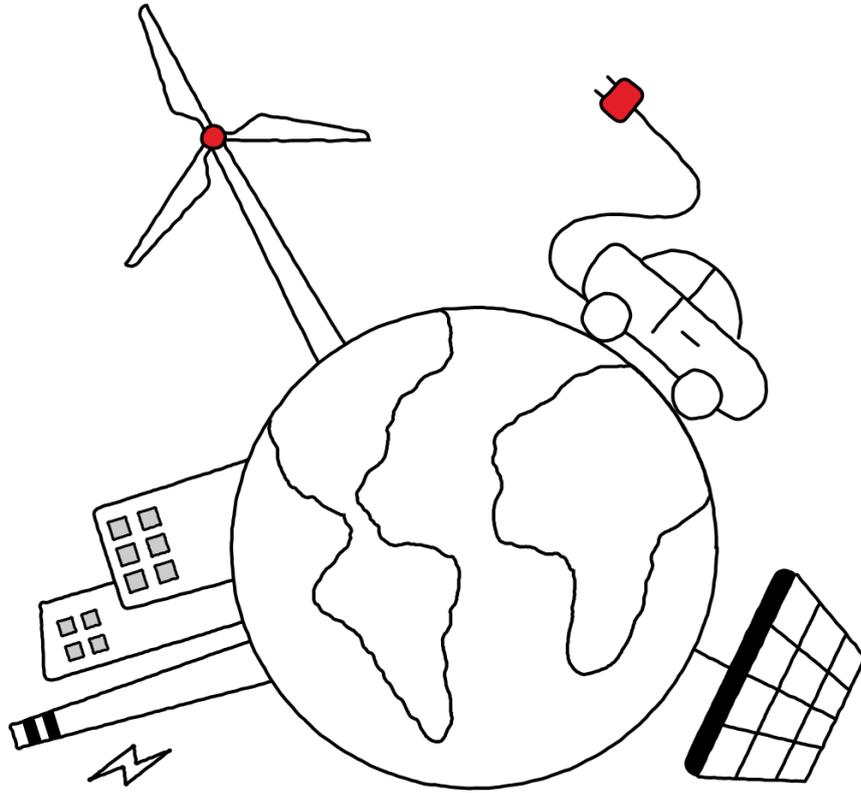


# Looking ahead

Infrastructure outlook for 2022



Infrastructure in the post-pandemic world.

# What's the next road to recovery?

The infrastructure sector continues to be resilient with robust performance across debt and equity. The sub-sectors worst hit by the pandemic are showing green shoots, recovering in line with the macro environment. We see some challenges to the economy around supply chain disruptions, inflation and rising infections. At the same time, we also see strengthening market and policy tailwinds around decarbonization and digitalization, which support performance and investment volumes.



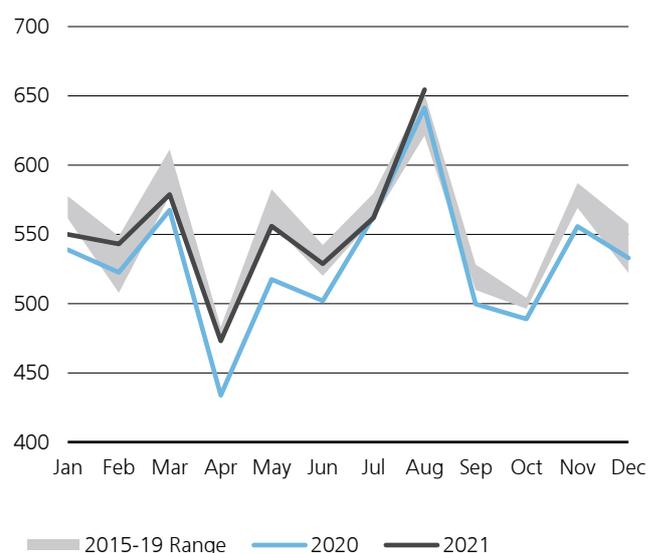
## Global economy stutters, but still on track with recovery

The global economy had been showing signs of a recovery but slowed in the third quarter, hit by a combination of supply chain constraints and the Delta variant of COVID-19. Business surveys reported that manufacturing production is lagging behind orders, as firms try to cope with bottlenecks clogging the supply chain. These include shortages in computer chips, a lack of truck drivers and disruptions in global shipping.

The eurozone bucked the global trend and economic growth accelerated slightly in 3Q21 to 2.2% QoQ, while growth weakened in both China and the US. Japan is also expected to report a slowdown in activity once figures are released. We expect the economy to pick up again in 4Q21 and moving into 2022 as supply bottlenecks ease, but this is far from guaranteed.

The recovery trend is supported by data across the energy and transportation sectors. Electricity usage in the US and Europe (Figure 1) has recovered well from 2020 levels and is now back within the normal ranges after falling in response to a slowdown in economic activity in 1Q20.

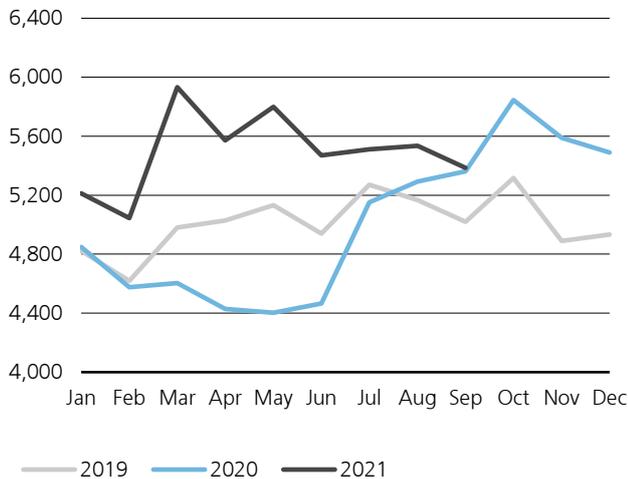
**Figure 1: Electricity supply in the US and Europe (TWh)**



Source: Bloomberg, November 2021

Transportation volumes are also recovering well. Container volumes at ports continued the strong run from 2H20 and volumes remain above 2019 levels. However, we did see a flattening in 3Q21, perhaps driven by the widely reported supply chain issues (Figure 2).

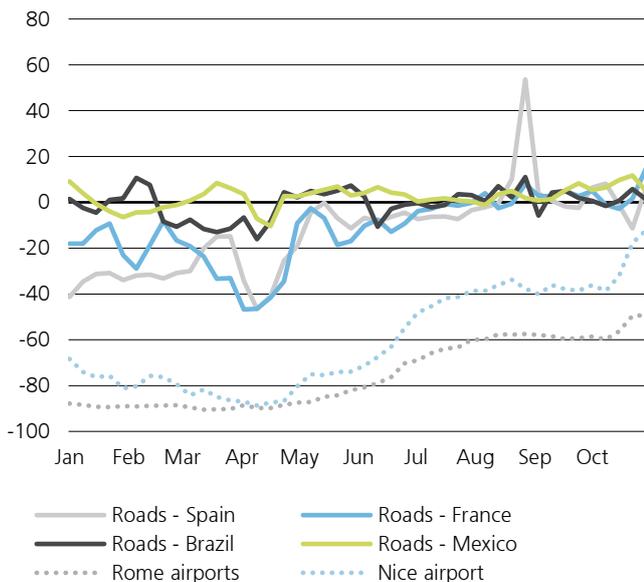
**Figure 2: Container volumes in the EU and 5 largest US ports (000 TEUs)**



Source: Bloomberg, November 2021

Toll roads are also reporting robust volumes, tracking 2019 levels in 2H21. Airports, the hardest hit sub-sector, are showing some green shoots although this sector's health will be highly dependent on country-specific COVID-19 policies (Figure 3).

**Figure 3: Toll road and airport volumes (% volume change from 2019)**



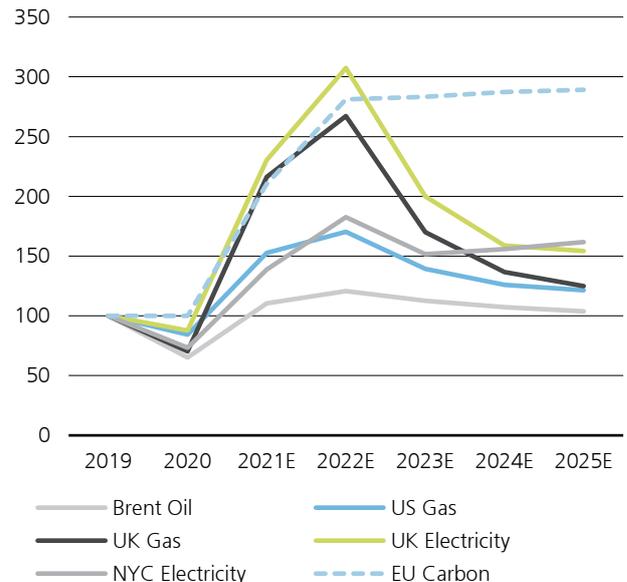
Source: Atlantia, November 2021. Legend refers to asset owned by Atlantia entities in these regions

While growth slowed, inflation remains high or has increased, with trends varying by country. Higher and more persistent inflation has seen market expectations for interest rate rises get brought forward, and central banks turn more hawkish. Indeed, in November 2021 the US Fed announced that it will start to slow its asset purchases by USD 15 billion a month. The Bank of England stunned markets by pulling back from an interest rate rise recently, although markets still anticipate hikes to be imminent.

Prior to the Global Financial Crisis, central banks emphasized that it takes 12-18 months for interest rate changes to filter through the economy and looked to act pre-emptively. Ultra-low inflation over the past decade has changed the hymn sheet, with central banks now looking for economies to pass certain milestones before starting monetary tightening. This increases the chances of central banks acting too late and increases the risks of persistently high inflation. We still expect inflation to be brought under control in an orderly fashion though. At the moment, a small number of sectors are driving high inflation as relative prices adjust.

For inflation to be tamed, this will require the currently high commodity prices to ease. Figure 4 shows the spike in 2021 across commodities, notably gas, carbon and electricity prices. The futures market indicates that prices will remain elevated next year before easing in 2023.

**Figure 4: Commodity price futures (indexed to 2019 prices, %)**



Source: Bloomberg, November 2021

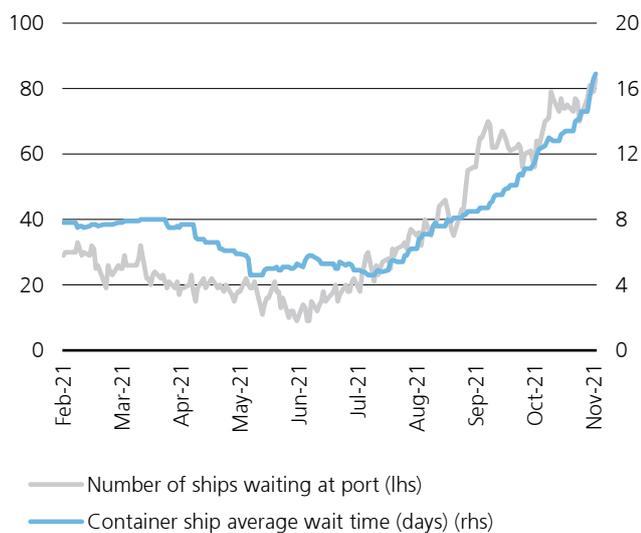
Finally, anxiety around inflation could subside if the current supply chain disruptions ease. This is the first theme that we will explore in more detail.

## Theme 1: Supply chain disruptions

The current supply chain crisis stems from four main factors: increasing consumer demand; lower production capacity; labor shortages; and logistical challenges. During the pandemic lockdowns, spending on consumer goods increased, partly boosted by stimulus packages and the inability to spend on services. Factories and logistics infrastructure were unable to keep pace, especially as many source countries operated zero-COVID-19 policies. For example, in August, China partly closed the world's third busiest container port, Ningbo-Zhoushan, after a single COVID-19 case was detected, disrupting supply lines across the world.

While production levels are now increasing, the main pinch point is around transportation. Figure 5 below shows the number of container ships anchored at Los Angeles and Long Beach ports and the average wait times. The rise in anchored vessels is partly caused by increasing demand and the lack of labor. In particular, for truck drivers whose services are required to offload products from ships and to remove empty containers. The ports have expanded operations to 24/7, which should gradually alleviate the situation.

**Figure 5: Port of Los Angeles / Long Beach congestion**  
(number of ships / wait time in days)



Source: Bloomberg, Wabtec, November 2021

The Baltic Dry Index, which measures the cost of shipping raw materials, can provide a useful data point (see Figure 6). The Index increased by 2.5 times between January and mid-September, before falling 50% in October and November. This was due to measures taken to ease port congestion and concerns around the impact of the Delta variant on the Chinese economy. We expect elevated prices to continue into next year. However, the recent drop in the Index may be a sign that the supply crisis is easing.

**Figure 6: Baltic Dry Index (2021)**



Source: Bloomberg, November 2021

Further, it could take some time before we see more slack elsewhere in the supply chain. For example, current trucking freight rates in Europe and the US are still near record highs. This is partially due to an acute shortage of truck drivers, which has been exacerbated by the pandemic. Unfortunately, the job of a truck driver does not appeal to most younger workers, and so finding replacements for retiring drivers has been difficult. These types of structural issues will take longer to resolve. Therefore, we may see alleviated prices in some parts of the supply chain for more years to come.

Longer-term, the current crisis only highlights the need for investments in traditional transportation infrastructure, and politicians are finally proactively addressing the problems. For example, as a part of the US's recently passed bipartisan infrastructure bill, USD 17 billion has been allocated to port infrastructure and waterways to strengthen supply chain resiliency, with USD 8 billion targeting near-term modernization and upgrades.

For infrastructure investors, there are some winners and losers across the sectors. Assets exposed to freight, especially ports, rail, and logistic infrastructure are performing strongly. Projects currently in the construction phase may experience cost overruns and delays. For example, Vestas and Orsted warned of the impact to their delivery and profitability as supply chain disruption hits the offshore wind sector. Similarly, over half of the 2022 solar projects in the US could be delayed or cancelled, according to a Rystad Energy analysis<sup>1</sup>.

## Theme 2: Decarbonization

The COP26 conference took place in November 2021, against the backdrop of a global energy crisis. Wholesale gas prices had risen up to 4 times over the preceding months as a result of post-COVID-19 demand in Asia, low European inventories, and restricted supplies. Low wind resource in the North Sea exasperated this crisis in Europe, where monthly average electricity prices increased up to 3 times.

Perhaps it is not surprising then, that the outcome was underwhelming. The conference was significant as it was the first *stocktake* of progress against the Paris Agreement. There were some positive agreements around deforestation, methane reduction, a carbon market framework, and financial support to facilitate a 'just' transition. However, many of these announcements are aspirational without tangible policies. This leaves it up to individual countries and organizations to set local policies.

In the summer, the EU introduced a package of proposals aimed at reducing emission by 55% (of 1990 levels) by 2030, otherwise known as *Fit for 55*. The centerpiece of their strategy is to leverage the EU Emissions Trading Scheme (ETS) by expanding it to more sectors (e.g., shipping) and to tighten emissions. The proposals also target increased renewables, greater energy efficiency gains, support for alternative fuels and electric-vehicle charging points. The package was a major contributor to the doubling of the ETS price over the past year to EUR 70/tonne. We expect this to provide tailwinds to the switch to low carbon fuels and towards cleaner transport.

The US also made a key announcement at COP26 regarding the reduction of methane leakage at oil and gas production sites, which is important for two reasons. First, methane has 84-86x more global warming potential than CO<sub>2</sub> as a greenhouse gas over 20 years, according to the UN. Second, US shale has been the biggest growth driver behind global oil and gas production this past decade.

A commitment by the US to reduce methane leakage would have a material impact on climate change, while only adding pennies to oil and gas prices, according to the Environmental Protection Agency.

Emerging technologies also remain a focus at COP26 as the world needs to look at new ways to continue the path of decarbonization. For example, energy storage is currently the most feasible solution to offset the intermittency of renewable energy. However, lithium-ion batteries, which is currently the most popular storage technology, has limited discharge duration (typically four hours). To address this, the Long-Duration Energy Storage (LDES) council was launched at COP26 to further promote developments in longer duration storage technologies, which will further enhance the long-term growth potential of renewable energy (see Figure 7).

Nuclear power, which was another widely discussed topic at COP26, is far more controversial. During the summit, NuScale, a US company, actually signed an agreement with Romania to deploy a small modular reactor (SMR) – a new type of nuclear technology that is supposedly safer, cleaner and cost competitive. However, critics argue that the technology is not commercially scalable yet. Therefore, it should not be viewed as a viable solution in the next 10 years, which is the most crucial period for addressing climate change.

Overall, the world is still divided on nuclear. Among the advocates, France, Slovakia and Finland are building new plants, with nuclear plants in various stages of preparation in the Czech Republic, Poland, Hungary, Bulgaria and Romania. The US even announced a USD 25 million package to support countries such as Poland, Kenya, Brazil etc. to access clean nuclear energy such as SMR. On the other hand, five EU nations including Austria, Denmark, Germany, Luxembourg and Portugal formed an anti-nuclear alliance at COP26.

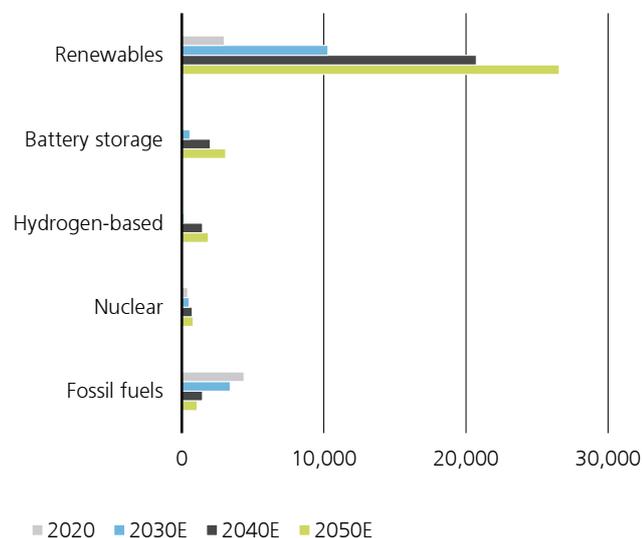
Across energy infrastructure, renewables remain attractive due to secular tailwinds, although some new projects are facing supply chain constraints. Energy storage will also become an increasingly important piece of the energy transition puzzle and new opportunities will continue to emerge as the sector matures. Investors will also need to start paying attention to other technologies such as carbon, capture and storage (CCS) or hydrogen, which have the potential to decarbonize not just the electricity sector, but also the transportation and industrial sectors.

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<sup>1</sup> Rystad energy research and analysis, October 2021

**Figure 7: Renewables will continue to displace fossil fuel generation to achieve net-zero**

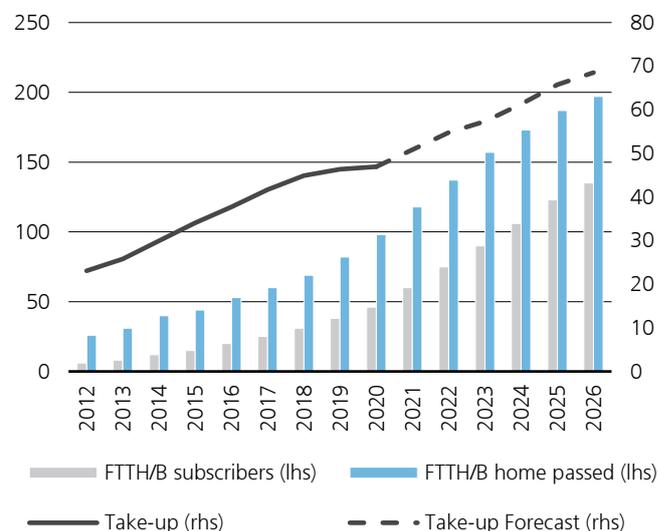
(Global energy capacity, GW)



Source: IEA Net Zero by 2050 Report, May 2021

**Figure 8: European fiber rollout and take-up**

(home passed and subscribers, million; take-up, %)



Source: FTTH Council for Europe, FTTH Forecast for Europe, September 2021; Data for EUR27+UK

## Theme 3: Digitalization

Digitalization is a universal theme. Gartner forecasts that global IT spending will reach USD 4.5 trillion in 2022, up 5.5% versus 2021. Data consumption growth continues to drive digital infrastructure investments, although there are some regional differences to how high-speed internet infrastructure is being rolled out (fiber vs. 5G, private vs. public financing for fiber).

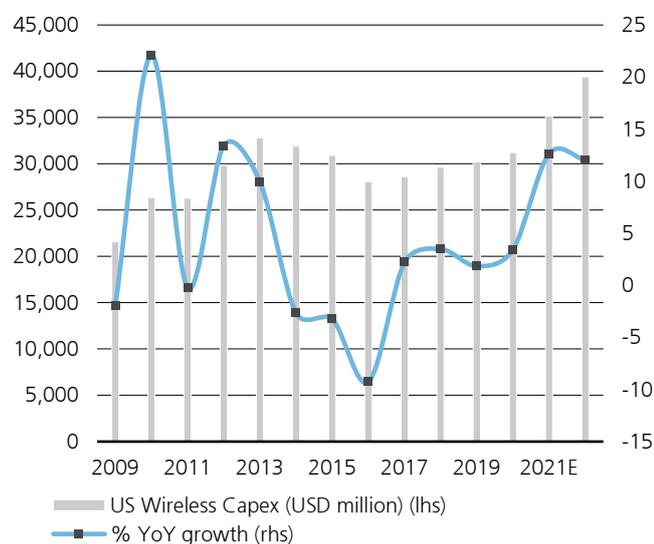
High-speed internet became a necessity for most households during the pandemic, and there is growing evidence that consumers are willing to pay a premium for faster internet connections. A UBS Evidence Lab survey<sup>2</sup> of 10,000 European consumers showed that over 29% of mobile subscribers are willing to pay a 5-10% premium for 5G, with 40% of broadband subscribers willing to pay a similar premium to upgrade to ultrafast speeds (1GB/s). Also, 18% of respondents said they would spend more on broadband as a result of COVID-19 and the need to work from home.

European investment continues to go into full fiber with strong government support, as the number of fiber-to-the-home (FTTH) subscribers is expected to more than double between now and 2026. At the same time, take-up will increase from around 50% to around 70% over this period (see Figure 8).

On the other hand, US high-speed internet rollout is a mix between 5G (focused on the higher spectrums vs. Europe) and fiber. Mobile broadband is a more realistic market in the US as there is more variability in location, terrain, and population density. Therefore, there is no one size fits all solution. US wireless capex is forecast to grow to almost USD 40 billion by 2022, vs. the USD 30 billion average annual spend in the last 10 years (see Figure 9).

<sup>2</sup> UBS Evidence Lab – European Telecoms Consumer Survey, August 2020

**Figure 9: US wireless capital expenditures**  
(capex; USD million, YoY growth)



Source: UBS Investment Bank, Communications Infrastructure: A Strong Signal for Tower Investment, June 2021

This increased capital spending is clearly a positive for telecom towers, but also for back-haul and middle-mile fiber that connects the towers to other parts of the broader digital infrastructure network. In addition, public support for bridging the digital divide is also ramping up, with the recent US infrastructure bill targeting USD 65 billion in broadband investments that will mainly provide grants to support underserved communities in gaining broadband access.

Finally, the data center sector also continues to grow rapidly with the densification of telecom infrastructure. For example, data center capacity in Europe continues to expand, driven by outsourcing, cloud applications, security and edge.

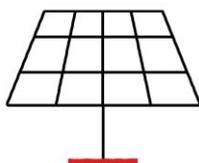
Capacity at top markets including Frankfurt, London, Amsterdam and Paris (or FLAP) will exceed 2GW for the first time, after adding over 400MW of capacity in 2021, according to CBRE.

Similarly, in the US, 1.2GW of data center capacity is currently under construction (versus ~4GW of existing supply), plus another 3.3GW in serious planning, according to Cushman and Wakefield.

Data center deal volumes by private investors reached an all-time high in 2021, headlined by the privatization of CyrusOne (USD 15 billion) and the sale of QTS's datacenters (USD 10 billion). Investors are also starting to look at *edge* data centers, which are smaller data centers located closer to end-users due to the rollout of 5G and new applications such as internet-of-things (IoT) and AI, which requires the instantaneous delivery of data. Edge data centers are uniquely positioned to satisfy those latency requirements.

Finally, the decarbonization and digitalization themes are converging here, as many customers are demanding that data centers use cleaner energy. For example, in November 2021, Dominion Energy filed plans to build 2.6GW of offshore wind facilities outside Virginia for USD 9.8 billion, which will provide clean energy to the data centers in Northern Virginia, the largest data center market in the world.

For investors, telecommunication infrastructure across towers, fiber and data centers are all attractive investments, given the long runway for global data consumption growth. However, the pandemic has also put a huge spotlight on the sector. This can be viewed as a double-edged sword – on the one hand, it could attract more market liquidity and government support, but on the other hand, it could also attract more competition and regulatory scrutiny.



## Private infrastructure markets

In this section we look at the health of the infrastructure equity and debt markets in terms of fundraising, valuations and performance.

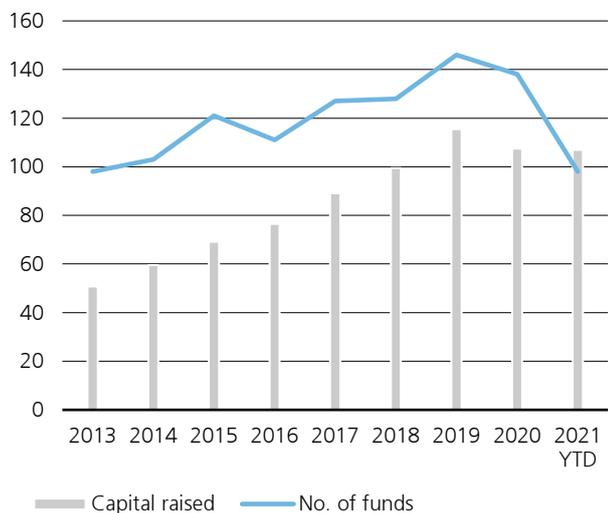
### Infrastructure equity

Infrastructure fundraising volumes are already in line with 2020 levels, are on-track to exceed 2019 levels, a record year (see Figure 10).

The trend of growing mega-funds continues with a dozen of them seeking more than USD 5 billion; four of those are seeking to break USD 10 billion.

Sentiment towards the asset class is also strong according to Preqin, with 51% of institutional investors looking to increase their allocation in the coming year (vs. 43% for private equity and 39% for private debt).

**Figure 10: Infrastructure fundraising trend**  
(USD billion)



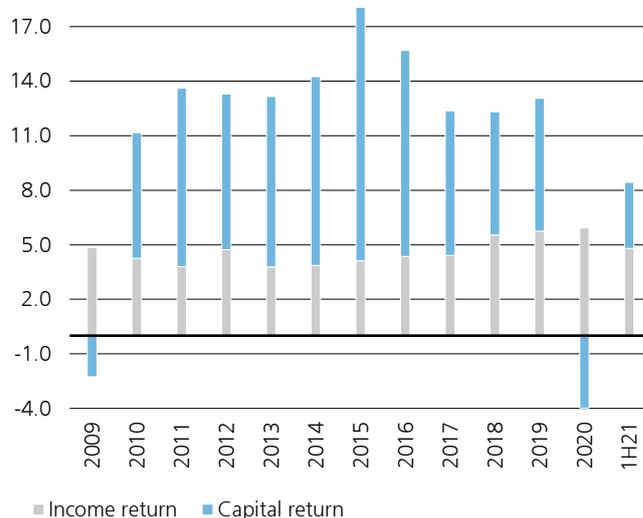
Source: Preqin, November 2021

The infrastructure sector recorded strong performance for the year to June 2021 with MSCI reporting a total return of 8.6% (see Figure 11). This follows a relatively resilient 2020 – in the circumstances – with total returns of 1.8%. These MSCI returns are in line with the returns from EDHEC of 9.2% for the year to September 2021. The improvement in the sector’s performance was driven by the swing in the transportation sector from -12.2% to +7% for 2021. As with the previous year, the income component of returns remained stable at around 5%, highlighting the quality of cashflows coming from essential infrastructure assets.

We track the private infrastructure EV/EBITDA transaction multiples (see Figure 12) based on over a thousand data points. 2020 was a peculiar year for multiples, as the steep decline in earnings have not been followed by an equal decline in overall valuations. Since the denominator has fallen more than the numerator, multiples based on 2020 earnings received an artificial boost. This dynamic has played out in both the private and public markets. With the recovery of earnings (i.e., the denominator) in 2021, multiples have moderated.

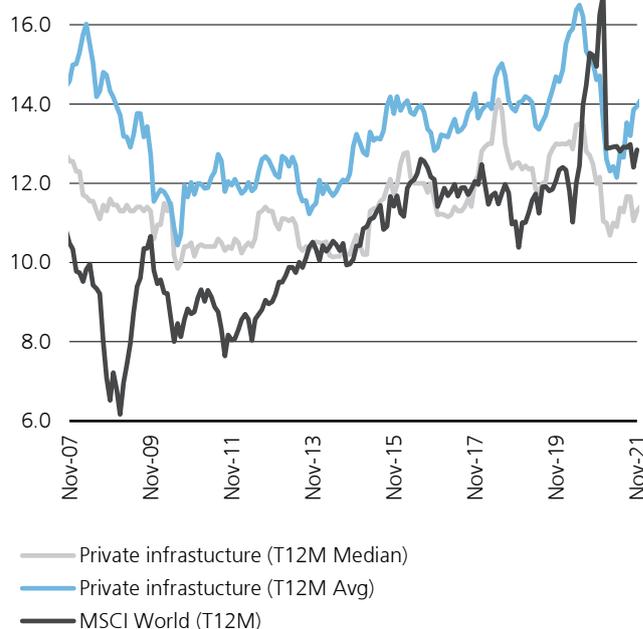
**Figure 11: Infrastructure performance**

(gross total return %, local currency, 12 months to June 2021)



Source: MSCI Global Quarterly Private Infrastructure Index, June 2021. Past performance is not a guarantee for future results.

**Figure 12: Private and public EV/EBITDA multiples have moderated as earnings recover** (EV/EBITDA multiple)



Source: UBS Asset Management Proprietary Database (based on 1,400 transactions); Mergermarket; InfraNews; Infrastructure Journal; Infrastructure investors; Bloomberg, November 2021

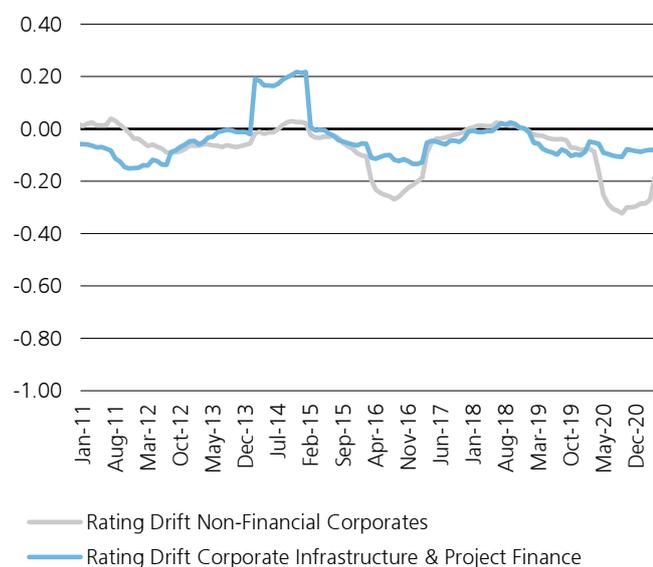
Average private multiples have converged with public market multiples, which is significant as private multiples traded at a premium for a number of years, especially before the pandemic. If we look at median private multiples, they are even trading at a slight discount to public markets.

According to Preqin, infrastructure dry powder stands at around USD 300 billion, relatively flat versus the end of 2020, after increasing by USD 100 billion in 2018 and 2019. This suggests that although competition remains intense, markets are becoming more balanced between deal supply and demand. Even with a record share of telecommunication deals, which typically trade at a premium versus other sectors, we are no longer seeing the extreme multiples of 2020 that significantly skewed overall average valuations upward.

### Infrastructure debt

The infrastructure debt market continued to be resilient in a challenging market environment, with significantly lower defaults and downgrades versus corporates (see Figure 13) in the year to March 2021. This reflects the essential nature of infrastructure assets, as well as the structural protection which is common to infrastructure financings.

**Figure 13: Rating drift was only slightly negative for corporate infrastructure and project finance issuers**

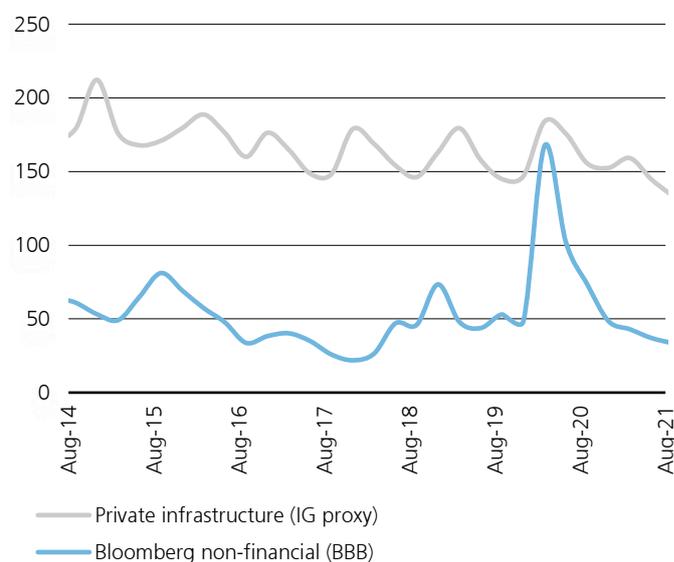


Source: Moody's: Default and recoveries: COVID-19 one year on – infrastructure proves its resilience, May 2021; UBS Asset Management, Real Estate & Private Markets (REPM), November 2021

Apart from a brief period in 1Q20 when public market spreads widened to reflect market uncertainty, private infrastructure debt has offered a sustained premium versus public corporate bonds (see Figure 14). This premium is required by investors to compensate for the investment being perceived as less liquid. However, for infrastructure, it is more than an illiquidity premium, it is a complexity premium, which is made up of the ability to source, structure and execute complex transactions.

European financing volumes for 2020 were down 11% to EUR 121 billion. While we shouldn't read too much into intra-year changes, the sharp drop in transportation (-11%) was notable (see Figure 15). We also saw a strong pick-up in activity in telecommunications and renewables as these sectors showed themselves to be resilient to COVID-19. We expect to see strong demand continue in these sectors. We also expect to see a recovery in transportation transactions as the market environment for demand-based assets continues to stabilize.

**Figure 14: Spreads on private infrastructure debt (basis points)**



Source: EDHEC Scientific Infrastructure – Debt Indices (Europe), November 2021



## Final thoughts

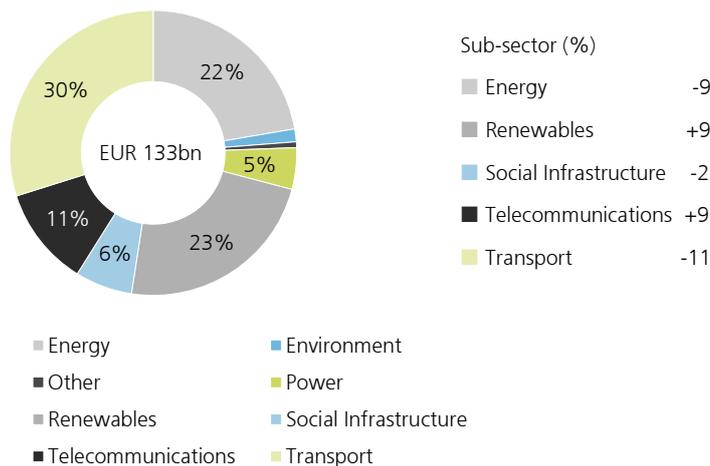
The infrastructure sector continues to recover well from the pandemic, showing robust risk-adjusted returns. We see a strong recovery in transportation sectors as economies re-open. Furthermore, the two themes that we consistently highlight, decarbonization and digitalization, continue to show very strong fundamentals and benefit from positive political support. While we are optimistic about the outlook for infrastructure, our conviction is somewhat fragile in the short-term.

Infection rates are rising again and talks of further lockdowns are emerging. We saw in 3Q21 that the economic recovery will not be without bumps. Overall, the sector is performing well and the long-term outlook is positive. Secular tailwinds and government support will continue to grow the investable universe for infrastructure, although attractiveness of each opportunity could vary significantly depending on region-specific market dynamics and local policies.

**Figure 15: Sector composition 2019 vs. 2020**

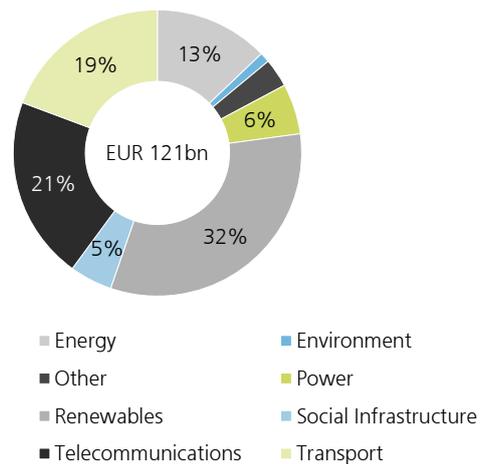
### Sub-sector split, 2019

(% of European market by transaction size)



### Sub-sector split, 2020

(% of European market by transaction size)

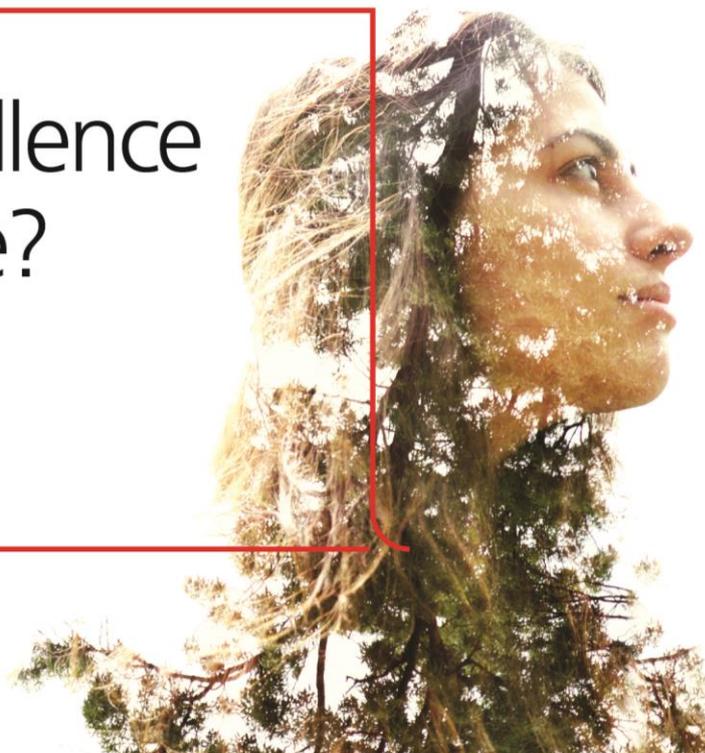


Source: Inframation, October 2021



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