Global Infrastructure Outlook 2025-50

Investing in infrastructure, the platform for accelerating human progress

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Introduction

Introduction

US$151.1 trillion

A staggering US$151.1 trillion of capital is needed to build and maintain infrastructure in the coming decades.

What might the world's infrastructure look like in 2050, after US$151.1 trillion in new investment?

Better. Smarter. More comprehensive. Responsive and predictive. Wired and wireless. Clean and resilient amid disruptions. Connected and robust. Reliant on powerful hardware and the most advanced software. Modernised—not only newly built but renewed. Infrastructure is much more than steel, concrete, and capital. It's the platform for economic prosperity and human thriving.

By 2050, the world will be increasingly dependent on electrification, data, automation, and circular resource flows. And infrastructure will no longer be defined solely by isolated physical assets like roads, grids, or plants. It will span the digital, environmental, industrial, and social systems that underpin productivity and human well-being. Importantly, these systems will all be interconnected—and they will rely on one another for smooth functioning.

New energy and digital assets will scale rapidly, accelerating the application of AI computing hubs and high-density data

centres, carbon capture networks, and microgrids that give users real-time control over reliability and cost. Roads will carry autonomous vehicles and embed abilities like dynamic pricing and wireless charging. Airports will function as predictive, intermodal hubs that manage vast fleets of drones and autonomous, electrified aircraft. Businesses will run automated, just-in-time supply networks powered by clean energy and secure computing. Systems will anticipate needs, allocate resources dynamically, and optimise performance—delivering structural productivity gains across every sector. The impact on communities will be significant, giving people more time to do the things they love.

That may sound like a lot to expect from the global network of roads, power plants, ports, buildings, and data centres. After all, parts of this network are ageing and in obvious need of repairs and modernisation. But the world requires nothing less from its built environment. Big changes are afoot in the coming 25 years. A projected 1.8 billion more people will live in cities by 2050—mostly in the Asia-Pacific region and Africa—and the number of megacities worldwide will nearly double. Climate impacts will test resilience and expose vulnerabilities in transport, energy, and urban systems. The rise of AI, cloud computing, and data-driven services will fundamentally reshape infrastructure needs. And as this Outlook is being written, recent developments in the Middle East are reinforcing how quickly geopolitical shocks can reshape infrastructure priorities. Disruptions to energy flows, shipping routes, and critical industrial inputs highlight the importance of resilience, redundancy, and security alongside efficiency, affordability, and decarbonisation.

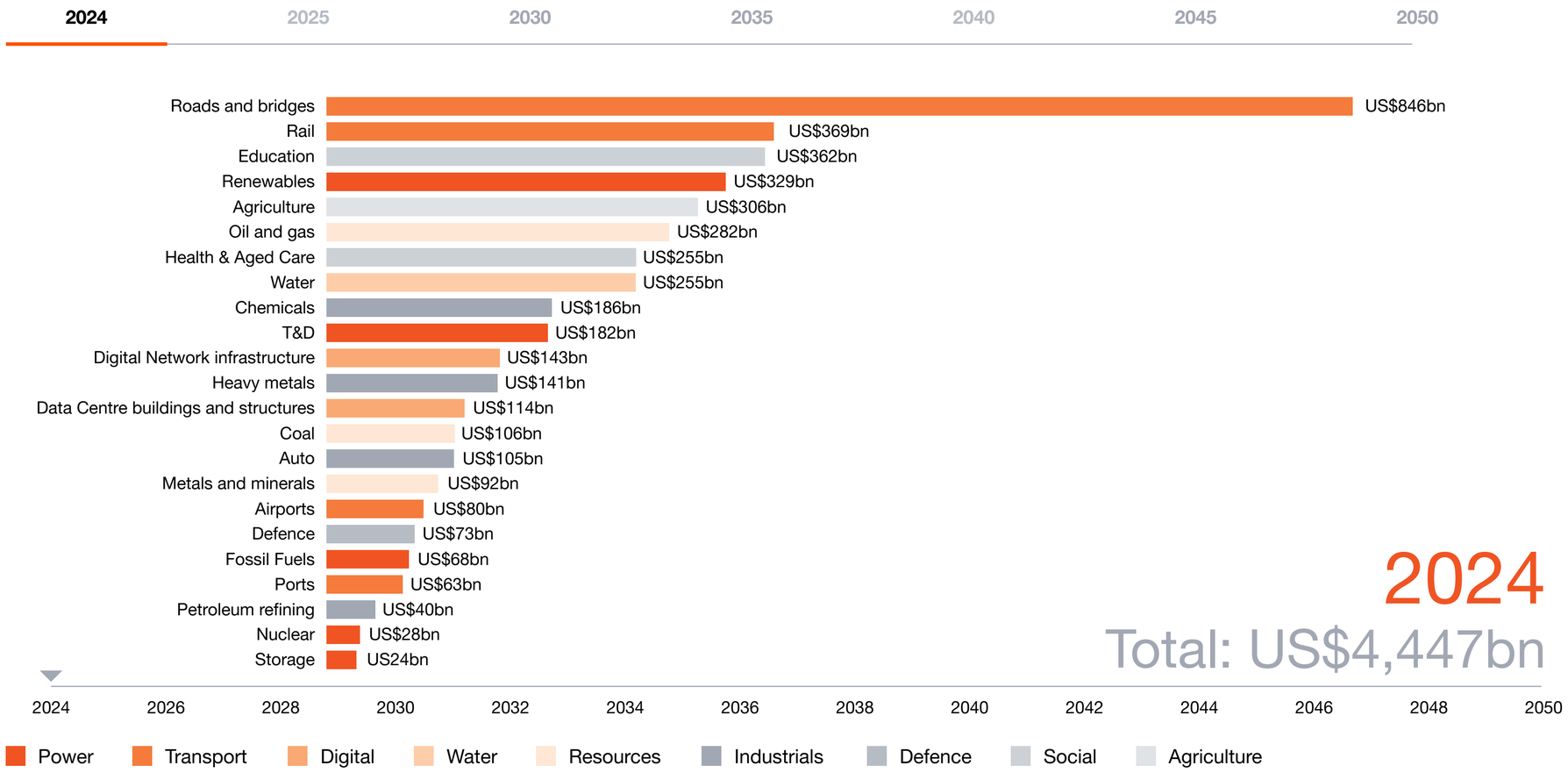
That's why PwC commissioned Oxford Economics to produce a new forecast model for infrastructure. Drawing on the last 20 years of spending data, our Global Infrastructure Outlook 2025–50 uses macro modelling engines, calibrated to today's geopolitical and economic realities. The Outlook covers nine sectors and 20 subsectors in 45 countries and territories, recognising the evolution of infrastructure over the past decade—think power storage and data centres—and the heightened importance of sectors such as defence infrastructure and the transmission and distribution infrastructure needed to support the AI revolution.

The result? The most comprehensive, market-ready global infrastructure forecast available, designed to help investors, policymakers, and industry leaders identify and seize opportunities sooner and with far greater precision.

In the period covered by our Outlook, global annual spending is forecast to rise from $4.4 trillion in 2024 to $6.9 trillion in 2050—representing a cumulative total of $151.1 trillion over 25 years.

Figure 1:

Race for the future: Charting the growth of infrastructure subsectors through 2050



Note: All spending figures are in 2023 US dollar prices.
Source: PwC's Global Infrastructure Outlook 2025–50. Forecast modelling by Oxford Economics.

PwC's Global Infrastructure Outlook 2025–50 explores the infrastructure the world will need, the new forms already emerging, the changing ways people and businesses will use these systems, and, more importantly for the present study, the financing and commercial models required to deliver them at scale. We highlight the global trends influencing the expansion of infrastructure spending, size the immense opportunities on offer, and identify the regions and sectors that present the greatest growth, in both absolute and relative terms.

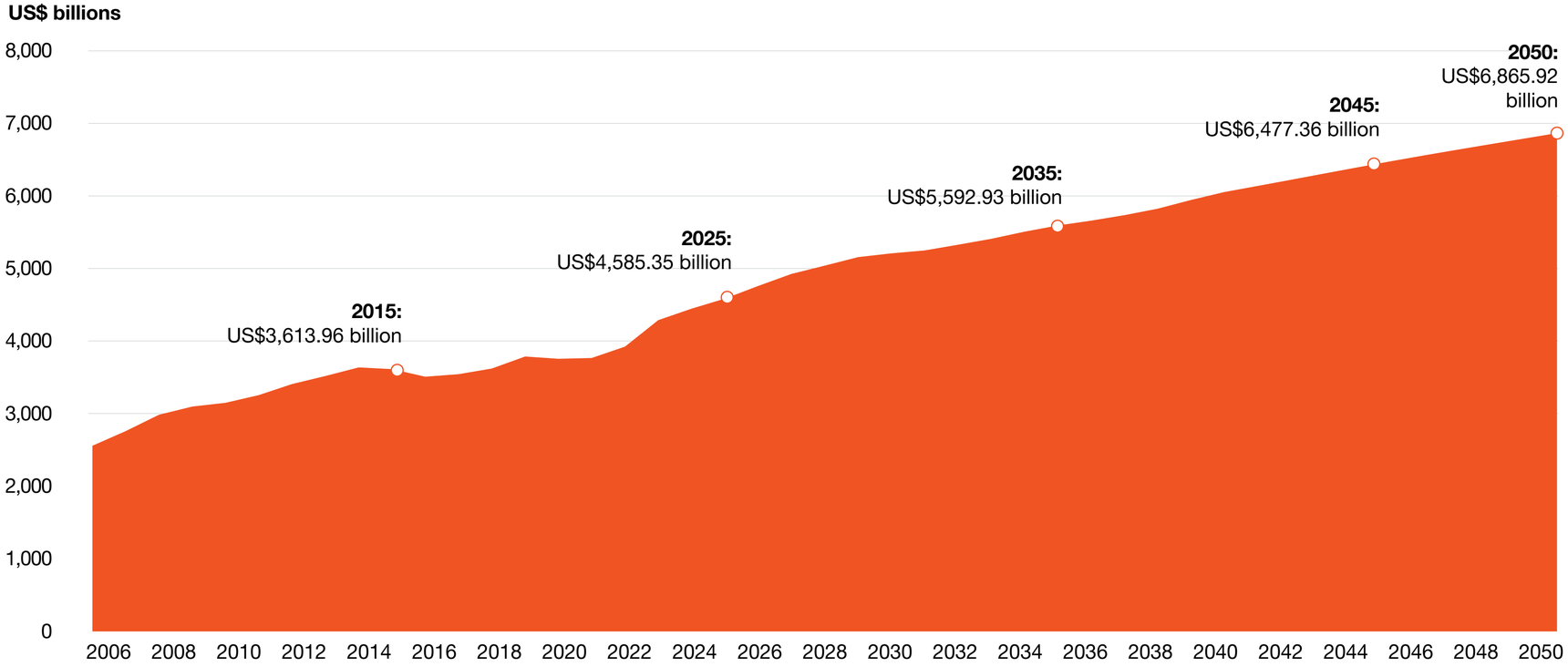
To be part of the movement that enables infrastructure, leaders will have to convert vision into value through actionable plans. They will have to act boldly to re-prioritise resources and show clarity and decisiveness, having the nerve to embrace non-traditional models.

The opportunity is real and measurable.
The time to unlock it is now.

Figure 2:

The platform for progress: Global infrastructure spending by sector

Total investment | Power | Transport | Digital | Water | Resources | Industrial manufacturing | Defence | Social infrastructure | Agriculture



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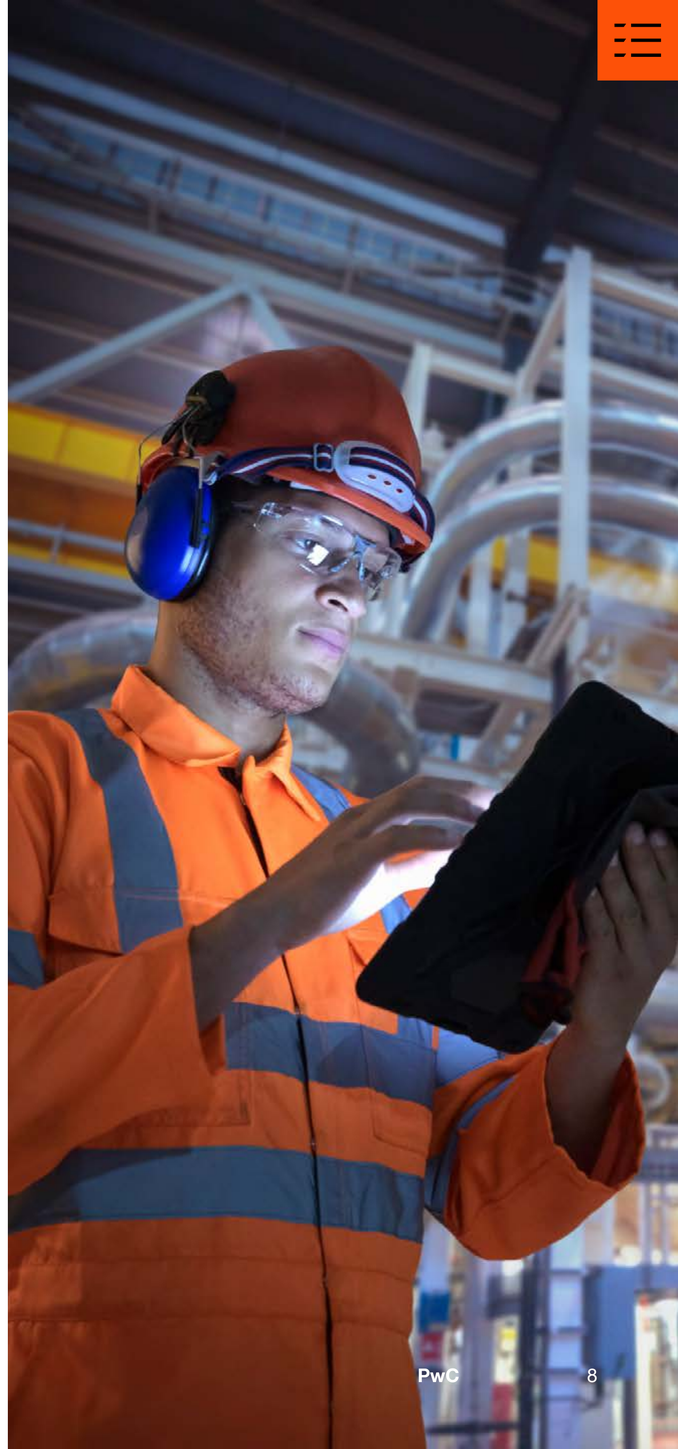


02

Driving Growth

Infrastructure spending in each sector

PwC's Global Infrastructure Outlook forecasts annual investment in nine sectors through 2050. In each category of infrastructure, underlying economic trends, the application of new technologies, and developments in key subsectors influence the rate of growth.

Digital infrastructure

Powerful investment flows

To unlock the full potential of advances in technology, data, and artificial intelligence, the world will require sustained investment in digital infrastructure. Alongside networks, fibre, towers, and satellites, data centres—the physical environments in which computation takes place—are becoming a defining infrastructure asset of the 21st century.

Rapidly growing global demand for data and digital services will drive strong investment in data centre capacity over the next 25 years. In the second half of the 2020s, what could have been decades of expansion will be concentrated into a short, highly capital-intensive build-out phase. Between 2024 and 2027, annual investment in data centre infrastructure will rise by 121%, from $114 billion to $252 billion. Hyperscale campuses, colocation facilities, and edge sites will be delivered at speed to meet the surging demand created by steady cloud growth, the rapid adoption of generative AI, and expectations for more compute-intensive AI applications and workloads.

But as newly constructed facilities ramp up and absorb demand growth, the pace of subsequent structural additions will moderate in the 2030s. In the 2040s, as markets mature, investment in buildings and structures will hold constant. Over this longer horizon, the focus of data centre investment is likely to rebalance away from boosting net new capacity and towards improving the utilisation, efficiency, and adaptability of existing stock. At that point, growth in data centre capacity will depend on successful commercialisation of the current generation of build-out as well as the energy requirements and efficiency of future generations of computing infrastructure.

US$256bn
Annual spending in 2024

US$322bn
Projected annual spending in 2050

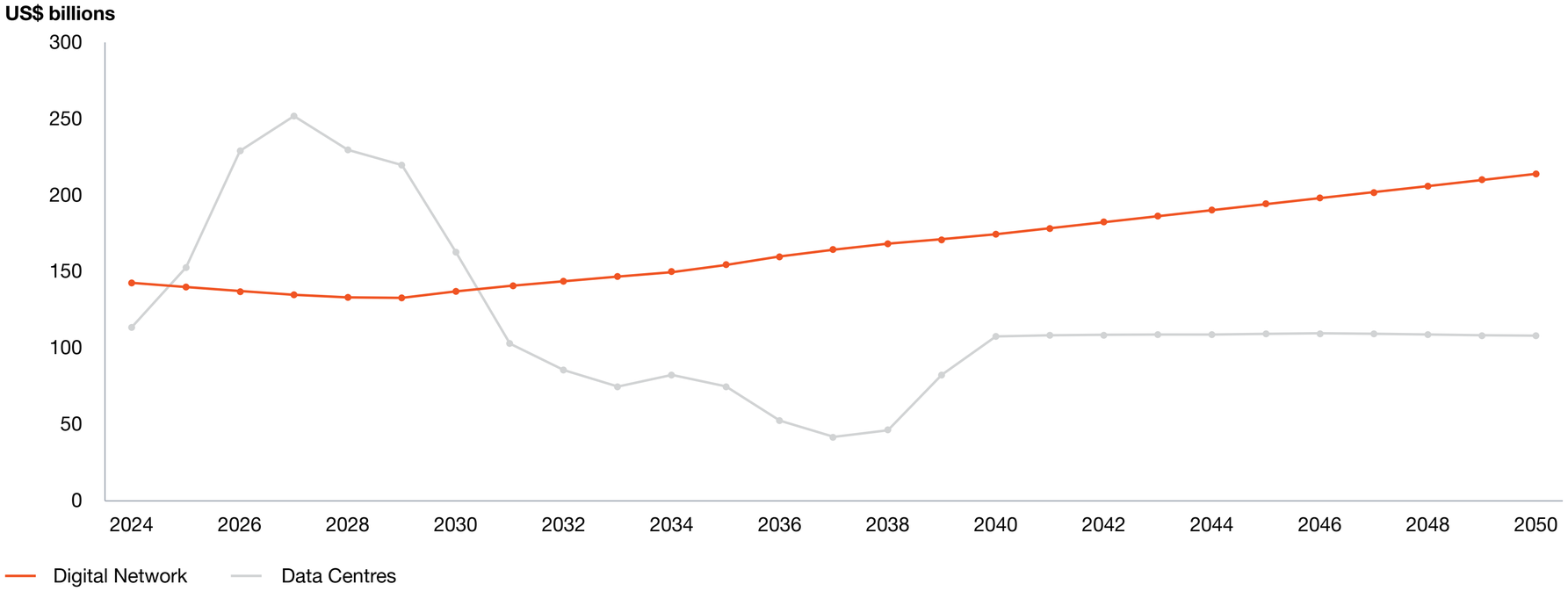
0.9%
25-year CAGR

26%
Increase in annual spending by 2050

US$7.4tn
Cumulative spending by 2050

Figure 3:

Digital's diverging paths towards growth: Annual spending on data centres will increase rapidly and then moderate, as investment in digital networks rises steadily



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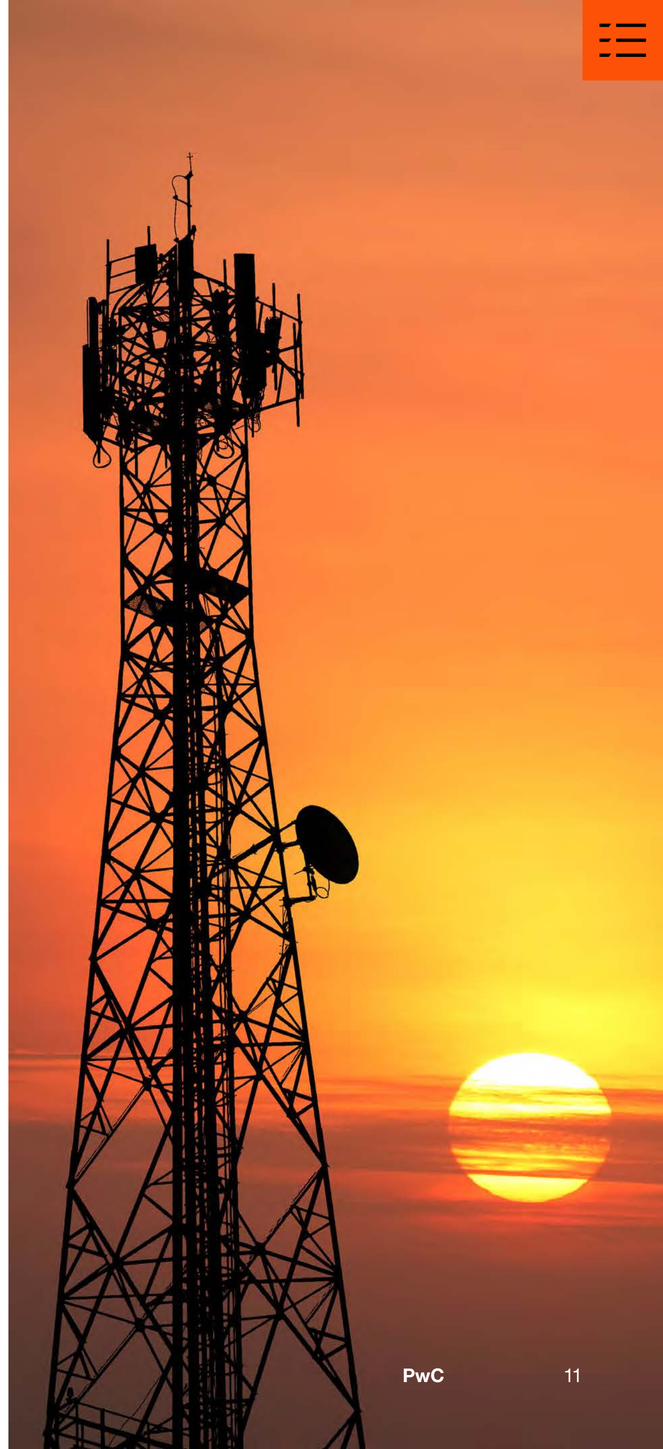


Transport

Major investment opportunities

More people moving around, especially in megacities, will require substantial investment in transport infrastructure—including the renewal of existing assets, as well as the maintenance and construction of new roads, bridges, tunnels, railways, airports, ports, and marine works. Transport accounts for 33% of all spending over the period covered in the Outlook. And spending on roads and bridges, at $30.6 trillion, will make up 60.5% of the transport total. Even countries with highly developed infrastructure networks will need to make significant investments to ensure they are fit for future purpose and resilient to climate and other disruptions.

Airport infrastructure spending ($3.1 trillion invested through 2050) will record the fastest growth. Driven by increasing passenger volumes and tourism flows, it'll rise 93% through 2050, while port infrastructure spending ($2.4 trillion through 2050) will benefit from broadening trade corridors and the upgrades needed for offshore wind capacity. Rail infrastructure spending ($14.1 trillion through 2050) will be buoyed by urbanisation and rail's status as a relatively low-carbon and efficient transport mode. The recent deterioration in transport reliability through the Middle East is also a reminder that, more and more, infrastructure must be designed for resilience as well as efficiency.

Digital technologies play a critical enabling role. Indeed, the convergence of digital and physical infrastructure will create the resilient and sustainable mobility systems of tomorrow. These transport systems will comprise integrated, multimodal infrastructure, combining roads, rail, ports, airports, and digital networks. Smart ports and airports will become engines of economic dynamism by employing automation, data analytics, and low-carbon technologies to improve efficiency and sustainability.

US$1.4tn
Annual spending in 2024

US$2.4tn
Projected annual spending in 2050

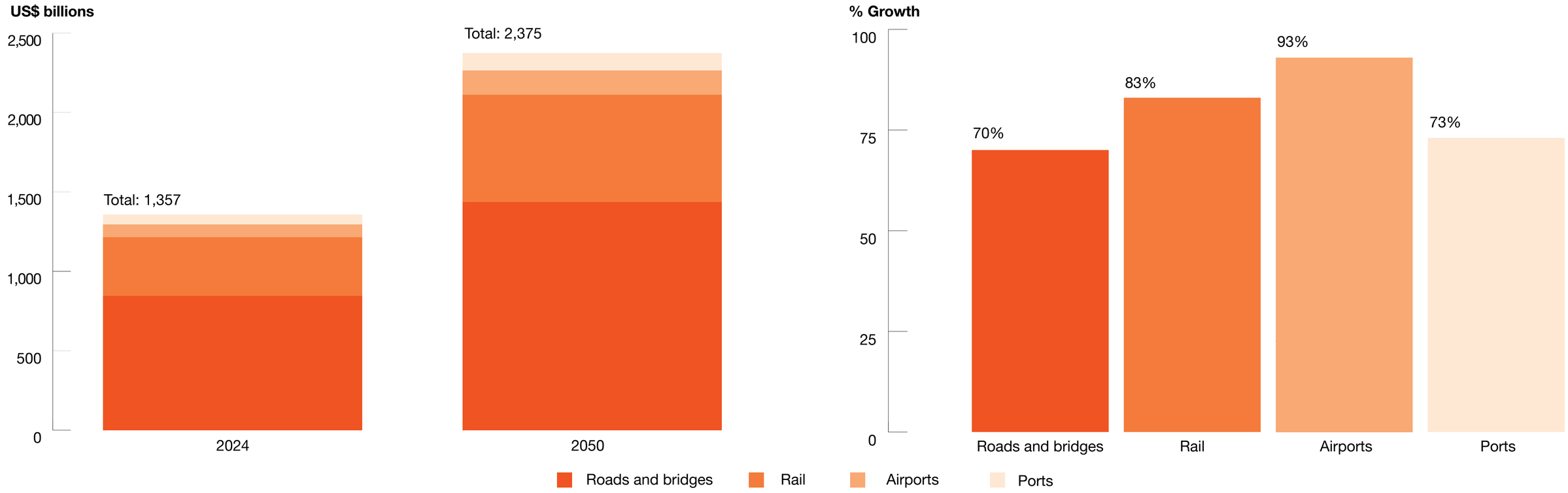
2.2%
25-year CAGR

75%
Increase in annual spending by 2050

US$50tn
Cumulative spending by 2050

Figure 4:

Investment in motion: Spending by transport subsector



Note: All spending figures are in 2023 US dollar prices.
Source: PwC's Global Infrastructure Outlook 2025–50. Forecast modelling by Oxford Economics.

Power

An enabler of the energy transition and the digital age

US$631bn
Annual spending in 2024

US$1.1tn
Projected annual spending in 2050

2.3%
25-year CAGR

79%
Increase in annual spending by 2050

US$25tn
Cumulative spending by 2050

Power infrastructure includes the fixed assets and structures used for the generation, storage, and distribution of electricity, including renewable assets, fossil fuel and nuclear power plants (with growing momentum behind small modular reactors), transmission and distribution (T&D), and battery storage. By 2050, annual investment will top $1.1 trillion. The growth reflects the fundamental global challenge of shrinking the world's carbon footprint and ensuring reliable, secure, and affordable supplies of fuel and power. (As the World Resources Institute notes, more than 70% of global greenhouse gas emissions comes from energy.) Meeting this challenge demands a holistic approach, coordinating investment across national and industry borders.

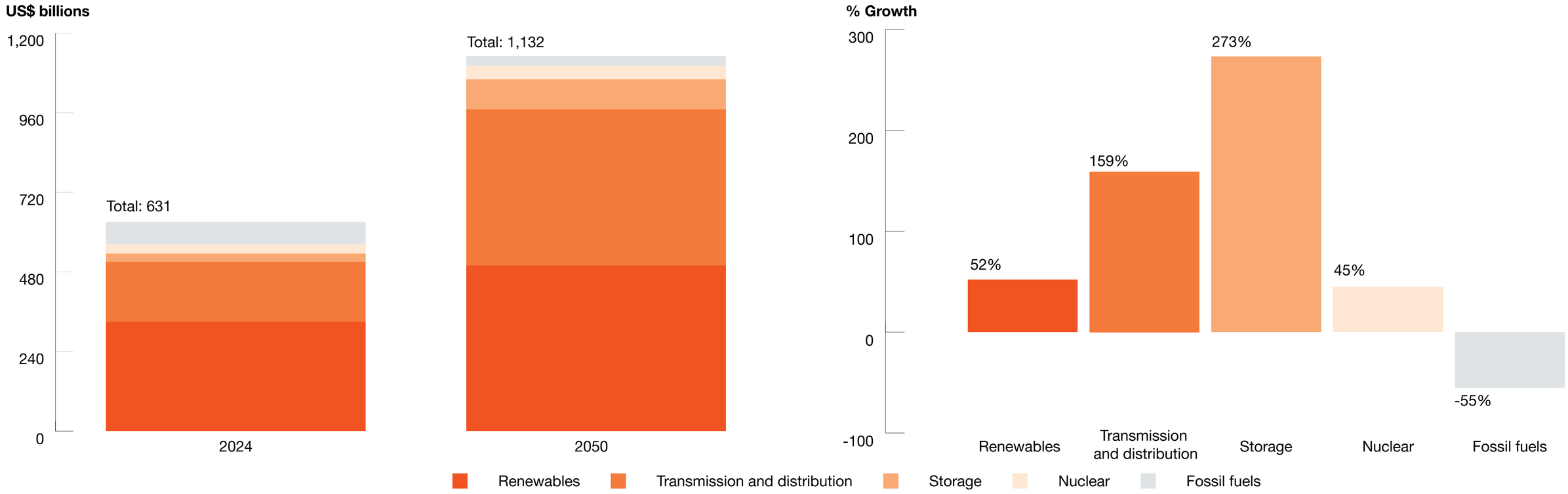
In periods of acute supply insecurity, governments and investors prioritise reliability, dispatchability, and fuel diversity alongside decarbonisation. This approach is likely to accelerate investment not only in renewables, storage, and grid modernisation, but also in strategic fuel infrastructure, reserve capacity, LNG import, and regasification assets, and system flexibility more broadly.

Global investment in power infrastructure will expand along three key dimensions: clean generation, power storage, and T&D. First, clean generation is accelerating. By 2050, investment in renewables and nuclear power will rise 52% and 45%, respectively, while investment in fossil fuel generation will decline by 52%. Second, as batteries and other technologies become the backbone of system flexibility, annual investment in power storage will grow 273% between 2024 and 2050, enabling grids to balance intermittent renewables, support rising electrification, and stabilise peak loads. In 2050, the $90 billion invested in storage will be three times the amount invested in fossil fuel energy. Third, as grids undergo major modernisation and reinforcement, T&D investment will rise 159%, driven by the need to manage bidirectional power flows and to serve and connect fast-growing new loads. These loads will include electric vehicle fleets, heat pumps, electrolysers, and increasingly power-hungry data centres and AI clusters.

And because electrification alone cannot deliver net-zero energy, PwC analysis highlights the need to scale sustainable aviation fuels, hydrogen, and biofuels as they reach commercial viability—creating an integrated, multi-vector energy system that supports both decarbonisation and long-term energy security.

Figure 5:

Powering the global economy: Spending by power subsector



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Source: PwC's Global Infrastructure Outlook 2025–50. Forecast modelling by Oxford Economics.

Resources

Less drilling, more mining

Resources infrastructure includes the plants, facilities, and networks that support the exploration, extraction, processing, transportation, and storage of oil and gas, coal, metals, and minerals, including mining facilities, pipelines, refineries, and storage terminals. As a profound transformation in energy plays out, it's the only sector projected to see a decline in investment during the forecast period. Most of the shrinkage can be ascribed to coal, with annual investment plunging 63% by 2050. Because oil and gas remain key factors in the energy equation, they'll continue to dominate the resources sector, accounting for 64% of investment in 2050.

The strategic importance of resources infrastructure extends well beyond oil and gas. Disruptions in the supplies of associated products such as sulphur, helium, petrochemicals, and fertiliser inputs can have cascading consequences for agriculture, semiconductor manufacturing, chemicals, and industrial production. Such issues broaden the case for investment in storage, processing, and trade-route diversification across critical resource value chains.

As PwC's 2025 Mine Report found, growth will largely be seen in metals and minerals critical for the energy transition, such as copper, lithium, and rare earths. Annual spending will rise 39% to $128 billion in 2050. Demand for these resources will be further spurred by grid modernisation and large-scale battery storage, electrification of transport, advances in defence technology and computing capacity, and improvements in the recovery and recycling of resources.

US$480bn
Annual spending in 2024

US$460bn
Projected annual spending in 2050

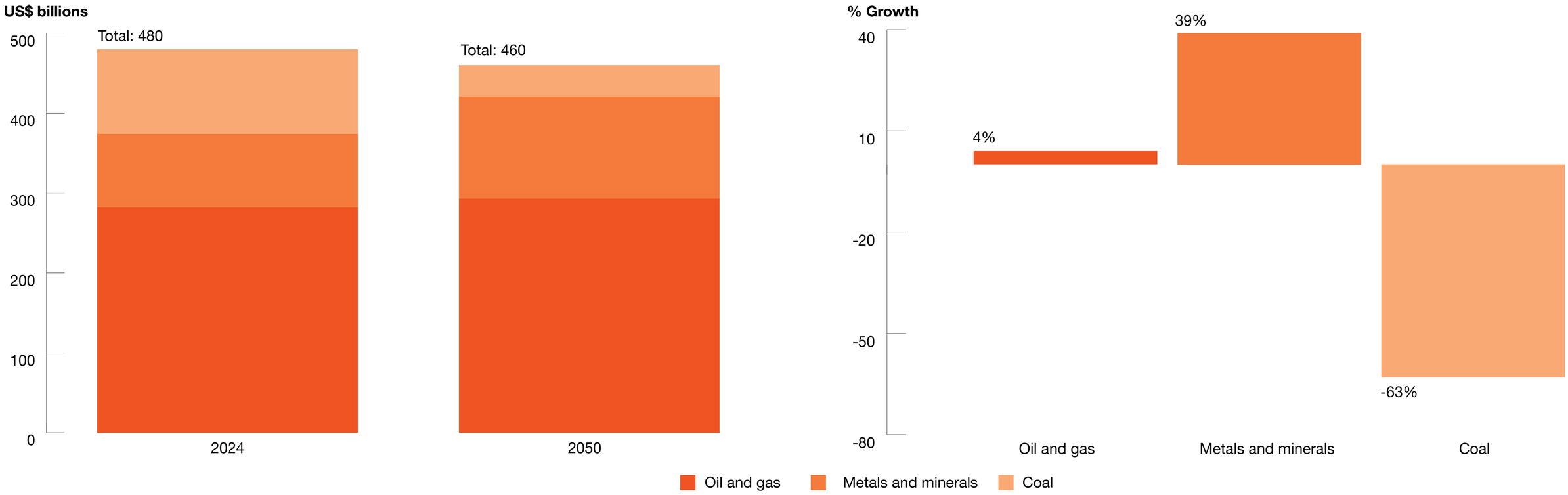
-0.2%
25-year CAGR

-4%
Decrease in annual spending by 2050

US$12.3tn
Cumulative spending by 2050

Figure 6:

Delivering critical materials: Spending by resources subsector



Note: All spending figures are in 2023 US dollar prices.
Source: PwC's Global Infrastructure Outlook 2025–50. Forecast modelling by Oxford Economics.

Social infrastructure

An often-underestimated asset class

Global spending on social infrastructure—encompassing healthcare, aged care, and education facilities—will increase steadily as demographic pressures mount and decades of underinvestment take their toll. By 2050, the proportion of people who are 65 or older will reach 20% of the global population, according to the World Health Organization. This will intensify demand on hospitals, aged care facilities, and supporting services. Chronic underinvestment in these areas has created large backlogs, both in upgrading existing facilities in developed markets and in building new ones to meet unmet demand in emerging economies. Annual spending on health- and aged-care facilities is projected to grow by 73% between 2024 and 2050. Meanwhile, spending on educational facilities is set to grow by 30% over the same period. Investments in both education and aged care also strengthen human capital—a foundational lever for productivity in the long term.

US$617bn
Annual spending in 2024

US$912bn
Projected annual spending in 2050

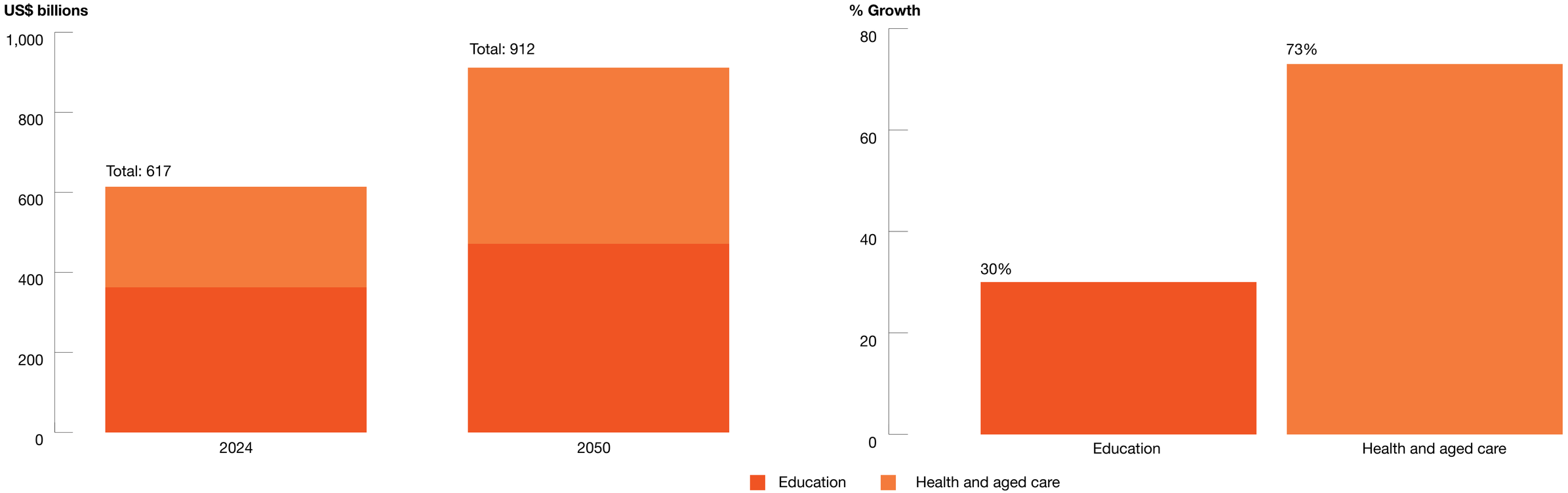
1.5%
25-year CAGR

48%
Increase in annual spending by 2050

US$19.4tn
Cumulative spending by 2050

Figure 7:

Support for society: Spending by social infrastructure subsector



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Industrial manufacturing

Reindustrialisation and advanced production

Industrial manufacturing—which forms the foundation of industrial economies—is set to change radically in the coming 25 years. This sector includes plants, facilities, and networks that support heavy metals and chemicals processing, petroleum refining, and automotive manufacturing. Chemicals will remain both the largest and the fastest-growing subsector, as population gains and rising incomes boost consumption of household products, basic chemicals, and agrochemicals—underpinning the subsector's projected 81% expansion between 2024 and 2050. Heavy metals and automotive manufacturing are set to grow more slowly, with increases of 44% and 21%, respectively, reflecting headwinds such as global excess capacity and trade tensions.

Meanwhile, global decarbonisation trends will flatten long-term demand for petroleum refining, contributing to its more modest 13% projected growth.

In mature markets, manufacturing plants and facilities are being transformed into smart, resilient, and sustainable hubs leveraging AI, robotics, and the internet of things to optimise production and reduce waste. As many emerging economies continue to expand their industrial base to meet growing demand, they'll need to embed flexibility and digital readiness from the outset. Industrial manufacturing will cluster in net-zero industrial districts powered by renewables and hydrogen, circular materials flows, and advanced automation.

US$472bn
Annual spending in 2024

US$712bn
Projected annual spending in 2050

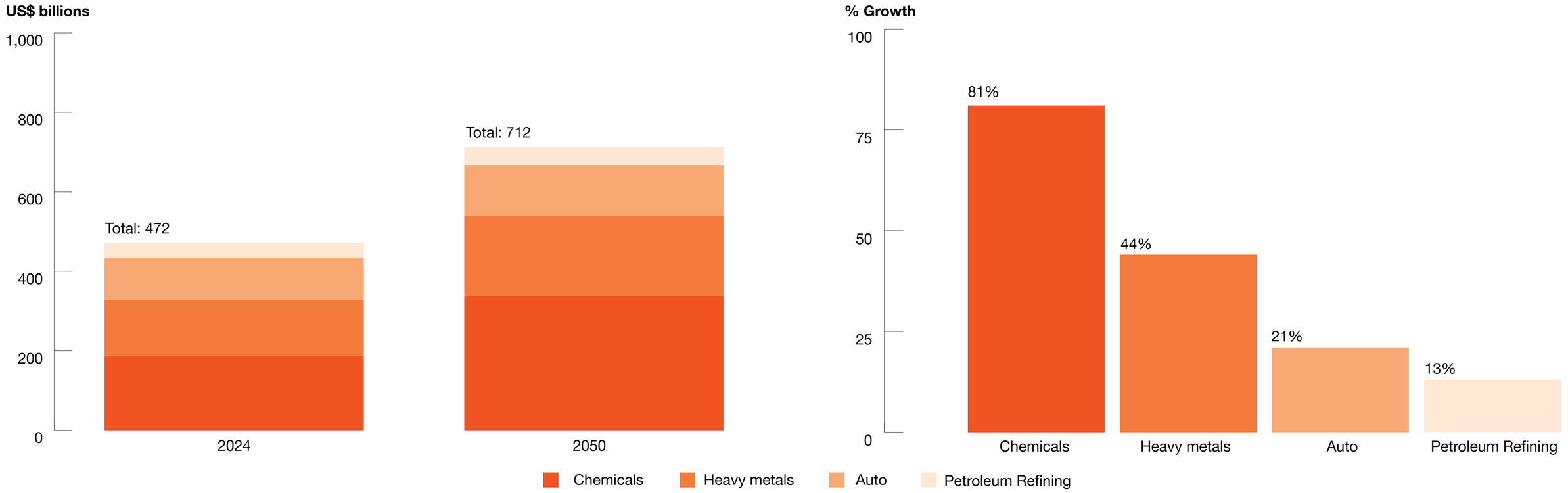
1.6%
25-year CAGR

51%
Increase in annual spending by 2050

US$15.5tn
Cumulative spending by 2050

Figure 8:

Factories of the future: Spending by industrial manufacturing subsector



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Defence

Switching to offence

Defence comprises physical installations such as shipbuilding facilities, dry docks, barracks and other military facilities, transport networks, depots and warehouses, and communications infrastructure. (It doesn't include weapons, vehicles, and equipment.) In the future, defence infrastructure will be energy-secure, digitally hardened, and climate-resilient, integrating microgrids, robust data networks, and autonomous surveillance. Annual defence infrastructure spending is projected to grow by 132% between 2024 and 2050. Even so, by 2050, it will represent only a little over 2% of total global infrastructure spending.

The rising investment in defence infrastructure will be driven by increasing security risks, particularly in Europe and the Asia-Pacific region. Other factors at play include shifting geopolitical alliances, the move to hybrid warfare, the need to build more resilient supply chains, and the imperative to recapitalise ageing defence infrastructure assets, particularly in the UK and EU. In the past, the traditional public-sector orientation of defence infrastructure often deterred private investors. But an opportunity is now developing to reframe defence as a strategic growth sector that will mobilise private capital. As governments seek to accelerate delivery so they can meet urgent operational needs, there will be significant investment potential and rising appetite from governments to innovate in both technology and commercial approaches.

US$73bn
Annual spending in 2024

US$168bn
Projected annual spending in 2050

3.3%
25-year CAGR

132%
Increase in annual spending by 2050

US$3.4tn
Cumulative spending by 2050

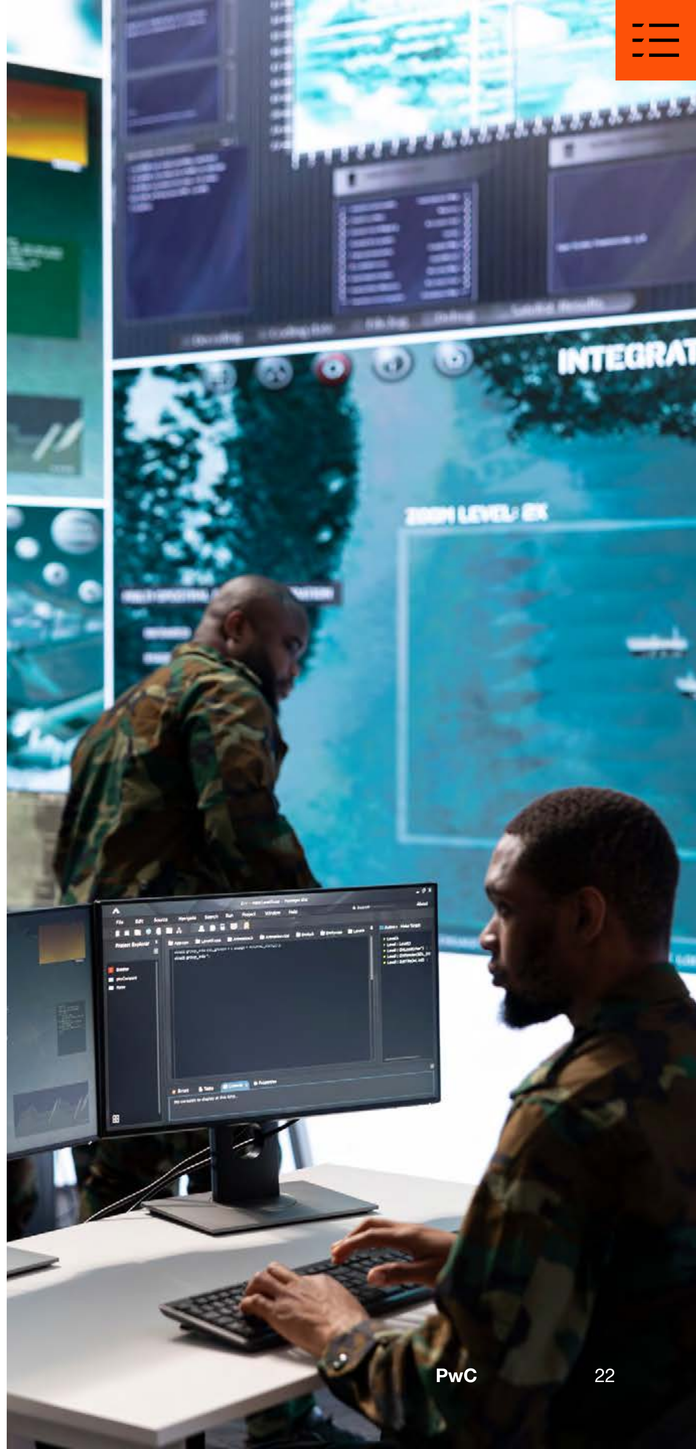
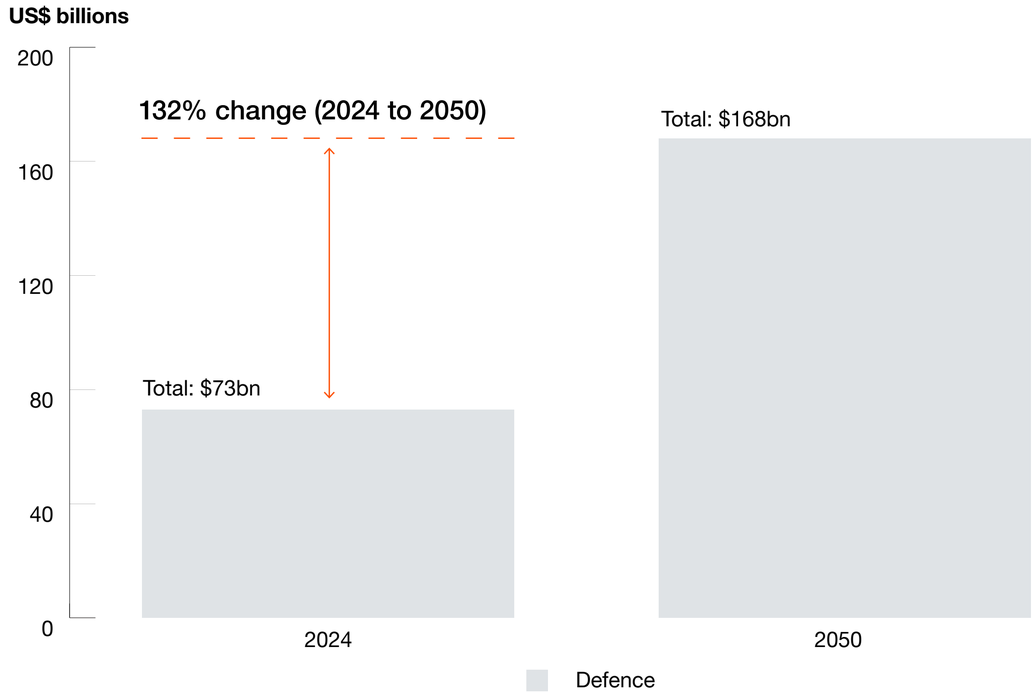


Figure 9:

Bolstering defence: Annual defence sector spending



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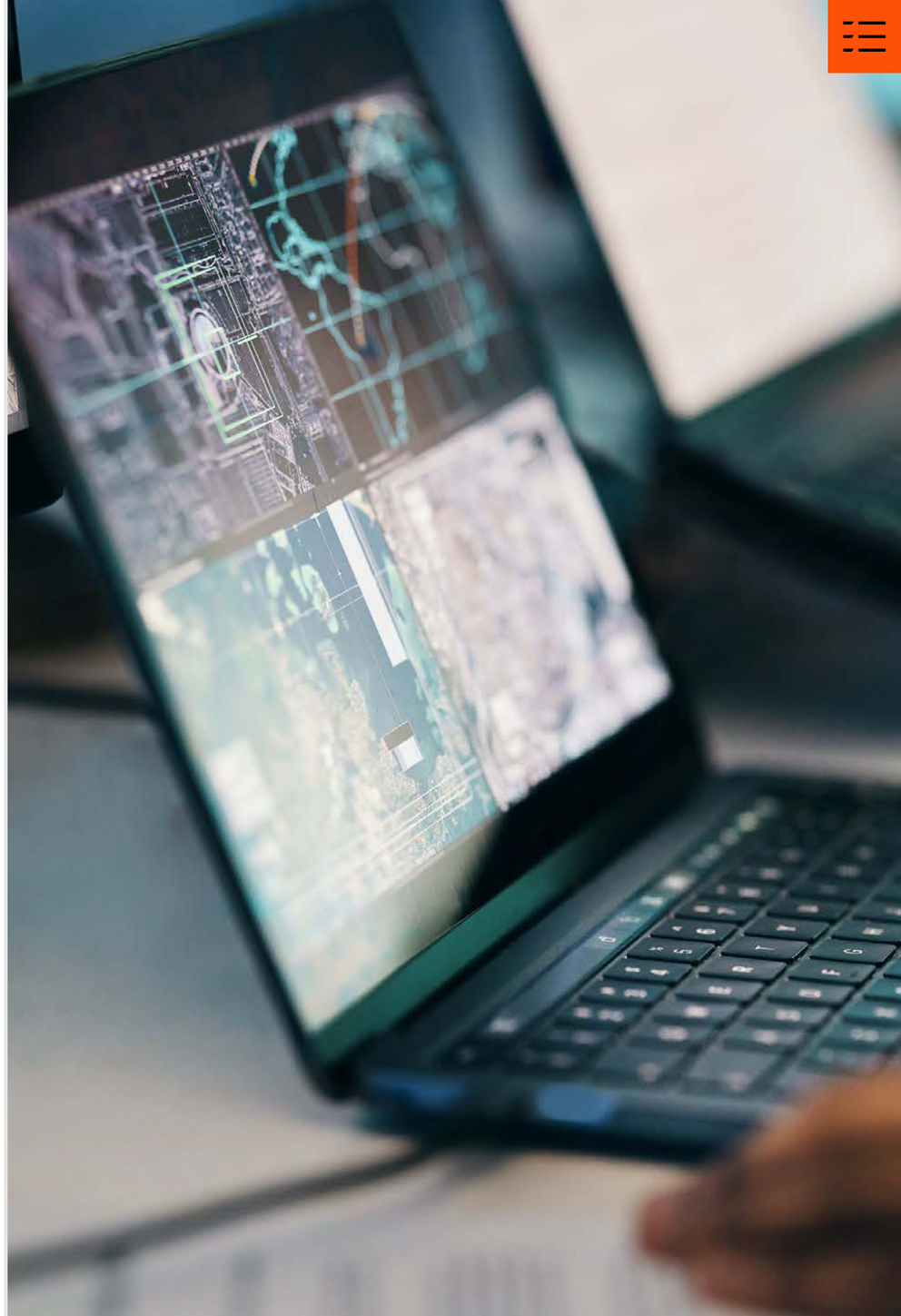


Water

Pressures continue to grow

Water represents a small share of total global infrastructure spending—$8.5 trillion between 2025 and 2050—but its strategic importance is only set to grow. The water sector faces mounting pressures from climate change, population growth, and shifting consumption patterns. It will play a critical role in shaping resilient systems and supporting global productivity over the long term.

Annual investment in water infrastructure is forecast to climb from $255 billion to $379 billion by 2050, a 49% increase—though growth will be uneven across regions. In advanced economies, mature service coverage and slower population growth will see investment channelled into renewal and maintenance, whereas developing and emerging markets will experience surging demand, driven by coverage gaps and demographic pressures. The Middle East, facing acute water stress, will require accelerated adaptation strategies to meet the twin challenges of rapid population growth and rising industrial needs.

US$255bn
Annual spending in 2024

US$379bn
Projected annual spending in 2050

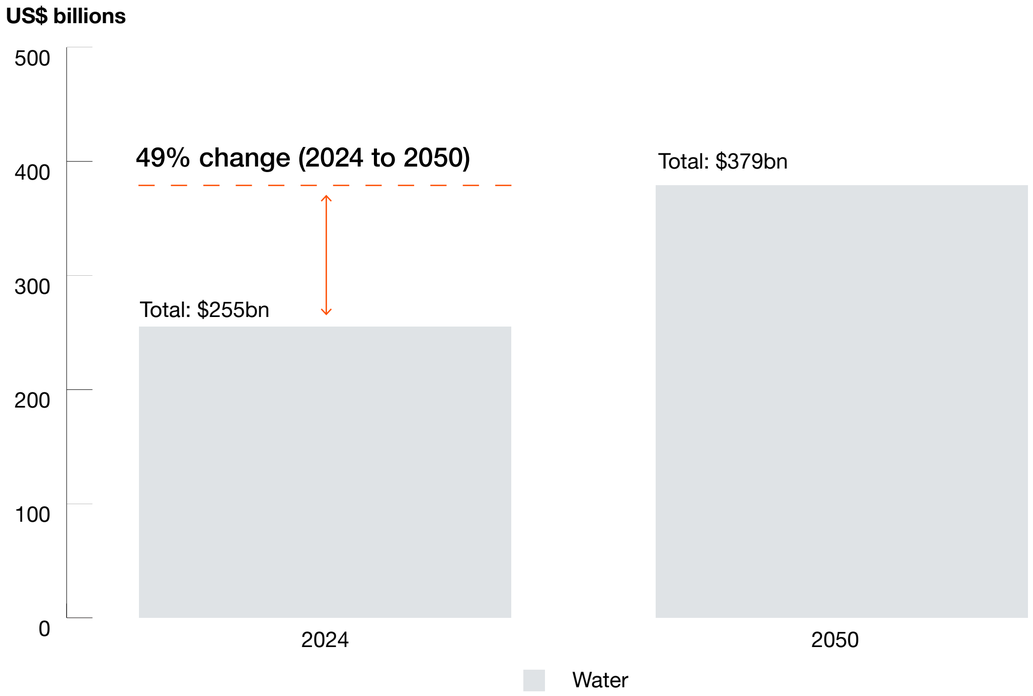
1.5%
25-year CAGR

49%
Increase in annual spending by 2050

US$8.5tr
Cumulative spending by 2050

Figure 10:

Water investment flows: Annual water sector spending



Note: All spending figures are in 2023 US dollar prices.
Source: PwC's Global Infrastructure Outlook 2025–50. Forecast modelling by Oxford Economics.

Agriculture

Secure and sustainable for the future

Between 2025 and 2050, $9.5 trillion will be invested in agriculture infrastructure. Like the water subsector, agriculture has an outsized strategic importance. Changes in climate, a growing population, and shifting consumption patterns combine to place significant pressures on agriculture.

Agricultural infrastructure spending is projected to rise from $306 billion in 2024 to $407 billion by 2050. Infrastructure development in agriculture is closely tied to output levels, which are set to expand most rapidly in developing and emerging markets grappling with demographic change and food security risks. The Asia-Pacific region will account for around 75% of total subsector spending over the next 25 years—with the Chinese Mainland representing 35% on its own. Africa, where primary production remains central to economic activity and agro-processing forms a significant part of the industrial base, is the fastest-growing region for investment.

US$306bn
Annual spending in 2024

US$407bn
Projected annual spending in 2050

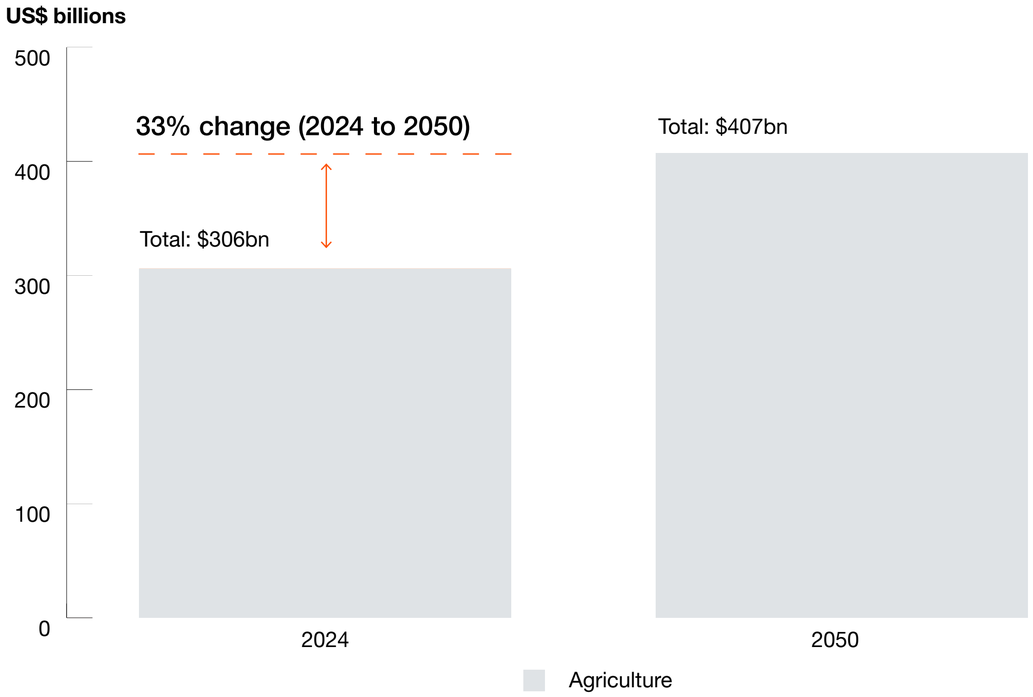
1.1%
25-year CAGR

33%
Increase in annual spending by 2050

US$9.5tn
Cumulative spending by 2050

Figure 11:

Agriculture investment takes root: Annual agriculture sector spending



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Source: PwC's Global Infrastructure Outlook 2025–50. Forecast modelling by Oxford Economics.

03

Regional Variations

Contrasting narratives

Regional variations in infrastructure investment

Though PwC's Global Infrastructure Outlook points to a 54% rise in annual infrastructure spending between 2024 and 2050, the overall figure masks wide regional variations. Population growth drives the need for infrastructure spending.

Each region of the world faces a distinct mix of demographic trends, natural resource availability, fiscal constraints, policy priorities, and risk exposures—factors that will shape the scale, timing, and composition of investment flows. Understanding these asymmetries is essential for investors and corporate firms allocating capital and capabilities across geographies, and for governments competing for private capital.

54%

rise in annual infrastructure spending to 2050 globally

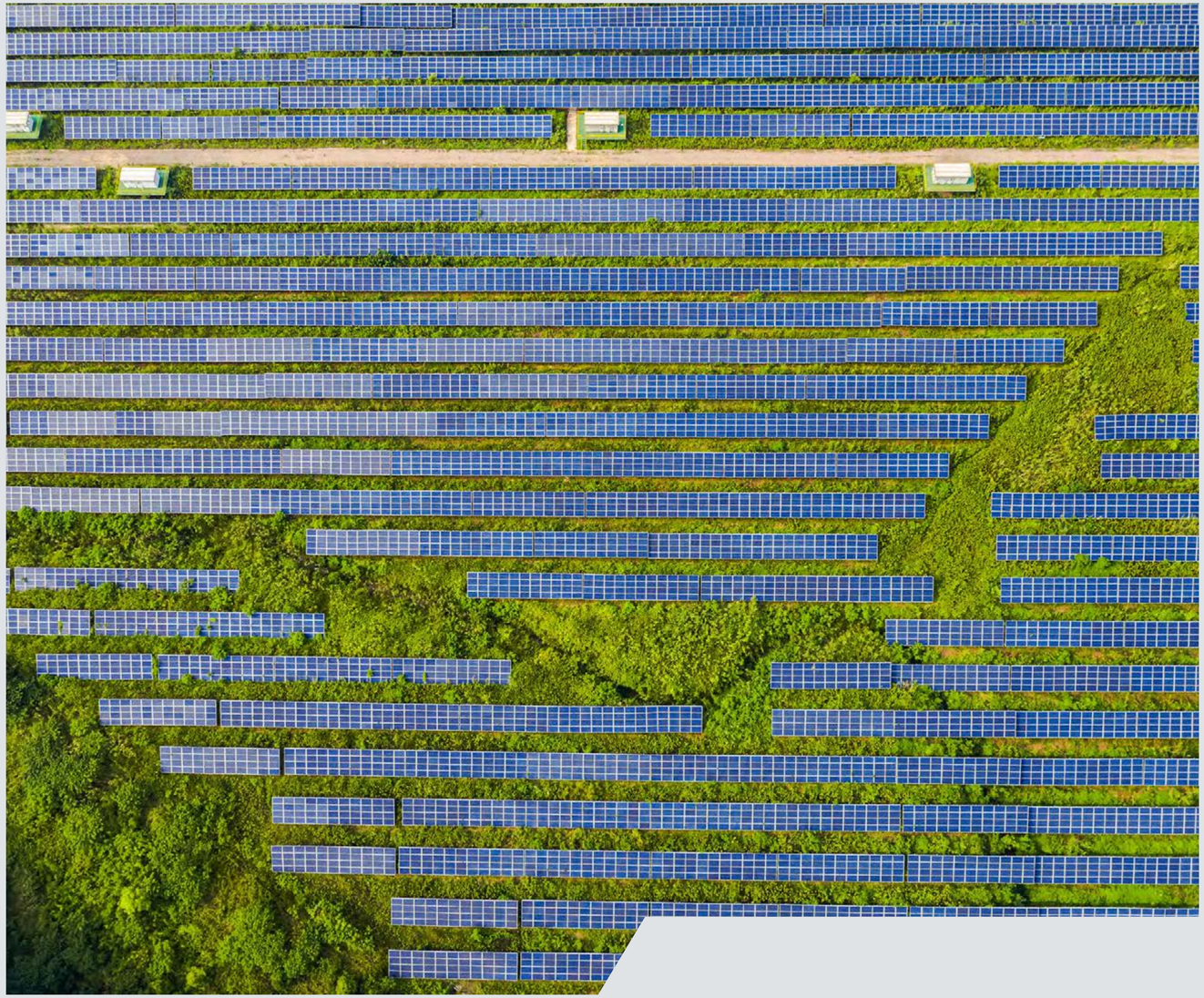
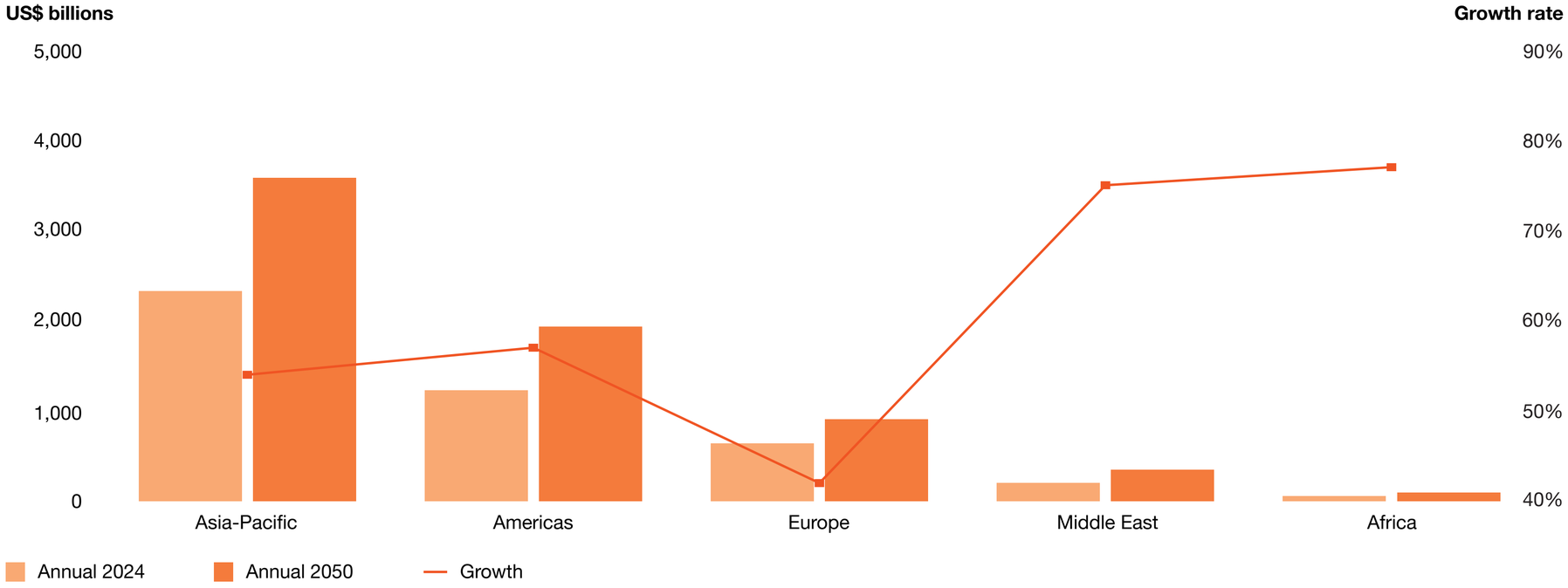


Figure 12:

A world of difference: Annual infrastructure spending by region



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Asia-Pacific: Building out and up

The Asia-Pacific region remains the engine of global infrastructure growth, accounting for over 52.4% of total investment through the forecast period. Regional infrastructure spending will rise from $2.3 trillion in 2024 to $3.6 trillion by 2050—an increase of around 54%. Annual spending on transport, which accounts for 40.8% of total investment, will grow by 86% between 2024 and 2050, led by major expansions in roads, rail, and airports. Power sector investment will increase by around 51% over the period, with especially rapid growth in transmission and distribution (197%) and utility-scale storage (300%). Meanwhile, the rapid build-out of digital infrastructure continues. Digital investment climbs by roughly 21% from 2024 to 2050, as data centres, fibre, and 5G networks expand across the region.

Advanced economies in the region, including Australia, Japan, New Zealand, and the Republic of Korea, are increasingly focused on the renewal of ageing assets, the expansion of digital and defence infrastructure, and the resilience of core networks. In contrast, emerging economies—including India (3.8% CAGR to 2050), Indonesia (3.6% CAGR), the Philippines (3.2% CAGR), and Vietnam (4.3% CAGR)—will deliver some of the strongest growth in infrastructure investment, propelled by relatively young populations, rapid urbanisation, and policy aimed at closing infrastructure coverage gaps and boosting industrial capacity. (For a more detailed explanation of mature and emerging economies in Asia-Pacific, see the methodology section.)

04

Unlocking the opportunity

Unlocking the opportunity

We expect the next 25 years to be defined by an unprecedented surge in global infrastructure investment. But there's no guarantee the required levels of spending will materialise. And top-line revenues don't automatically translate into profitable investments. To unlock value, investors, governments, and corporations will need a strategic, system-wide approach that overcomes today's constraints and accelerates delivery.

Key imperatives include:

01 Embed long-term strategic planning:

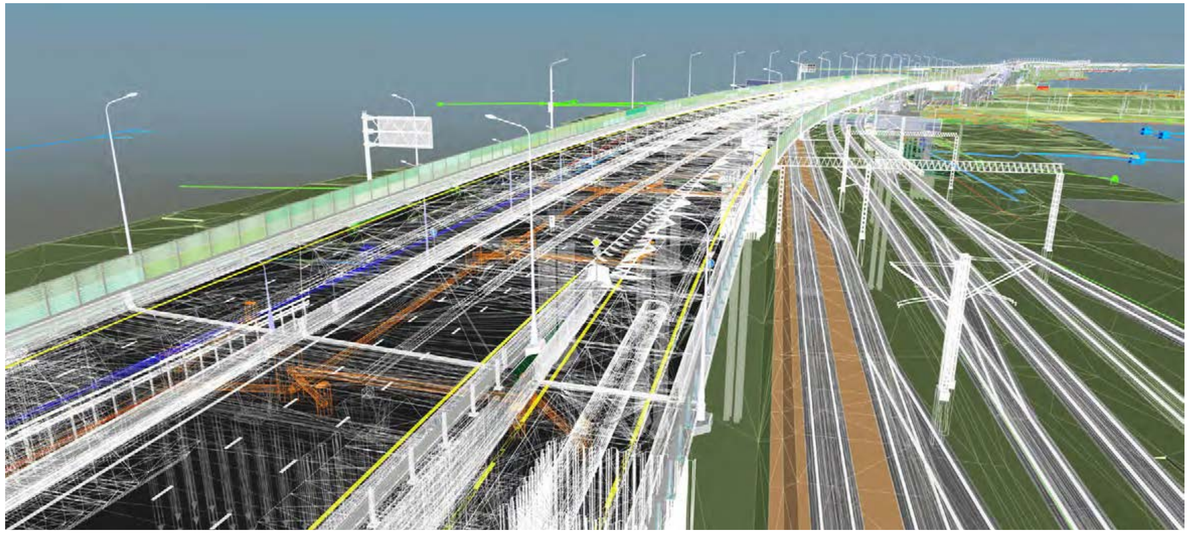
Political and policy uncertainty and regulatory and planning delays hinder the development of infrastructure and reduce its attractiveness as an investment. At the same time, infrastructure assets are inherently long-lived, often spanning multiple economic and political cycles. To maximise their value, robust frameworks that enable decision-making beyond short-term horizons are needed. This means establishing stable regulatory environments and clear national or regional strategies that provide certainty for investors and delivery partners. Governments should form independent bodies empowered to make infrastructure investment decisions across political parties. In parallel, planning and regulatory approval processes must be streamlined to accelerate delivery and reduce uncertainty.

02 Move from siloes to integrated systems:

Concentrating investment in power or digital sectors without making corresponding upgrades in other sectors like transport or water risks creating bottlenecks that may ultimately constrain both returns and growth. Conversely, spreading and coordinating investment across the infrastructure ecosystem unlocks multiplier effects—while also enabling the alignment of capital, capability, and policy to deliver integrated systems that boost productivity and long-term value. Consider: combining data centre campuses with clean power purchase agreements and water reuse. Developing electric vehicle corridors alongside grid upgrades, battery storage, and depot charging. Linking port automation with rail and logistics hubs. Examples of successful coordination abound.

03 Innovating financing and partnership mechanisms:

Because public budgets alone will be insufficient institutional investors, sovereign wealth funds, pension funds, and private credit providers will be central to the next 25 years of infrastructure development. What's needed is more effective and efficient collaboration between governments and the private sector. This includes developing new financing structures, risk-sharing mechanisms, and delivery models that leverage the strengths of both sides. One example is capital recycling, wherein governments sell or lease mature infrastructure assets and reinvest the proceeds into new projects—unlocking funding without increasing public debt. A priority will be rapid bankability of new technologies, including green hydrogen, geothermal technology, virtual power plants, behind-the-meter platforms, advanced storage, and data centre energy solutions. This will require standardised performance data, common risk taxonomies, stronger public-sector risk-mitigation tools, and new insurance products that de-risk technologies in the early stages. Blended finance will also need to evolve. Instead of bespoke, deal-by-deal structures, the market will shift towards standardised, scalable platforms: template risk allocation models, platform-level vehicles that pool assets, modular instruments, and digital marketplaces that match de-risked projects to capital, particularly in emerging markets.

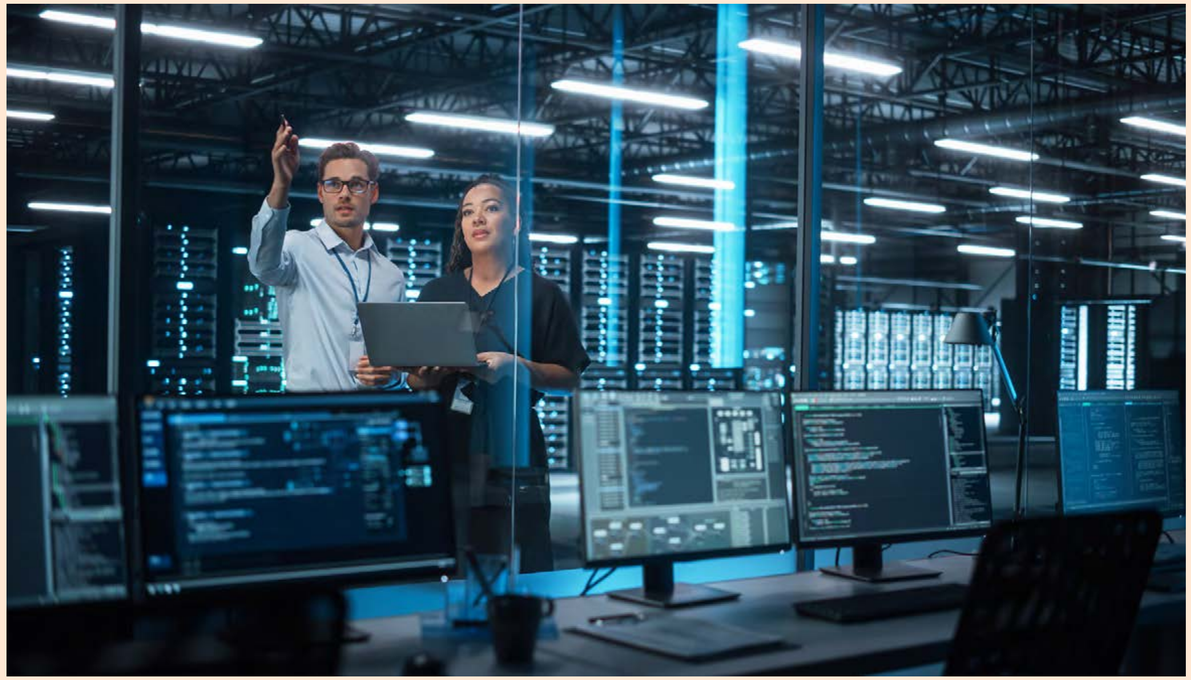


04 Redefining planning and construction:

By 2050, industries will deliver infrastructure through integrated, cross-sector platforms. Energy, transport, digital, water, and industrial systems will be co-designed, co-located, and co-optimised. They'll be supported by modular construction and automated project controls that compress delivery times and improve accuracy. End-to-end building information modelling (BIM), digital twins, and integrated data environments will be universal. Generative AI and agentic AI will transform delivery by predicting long-term risks at the concept stage, auto-generating and stress-testing design and sequencing options, orchestrating complex interfaces, and recommending real-time mitigation—thus reducing overruns, accelerating delivery, and saving billions across capital programmes. In parallel, circular construction practices—large-scale reuse and recycling, low-carbon materials, off-site manufacturing, and low-impact site practices—will materially reduce the cost and carbon footprint of major projects.

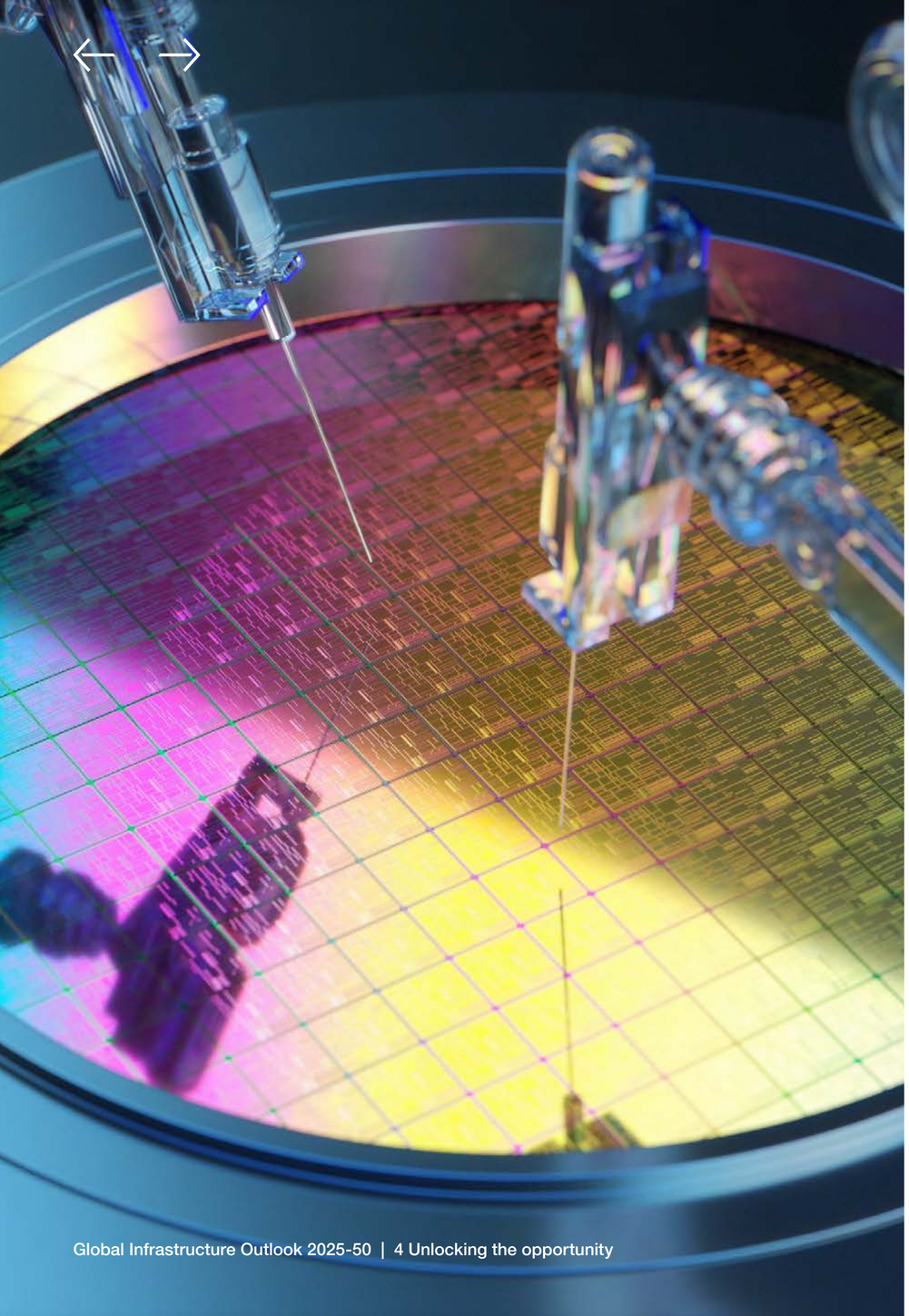
05 Adopting new commercial models:

Outcome-based contracting—focused on emissions, resilience, reliability, and user experience—will become the default. Infrastructure as a Service subscription models will expand across energy, digital, mobility, heat, and resilience assets, with data-driven value streams increasingly complementing traditional tariffs. As systems become more integrated, multi-party platform models will replace linear supply chains. These platforms—sharing risk, data, and value across operators, technology providers, investors, and the public sector—will enable faster deployment of infrastructure at lower cost.



06 Engaging communities early and consistently:

Community opposition can delay or derail projects. Involving communities from the outset and maintaining an ongoing dialogue helps explain why both public and private investment is needed, and how these projects will deliver real benefits to people—such as more jobs, improved access to places of employment, and better connectivity to essential services. And because the high cost of capital and access to financing is a challenge, communities also need to be engaged on the topic of who pays for infrastructure. Leaders must reframe costs and investments that can generate both a financial and a social return in the form of improved quality of life or expanded services.



Acting with Courage

Successfully addressing all these imperatives will require each key group of stakeholders in the infrastructure ecosystem to take specific steps.

Governments

- Create enabling environments through transparent project pipelines, streamlined regulatory frameworks, and innovative financing models that attract private capital and accelerate delivery.
- Consider targeted intervention in areas where supply chain fragility threatens national resilience.

Investors

- Recognise the evolving risk–return landscape, and align capital with those sectors and regions poised for long-term, stable growth.
- Be alert to a changing landscape of opportunity as new sectors emerge as growth areas, and as global need shifts towards the Asia-Pacific region and emerging markets.

Corporations

- Anticipate and adapt to the shifting infrastructure ecosystem, leveraging technology, supply chain resilience, and cross-sector partnerships to capture new opportunities.

Communities

- Engage early and often in the planning and delivery process. By doing so, you can help realise the promised outcomes of this new age of infrastructure, which include improved quality of life, greater connectivity, and more equitable access to essential services.

The world will be very different in 2050. It needs a productivity revolution. To deliver that revolution, stakeholders must work together to channel the right investment into the right assets at the right time and in the right ways. Starting today.

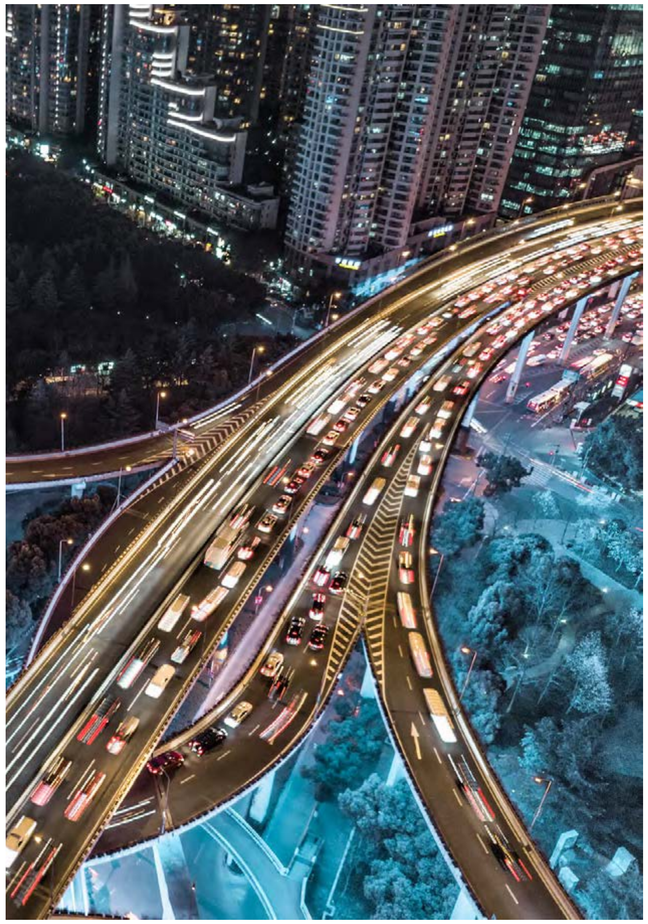
Definitions and methodology

Definition of infrastructure spending

Infrastructure spending is defined as gross fixed capital formation (GFCF) by the public and private sectors on fixed, immovable structures that support long-term economic growth. In addition to new spending, it includes replacement spending and capital expenditure on maintenance (i.e. to substantively extend the lifetime of an asset). This measure is a subset of total fixed spending and excludes cultivated biological resources, intellectual property products, transport equipment, and information and communications technology (ICT) equipment.

The definition of infrastructure spending has varying implications for different sectors. A few examples: ICT equipment, such as CPUs and GPUs, which represents a significant proportion of the capital outlays for data centre construction, is not included under the definition of infrastructure. Power infrastructure assets such as solar panels are not explicitly defined under the OECD definition of GFCF. Transport equipment such as rolling stock or ships and planes in the defence sector are not included in the infrastructure figures.

It should be noted that this is our preferred definition, but the analysis has required us to collect data from a wide range of sources, and definitions inevitably vary across those sources. We have attempted to identify the available data that most closely aligns with the definitions used.



Data sources

The main challenge in providing comparative infrastructure spending figures across countries and sectors is the lack of a single and consistent dataset. A comprehensive data sourcing exercise was undertaken for the analysis contained in this report. Most data sources, accessed in 2025, provided figures up to either 2023 or 2024.

The main sources of spending data used were the OECD, Eurostat, and national statistical agencies. Data that was not available from official public sources was estimated with a variety of techniques. This process involved using additional data sources (International Energy Agency, Milex), estimating sectoral infrastructure spending from sectoral capital expenditure, or using available metrics from peer countries to estimate spending.

Spending forecast methodology

Oxford Economics created a new database of infrastructure spending forecasts to anchor PwC's research. The forecasts are based on Oxford Economics proprietary models for the construction industry and cover nine sectors in 45 countries and territories. The infrastructure spending forecasts are globally consistent, and are linked through global and country-level assumptions of trade volume and prices, competitiveness, capital flows, interest and exchange rates, and commodity prices. For a particular country and sector, the infrastructure spending forecast is informed by end-use demand factors such as population growth, income growth, cost of capital, and economic activity across sectors.

Given the changing composition of economies over time, the infrastructure spending forecast will diverge from country-level GDP.

The database provides a structural economic framework that considers both supply and demand factors affecting sectoral growth. This is distinct from spending projections based on a pipeline of publicly announced projects, which are unable to provide long-term projections of spending due to a lack of project visibility in the future. The new infrastructure spending forecasts provide a macroeconomic outlook on future spending outcomes across the countries and sectors examined in this report.

The calculations for defence stem from a slightly different methodology. Unlike other sectors, these projections are not derived from structural economic modelling; instead, they assume a fixed share of GDP, adjusted for announced and anticipated changes to defence spending as a percentage of future GDP. These reflect policy signals such as NATO's interim target of allocating 1.5% of GDP to defence infrastructure (excluding equipment and personnel) by 2035, on the path towards a longer-term ambition of 5% of GDP.

Throughout this Outlook, growth percentages are calculated based on exact projections rather than the rounded sums mentioned in the narrative.

Sector definitions

The nine sectors of infrastructure investment analysed in this report consist of spending on fixed assets and structures used for the following purposes:

Agriculture

The growing of crops, raising and breeding of animals, and harvesting of timber and other plants, including the cost of irrigation and drainage, on-farm structures, and storage facilities

Digital infrastructure

The information and communications sectors, including towers, fibre and cable networks, data centres, and related facilities.

Defence

Physical installations that support defence, including barracks and other military facilities; transport networks, depots, and warehouses; ship-building facilities and dry docks; and communications infrastructure.

Industrial manufacturing

Plants, facilities, and networks that support heavy metals and chemicals processing, petroleum refining, and automotive manufacturing.

Power

Generation, storage, and distribution of electricity, including renewable assets, fossil fuel and nuclear power plants, transmission and distribution, and battery storage.

Resources

The exploration, extraction, processing, transportation, and storage of oil and gas, coal, metals, and minerals, including mining facilities, pipelines, refineries, and storage terminals.

Social infrastructure

The provision of health or education services, including aged care facilities.

Transport

Transportation, including roads, bridges, tunnels, railways, airports, ports, and marine works.

Water

The treatment and distribution of water, including sewage and drainage systems. Assets include treatment plants, dams, pipelines, and drains.

Regional definitions:

Each region in the Outlook is represented by a group of countries and territories that act as a viable proxy for the whole. The proxies for each region are:

Africa

Americas

Asia-Pacific

Europe

Middle East

Australia
The Chinese Mainland
Hong Kong SAR
China
India
Indonesia
Japan
Malaysia
New Zealand
Philippines
Republic of Korea
Singapore
The Taiwan region
Province of China
Thailand
Vietnam

Advanced or mature economies in Asia-Pacific include Australia, Japan, Hong Kong SAR, New Zealand, Republic of Korea, Singapore, and the Taiwan region. Developing and emerging Asia-Pacific economies include the Chinese Mainland, India, Indonesia, Malaysia, the Philippines, Thailand, and Vietnam. Definitions are based on IMF aggregations, found here.

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