



Emerging trends in infrastructure

2024 edition

KPMG International

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Foreword

Enabling transitions

All at one time, we want to change our energy mix, our climate, our economies, our global trade patterns, our cities, our technology and our social equity. And we plan to do it all against a backdrop of a non-stationary environment, divisive geopolitical rhetoric and deep economic uncertainty. It is a mammoth task.

Humanity's success or failure will largely rest on the shoulders of our infrastructure. Infrastructure will be central to the energy transition and achieving our climate adaptation goals. It catalyzes economic growth and facilitates trade. It underpins urban renewal, lays the foundations for digital transformation and — when done well — can help embed social equity.



To achieve this we need to change (and improve) the way we plan, fund, develop and operate our infrastructure. It will require collaboration, new funding mechanisms, innovative regulatory regimes, new construction techniques, broader skill sets and — more than anything — a high degree of flexibility and creativity. Business as usual is not an option. Countries, territories, cities and corporates have to reinvent themselves as well as up-skill and innovate to meet the emerging changes and potential opportunities. Enabling the world’s transitions, therefore, must start with a transition in the infrastructure sector.

In this edition of *Emerging Trends in Infrastructure*, KPMG infrastructure professionals share their view of the ten trends that — in our opinion — have the potential to shape the world of infrastructure in 2024. Where there was a choice to be optimistic or pessimistic, we chose the former; we believe humanity can pull together to solve the urgent challenges the world faces.

As always, we hope that this edition of *Emerging Trends in Infrastructure* inspires readers to think differently about the challenges facing humanity and the opportunities and solutions that could be created by the infrastructure sector to achieve our collective goals.

At KPMG member firms, our multidisciplinary teams of infrastructure professionals are dedicated to helping public and private sector organizations deliver the outcomes they are seeking, as efficiently and effectively as possible. KPMG professionals thrive on helping solve the world’s biggest challenges. And we are eager to share our insights and knowledge as we move towards a transformed infrastructure sector.

To learn more about the trends and topics raised in this report, we encourage you to contact your local KPMG member firm.





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Trend 1:

A broader focus for the Just Transition





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A broader focus for the Just Transition

Change creates opportunity. And, as the world transitions towards a clean energy future, society faces a historic opportunity to ensure that the transition is just, fair and equitable. It is an opportunity we cannot afford to squander. The world would be considerably worse-off if we do.

To date, much of the conversation around the ‘just transition’ has been focused on jobs. Yet solving the jobs part of the equation may be the easy task. Other industries have gone through similar disruption in the past; governments have a good idea of what it takes to re-skill people and diversify economies. Besides, it now seems clear that the transition away from fossil fuel usage will take some time.¹

The bigger challenge is likely to be in ensuring that investment, development and sustainability outcomes are spread equitably between developed and emerging markets. The reality is that massive investment will need to be placed into scaling up renewables (as KPMG international’s recent report, *Turning the tide in scaling renewables* finds, the gap between the investment needed and capital deployed is wide),² improving climate adaptation in high-risk geographies, creating supportive regulatory regimes, developing new economy skills and capabilities, and capacity building, for example. And the developed world is currently capturing the lion’s share of those inflows.

The emerging markets are also seeing massive increases in clean energy investment and capacity. It is likely that future investments into traditional energy sources will likely be channeled to the emerging markets where regulations are less clear and where some countries still have not defined their decarbonization pathways or set net zero targets.

Not only could this create an imbalance in how the benefits of the energy transition are spread around the world, it also creates significant risk for Development Finance Institutions (DFIs) and private investors seeking to fund projects in hard to abate sectors in these countries (steel and cement in particular). As a result, attempts to develop cleaner, more sustainable infrastructure in these markets are being marginalized.

In order to meet the UN SDGs, the world should be ensuring economic development and transition to low carbon happens together rather than at the cost of each other. This would require greater focus on capability development, investment in R&D, promoting alternate industries and creating new pillars of economic growth — decarbonization, energy efficiency, smart infrastructure. The launch of the Just Energy Transition Partnership (JETP) in Indonesia, is a landmark, long term partnership designed to create an ambitious and just power sector transition in Indonesia. The JETP will focus not only on delivering strong emissions reductions, but also on driving sustainable development and economic growth, while protecting the livelihoods of communities and workers in affected sectors.³

This year will be critical to bridge the divide between the developed markets and emerging nations and build trust by ensuring pilot projects are successfully implemented and are the showcase for future projects. The ‘loss & damage fund’ formalized at COP28 is a good start,⁴ but what the world should be ensuring is multi-party commitment to a ‘recover & restore’ approach that drives constructive interventions with a view to accelerate sustainable social change.

The infrastructure sector is likely to play a key role. Infrastructure investors will have an opportunity to shape the capital flows. Owners and operators can influence the value expectations. Developers can help ensure supply chains and approaches are diversified and sustainable. Regulators will make sure consumer rights and expectations are being met.

Over the coming year, some governments and international organizations are expected to start broadening their definition of ‘just transition’ and, with it, encourage greater collaboration between nations, sectors and citizens. Multilateral organizations and collaborative alliances — like KPMG’s membership with the WWF and UNDP as part of the Alliance for a Just Energy Transition⁵ — will be critical to driving this change and achieving a balanced outcome. And infrastructure investors, developers and operators are expected to start to pay much more attention to the emerging markets which, in turn, should help put just transition into practice.

¹ KPMG in Singapore, [Navigating the post-COP28 landscape for global decarbonisation](#), 2023

² KPMG international, [Turning the tide in scaling renewables](#), 2023

³ US Embassy & Consulates in Indonesia, United States supports the launch of the Just Energy Transition Partnership (JETP) in Indonesia, 2023

⁴ WWF, The agreement on the Loss and Damage Fund marks a positive start, now countries must deliver the finance to the vulnerable communities needs, 2023

⁵ UNDP, The Alliance for a Just Energy Transformation, 2023



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Trend 2:

A turn in geopolitics



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A turn in geopolitics

The world is in a state of geopolitical and social upheaval. Facing a range of pernicious challenges — economic, climate, trade, inequality and technological, to name a few — that are impacting people’s day-to-day lives and influencing global political agendas.

As the climate emergency becomes more acute,⁶ schisms between various regions of the world deepen, and economic uncertainties and debt challenges start to bite, there may be further fracturing of global consensus and an increase in conflict as countries and territories vie over scarce resources, capital and power.

With collaboration, partnership and trust in short supply and geopolitical and economic headwinds dominating the headlines, the actual and perceived risks to businesses have grown multi-fold. More than 40 percent of the world’s population is set to elect new governments this year (including India, Indonesia, South Africa and the US), so expect the rhetoric and uncertainty to rise.

However, there is optimism that the real impacts of the climate emergency and the need for a just transition could inspire some countries, institutions and leaders to put the global good ahead of their national interests and come together to forge new alliances focused on building consensus and forming the foundations for collaboration.

This would be good news. KPMG believes that all stakeholders should come together and drive consensus on critical developmental

and climate agendas. A win-win partnership needs to evolve focused on leveraging technology, innovative and alternate capital as well as broader policy alignment to drive growth.

Should the world veer towards less partnership and collaboration, the impact on the infrastructure sector will be significant. Infrastructure investors and owners may struggle to square away the uncertainty and regulatory complexity, thereby slowing dealmaking and reducing investment right at a time when the world needs it most. The cost of projects could increase as construction companies and developers price new risks into their bids. Projects in the developing markets that need it the most may get stalled waiting for policy certainty, government direction and flow of international capital.

This year, some infrastructure players and investors are expected to focus on finding ways to measure, manage and mitigate the risk of uncertainty as a hedge against a shift away from global collaboration. Additionally, it is hoped that to see leaders and policymakers start to focus on collaboration over competition, global good over national protectionism, and action over rhetoric.

KPMG is cautiously optimistic about the triumph of economics and good policies over protectionism and divisive short-term strategies. In more ways than one, what the world does in 2024 may define the trajectory for the rest of the decade and set the stage for our ability to meet (or fall woefully short of) our net zero and SDG goals.

Snapshot of elections across the globe in 2024



⁶ WWF, The Climate Crisis, 2023



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Trend 3: The rise of philanthropic capital



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The rise of philanthropic capital

Even before the pandemic, governments around the world were struggling to fund all the infrastructure they needed. The fiscal supports and economic impacts of the pandemic have made the task nearly impossible. As evidenced by the revised future development plans HS2 (a high speed rail line) in the UK,⁷ even the most developed markets may struggle to find the fiscal space to deliver on all their stated objectives.

As the world approaches the 2030 energy transition milestone (global greenhouse gas emissions need to be cut 43 percent by 2030, compared to 2019 levels, to limit global warming to 1.5°C), it is becoming increasingly clear that exponentially more investment will be needed. Yet governments simply do not have the budgets to make this a reality.

In the emerging markets, it often falls on the Multilateral Development Banks (MDB) and big national development agencies to bridge the gap. In part, this is about helping markets and their regulators to improve governance, enhance project preparation capabilities and prioritize pipelines into programs of work that might attract private investors.

MDB funding can only go so far and, at best, can act as a catalyst for mobilizing more capital. And many of the MDBs are limited in how much they can spend. Their capital increases are dictated by shareholder countries who are also struggling to meet their own domestic budget shortfalls. Despite their critical role in closing infrastructure gaps in emerging markets, it is unlikely that more capital will flow from shareholders into the MDBs any time soon.

Can philanthropic capital fill the gap? According to KPMG professionals analysis, the quantum of philanthropic capital being

allocated to infrastructure development is rising. Part of the increased flow is coming from global philanthropic organizations that have always been focused on catalyzing positive outcomes for society. And KPMG member firms are also seeing increased allocations coming from family offices and ultra-high-net-worth individuals seeking to make an impact.

Working in partnership with MDBs and development agencies, these philanthropic investors are using their financial strength and different return expectations to help MDBs crowd more private sector capital into projects using forms of ‘blended finance’ (a topic high on the agenda at COP28)⁸ where development and philanthropic funds are used to reduce the risk for private capital, thereby making projects more bankable and attractive.

A good example is the recent US\$1.1 billion SDG Loan Fund developed by AllianzGI and Dutch Development Bank FMO.⁹ The Fund benefits from multiple layers of risk protection including a \$111 million first-loss investment from FMO, which is credit-enhanced with a \$25 million unfunded philanthropic guarantee provided by the John D. and Catherine T. MacArthur Foundation (MacArthur Foundation). MacArthur Foundation’s triple A rated guarantee enabled FMO’s first loss investment by resolving key risk and technical factors.

Over the coming year, many MDBs and other multi laterals are expected to place a greater focus on crowding in philanthropic capital as a way to better drive private capital flows. Should they be successful, a greater volume of projects should start to come to market — particularly in the emerging markets.

⁷ GOV.UK, Press Release, PM redirects HS2 funding to revolutionise transport across the North and Midlands, October 2023

⁸ KPMG in Singapore, [Navigating the post-COP28 landscape for global decarbonisation](#), 2023

⁹ The SDG Loan Fund, Blended Finance Fact Sheet, Convergence Blended Capital, 2022



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Trend 4: Towards the 'infrastructure mesh'



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Towards the ‘infrastructure mesh’

The magnetism of city centers is diffusing. Many city leaders increasingly recognize that storing all of a city’s value in the center is creating an imbalance in access and opportunity. It also seems clear that citizens are looking for a new version of the ‘15-minute city’ where everything is within reach ... notwithstanding the occasional commute into an office somewhere.

At the same time, there is a continued shift towards infrastructure decentralization. Mini-grids and solar panels are popping up to take the pressure off large base-load generation facilities.¹⁰ Mobility as a Service providers are extending the reach of mass transit and bridging the final mile. Digital healthcare is moving services into homes and out of hospitals.

This is a fundamentally different world for infrastructure planners and investors. Rather than focusing on building massive trunk infrastructure and expanding existing networks, an opportunity is emerging to instead focus on incentivizing businesses, consumers and users to mesh their own assets into the infrastructure that is already in place. And for existing infrastructure providers and owners to mesh their assets more effectively into the holistic infrastructure network.

It’s a big opportunity. Greater connectivity between public and private infrastructure will lead to greater value of the whole. Done right, it is about making better use of the assets that are already in place. At the same time, an infrastructure ‘mesh’ approach allows governments to address some of the resilience issues that naturally come from putting all your eggs in one basket.

This does not, however, suggest that government can simply sit back and let consumers take on the burden of developing and paying for urban infrastructure. There are many

infrastructure assets and services that will remain solely within the government’s remit — either due to cost or complexity. Governments will also need to ensure that the connectivity infrastructure is available, sustainable and effective enough to allow meshes to form (upgrading the electricity generation network to accommodate decentralized renewables, for example¹¹).

Regulators will need to update and adapt their capabilities in order to address the range of technology and business model challenges they now face. Regulation works well in highly concentrated sectors where a handful of companies can be held to account. Reengineering regulation to suit a decentralized market where consumers are feeding into the system and paying their own replacement costs will be much trickier. New mechanisms will need to be found.

That being said, new cities, could see a significant advantage by setting the stage for distributed infrastructure right from the start by designing and implementing based on decentralized models delivered through effective partnerships.

Infrastructure designers and developers will also need to rethink their approaches to incorporating whole system thinking into their designs and connectivity into their models. The days of building monolithic, industrial-era, single-purpose assets are coming to a close. Infrastructure players will need to adjust accordingly.

This year, expect more governments to start talking about the ‘infrastructure mesh’ (though maybe not in those exact words). And expect infrastructure players to start evolving in response.

¹⁰ World Bank, Solar Mini Grids Could Power Half a Billion People by 2030

¹¹ [KPMG International, The role of energy and utilities in achieving net zero cities](#)



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Trend 5: Contracting for technology



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Contracting for technology

Every year, this publication predicts that the infrastructure sector will finally embrace digital, innovation and technology. And while there have certainly been some pockets of digital transformation seeping into the infrastructure sector, progress has been comparatively slow versus other sectors. So why do KPMG professionals think things will change this year?

Some of our optimism is based on the technology landscape. Generative AI showed us that disruptive technologies can emerge and go mainstream in months or even weeks. The uptake of digital twins in asset management and design demonstrates that industry has the capacity and desire to transform. Demand for digital services from users and consumers is amplifying the pressure.

Recognizing potential funding shortfalls and environmental objectives, many governments and asset owners see technology as a way to maximize the value of existing assets and investments. There is also pressure rising from investors and owners who recognize that technology can enhance the sustainability and resilience of their assets. They don't just expect to see technology embedded into designs, they also want to know how the assets will absorb or integrate new (and possibly as-yet unimagined) technologies in the future.

There is some cause for skepticism that this trend will materialize in the next year. The reality is that it has taken decades for the construction industry to adopt things like Building Information Modeling (BIM), modular construction and digital twins. Margins for construction companies remain tight and there are few demand-side incentives to encourage them to invest in technologies that aren't either mandated or evaluated in their contracts. That they will suddenly become innovation evangelists seems far-fetched.

However, there is some room for optimism. Over the past few years, a growing number of governments and international institutions start to think much more critically about how they might more appropriately contract for innovation and technology. New models and approaches are being developed which, if proven successful, could unlock a wave of innovation across the sector.

There are also pockets of innovation to be found around the world. Many construction companies in Asia, for example, are using IoT technology, digital dashboards and AI-enabled cameras to drive operational improvements. In some markets, these types of technologies are becoming business as usual in the design phase.¹²

KPMG member firms have global experience in helping clients navigate innovative and technology forward approaches. A client was supported in developing a framework for Digital Twin development to support the development of transport digital twins.

While for another client, a KPMG member firm wrote the full business case to successfully draw down funding to establish the testbed program.

Perhaps the greatest catalyst to this trend materializing is capability and capacity development. Procurement leaders need to properly understand the value technology provides and how to contract for it. Regulators need to develop the right mechanisms to support it and govern it. Contractors and developers need the capabilities to integrate and operate it. Consumers need the digital skills to use it. And while the market for these types of skills is tight, it is slowly expanding.

We believe that modern construction methods and technologies like Digital Twins will increasingly become embedded in the sector, and the real benefits of AI will start to show in the next couple of years. Real improvements in terms of construction efficiency, operational improvement, and innovative design will emerge. We also expect to see significant action and adoption driven by innovation in other sectors such as fintech for payments (toll road), logistics infrastructure (better fleet management), hospitals (effective patient online care and information management) and governance (e-gov). Technology will also be an important enabler to fast tracking sustainable and green infrastructure.

We are confident that technology will remain an enabler and key driver for growth. Don't expect it to fall off our list of top trends any time soon.

¹² KPMG International, [14th Global Construction Survey, 2023](#)



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Trend 6:

Driving the energy transition





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Driving the energy transition

At COP28, nearly 200 nations agreed to triple renewable energy capacity and double energy efficiency by 2030¹³ in order to meet international Net Zero goals as outlined in the Paris Agreement.¹⁴ As noted in KPMG's *Turning the tide in scaling renewables*, that will require a massive amount of capital investment — more than governments can supply alone.

There is also increasing recognition that — in a world of growing uncertainty and disruption — the energy priorities for many governments also include security, access and affordability. And that means that hydrocarbons will continue to be a key source of energy for the foreseeable future (according to the 2023 Statistical Review of World Energy report, in association with KPMG and Kearney, hydrocarbons still accounted for 82 percent of energy supply).¹⁵

More prudent attitudes are prevailing. Rather than calling for an end to hydrocarbon-based energy generation, many observers are now suggesting a rapid shift towards transition fuels and that any new generating capacity be primarily renewable. They are advocating for the oil and gas industry to more rapidly develop and implement carbon capture, utilization and storage technologies. They are encouraging the formation and standardization of carbon credit markets. They note the need for greater allocations to the emerging markets in order to encourage clean development. The launch of the Cement and Concrete Breakthrough by Canada and the UAE addresses a critical area of urban emissions. Cement, accounting for about 7 percent of global emissions, is a sector in urgent need of decarbonization. This initiative aims to speed up progress towards net-zero cement by fostering investment and collaboration across the value chain, including novel solutions like carbon capture and innovative materials.¹⁶

Unfortunately, the path to Net Zero is becoming increasingly complicated. Government incentives are distorting market dynamics. Protectionism in the form of incentives, industrial policy and trade wars are driving competition between nations. Budget deficits and concerns about possible recessions are reducing fiscal space for investment. Market risks are growing, particularly in those regions most exposed to the climate crisis. And all of this against a backdrop of increasingly violent and destructive weather events that create a need for further investments in resiliency or adaptation strategies.

In markets where governments have made firm commitments to meet their Paris Agreement goals, the need for aggressive policymaking is clear but in some cases needs to be balanced against other short to mid-term policy priorities. The Green Public Procurement Pledge, signed by countries like the United Kingdom, United States, Canada, and Germany, commits to using low and near-zero-emissions steel, cement, and concrete in public procurement. This pledge is a significant step towards reducing emissions in the construction sector and developing harmonized emissions accounting standards for construction materials. Energy transition is going to be a journey that requires wide ranging collaboration between governments and the private sector. KPMG professionals hope that the participation of oil producing countries at COP28 brings divergent perspectives, but is also a recognition that might bring practicable approaches to help deliver on the goal.

In the lead up to COP29 in Azerbaijan this year — there is likely to be a tightening of the language around the phase out of fossil fuels in energy systems. COP28 ended with a promise to 'transition away from' them¹⁷; expect delegates to COP29 to want to revisit what that means. And expect infrastructure planners and investors to be listening closely to the dialogue.

¹³ KPMG in Singapore, *Navigating the post-COP28 landscape for global decarbonisation*, 2023

¹⁴ IEA, *Tripling renewable power capacity by 2030 is vital to keep the 1.5°C goal within reach*, 2023

¹⁵ Energy Institute, in association with KPMG International and Kearney. "2023 Statistical Review of World Energy." 2023.

¹⁶ Canada.ca, *Canada launches the Cement & Concrete Breakthrough initiative at COP28*, New release, 2023

¹⁷ WWF, *COP28: Key takeaways from the UN climate summit*, 2023



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At the same time, investors should be expected to ramp up their pressure through capital allocation. Regulators will get better at forcing the issue. Consumers will become more open to shouldering the financial costs. And global institutions will create innovative mechanisms and programs to help drive capital towards energy transition initiatives in the emerging markets. One such innovative project that a KPMG member firm is advising on is the Cirebon IPP ETM pilot project in Indonesia. The 660-megawatt coal-fired power plant (CFPP) Cirebon-1 in Indonesia will likely be retired almost 7 years

earlier than scheduled as a result of discussions with the plant's owners and the Government of Indonesia under the Energy Transition Mechanism (ETM) program of the Asian Development Bank.

As the focus shifts to operationalizing the renewables and efficiency goals agreed at COP28 and realities of the energy transition start to hit home, expect to see everyone become more prudent about what must be achieved and the tradeoffs that must be made.¹⁸

¹⁸ WWF, COP28: Key takeaways from the UN climate summit, 2023



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Trend 7: Reforming the regulatory remit





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Reforming the regulatory remit

Regulation used to be all about consumer protection. Regulators wanted to ensure that critical services were affordable, that access was secure and that assets were being replaced appropriately. Now things have become a lot more complex. Regulator scope has expanded to include risks like cyber security, resilience, decarbonization and innovation. And more is on the horizon.

The big question is whether regulators should be taking on these new roles and areas of focus. Many would argue that these topics are actually the remit of politicians and policymakers, not regulators. Regulation is best used in slow-changing, highly-concentrated sectors where risks are known and controllable. New and emerging areas like Generative AI and decarbonization challenge the model.

It is not surprising that regulators are struggling to cope. While there are some regulators that move quickly to get their arms around key issues (particularly in Asia), there are also many that are reluctant to intervene on a topic unless they have a clear political remit to do so, meaning they often aren't tasked to the job until it is too late. Regulators sometimes lack the technical skills, particularly when it comes to emerging issues and technologies. This means that, even when they have a clear policy steer, they don't always have the capabilities or capacity to manage it appropriately.

Current regulatory models are also limiting regulators' ability to deal with the increasingly difficult trade-offs that are being expected to be made. The traditional 'RPI-X' model might keep customer bills low, but it does not incentivize the scale and pace of investment that is required for challenges like the energy transition and building climate resilience.

This year, expect this debate to come to a head in many markets. It will start with continued challenges that force politicians and regulators to have a more sober and collaborative conversation about what regulation can and can't do. That will require politicians to take more responsibility for many of these issues.

That should lead to a level of regulatory reform, supported by a concerted effort on the part of regulators and governments to develop new models that incentivize more investment and innovation. This will require not only an infusion of new skills and talent capable of managing emerging technologies and creating innovative mechanisms. It will also require regulators to be given greater breadth of responsibility within clearer political parameters.

At the same time, investors and capital markets will need to recognize that different flavors of regulation can work in different markets. Expecting developing nations to adopt the regulations of the developed nations — or withholding funding until they do — will not empower emerging market regulators but rather undercut them.

While it may not be as immediately noticeable, this should be expected to be a strong trend in 2024. Demand for robust and effective regulation across a range of fast-moving trends will force the issue up the agenda. Regulators will take the opportunity to adapt and upskill. Also, regulatory activism should be expected to increase (similar to what happened with antitrust regulations) with a focus on driving growth across sectors while balancing consumer, investors and environmental stakeholder expectations.



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Trend 8: Bending not breaking



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Bending not breaking

What's old can often become new. Yet new is not necessarily better. Nature based solutions are a prime example. Infrastructure organizations and biodiversity experts have been talking about 'ecosystem-based approaches' for years. More recently, however, the concept has been receiving greater attention.

In part, that has been driven by policymakers and regulators. In the US, for example, the White House released their 'Roadmap for Nature-Based Solutions' in 2022.¹⁹ In the UK, the topic has been raised up the agenda by the Biodiversity Net Gain (BNG) strategy that effectively mandates developers to consider nature-based solutions in their design and planning.²⁰ It was also high on the agenda at COP28 where nature-based solutions, biodiversity and climate mitigation and adaptation were notable themes.

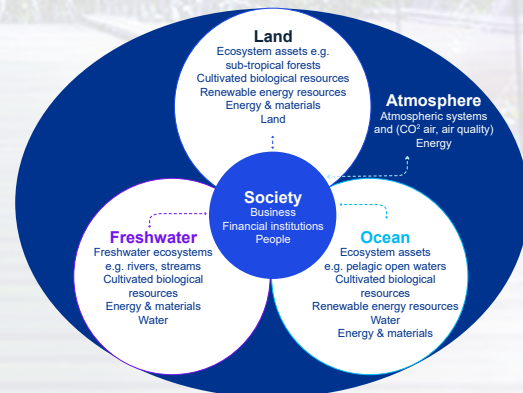
Accelerating the drive for nature-based solutions is the increasing body of evidence that suggests these 'green infrastructure' solutions can be more effective, sustainable and affordable than traditional 'grey infrastructure'. There is also a deep recognition that protecting existing nature-based solutions — like those mangrove forests — can be much more cost effective than building new dams or sewer systems. And, when complemented by rain gardens, bioswales and permeable pavement, they can provide a much more resilient and sustainable form of protection against flooding, for example.

However, to really mainstream nature-based solutions, organizations need to be able to properly measure and account for the real value of these assets. On this score, the Taskforce on Nature-related Financial Disclosures (an industry-led initiative that KPMG is proud to be involved in) has helped move the needle by providing recommendations designed to meet corporate reporting requirements.²¹

The widespread adoption of valuing nature-based assets and solutions would enable companies to better account for these assets on their balance sheets. It would also help catalyze the growth in marketplaces where these assets could be traded, thereby expanding their appeal to private investors. It would also enable governments to make more informed decisions that balance infrastructure delivery with sustainable development.

Driven by strong policy tailwinds, new disclosure recommendations and growing anxiety about the climate emergency, expect to see increased focus on nature-based solutions over the coming years. The challenge here is to transform this pressure into proactive corporate responsibility, fostering a culture of accountability that extends beyond compliance. Indeed, it won't be too long before developers default to nature-based solutions over pouring concrete.

Environmental assets by realm



Source: KPMG International, [How can organizations grow with nature](#), 2022

¹⁹ White House Fact Sheet: Biden-Harris Administration Announces Roadmap for Nature-Based Solutions to Fight Climate Change, Strengthen Communities, and Support Local Economies, 2022

²⁰ GOV.UK, Understanding bio diversity net gain, 2023

²¹ KPMG International, [Growing with nature](#), 2022



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Trend 9:

The race to green growth





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The race to green growth

The Inflation Reduction Act (IRA) in the US provides the most comprehensive package to date to support clean energy projects through a series of tax incentives, grants and low interest loans and created international interest for investments.²² And it forced governments and investors around the world to sit up and take notice.

With some US\$783 billion in funding and incentives on offer, the IRA is clearly a powerful tool.²³ Nearly US\$350 billion in clean energy investments were announced in the year after the IRA was passed.²⁴ A different report suggests that more than US\$70 billion flowed into the US battery sector during the same period.²⁵

Few other markets have the budget elasticity to compete. The EU's Green Deal has similar objectives²⁶, but the quantum of money on the table is lower and the process for securing it is more complicated.

Yet the reality is that private investors tend to allocate their capital globally, meaning there is still a lot of capital looking for bankable projects in emerging and developed markets outside of the US. There are also arguments to be made that the US's massive flood of investment into clean energies will effectively help reduce the cost of these technologies for future adopters.

While most governments will not be able to compete with the firepower of the IRA, there is still much they can do to improve investment flows into their own green energy and resilience markets.

For one, governments could be focusing on improving deal preparation, project pipelines and regulatory regimes. They could be helping to cut red tape for renewables developments. They could be reinforcing project and contract certainty through clear policymaking. Rather than competing on incentives, they should be competing on governance. The reality is that investment and incentive programs invariably end, whereas improvements in capacity, capability and governance are much easier to sustain and grow.

There will also likely be some assistance coming. The Loss and Damage Fund formalized at COP28 — along with a number of other big transition capital funds announced recently — will help channel capital towards the markets that need it most. Used as part of a blended finance structure (see Trend 3 for more on this), it could rapidly mobilize global capital into green developing market projects.²⁷

Given the current geopolitical environment, it is likely that some countries gravitate towards protectionism, particularly as disparities grow larger and the impacts of the climate crisis become more damaging. Eventually, however, policymakers and leaders should realize that equitable green growth — evenly dispersed — is the solution to a wide range of problems. But it requires collaboration not competition.

²² KPMG US, New law promises seismic changes on energy and climate, 2022

²³ KPMG US, Inflation Reduction Act, 2022

²⁴ White House fact sheet, Biden- Harris administration leverages historic U.S. climate leadership at home and abroad to urge countries to accelerate global climate action at U.N. Climate Conference (COP28), 2023

²⁵ Benchmark Source, "One Year On, Biden's IRA Has Changed the Battery Landscape," Benchmark Mineral Intelligence, August 15, 2023,

²⁶ KPMG International, [European Green Deal Policy Guide](#), 2021

²⁷ WWF, The agreement on the Loss and Damage Fund marks a positive start, now countries must deliver the finance to the vulnerable communities needs, 2023



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Trend 10: The next frontier





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The next frontier

Just 20 years ago, space was the sole domain of governments. Nobody else had the capital or capability to take on such a mammoth task. But no longer. Today, it's private companies like SpaceX and its competitors that are pushing the boundaries of space exploration and development. Who would have thought?

At a more terrestrial level, similar rapid technological disruption is upending the status quo across infrastructure sectors. Consider, for example, the rapid adoption of contactless ticketing on metros. Or the introduction of automated vehicles.

Technological progress (or, if you prefer, disruption) is happening in shorter cycles with greater impact. If you are responsible for planning, operating or owning an asset with a 50-plus year lifespan, this might be disconcerting. In a world of big technological leaps, it can be challenging to plan for the long-term with any degree of certainty.

The answer is flexibility. For example, infrastructure owners and designers should be thinking about how they might repurpose and adapt their assets to serve alternative purposes in the future. Are there design elements that you could include today that would allow the asset to be repurposed if and when it becomes tactically obsolete?

Technological flexibility will also be important. That might mean using open data and design principles to allow new technologies and tools to be bolted on in the future. Or perhaps contracting for services and outcomes rather than specific technologies or assets.

Governments will also need to be more flexible about ownership. One lesson from the emergence of the space industry is that the lines between public and private infrastructure provision are rapidly blurring. In this case, the US government saw the writing on the wall and was flexible enough to partner with the commercial space industry to advance national objectives including space exploration, national security, combating the climate crisis, and international partnerships, including building commercial space stations, in-space assembly and manufacturing, extracting and using resources on the Moon, addressing the hazard of space debris, and fueling stations in orbit.²⁸ That gave them much greater flexibility to execute on their objectives using the best technologies available at any given time.

Now it seems there are no infrastructure areas too big or too risky for the private sector to take on, and no public agenda that the private sector can't influence. Saving the world is as much a mission for the private sector as it is for the public sector (better yet, working together).

Over the next few years, expect to see governments and infrastructure planners place greater emphasis on creating flexibility in their infrastructure designs and assets. It won't stop a new technology from disrupting your plans. But it will allow you to make better use of your existing investments for longer and give you the confidence that — when disruption does come — you will have options for dealing with it.

²⁸ White House, FACT SHEET, U.S. Novel Space Activities Authorization and Supervision Framework, 2023



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How KPMG can help

KPMG firms' infrastructure professionals strive to see the bigger picture, thinking holistically. They leverage multidisciplinary capabilities available across KPMG's global network of member firms, tapping into new technologies and working with alliance partners to help deliver outcomes. KPMG professionals focus on the future with the aim of ensuring clients are maximizing their opportunities and managing their risks.

As public and private sector organizations pick up the pace of action on the energy transition, service modernization and economic growth, KPMG professionals can bring the insights, tools and capabilities organizations need to create, quantify and execute their strategies more efficiently and effectively.

Global infrastructure insights with local experience

KPMG infrastructure professionals seek to harmonize local expertise with a global perspective. Understanding the nuances of local markets, so member firms can tailor approaches that resonate with specific regional needs while drawing upon leading practices from KPMG firms' operational footprint. This helps ensure that the advice provided is both locally relevant and global in scope, allowing organizations to navigate their unique challenges while staying on top of global trends.

A world of capabilities

With more than 2,500 infrastructure professionals in 120 countries and territories providing deep sector expertise across critical projects like digital infrastructure, roads, rail, ports and energy infrastructure, KPMG member firms can help you overcome challenges at each stage of the asset lifecycle for both new and existing infrastructure.

Whether planning, procuring, delivering, operating or transitioning, KPMG infrastructure professionals take an integrated approach with strategic, commercial and technical capabilities to help deliver projects that are environmentally sustainable, socially impactful and drive lasting economic growth. For example, KPMG is a recognized leader in climate change consulting and supply chain strategy.^{29, 30}



We're ready to help

KPMG member firms multi-disciplinary infrastructure practices are dedicated to helping public and private sector organizations deliver the outcomes they are seeking, as efficiently and effectively as possible. KPMG professionals thrive on helping solve the world's biggest challenges. And we are eager to share our insights and knowledge as we move towards a transformed infrastructure sector.

To learn more about the trends and topics raised in this report, we encourage you to contact your local KPMG member firm.

²⁹ KPMG International, [KPMG recognized as a global market leader in Climate Change Consulting, 2023](#)

³⁰ KPMG International, ["KPMG recognized as a Supply Chain Pacesetter", 2023](#)



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