**Governments
around the world
are devising ways
to mitigate the
threat of
deepfakes.**

Trajectory of deepfakes: turbulence ahead

Technology is likely to improve to the point where ordinary Internet users can create highly realistic deepfake media within years. Businesses and governments alike will be challenged in this new environment. Threats such as deepfake-enhanced phishing attacks, including the aforementioned example of the UK energy company subsidiary, stand to increase and become more sophisticated. In June of this year, the US Federal Bureau of Investigation [warned](#) of an increase in complaints reporting the use of deepfakes to apply for remote work positions. As deepfakes improve in both accuracy and ease of production, companies must brace for a future of heightened risk around synthetic media.

Governments too are likely to face more disruptions brought on by more accurate deepfakes. Recent incidents such as the [meetings](#) between the mayors of Berlin, Madrid, and Vienna with a deepfake of the mayor of Kyiv highlight the potentially devastating security threats deepfakes can pose. And while the low-quality [deepfake](#) from March of Ukrainian president Volodymyr Zelenskyy calling on his country's forces to surrender was quickly debunked, less prepared governments may be caught off guard by higher-quality synthetic media.

Further, deepfakes have given rise to the “liar’s dividend,” or the ability of powerful actors to label true and incriminating information as false. Strikingly, a US congressional candidate was able to gain traction for a [conspiracy theory](#) that claimed George Floyd had died years before his actual death. Moreover, the proliferation of deepfakes has given rise to information uncertainty as the line between real and fake blurs. Journalists and human rights advocates in [Myanmar](#), for example, have struggled to prove real and false information amid frequent denial from authorities. And in Gabon, members of the military initiated a failed [coup d'état](#) after suspecting a genuine video appearance of the president, whose health and state of life were in question, had been falsified. Further, the ability to both detect and regulate deepfakes remains in question. Technologies aimed at spotting deepfakes are improving but appear to be in a cat and mouse game as deepfake technology continuously adapts to evade detection. Researchers at UC San Diego [showed](#) in 2021 for the first time that deepfake detectors can be deceived as adversarial models were able to attack machine-learning processes. Rapid gains in technology will also likely outpace the ability of regulators to keep up with a quickly changing deepfake landscape.

Outlook

While the prospect of a world flooded with highly convincing and easy to produce deepfakes presents frightening risks, the worst impacts of such a future can be mitigated if governments, businesses, and society take sensible measures today. Deepfakes, fortunately, did not play a significant role in the 2020 US presidential [election](#), in part thanks to greater public awareness and the boosted vigilance of social media platforms. Further, content provenance methods, such as those developed by the [Content Authentication Initiative](#), serve as a strong supplement to detection tools and could prove effective with wider adoption by the media and public. While more sophisticated deepfakes, including next-generation synthetic audio and AI-generated text, could pose more insidious threats, greater public awareness and media literacy could help combat these challenges. Further, there have been beneficial applications, such as King's College London and graphics processing company NVIDIA's collaboration to engineer 100,000 [synthetic brain images](#) that help determine how diseases evolve over time. On the other hand, failure to brace for the worst impacts of proliferated deepfakes stands to worsen the global information environment, eroding public trust, escalating social and political polarization, and imposing additional costs on businesses.

Implications for business

- **Brace for state-supported disinformation campaigns.** State-backed actors, especially those supported by authoritarian governments, are likely to amplify AI-backed disinformation campaigns. Companies operating in such countries or competing against the interests of such states must be prepared to respond to these attacks, strengthening crisis management and collaboration with home governments to combat disinformation.
- **Run crisis scenarios to enhance capacity to counter deepfake attacks.** Strategic companies will devote resources and people to the issue, designating specific crisis management teams (including red and blue team simulations) and bolstering response capabilities on social media and in external communications. Small to mid-size enterprises (SMEs), often lacking the resources of larger corporations, may be particularly vulnerable to these attacks: an Australian government [survey](#) found SMEs in the country to be significantly underinvested in cybersecurity staff. Partnerships among companies, academia, and government agencies may also boost preparedness for deepfake attacks.
- **Enhance training on deepfake detection for employees.** Training employees on best practices to detect and respond to deepfake attacks will provide a crucial layer of defense. Prepared employees can defend against increasingly sophisticated deepfake attacks, including targeted phishing scams, protecting companies against financial and reputational losses. As deepfake attacks stand to increase in frequency and sophistication in the coming years, businesses must prepare their employees for this rising threat.

Small to mid-size enterprises may be particularly vulnerable to deepfake attacks.

Assessing the status of Global Trends 2021–2026

The five trends identified in last year's Global Trends publication, [Promise and peril](#), remain highly relevant and continue to shape the global operating environment. Each of these trends has advanced in the past year, although some more rapidly than others. We present an update on the evolution of each trend below.

- **The race for quantum primacy.** Quantum computing has continued to advance over the past year. China, in particular, has achieved a [breakthrough](#) with its April announcement that a quantum processor on its soil is one million times faster than what Google's achieved in 2019. In May, IBM [announced](#) its plans to expand its road map for achieving large-scale, practical quantum computing with new modular architectures and networking, giving its quantum systems up to hundreds of thousands of qubits. And in August, Quantinuum, the quantum computing company spun out from Honeywell, [revealed](#) that its breakthrough in the technology should help accelerate the commercial adoption of quantum computers. Though quantum becoming mainstream is still a few years away, we anticipate steady advances to continue.
- **Sharp rise in water dislocations.** The United Nations [estimates](#) that more than 2.3 billion people are facing water stress—and these numbers are growing. Unless action is taken, 700 million people are at risk of being displaced by drought. The American West is experiencing acute water crises, with two of the largest reservoirs in the United States at dangerously low levels because of climate change and overconsumption of water, which could affect the water and electricity supply for millions in six western states and Mexico. And unprecedented heat across Europe this summer caused a drought that is on pace to be the [worst in more than 500 years](#). Agritech innovations will become more necessary for the world to contend with this sharp rise in water dislocations.
- **Escalation of ungovernability.** Rising inequality, the conflict in Ukraine, and sky-high inflation are just a few of the factors that are contributing to growing ungovernability in 2022. Global government debt is forecast to [soar](#) to a record \$71 trillion this year, up 9.5 percent from the year prior. With dwindling resources amid a volatile international economic environment, world leaders are facing growing popular discontent and civil unrest. The protests in Sri Lanka that began in March of this year are just one example of economically fueled grievances boiling over and culminating with the overthrow of a government. Given the fragile state of geopolitics and the monetary pressures that are continuing to mount on a global scale, it is unlikely that ungovernability will be scaled back in the near term.
- **Central bank digital currencies (CBDCs) go mainstream.** As of 2022, 105 countries representing more than 95 percent of global GDP are [exploring](#) a CBDC. This is a vast acceleration from 2020, when only 35 countries were considering adopting the technology. China's central bank is [expanding](#) its digital yuan pilot scheme to more cities, residents of the Bahamas can now use facial recognition technology to authorize mobile payments with the CBDC Sand Dollar, and a Belgian bank messaging system is partnering with a French IT business to look into cross-border payments. The United States is a notable laggard in the CBDC arena, though President Biden signed an [executive order](#) in March calling for the responsible development of digital assets, which include CBDCs. As this nascent field continues to grow, countries that are not at least exploring the possibility of implementing a CBDC will likely be forced to play a game of catch-up.
- **The new age of genetic manipulation.** COVID-19 has sparked an increased interest in the field of health, and this is only growing in 2022. Genetic manipulation in particular is ramping up, with a man in the United States [receiving the heart](#) of a genetically altered pig at the start of the year. Scientists in Australia and beyond are [hoping](#) to bring the Tasmanian tiger back from its century-long extinction with pioneering gene editing technology. And researchers have [boosted](#) the yield of a Chinese rice variety by 40 percent by giving it a second copy of one of its own genes. With applications across a myriad of industries, genetic manipulation remains poised to further permeate the world of technology and innovation.

About Global Trends

Our Global Trends 2022–2027 report identifies five macro trends that play an outsized role in the current and future operating environment for businesses, governments, and citizens around the world.

As part of its core mandate to help leaders anticipate and plan for the future, the Kearney Global Business Policy Council continually scans the horizon for developments across the global external strategic operating environment in the key dimensions of demography, economy, environment, geopolitics, governance, resources, and technology. In assessing these dimensions, the Council identifies emerging trends on an annual basis that may be slightly below the radar but are likely to have significant implications for how businesses and governments operate in the next five years. Our Global Trends 2022–2027 report explores the manifestation of each of this year’s trends today, analyzes its medium-term outlook, and presents its high-level implications for business and government. This publication also revisits the trends that the Council identified in last year’s report to assess their trajectories over the past year and update their prospects.

The goal of the Council’s annual global trends publication is to help business and government leaders and strategic planners question their assumptions and build their capacity for adapting to the future—whatever it may bring. As such, the Council’s global trends analysis can help organizations develop monitoring systems for the evolution of trends—and the strategic shocks they may generate—that are most germane to their sector or industry, mitigating downside risks, recognizing opportunities, and strengthening their long-term strategies.

The Global Trends report can help organizations mitigate their risks, recognize opportunities, and strengthen their long-term strategies.

Authors



Erik Peterson
Partner and managing director of the Global Business
Policy Council, Washington, D.C.
erik.peterson@kearney.com



Terry Toland
Consultant, Washington, D.C.
terry.toland@kearney.com

The authors would like to thank Gabriella Huddart and Kevin Wolfe for their valuable contributions to this report.

About the Global Business Policy Council

The Global Business Policy Council is a specialized foresight and strategic analysis unit within Kearney. Since its first CEO Retreat in 1992, the Council has been a strategic service for the world's top executives, government officials, and business-minded thought leaders. Through public-facing thought leadership, exclusive global forums, and advisory services, the Council helps to decipher sweeping geopolitical, economic, social, and technological changes and their effects on the global business environment. The Council is dedicated to providing immediate impact and growing advantage by helping CEOs and government leaders anticipate and plan for the future.

[kearney.com/business-policy](https://www.kearney.com/business-policy)

About Kearney

Kearney is a leading global management consulting firm. For nearly 100 years, we have been the trusted advisor to C-suites, government bodies, and nonprofit organizations. Our people make us who we are. Driven to be the difference between a big idea and making it happen, we help our clients break through.

[kearney.com](https://www.kearney.com)

For more information, permission to reprint or translate this work, and all other correspondence, please email insight@kearney.com. A.T. Kearney Korea LLC is a separate and independent legal entity operating under the Kearney name in Korea. A.T. Kearney operates in India as A.T. Kearney Limited (Branch Office), a branch office of A.T. Kearney Limited, a company organized under the laws of England and Wales. © 2022, A.T. Kearney, Inc. All rights reserved.

