Global Macro Research

22 May 2025

9:14 minute read

#Global / #Sustainability / #Industrial policy

How large are global infrastructure needs?

Both developed and emerging economies have huge physical infrastructure investment needs, which we quantify using a new modelling framework. Building this infrastructure will be essential to underpin future growth and hitting sustainable development goals. Substantial amounts of private capital will be required to help fund this investment.

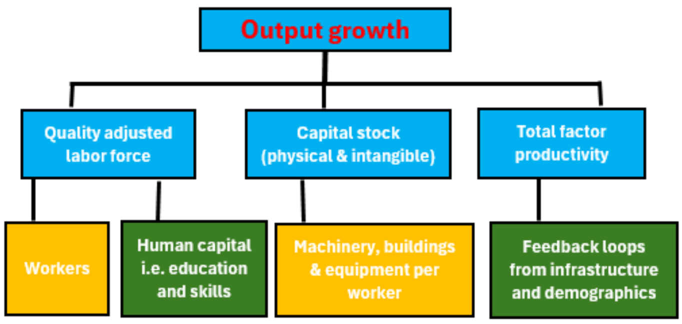
Key Takeaways

- The world will need to spend almost $64 trillion on physical infrastructure over the next 25 years, equivalent to 1.7% of global GDP per year.
- Emerging markets (EMs) account for $43 trillion of this, reflecting their greater development needs and faster economic growth, while developed markets (DMs) need to spend $21 trillion. Transportation and power generation make up the bulk of physical investment needs.
- The seven-million-km expansion of the global road network, alongside substantial maintenance costs of existing roads, is by far the largest cost within transportation investment, totalling $28 trillion.
- Rising power needs, the electrification of transport, and the pivot towards renewable energy, imply that global power generation capacity needs to rise from 8,000 gigawatts (GW) to over 21,000 GW (+165%) by the middle of this century, at a cost of $27 trillion. This could be pushed higher still by power-hungry new technologies, such as artificial intelligence data centres.
- China's $12 trillion expenditure on power generation is set to be the largest single infrastructure investment undertaken by any country, equivalent to almost a fifth of total global infrastructure spending.
- We expect that the private sector will be increasingly required to help finance these infrastructure needs, as governments are squeezed by high debt levels and geopolitical pressures to spend more on defence.

Infrastructure investment is essential to lay a solid foundation for global growth

Different countries and regions face radically different long-term economic futures. Varying population dynamics, stages of development, growth models, political systems, and institutional strength all influence potential economic growth and prosperity.

Figure 1: Infrastructure is a key building block of long-run economic growth



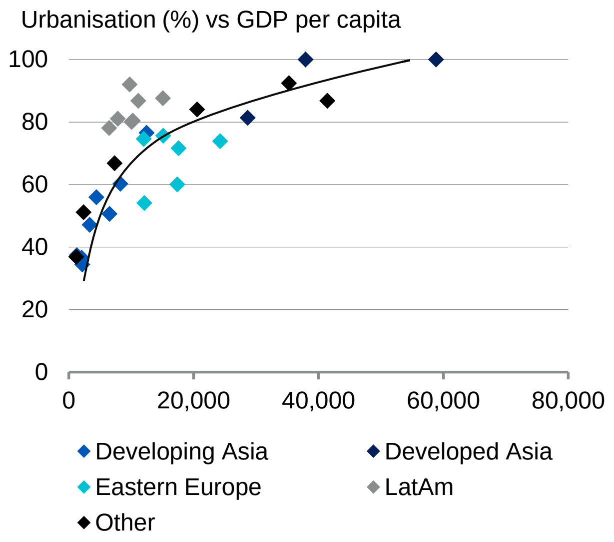
Source: Aberdeen, May 2025

Physical infrastructure – such as road and rail, power generation and utilities – is a 'keystone' within the building blocks of growth. Good infrastructure cuts the cost of doing business, for example by lowering the cost of producing goods and moving them around the country, which then filters through the vast network of interconnected firms and consumers (see Figure 1). Reliable – and increasingly green – sources of power do more than just keep the lights on.

Emerging markets have the largest infrastructure needs…

Emerging markets (EMs) with rapidly growing populations, such as India or Nigeria, and rising urbanisation rates generally face the greatest need to expand their infrastructure. Relatively low urbanisation rates – particularly in developing Asia – imply that infrastructure spending will rise as workers migrate from rural jobs with low productivity and wages to cities, where prospects are brighter (see Figure 2).

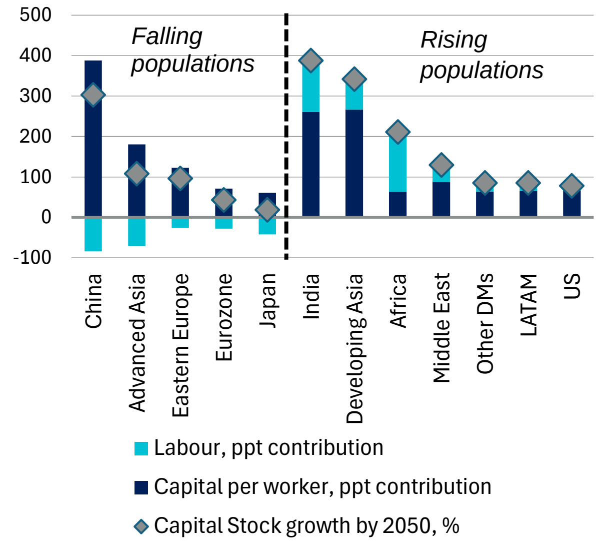
Figure 2: Rising urbanisation will drive EM infrastructure needs



Source: Aberdeen, Haver, World Bank, May 2025

Even in EMs that face a challenging demographic outlook (such as China, Thailand, Korea), relatively low levels of capital per worker suggest that investment and infrastructure needs will remain high. Consistent with our global growth projections, capital deepening – which leads to a productivity boost via the accumulation of machinery, computing power, buildings and other economic infrastructure – can outpace falling populations in China, high-income Asia, Eastern Europe, the Eurozone and even Japan (see Figure 3).

Figure 3: Rising capital per worker can more than offset demographic drags

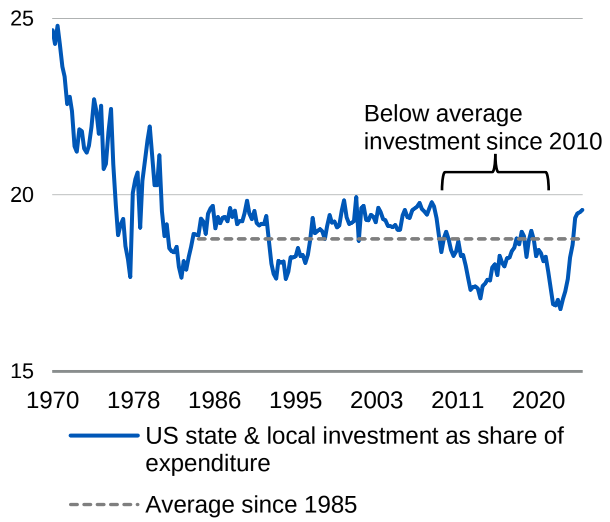


Source: Aberdeen, Haver, May 2025

…but developed markets also face substantial "infrastructure gaps"

The accumulation of years of declining public infrastructure spending (see Figure 4) also means that many DMs have substantial infrastructure needs, even before considering climate-related expenditure.

Figure 4: US public sector infrastructure spending was weak for a decade, suggesting scope for catch up



Source: Aberdeen, Haver, May 2025

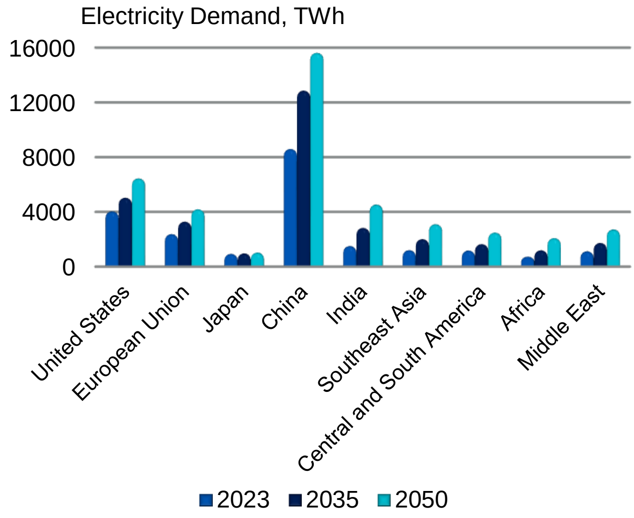
Infrastructure in the US was given a "C" rating in its last report card by the American Society of Civil Engineers (ASCE). Many roads, airports, schools and the energy sector infrastructures were judged to be in poor condition, with "D" ratings. The ASCE flag that the structural integrity of dams and levees are increasingly affected by extreme weather events, while the number of "high hazard" dams has risen by 20% since 2012.

Power-generation capacity needs to surge

Energy grids across the world need to undergo a massive expansion to accommodate economic growth, the move towards renewable sources of power, the electrification of transportation and emerging technologies, such as artificial intelligence (AI) data centres.

According to the International Energy Agency (IEA), the US economy's electricity consumption could rise from 4,000 terawatt hours (TWh) in 2023 to almost 6,500 TWh by 2050, a 60% increase (see Figure 5). Among other developed regions, demand in the EU is projected to rise by 76%, while Japan's may only rise by 11%.

Figure 5: Global electrification adds to power demand



Source: IEA, Aberdeen, May 2025

Demand is expected to rise more rapidly among emerging markets, usually from lower bases. Indeed, the IEA forecasts that demand will increase more significantly in India (200%), Africa (186%), Southeast Asia (158%) and the Middle East (142%). Chinese demand is also on track to rise by 82% to over 15,600 TWh by 2050.

Much of this demand reflects a combination of structural changes (economic growth, the size of manufacturing sectors, urbanisation and demographics) and the need to shift transport away from fossil fuels and onto the grid.

But electricity-generation capacity also needs to expand more than what is implied by demand growth alone.

That's because the pivot towards renewable energy requires a greater amount of capacity to be installed relative to thermal power. Put simply, the limited window of sunshine per day and the vagaries of wind mean a larger capacity is needed to collect and store energy. As we discuss later, our latest modelling shows that the pivot to renewables almost doubles the amount of capacity that needs to be installed to meet demand for many major economies.

Moreover, there is a risk that we are underestimating power needs due to the power-hungry nature of AI. According to the IEA, the typical AI data centre needs capacity of around 100 megawatts (MW), equivalent to the annual electricity needs of 100,000 households. Larger and more power-hungry centres used for more complex models, alongside increasing demand for AI-related services, could see these energy needs rise dramatically.

So how can we calculate infrastructure needs?

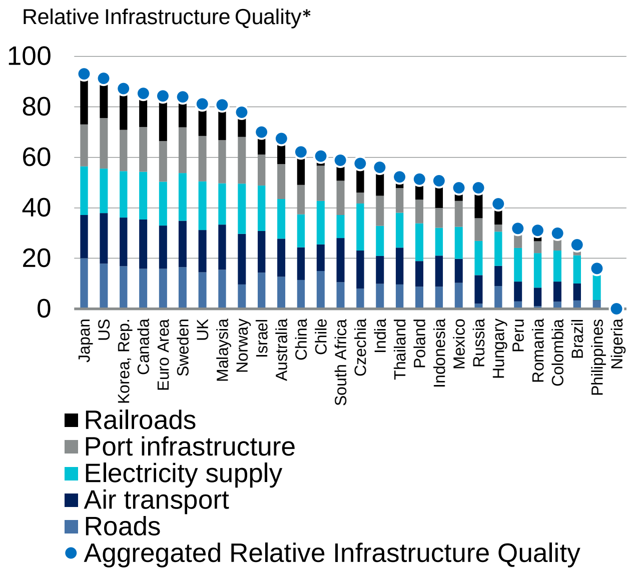
Data limitations make estimating precise infrastructure needs far from straightforward, even if we limit ourselves to considering physical infrastructure (transport, power, utilities), rather than considering wider definitions that could include social infrastructure (such as education, health, and public housing).

Moreover, judging the path for infrastructure is dependent on economic size, which in turn is dependent on infrastructure.

A 2022 World Bank Review finds that each dollar of public infrastructure spending generates $1.50 in additional economic output, suggesting a positive feedback mechanism exists that could push countries onto stronger growth paths, allowing even more investment to take place.

The World Bank notes that there are relatively few studies to help judge the feedback loop for EMs, but recent work supports the assertion that the effect is stronger. Typically, infrastructure is of poorer quality in EMs (see Figure 6) suggesting improvements can create a bigger boost.

Figure 6: EMs will benefit most from infrastructure investment, but DMs can get a productivity boost too



Source: World Bank, World Economic Forum, Aberdeen, May 2025. *Note: 2017 figures are taken from the WEF's Global Competitiveness Index, and then normalised for our country sample. Aggregated quality scores are a simple average across infrastructure types.

A country with an under-developed road and rail transport system could find that addressing these infrastructure shortfalls raises whole-economy productivity, which in turn opens the door to further investment from both the public and private sector as its economic size increases.

Such a dynamic would be most pronounced in EMs but could operate to a lesser extent in DMs that have under-invested for long periods.

However, we must separate out what could be, from what is likely. History is littered with examples of EMs failing to emerge, suggesting that budgetary, institutional and other political and practical constraints often block a virtuous cycle between infrastructure and growth from forming.

Our estimates of infrastructure spending needs are therefore conditioned on our long-term growth forecasts and then combined with other key explanatory variables such as stage of development (GDP per worker), population trends, urbanisation rates, and current economic structures (for example the shares of industry and agriculture).

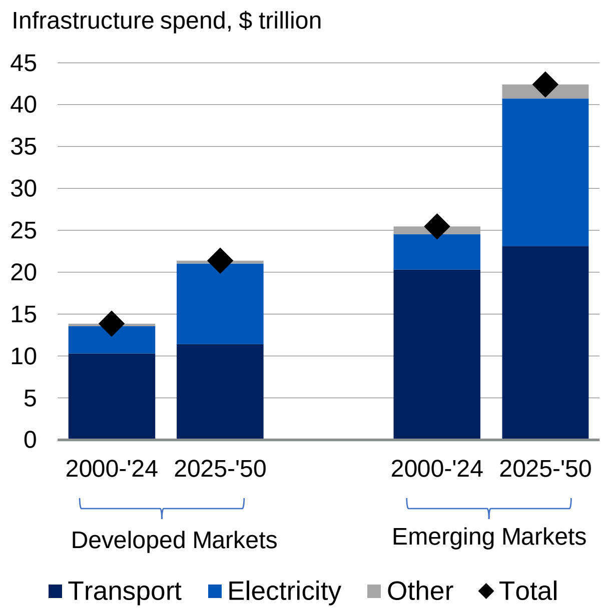
At a high-level, infrastructure needs moderate as income levels rise and the extent to which countries have already built out physical infrastructure, although those countries with substantial existing infrastructure must also spend more on maintenance to counter wear and tear. As such, we also build in depreciation costs.

For more detail on the modelling approach we use and the results, please see Appendix 1, 2 and 3.

How much does the world need to spend on infrastructure?

We find that the world is likely to spend almost $64 trillion on infrastructure over the next 25 years, equivalent to 1.7% of global GDP per year. Emerging markets account for $43 trillion, while developed markets may spend $21 trillion; transportation and power generation make up a similar share of expenditure in both cases (see Figure 7).

Figure 7: EMs will spend the most, but DMs still have substantial infrastructure needs

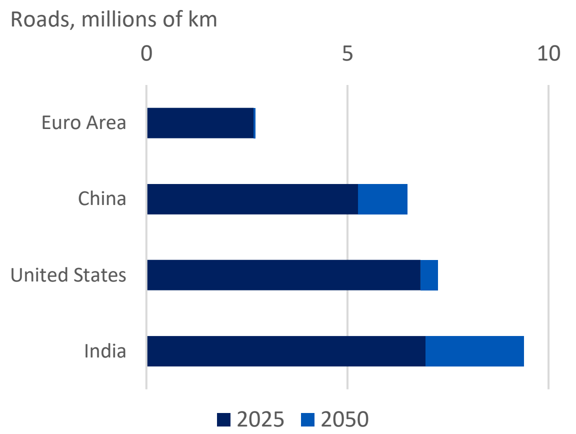


Source: Aberdeen, May 2025. *Note: spending is in real 2025 USD terms.

Investment in the road network makes up the bulk of the global expenditure on transport (around $28 trillion across EMs and DMs), largely reflecting the seven-million-km expansion of the global road network (+20%) we project, but also the high maintenance costs of existing roads.

India and China are likely to account for most of the new roads built, while we see some scope for US roads to expand too (+0.4 million kilometres). In contrast, we project little change in the road network in Europe, partly reflecting more muted population and growth trends (see Figure 8).

Figure 8: It's costly to keep the world moving



Source: Aberdeen, May 2025.

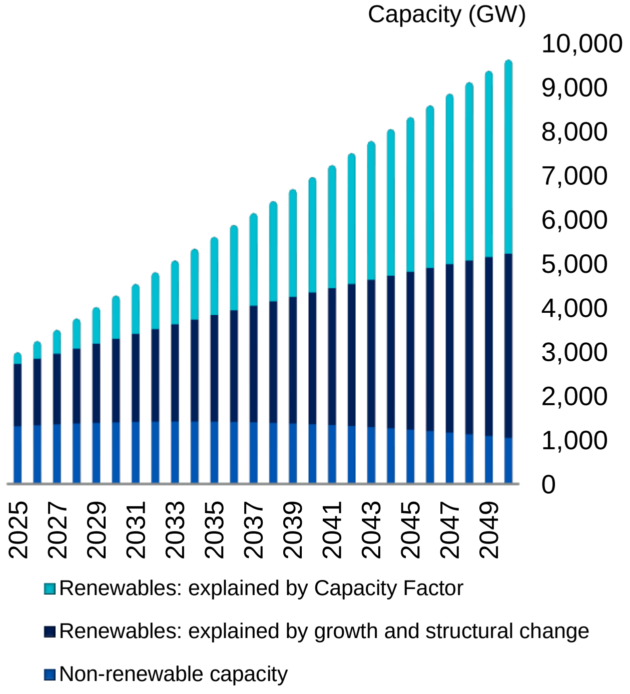
That said, the size of the existing European road network comes with substantial maintenance costs, meaning that it is still one of the largest infrastructure expenditures worldwide ($1.8 trillion).

Rising power needs and the pivot towards renewable energy sources imply more than $27 trillion of expenditure, a notable rise from that of the prior 25 years (see Figure 7). Our models project that global generation capacity needs to rise from 8,000 GW to over 21,000 GW (+165%) by the middle of this century.

Less than half of this staggering increase is due to rising demand from global economic growth and structural change. The pivot towards renewables – which require larger infrastructure investment costs upfront to replace an equivalent amount of thermal power capacity – explains around two-thirds of the rise.

China is a key part of the global energy story and illustrates this dynamic. Absent a move towards renewables, we would have expected electricity generation capacity to rise from around 3,000 GW to 5,250 GW by 2050. But the lower 'capacity factor' of renewables means we expect China's generation capacity to rise to over 9,500 GW (see Figure 9).

Figure 9: China's power needs could triple by 2050



Source: Aberdeen, May 2025.

As a result, China's expenditure on power generation is set to be the largest single infrastructure investment undertaken by any country: $12 trillion is almost 45% of global power generation expenditure and almost a fifth of total global infrastructure spending over the next quarter century.

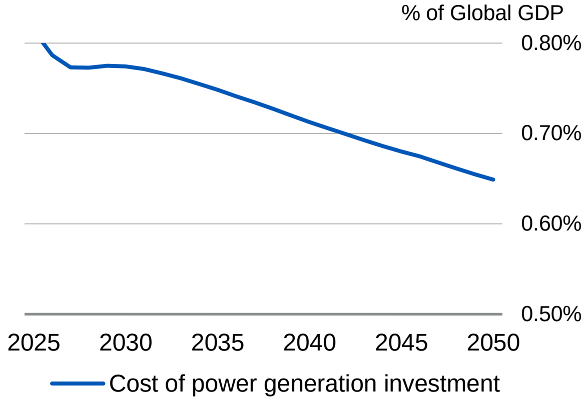
Moreover, the risks are skewed towards an even larger and faster power generation expansion. Leaning into power generation may help China offset drags from real estate and trade tensions with the US. Building up excess capacity may even be part of the country's long-run strategic aims. Power could be exported to neighbouring countries, which would tie them to China politically.

Green lights ahead

The good news is that investment costs for the green transition related to electricity generation should fall modestly relative to GDP as economies expand (see Figure 10). Should the price of solar fall more than our cautious assumptions, costs could drop even more quickly and the share of renewables within power generation could rise more quickly.

Moreover, while installation costs are higher for renewables - due to the need to install more than twice the power capacity vis-à-vis non-renewables – this is unlikely to deter many countries as substantial operating savings come from not having to obtain coal or gas to burn.

Figure 10: The power rollout gets cheaper over time

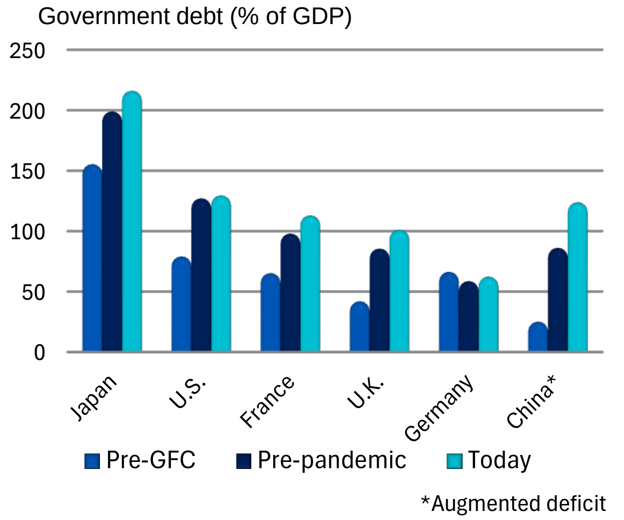


Source: Aberdeen, May 2025

How will future infrastructure needs be funded?

Both public and private capital have a role to play in funding infrastructure. The former can be cheaper because governments can borrow at lower rates, but many governments are feeling the squeeze from higher interest rates, elevated debt levels (see Figure 11) and geopolitical pressure to raise defence spending and insulate supply-chains.

Figure 11: Government fiscal space is being constrained by high debt levels and interest rates



Source: Aberdeen, Haver, May 2025

We expect that private sector involvement will be called on to help fill the gap formed by more reticent governments, bringing efficiency, capital discipline, innovation and – counter to some pre-conceptions – a long-term view removed from election cycles.

Authors

Robert Gilhooly, Tettey Addy & Mark Bell

Appendix 1: Creating global growth projections

Before we attempt to estimate how infrastructure needs will evolve, we must consider the likely growth paths for the world's largest economies, as these will be key factors influencing total spending.

The process of explaining the drivers of historic GDP growth and then projecting forward the path of growth for 28 of the world's largest economies can be divided into two distinct phases. The first involves breaking down GDP growth into the contribution from different factors of production (labour, capital and productivity) and the second involves projecting forward these factors to get estimates of how economies could evolve out to 2050.

1. Estimating the contribution to GDP from the factors of production

To assign contributions from the factors of production we first calculate Cobb-Douglas production functions:

$$Y_t = A_t * K_t^{\propto} * (L_{t*}h_t)^{(1-\propto)} \qquad (1)$$

Here, $\mathrm{Y_t}$ is real GDP, $\mathrm{A_t}$ is total factor productivity (TFP), $\mathrm{K_t}$ is the capital stock, $\mathrm{L_t}$ is the labour force and $\mathrm{h_t}$ is human capital. $\propto$ represents the capital share of output and correspondingly $(1{-}\propto)$ is the labour share.

Variables are put into natural logarithms, such that equation (1) is transformed to:

$$\hat{Y}_t = \hat{A}_t + \propto \hat{K}_t + (1{-}\propto) * \hat{L}_t + (1{-}\propto) * \hat{h}_t \qquad (2)$$

In terms of the inputs, real GDP and estimates of the labour force are readily available for most countries, and where data is scarce, we utilise Oxford Economics' database to expand our time series.

To ensure we are accounting for both the quality and quantity of labour we use the human capital indices from the Penn World Tables (PWT).

$\propto$ is also informed by the PWT, typically taking a value of between 0.5 to 0.6, where emerging markets typically have a lower labour share of income than developed markets.

Estimates of the capital stock are available from the PWT, but we choose to calculate these ourselves using the Perpetual Inventory Method (PIM). While we cross-check our figures against those in the PWT, and ensure that the capital stock to GDP ratio does not accelerate excessively (which would be implausible, and moreover could be a sign of impending crisis in the extreme), calculating the capital stock ourselves is necessary for the projections in the second stage.

The capital stock is calculated as the previous period's capital (K_{t-1}) adjusted for depreciation (∂) (reflecting wear and tear and the process of equipment becoming obsolete, for example) plus the current period's investment (I_t), in real terms:

$$(K_t) = (1-\partial)(K_{t-1}) + (I_t) \qquad (3)$$

Finally, since we are unable to observe TFP independently, but have all the other figures, $\mathrm{A_t}$ is calculated as the residual from the other inputs.

Now that we have a full suite of inputs, we can consider the likely trend variables (denoted by a *). The trend estimates of the capital stock and of human capital are assumed to equal their actual values, as is standard economic practice. Trend labour force growth and trend TFP are initially calculated as Hodrick-Prescott filtered estimates, but then refined such that the overall output gap profile conforms to our understanding of the individual country's economic history and adjusts for the pitfalls of deriving productivity as a residual (inputs can be understated in a boom and overstated in a crisis, for example).

Potential growth $\tilde{\tilde{Y}}_t^*$ is therefore:

$$\tilde{\tilde{Y}}_t^* = \tilde{\tilde{A}}_t + \propto \tilde{\tilde{K}}_t^* + (1-\propto)\tilde{\tilde{L}}_t^* + (1-\propto) * \tilde{\tilde{h}}_t \qquad (4)$$

2. Creating long-run GDP projections

UN population data provide a fairly robust estimate of how population is likely to evolve. For smaller economies, such as some in Eastern Europe, there is a risk that migration flows result in larger-than-expected changes in overall population, while for larger economies migration flows typically have less potential to create a surprise.

We can utilise population projections by 5-year age cohorts $(N_{i,t})$ and combine them with estimates of labour force participation $(LFPR_{\ i,t})$ and unemployment $(U_{i,t})$ from the OECD (also in 5-year groups) to create a measure of trend labour force.[1] This also allows us to consider how participation and engagement trends – such as rising participation of older cohorts, and the combination of falling participation and rising unemployment in younger age cohorts – may affect labour force growth.

We assume a modest rise in participation rates for older age groups and a decline for younger groups for the next 10 years, beyond which, we hold participation rates fixed. Equation (5) sets out the calculation, with age cohorts spanning groups 15-19 to 65-69 (i to n):

$$L_t^* = \sum_i^n [N_{i,t} * LFPR_{\ i,t} * (1 - U_{i,t})] \quad (5)$$

For human capital, we assume that progress towards developed-market levels follows a concave path: when EMs are less developed, we assume larger gains, while higher income EMs converge more slowly. We cross-check our human-capital projections against their implied stages of development. While this projection may seem simplistic, it does capture the long-term trends which have seen steady gains in human capital, even throughout multiple boom-and-bust economic cycles.

To project the capital stock, we make use of the investment-to-GDP ratio and (again) ensure consistency with the stage of development. We make sure that the capital-stock-to-GDP ratio only rises modestly and that the output gap converges to zero within five years or so. For most EMs the growth path assumes that the investment-to-GDP ratio gradually falls, consistent with some rebalancing towards consumption as the primary engine of growth – again, the pace of this change is informed by the stage of development, but also considers country-specific factors, for example China's high savings rate. In the early stages, this is an iterative process to ensure consistency, and depends on the overall GDP projection, which must also include taking a view on trend TFP.

TFP is the hardest and potentially most controversial judgement; as a residual it is a "measure of our ignorance". It has also shown wild swings, rising rapidly before the GFC and falling notably post-GFC. Indeed, in some EMs – such as Brazil – TFP has recorded long periods of negative growth as the economy's productive capacity declined. Several commodity exporters witness consistent falls in TFP.

For most economies, we average through the boom and bust in TFP, assuming that productivity is unlikely to return to pre-GFC rates but is likely to be somewhat better than seen in the past 10 years. Our EM projections are typically only consistent with productivity gains driving modest convergence towards US per capita GDP, a continuation of the tepid pace of convergence seen recently.

1 Ideally, we would also consider trends in hours worked, but this is not feasible in EMs due to data limitations. OECD participation and unemployment data does not cover all major EMs, where not available we have used national sources or applied the rates of other countries of close geographical proximity.

Appendix 2: Methodology for estimating infrastructure investment

We follow and build upon the methodology set out in the Asian Development Bank's "Meeting Asia's Infrastructure Needs" (2017) report, adapting the modelling techniques in some instances to account for key features of the data, while also explicitly building in the pivot to renewable energy within our electricity generation capacity figures, rather than considering mitigation and climate proofing as additional costs as the ADB do.

1. Estimating baseline models to link infrastructure to growth and structural change

Seven types of infrastructure spending are considered across three broad groups: transport (road, rail, air, ports), utilities (broadband, sanitation) and power (electricity-generation capacity). All dependent variables are either scaled relative to population (air passengers, container traffic, utilities, power) or land mass (road, rail).

Panel models are run with country fixed effects in the following specification:

$$I_{n,i,t} = \alpha_0 + \alpha_1 y_{i,t} + \alpha_2 Agr_{i,t} + \alpha_3 Ind_{i,t} + \alpha_4 Inv_{i,t} + \alpha_5 Urb_{i,t} + \alpha_6 Popden_{i,t} + \vartheta_i \quad (1)$$

Here, $I_{n,i,t}$ is the type of physical infrastructure (n) of country (i) in year (t), which is explained by: GDP per worker ($y_{i,t}$); shares of agriculture, industry and investment in GDP; the urbanisation rate; and population density. All variables are expressed in natural logarithms, while broadband and sanitation are transformed using arcsine to account for their bounded properties (i.e. they cannot go above 100%):

$$Itrans_{n,i,t} = arcsine(\sqrt{(I_{n,i,t}/100)}) \quad (2)$$

2. Projecting infrastructure stocks and estimating expenditure

Forecasts of the explanatory variables are then used to project infrastructure from 2025 to 2050.

Our global growth work – set out in Appendix 1 – forms the backbone, providing consistent projections of GDP per worker and the investment share of GDP. Population density figures consistent with the population data used within the growth work are readily available. Finally, shares of agriculture, industry and the urbanisation rate are modelled to be consistent with an economy's stage of development and country-specific trends.

Spending on infrastructure ($Icost_{n,i,t}$) is calculated based on the change in the projected infrastructure stock (i.e. unscaled) and the cost of maintaining existing infrastructure at any given point in time:

$$Icost_{n,i,t} = c_n.\left(I_{n,i,t} - I_{n,i,t-1}\right) + c_n.\left(\delta_n * I_{n,i,t-1}\right) \quad (3)$$

Similar to ADB (2017) we assume depreciation rates (δ_n) of 2% for rail, ports and power, 3% for roads and sanitation and 5% for broadband. Infrastructure unit costs (c_n) also generally follow those set out in ADB (2017) or are updated using more recent literature where available, translated into 2025 prices. One key difference is the cost of electricity generation capacity, which – as we discuss next – has fallen dramatically for renewables, and is likely to decline further.

3. Green power: projecting renewable shares and accounting for falling costs

A marked structural shift in power generation towards renewable sources is already underway worldwide. Most governments are committed to reducing greenhouse gas emissions, although the pace and ambition across major economies varies widely.

We judge that Net Zero aims will generally fall short of stated government policies, but believe that the falling cost of renewable energy will nonetheless raise the share of renewables within global electricity generation capacity from around 45% currently to 75% by 2050. Plausible projections for the share of renewables are assessed on a country-by-country basis, with input from Aberdeen's Sustainability Group. Developed markets average a renewables share around 80% by 2050, while emerging markets are closer to 65%.

A key difference in assessing the costs of electricity generation capacity compared to other types of infrastructure is that replacing thermal power with renewables capacity does not happen one-for-one. Renewables have a lower 'Capacity Factor' – in part reflecting variable daylight and weather patterns – hence, additional renewable capacity is required to replace non-renewable capacity.

Electricity capacity models are first run to ascertain baseline power needs relative to GDP growth and structural changes (as set out in equation 1). But we then assume that renewables require 2.5 times more capacity to be installed per unit of baseline power needs, and build this assumption into our projections.

Finally, we assume that renewable costs continue to decline, albeit at a more modest pace than recent experience. We use projections of solar & storage costs from DNV's Energy Transition Outlook 2024, which also includes some variation in costs across regions.

Projections therefore embody country-specific assumptions on renewable shares which can be achieved and also region-specific costs of achieving these. For most countries, the cost of solar & storage falls by around 20% by 2050 in real terms.

There is a reasonable chance that installation costs could fall by more than we assume. The fall in solar costs over the last 10 years or so has far exceeded consensus expectations, but the broader associated costs to link renewables to the electricity grid and to build ancillary storage infrastructure – such as industrial-scale batteries and pumped hydro – may be higher, suggesting risks may be only modestly skewed towards a greater fall in real costs than we embody.

Total expenditure projections typically reflect the renewables' rollout, but also the maintenance costs associated with gradually managing down the stock of thermal power generation. For some fast-growing (low-income) emerging markets, both renewables and non-renewables may need to expand for a period of time to deal with rapid rises in power needs, even if renewables make up the largest growth driver.

Total cost is therefore the sum of expenditure across the two types of power generation (p) i.e. renewable, non-renewable, which is:

$$Elect\_cost_{p,i,t} = c_{p,t}.\left(I_{p,i,t} - I_{p,i,t-1}\right) + c_{p,t}.(\delta_p * I_{p,i,t-1}) \qquad (4)$$

Where $(c_{p,t})$ picks up the falling cost of renewables over time. In contrast, non-renewable costs are assumed to be fixed in real terms.

Appendix 3: Infrastructure gaps and detailed projections

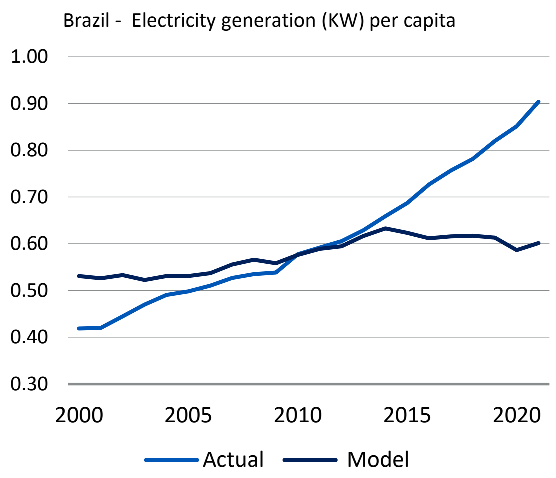
1. Models can help identify countries who have been under- or over-investing

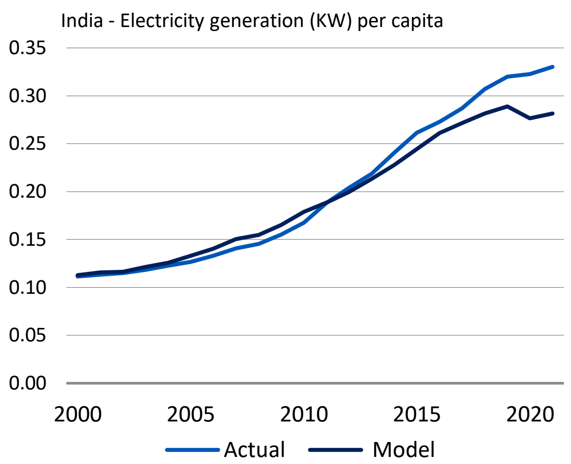
"Infrastructure gaps" are typically defined as the difference between current expenditure on infrastructure and future spending. But, since infrastructure can scale up as economies grow, such a definition in practice tells us little about underlying needs or funding constraints going forward.

Moreover, defining "gaps" in this way could potentially be misleading. A country which has been investing heavily (or excessively) in infrastructure in recent years and is expected to continue at similar (or lower) rates would have only a small (or negative) "gap", for example. In contrast, a fast-growing emerging market could appear to have a huge "gap", but one that is relatively easily funded given rising economic size and fiscal capacity.

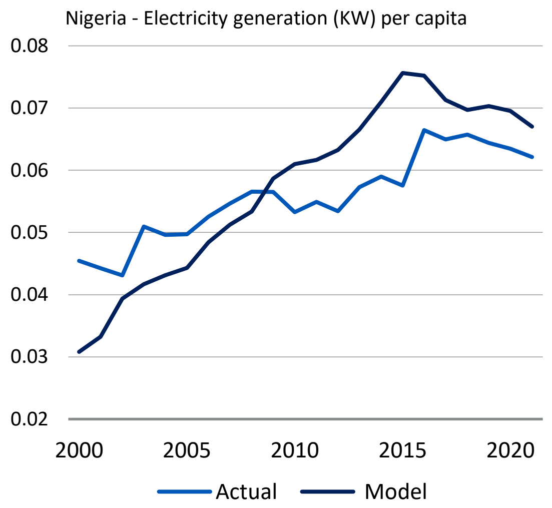
Models provide another avenue to consider which countries may have been under- or over-investing. The below charts provide a selection of examples where investment has been running notably above or below model-implied levels. Section 2 breaks down physical infrastructure needs by country and type, illustrating the major global drivers.

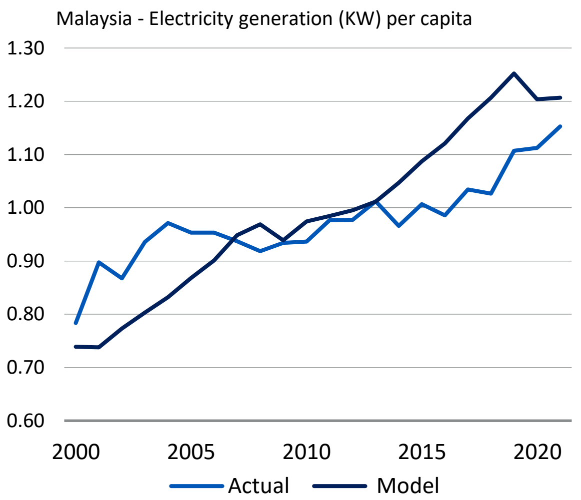
The pivot to renewables partly explains stronger electricity investment in Brazil and India…



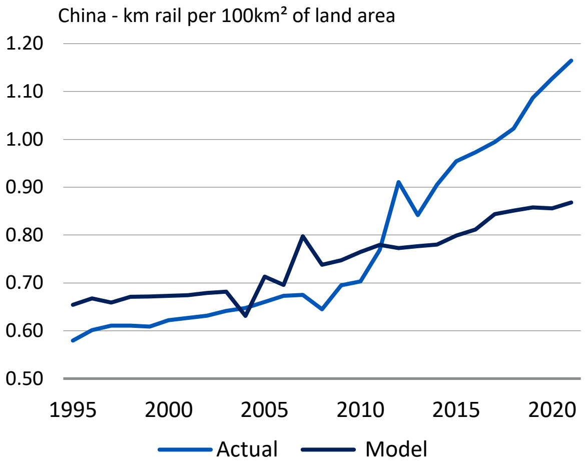


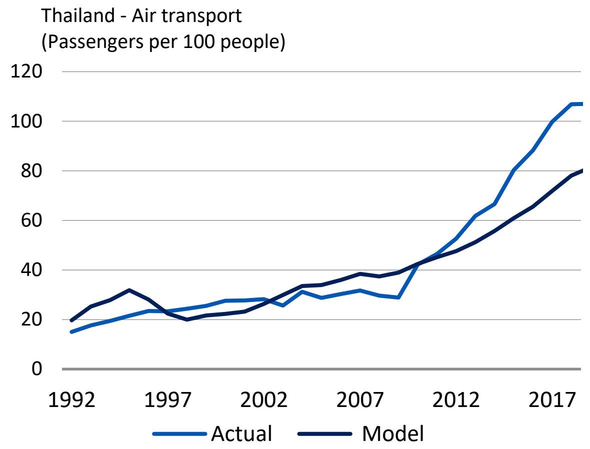
… given this structural shift, Nigeria and Malaysia's shortfall is more striking.



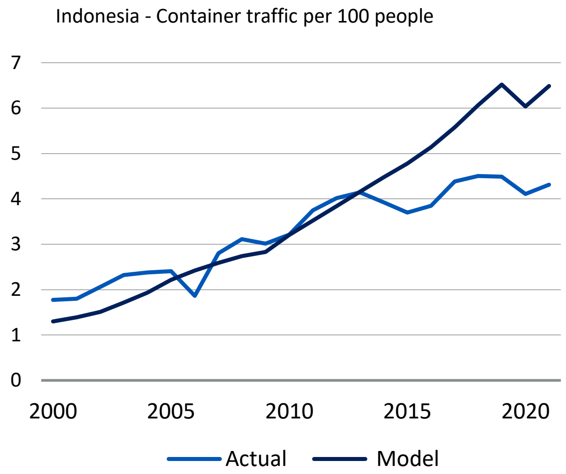


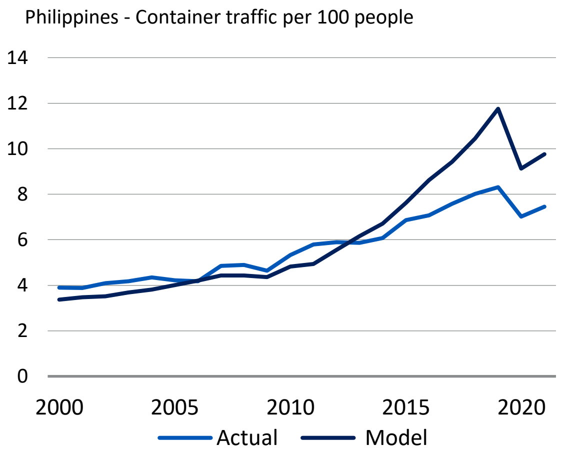
China may have been over-investing in rail, while models likely fail to account for Thai tourism…



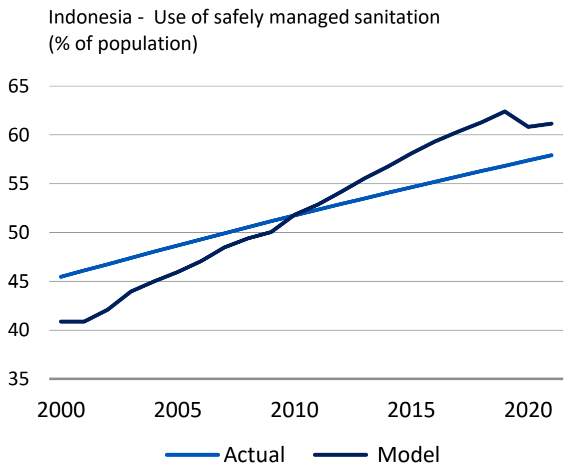


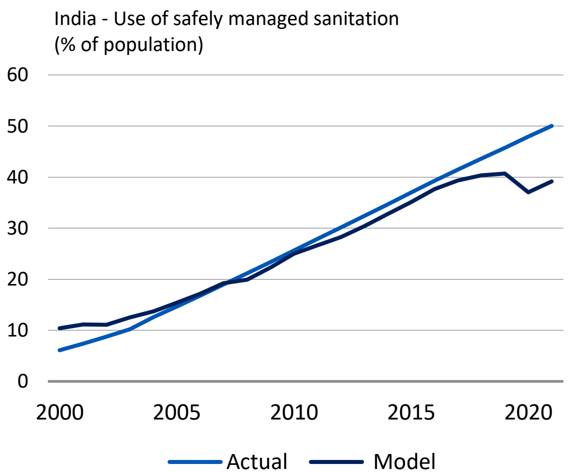
… despite being deeply embedded in global supply chains, models flag scope for accelerated port investment in much of ASEAN…





… Indonesia is slightly lagging in sanitation, but most EMs (such as India) exceed model predictions.





2. Infrastructure needs by country and type of physical infrastructure

GLOBAL INFRASTRUCTURE NEEDS ($ trillion, Total 2025-2050, real $2025 prices)								
	AIR	ROAD	RAIL	PORT	TELECOM	SANITATION	ELECTRICITY GENERATION	TOTAL
China	0.109	4.787	0.265	0.932	0.316	0.241	11.718	18.4
United States	0.044	4.862	0.671	0.060	0.068	0.074	5.910	11.7
India	0.026	7.261	0.296	0.219	0.333	0.306	2.722	11.2
Euro Area	0.008	1.756	0.382	0.073	0.044	0.063	1.619	3.9
Canada	0.003	1.007	0.229	0.006	0.009	0.009	0.661	1.9
Brazil	0.002	1.082	0.333	0.009	0.019	0.026	0.291	1.8
Japan	0.002	0.832	0.066	0.016	0.011	0.016	0.503	1.4
South Africa	0.001	0.537	0.674	0.008	0.005	0.012	0.209	1.4
Indonesia	0.009	0.460	0.248	0.103	0.048	0.065	0.373	1.3
Russia	0.000	0.689	0.268	0.001	0.006	0.016	0.313	1.3
Thailand	0.003	0.780	0.171	0.057	0.009	0.009	0.184	1.2
Mexico	0.001	0.898	0.036	0.004	0.013	0.012	0.224	1.2
Australia	0.004	0.724	0.031	0.011	0.005	0.007	0.291	1.1
United Kingdom	0.005	0.305	0.054	0.011	0.014	0.014	0.354	0.8
Poland	0.000	0.357	0.091	0.004	0.006	0.005	0.215	0.7
Malaysia	0.004	0.329	0.070	0.077	0.006	0.008	0.170	0.7
Nigeria	0.001	0.280	0.134	0.003	0.049	0.052	0.125	0.6
Philippines	0.010	0.031	0.020	0.093	0.036	0.036	0.237	0.5
South Korea	0.002	0.079	0.011	0.034	0.008	0.008	0.286	0.4
Chile	0.000	0.346	0.007	0.006	0.002	0.004	0.059	0.4
Colombia	0.002	0.150	0.087	0.005	0.007	0.006	0.084	0.3
Sweden	0.001	0.129	0.036	0.002	0.002	0.002	0.151	0.3
Romania	0.000	0.073	0.046	0.003	0.003	0.003	0.132	0.3
Peru	0.001	0.131	0.052	0.007	0.006	0.005	0.057	0.3
Hungary	0.000	0.154	0.030		0.001	0.001	0.034	0.2
Norway	0.001	0.072	0.013	0.001	0.001	0.001	0.125	0.2
Czech Republic	0.000	0.046	0.036		0.002	0.002	0.099	0.2
Israel	0.001	0.016	0.001	0.007	0.003	0.003	0.094	0.1
WORLD TOTAL	**0.2**	**28.2**	**4.4**	**1.8**	**1.0**	**1.0**	**27.2**	**63.8**
Annual average	**0.01**	**1.08**	**0.17**	**0.07**	**0.04**	**0.04**	**1.05**	**2.45**

Important Information

For professional and Institutional Investors only – not to be further circulated. In Switzerland for qualified investors only.

Risk warning
The value of investments, and the income from them, can go down as well as up and an investor may get back less than the amount invested. Past performance is not a guide to future results.

Any data contained herein which is attributed to a third party ("Third Party Data") is the property of (a) third party supplier(s) (the "Owner") and is licensed for use by Aberdeen*. Third Party Data may not be copied or distributed. Third Party Data is provided "as is" and is not warranted to be accurate, complete or timely. To the extent permitted by applicable law, none of the Owner, Aberdeen* or any other third party (including any third party involved in providing and/or compiling Third Party Data) shall have any liability for Third Party Data or for any use made of Third Party Data. Neither the Owner nor any other third party sponsors, endorses or promotes the fund or product to which Third Party Data relates.

*Aberdeen means the relevant member of the Aberdeen Group, being Aberdeen Group plc together with its subsidiaries, subsidiary undertakings and associated companies (whether direct or indirect) from time to time.

The information contained herein is intended to be of general interest only and does not constitute legal or tax advice. Aberdeen does not warrant the accuracy, adequacy or completeness of the information and materials contained in this document and expressly disclaims liability for errors or omissions in such information and materials. Aberdeen reserves the right to make changes and corrections to its opinions expressed in this document at any time, without notice.

Some of the information in this document may contain projections or other forward-looking statements regarding future events or future financial performance of countries, markets or companies. These statements are only predictions and actual events or results may differ materially. The reader must make his/her own assessment of the relevance, accuracy and adequacy of the information contained in this document, and make such independent investigations as he/she may consider necessary or appropriate for the purpose of such assessment.

Any opinion or estimate contained in this document is made on a general basis and is not to be relied on by the reader as advice. Neither Aberdeen nor any of its agents have given any consideration to nor have they made any investigation of the investment objectives, financial situation or particular need of the reader, any specific person or group of persons. Accordingly, no warranty whatsoever is given and no liability whatsoever is accepted for any loss arising whether directly or indirectly as a result of the reader, any person or group of persons acting on any information, opinion or estimate contained in this document.

AA-230525-194007-41

aberdeen Investments