

# UK Sustainable Infrastructure

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**Unlocking the UK's  
regional potential  
by building a  
new generation  
of sustainable  
infrastructure**

**octopus**investments

A brighter way

## Executive summary

Transitioning the UK's economy to net zero will require infrastructure investment to increase to over £50bn per year over the next decade - more than double the amount currently being invested. This infrastructure will provide the backbone for a new wave of green jobs across the country, with the UK government targeting 2 million green jobs by 2030<sup>ii</sup>.

Unlike jobs in tech and financial services which tend to cluster in London, sustainable infrastructure jobs will likely be spread across the UK's regions - where our engineering, manufacturing and energy expertise remains, and where the next generation of wind farms, EV chargers, heat pumps and hydrogen industrial hubs will ultimately get built. If investors, businesses and government can co-ordinate their investment decisions, the next generation of sustainable infrastructure can also act as the anchor around which future jobs and businesses can cluster.

The social impact of this infrastructure is fully aligned with its financial returns - the more households and businesses that benefit from using this sustainable infrastructure, the higher returns it will generate.

### The context: net zero and regional inequality

Parties across the UK political spectrum have set net zero and unlocking the UK's regional potential as two top economic policy priorities for the next decade. The scale of these challenges is well documented: the UK has the highest levels of regional income inequality in the OECD<sup>iii</sup>, and risks missing its 2030 net zero targets unless investment ramps up significantly<sup>iv</sup>.

But big challenges lead to big opportunities for future investment and job creation. As a sustainable infrastructure investor, we believe that the twin opportunities of net zero and unlocking the UK's regional potential can go hand in hand.

We have seen the beginnings of this in the renewables sector, which supports c. 100,000 jobs across the country, and is growing four times faster than the rest of the economy<sup>v</sup>. But much more needs to be done - not least because electricity generation only accounts for less than 20% of UK greenhouse gas emissions<sup>vi</sup>.

Transitioning the UK economy to net zero will require a whole new wave of sustainable infrastructure to be built, changing the way we travel, heat our homes and power our industries. Building this new wave of infrastructure early and at scale has the potential

to create a new wave of jobs and businesses across the entire country. Our recently launched Octopus Sustainable Infrastructure strategy has experienced this shift in momentum towards the UK's regions first hand - 72% of our current pipeline is based outside London and the South East, versus only 25% for private equity investments as a whole (based on data from 2011-2017)<sup>vii</sup>.

Social benefits aside, investing in the growth of UK sustainable infrastructure businesses also offers a highly attractive risk-reward profile for investors. These businesses combine the downside protection that comes from building asset-backed infrastructure, with the upside potential that comes from investing growth equity in platforms rapidly scaling critical infrastructure sectors. They also allow investors to gain early exposure to the sectors that will become the core infrastructure of the future and value creation that comes with it.

At Octopus, we acknowledge that tackling society's biggest challenges will clearly require co-ordinated investments across a wide range of sectors. For example, unleashing a region's economic potential typically requires investments in housing, infrastructure and SME growth all at the same time. Many 'regeneration' projects fail because they do not appreciate the interlinkages between these different types of sectors. Our sustainable infrastructure team therefore works closely with our real estate and venture capital teams to share knowledge and opportunities.

### What is sustainable infrastructure?

There are countless definitions of sustainable infrastructure, but to simplify we think of sustainable infrastructure as being the infrastructure required to support the transition to net zero.

The most prevalent example of sustainable infrastructure today is renewable energy - notably wind, solar and biomass. The renewables sector has grown rapidly, accounting for 40% of UK electricity generation in 2022 versus only 6.5% in 2010<sup>viii</sup>. At the same time, the renewables market has matured significantly. When Octopus first invested in the solar developer Lightsource (now Lightsource BP) in 2010 the market was nascent with most institutional investors reluctant to invest. Now UK renewables represent a

well-established core/core-plus infrastructure asset class with deep pools of institutional investment (£120bn invested since 2010, and a further £100bn predicted to 2030<sup>ix</sup>). This market growth represents a real success story for government, investors and businesses alike.

But sustainable infrastructure doesn't stop with renewables. Decarbonising our economy will require significant investment across a new wave of infrastructure sectors – not least because electricity generation only accounts for less than 20% of UK greenhouse gas emissions<sup>x</sup>. Research from PwC and McKinsey suggests that the UK will require over £50bn per year of private infrastructure investment to hit net zero by 2050. We see four key growth sectors as key – energy transition, mobility, digital infrastructure and circular economy. Example investments within these sectors would include heat networks, EV charging points, green datacentres, and plastics recycling. These emerging infrastructure sectors often have proven technologies with proven demand, and are ready for rollout across the UK. Where sustainable infrastructure technologies are not yet proven (e.g. nuclear fusion) and require significant further technology investments, we tend to think of them as venture capital investments rather than sustainable infrastructure investments.



### The evolving face of infrastructure investing

Infrastructure investment has experienced exceptional growth in the last decade as an asset class, with a 7-fold increase in Europe-focused infrastructure AUM from 2011-2021<sup>xx</sup>. Investors have been attracted to the asset class due to its consistently strong and stable return profile. While a broad asset class in itself, most infrastructure sectors have demonstrated the robustness to economic cycles promised.

Key characteristics of infrastructure investments typically include the essential nature of the underlying assets, ability to generate predictable and stable cash flows over time, inflation protection, high capex/low opex ratio, and a relatively high barriers to entry.

To date, infrastructure AUM growth has mainly been driven by 'core' and 'core-plus' infrastructure strategies, investing in lower-risk physical assets such as regulated utilities, rail, airports and renewable generation.

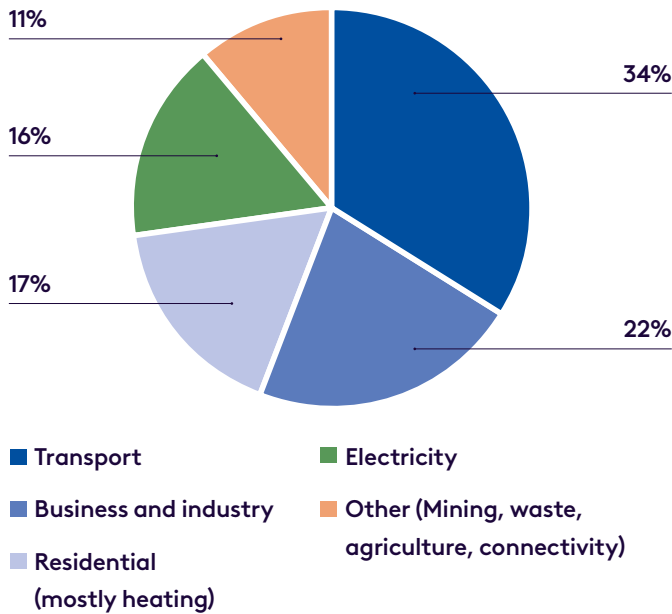
While rapid growth is expected to continue generally, value-added and opportunistic infrastructure strategies are becoming more prominent and for a number of reasons. Investors have grown more comfortable with the infrastructure sector while seeking higher returns.

This aligns with a growing need for this type of capital to deliver net zero. Value-added and opportunistic infrastructure has a very strong overlap with the next generation of sustainable infrastructure which requires growth capital to scale. We see EV charging, energy storage, heat networks and recycling facilities as good examples of value-added infrastructure.

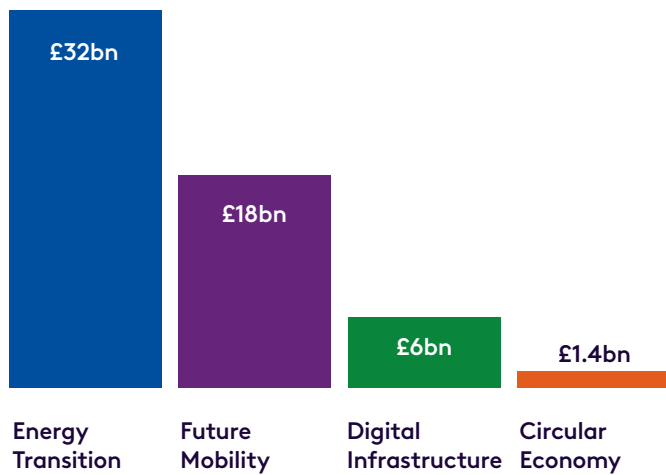


Rolling out this new wave of sustainable infrastructure will require collaboration between governments (national and local), investors and businesses. In particular, the UK Infrastructure Bank (UKIB) was established in 2020 to play a central role in this process. The UKIB's twin aims of tackling climate change and regional economic disparities reflect a broader recognition in government that these aims are closely linked.

### UK 2022 CO2 Emissions (MtCO2e) by sector<sup>1</sup>



### Infrastructure Investment required to hit net zero by 2050 (£bn per year figure.)



Sources: UK 2022 Emissions Data (ONS), PwC (2020): Unlocking capital for Net Zero infrastructure, McKinsey (2011): Keeping Britain Moving

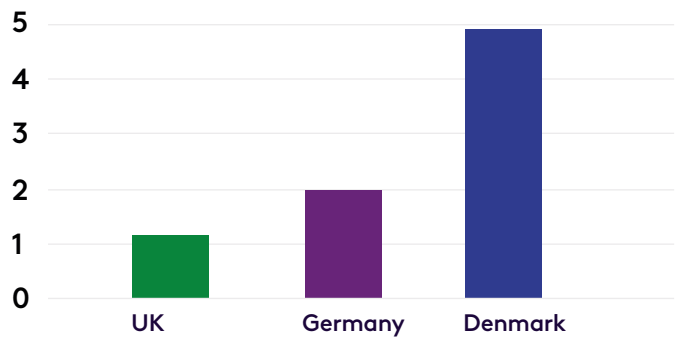
## Sustainable infrastructure and maximising regional potential – do they go hand in hand?

The transition to net zero has the potential to be the economic opportunity of the 21st century, creating a new wave of jobs across the UK. Sustainable infrastructure will play a two-fold role in this process: i) creating direct and indirect jobs in building the infrastructure itself, and ii) in unlocking multiplier effects on the areas where infrastructure gets built.

### Sustainable infrastructure: direct and indirect job creation

To some extent we have seen the job creation potential of sustainable infrastructure in the renewables sector, which now supports c. 100,000 jobs. However, many argue this number could have been significantly higher if the UK was more involved in the supply chain for renewables projects. The UK has the largest share of offshore wind capacity in the world, but most project developers and supply-chain companies (e.g. turbine manufacturers) are from abroad – particularly from Germany, China and Scandinavia<sup>xi</sup>. For every MW of wind energy, the UK produces roughly 1 job, versus 2 in Germany and 5 in Denmark<sup>xii</sup>.

### Wind energy jobs per MW installed



The new wave of infrastructure mentioned above has the potential to unlock even more jobs and regional economic potential than the renewables sector. For the UK to hit net zero, this could create up to 102,000 jobs in the circular economy and recycling sector, 60,000 in the heat pump sector, 221,000 in the hydrogen and carbon capture sector and 230,000 in the building retrofit sector<sup>xiii</sup>. Furthermore, if the UK can scale up its businesses with world-leading technologies in sectors<sup>xiii</sup> like hydrogen, carbon capture and energy storage – the potential for future job creation could be even greater.

There are good reasons to believe that jobs in sustainable infrastructure in particular will be spread across the UK, rather than focussed in London and the South East as recent economic growth has tended to be – and this argument has been made by Government<sup>xiv</sup>, industry and academia<sup>xvi</sup>.

Firstly, most of underlying physical infrastructure needed for net zero will be located outside London and the South East. In part this is because much sustainable infrastructure (e.g. renewables or energy storage) requires cheap land and proximity to solar, wind or hydro resources. In part, this is because sustainable infrastructure (e.g. EV chargers or heat pumps) needs to be built where people live and work – which is mostly outside London and the South East.

Secondly, and perhaps more importantly, the businesses that both develop and roll out sustainable infrastructure tend to be located in the UK's regions. 72% of our current sustainable infrastructure investment pipeline is headquartered outside London and the South East – versus only 25% for UK private equity investments as a whole.

The regional nature of sustainable infrastructure businesses is often because these businesses tend to draw on the UK's energy, manufacturing and engineering expertise – much of which is regional – rather than expertise in software and financial services which is often more concentrated in London. It is also because sustainable infrastructure businesses are often originally developed as spinouts from the UK's world-leading university network – which itself is regional in nature. A good example of the importance of these factors is ITM Power, which operates the world's largest hydrogen electrolyser factory in Sheffield, with close collaborations with the University of Sheffield nearby.

The UK's financial sector needs to start backing these sustainable infrastructure businesses to start up, and crucially scale up, if it wants to turn net zero into a real opportunity for job creation and maximising the UK's regional potential.

### Infrastructure multiplier effects

The socio-economic impacts of sustainable infrastructure go well beyond the direct and indirect jobs created in its construction. Infrastructure provides the backbone to the UK economy, and is the base upon which productive businesses grow – most businesses require energy, connectivity and

transport infrastructure in particular in order to operate productively.

As such, investments in infrastructure tend to have a multiplier effect in creating further employment and business growth. Infrastructure investment multipliers have been estimated at 1.5-2.7<sup>xvii</sup> – meaning that they increase a country's GDP by 1.5-2.7 times the initial infrastructure investment.

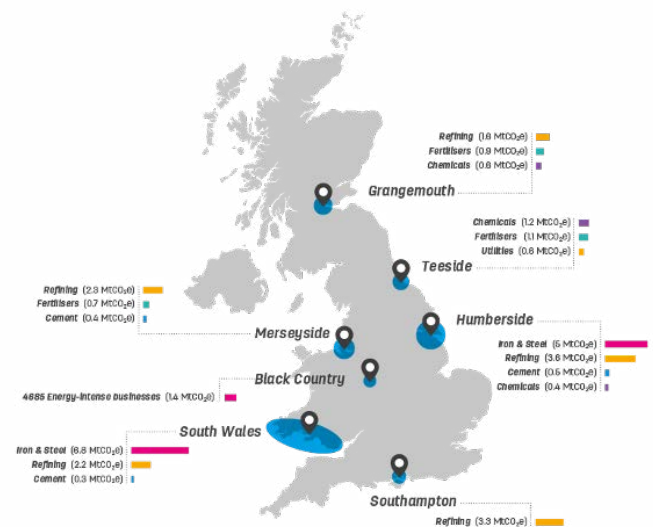
Infrastructure investments play a particularly important role in stimulating *regional* growth.

## Building sustainable infrastructure in industrial clusters can protect existing jobs and unlock new manufacturing sectors

Firstly, building infrastructure across the UK will enable the whole country to act as a productive platform for businesses. Fibre broadband is a good example of this – and indeed the government's Levelling Up paper includes an explicit target for 85% of the UK to have gigabit-capable broadband by 2025.

Secondly, infrastructure acts as a co-ordination device for other investors on where to locate their economic activity. For example, the UK government is currently planning to focus future carbon capture, hydrogen and energy storage investments into industrial clusters located across the UK's regions, with four clusters planned for 2030. With the right backing from investors and businesses, these could not only help to decarbonise the industries and jobs that already exist in these areas, but also serve as a platform for the UK to expand its industrial footprint into the low-carbon

Source: Zero Carbon Hub



manufacturing opportunities of the future (e.g. green steel, low-carbon cement etc).

### Ensuring a just transition

A 'just transition' involves moving to a sustainable economy in a way that is fair to everyone, including those working in polluting industries.

The sustainable infrastructure sector has a central role to play in the just transition. For example, in the UK energy sector – growth in renewables and grid engineering jobs is set to outpace the decline in oil and gas jobs. The National Grid estimate that the energy sector's total direct workforce will need to almost triple by 2050, with 75% of jobs projected to be outside London. The retraining of oil and gas sector employees for new sectors like offshore wind and energy storage will play a key role in this transition – and we are highly mindful of this as an investor.

Furthermore, research from the Centre for Economic Policy also suggests that green jobs provide good quality employment, pay higher wages and are at lower risk of automation than non-green jobs. As a B-Corp, the quality of jobs that we produce as an investor matters to us – our Sustainable Infrastructure strategy therefore tracks the direct and indirect job-creation that its investment creates by salary, gender and location.

Their report is here: <https://cep.lse.ac.uk/pubs/download/special/cepsp39.pdf>

### Why invest in sustainable infrastructure?

Social benefits aside, the underlying investment case for sustainable infrastructure investment remains strong given the asset class's long-term secular growth trends, inflation protection and resilience to economic uncertainty.

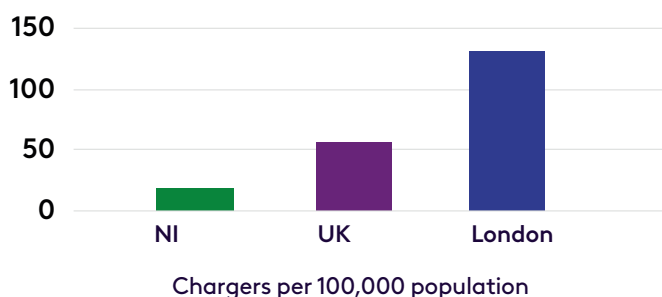
This remains true even as the broader infrastructure sector is facing challenges – both from rising rates (which make core infrastructure equity returns comparable to investment grade debt) and from sustainability-related risks (e.g. gas networks potentially becoming stranded assets). H1 2023 infrastructure fundraising was only 16% of the five-year average since 2016, but the sustainable infrastructure sector in particular has remained notably resilient to this slowdown<sup>xix</sup>.

These trends have resulted in many infrastructure investors looking to higher-returning strategies. This can come either by investing equity into renewable energy developers (rather than just investing in renewables assets), or by investing growth equity into the new wave of infrastructure businesses mentioned in the previous section - where the underlying infrastructure is proven but not yet mature as an asset class.

We believe this new wave of sustainable infrastructure represents an exciting opportunity for investors while addressing a real funding gap. These emerging infrastructure sectors are often viewed as too mature for venture capital but too early-stage for traditional infrastructure project finance. These sectors therefore require growth equity investment into 'platform' companies that repeatedly build the underlying infrastructure, rather than into individual assets or projects (attracting larger scale and lower risk debt and equity investors).

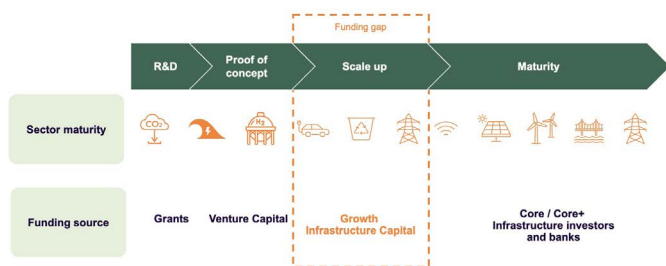
A good example of a growth equity investment into an infrastructure platform is our Sustainable Infrastructure strategies recent investment in Weev, a leading EV charge point operator in Northern Ireland. We are backing Weev's £50m rollout of thousands of EV charging points across Northern Ireland, which is currently the UK's most underserved region for EV charging. EV charging infrastructure is currently in scale-up phase, and we strongly believe that the market will ultimately mature to become a core infrastructure of the future – going on the similar journey that wind and solar have gone on as asset classes over the past 10-20 years.

### NI is one of the UK's most underserved regions for EV charging





This funding gap results in strong deal flow for those prepared to do the work, and a strong opportunity to deliver attractive risk adjust returns.



### Infrastructure growth equity returns can be thought of in terms of three layers of value:

- **Asset-Level Returns:** This is the hold-to-maturity return on the underlying assets being built (e.g. EV chargers). This layer of value is common to all types of infrastructure.
- **Yield Compression:** This is the incremental value that is generated by selling assets at a lower discount rate than the rate you originally invested at – typically because the asset and sector has matured and become derisked. For example, the discount rate on an EV charging investment made today will be significantly higher than it is expected to be when assets have delivered on their business plans and the sector is more mature. This has happened in the renewables sectors where asset valuations have increased with sector maturity and attracting investors with lower cost of capital.
- **Platform Value:** Early-stage infrastructure investments require investing into companies that are rolling out the infrastructure – not just investing in the assets themselves. By investing

in these companies (e.g. a company that builds, operates and owns EV chargers), investors can create 'platform value' in the company itself – which consists in the company's ability to repeatedly roll out further assets and manage/optimize them.

As a result, we see target returns in the sustainable infrastructure growth equity space being significantly higher than the traditional renewables sectors where value is generated from asset-level returns only. At the same time, infrastructure growth equity also offers strong downside protection from the fact that the majority of funding is going into physical infrastructure assets that have intrinsic value – and investors can also structure investments in the form of preferred equity for example to further limit downside risk.

Investing in these emerging sectors today therefore offers the prospect of attractive returns – as well as gaining exposure to a pipeline of future core infrastructure projects.

### Conclusion

The transition to net zero and maximising the UK's regional potential represent two massive investment opportunities over the coming decades. Unlocking these opportunities is a complex process, and will require co-ordinated investment across a range of asset classes. But one asset class where these twin opportunities can really go in hand is sustainable infrastructure.

We have seen this to some extent already in the renewables sector, which supports c. 100,000 jobs and is growing at four times the UK sector average – with notable job creation in Scotland and Wales. But the scale of the opportunity goes well beyond renewables.

A new wave of sustainable infrastructure will be required to transition to net zero – across a range of sectors including mobility, energy, digital infrastructure and the circular economy. With this new wave of infrastructure will come a new wave of businesses and jobs across the country. Unlike the last few decades of UK growth, this future jobs growth has the potential to spread across the UK's regions – where our engineering, manufacturing and energy expertise remains, and where the new wave of sustainable infrastructure will ultimately get built. Governments, investors and businesses will all play a key role in ensuring that these infrastructure investments unlock the supply chain growth and economic multiplier effects that could enable them to be



truly transformative.

At Octopus, we believe that this new wave of sustainable infrastructure could not only be transformative for the UK's economy – but also that it represents an exciting new investment opportunity. Done correctly, investing in the businesses rolling out this new wave of infrastructure can provide the downside protection of infrastructure assets with the upside potential of growth equity in a rapidly growing sector. We'd love to speak with any businesses, investors, charities or government bodies that are interested in partnering with us along the way.

**For more information, please get in touch via [investorrelations@octopusinvestments.com](mailto:investorrelations@octopusinvestments.com)**

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<sup>i</sup> PwC (2020): Unlocking capital for Net Zero infrastructure, and McKinsey (2011): Keeping Britain Moving

<sup>ii</sup> <https://www.gov.uk/government/news/uk-government-launches-taskforce-to-support-drive-for-2-million-green-jobs-by-2030>

<sup>iii</sup> <https://www.ippr.org/publications/looking-out-to-level-up>

<sup>iv</sup> <https://www.bbc.co.uk/news/58160547>

<sup>v</sup> <https://www.statista.com/statistics/690043/renewable-energy-employment-uk/>

<sup>vi</sup> UK ONS Emissions Data (2022)

<sup>vii</sup> <https://www.ft.com/content/51ba7fa6-56d7-11e9-91f9-b6515a54c5b1>

<sup>viii</sup> <https://www.ref.org.uk/publications/229-renewables-output-in-2010#:~:text=The%20United%20Kingdom%20failed%20to,of%20electricity%20from%20renewable%20sources.&text=This%20shortfall%20occurred%20in%20spite,the%20period%202002%20to%202010>

<sup>ix</sup> <https://www.theguardian.com/environment/2023/aug/11/uk-renewable-energy-investment-lagging-behind-rest-world-data>

<sup>x</sup> UK 2022 Emissions Data (ONS)

<sup>xi</sup> <https://www.euronews.com/2023/03/03/britains-plan-to-profit-from-the-offshore-wind-boom-has-been-blown-off-course>

<sup>xii</sup> <https://www.irena.org/Data/View-data-by-topic/Benefits/Renewable-Energy-Employment-by-Country>, <https://ourworldindata.org/grapher/cumulative-installed-wind-energy-capacity-gigawatts?facet=entity&country=DEU~IND~ESP~ITA~AUS~JPN~GBR>

<sup>xiii</sup> <https://www.element-energy.co.uk/wordpress/wp-content/uploads/2019/11/Element-Energy-Hy-Impact-Series-Study-1-Hydrogen-for-Economic-Growth.pdf>

<https://www.gov.uk/government/publications/green-jobs-taskforce-report>

<sup>xiv</sup> [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/1003570/gjtf-report.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1003570/gjtf-report.pdf)

<sup>xv</sup> <https://www.cbi.org.uk/articles/insight-for-business-on-the-uk-s-net-zero-transition/>

<sup>xvi</sup> <https://www.lse.ac.uk/granthaminstitute/news/growth-net-zero-and-levelling-up-three-mutually-reinforcing-objectives-to-encourage-investment-in-the-uk/>

<sup>xvii</sup> <https://www.github.org/infrastructure-monitor/insights/fiscal-multiplier-effect-of-infrastructure-investment/>, <https://www.spglobal.com/en/research-insights/featured/special-editorial/infrastructure-productivity-boost-coronavirus>

<sup>xviii</sup> <https://www.jstor.org/stable/26363345>

<sup>xix</sup> <https://www.preqin.com/insights/research/quarterly-updates/q2-2023-infrastructure>

<sup>xix</sup> <https://www.preqin.com/insights/research/reports/future-of-alts-2027-infrastructure>

<sup>xx</sup> <https://www.preqin.com/insights/research/reports/future-of-alts-2027-infrastructure>