

Top trends in 2020

Infrastructure Outlook



Infrastructure 2020: cleaner and more connected

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Top infrastructure trends for 2020

This paper focuses on three key themes in Europe and North America to help investors navigate portfolio allocation decisions. A unifying trend across regions is customers demanding more action to combat climate change, meaning more investment opportunities in low carbon infrastructure and risks for carbon-intensive sectors. We're also seeing opportunities in digital infrastructure with infrastructure investors continuing to invest heavily into the sector which is underpinned by the increasing essentiality of connectivity. Broader private infrastructure debt and equity markets also appear healthy despite the more challenging political and economic environment.

Macroeconomic overview

In 2019, both economic forecasts and interest rate and bond yield projections have been cut. Concerns abound over prospects for the global economy and whether it will enter recession in 2020. Indeed, some economies, such as Germany and Singapore, are already skirting technical recessions, while Hong Kong is already there as protests take their toll on economic activity. That said, the main economies of the world continue to show growth, albeit weakening.

World trade volumes have reversed, and in the three months to August were down 1.5% compared to a year earlier. The impact has mainly been felt in industry where, over the same period, world industrial production growth slowed to 0.7%. This is the most pronounced slowdown since the financial crisis. A key question is whether the service sector can remain resilient, having held up reasonably well. It is quite possible that weakness in trade and manufacturing will eventually spill over. The likelihood of recession has risen, with Oxford Economics putting the probability of recession in the US over the next 12 months at 40%, up from below 30% at the start of the year.

The key global recession indicators flashing red at the moment are the US yield curve and world industrial production, though unconventional monetary policies mean the predictive power of the yield curve might be diminished. The term premium on long dated bonds has fallen, making an inversion easier to achieve than in the past. Other recession indicators include US corporate earnings and commodity prices, which are currently flashing amber, and global stocks, corporate bond spreads and US credit standards, which remain green.

The escalation of the trade war and cooling growth has spurred central banks around the world to action and seen a U-turn in monetary policy. The Federal Reserve has cut US rates three times, largely reversing the four hikes of 2018. However, it is unclear whether the Fed has been driving markets or responding to them; what Ben Bernanke called a "hall of mirrors". In September, the ECB cut its deposit rate to -0.5%, extended its forward guidance and restarted its asset purchase program at EUR 20 billion a month.

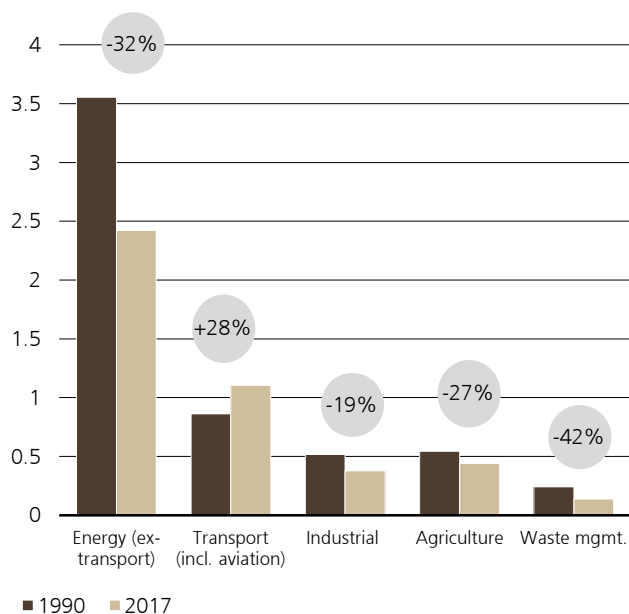
Top three European market trends

A climate emergency: a changing perspective or empty new words?

The Collins Dictionary word of 2019 was "climate-strike" boosted, in part, by the Extinction Rebellion movement. Other climate-related vocabulary such as climate emergency and *flygsham* (flight-shaming) also entered the mainstream.

Fitting then that the newly appointed European Commission (EC) President, Ursula von der Leyen, has made environmental protection her number one priority and is promising to deliver a "green deal" for Europe in her first 100 days. The deal will set out the roadmap to achieve a tightening of the European Union's emission reduction targets for 2030 to 55% from 40% (vs. 1990 levels) and net zero by 2050. To achieve this, the EU is planning to unlock EUR 1 trillion of funding for "climate action and environmental sustainable investment" over the next decade. The target of achieving net zero by 2050 is hugely ambitious and will require a coherent set of policies for investment across all sectors of the economy.

Figure 1: EU emissions have fallen 22% since 1990
Million tons of carbon dioxide equivalent (Mt CO₂e)

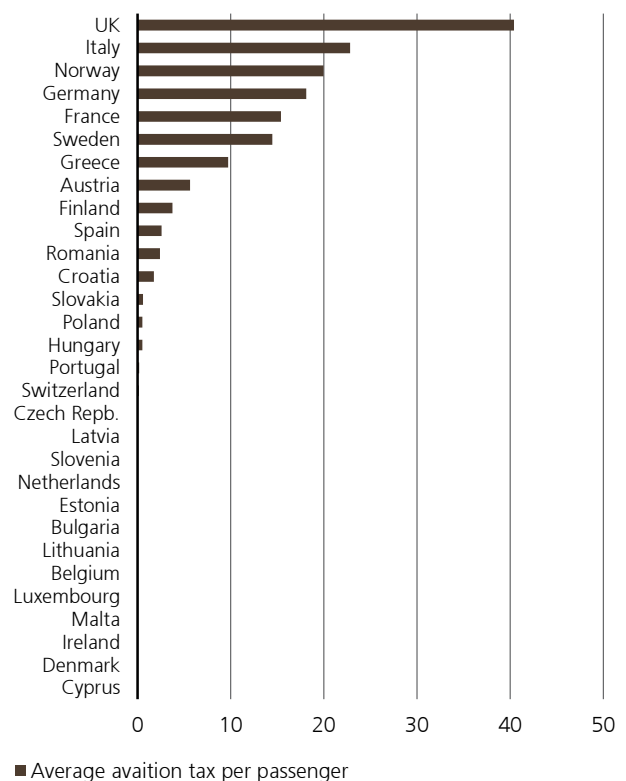


Source: European Environment Agency, November 2018

The EU has already made a number of meaningful policy steps. The reforms to the EU Emission Trading Scheme (ETS) market (discussed in [last year's outlook](#)) resulted in average carbon prices in 2019 of EUR 25/ton. The recent announcement that the European Investment Bank will cease issuing loans for projects aimed at coal, oil and natural gas infrastructure by 2021 is another sign of substance. However, when Ms. von der Leyen looks at the EU's actual and historical emissions, it may be transportation that gives her greatest cause for concern: emissions are 28% higher than in 1990 and have increased for the fifth year in a row. In many respects, energy was the low-hanging fruit whereas lowering transportation-related emissions requires some innovative thinking.

The push for electric vehicles (EVs) in Europe will certainly help, but it seems inevitable that the aviation industry will continue to face scrutiny. There is currently no EU-wide policy on aviation taxes with a large range of country-level taxes applied across the bloc.

Figure 2: Wide range of aviation taxes across Europe
Average aviation taxes per passenger
(EUR, total taxes/passengers)



Source: Draft European Commission (leaked) study on aviation taxes, 2018

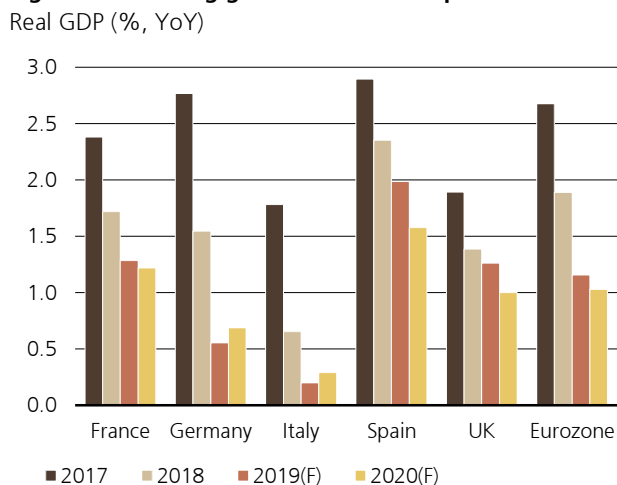
A leaked EC report highlighted two possible measures to reduce aviation emissions: applying VAT on all tickets; and applying a fuel tax on flights within and departing the EU. Flights across the EU could fall by 19% and 11% in the VAT and the fuel tax scenarios, respectively. The report argued, however, that the net impact for EU jobs and GDP would be limited if the proceeds were reinvested in the economy. The result varies between countries, and those with low existing taxes would likely be the most impacted if either of these hypothetical scenarios were to emerge. It is worth highlighting that getting an EU-wide policy of this nature passed would be a significant undertaking.

In summary, the EC has unveiled ambitious plans but the devil will be in detail of the green deal. The potential surge in investment should be a positive for investors with a focus on energy transition. On the other hand, the target of net zero by 2050 could mean taxes on aviation which would be negative for certain airport investors.

QE is back, but where is the growth coming from?

Last year we opined that the political environment, namely the rise of populism and trade wars, was dragging on the European economy. Nowadays, while the European political environment seems to have settled, economic prospects continue to look relatively bleak: growth of 0.2% in 3Q beat consensus forecast expectations; however, sentiment remains depressed and industrial production is in negative territory. In fairness, there has been a general deceleration in the global economy which has weighed on the eurozone, particularly the external sector. The added political uncertainty has also been a drag with the fallout from the trade wars hitting manufacturing and the impasse over Brexit weighing on private investment.

Figure 3: Declining growth across Europe



Source: Oxford economics, November 2019

Mr. Draghi's parting gifts to the eurozone were another base rate cut and the restarting of the ECB's asset purchase program at EUR 20 billion per month. The new ECB President, Christine Lagarde, is facing a eurozone economy with declining GDP growth and inflation that is stubbornly low, and few untapped policy measures in her arsenal. Additionally, while the political threats have recently dissipated, risks loom on the horizon with the UK elections and continued uncertainty over the form of their exit from the EU.

Infrastructure investors with UK exposure will anxiously follow the outcome of the 12 December election. A key strand of the Labour Party's policy is the nationalization of key entities and sectors, including railways, electricity distribution, Royal Mail, water utilities and BT Openreach. This would likely result in impairments for the owners of these assets.

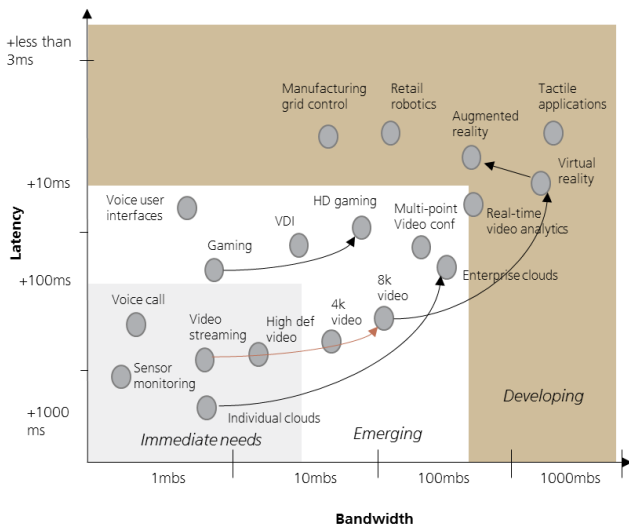
We continue to favor unregulated assets over regulated assets in Europe given the low interest rate and inflation environment, and the continued public pressure on the private ownership of infrastructure assets across Europe.

Telecommunications investment continues to surge

We noted in last year's outlook that infrastructure investors were becoming increasingly active in the telecommunication space. This trend continued in 2019, with the German and UK fiber markets particularly active: EQT, KKR, Basalt and MIRA made large investments through the acquisitions of Inexio, Hyperoptic, Manx Telecom and KCom, respectively.

KCom is the latest in a series of telecommunication companies to be de-listed, reflecting the increase in mega-funds in the infrastructure market. There is also a strong argument, however, that fiber assets are better suited to private investors given the high capex requirements and long payback periods versus a more short-term, dividend-focused model in the public market. Telecommunication companies also continued to dispose of assets, taking advantage of high multiples for secure assets. In 2019, Vodafone and KPN sold their non-core data centers to infrastructure investors.

Figure 4: Increasing requirement for bandwidth and low latency. Milliseconds (y-axis) and megabits/second (x-axis)



Source: GSMA Intelligence, ADC consulting group, edited by UBS Asset Management, Real Estate & Private Markets (REPM), August 2019

Figure 4 gives a high level view of the applications and devices that require high bandwidth and/or low latency. Broadly speaking, if you believe that the applications and devices listed in the "emerging" segment will become mainstream in the next 5-10 years, then this is supportive of significant investments requirements in both fiber and data centers.

As well as storing data, data centers are required to process and distribute data across networks. To create low latency, more data centers will be required close to data dense areas (so called "edge" data centers) as latency is a function of distance.

While we are bullish on the fundamental drivers behind the investment into digital infrastructure, we are also mindful of the risks, as outlined in our previous paper ([click here](#) to read). For example, the business case for fiber take-up rates needs to be based on the speed and cost of users' existing connection, and must reflect the nuances of each particular market. According to Analysys Mason, the average UK user consumes 117GB per month at home. Around 80% of this traffic is fixed-line, with TV accounting for approximately 50% of traffic. In Austria, the monthly figure drops to 51GB with only around 60% coming from a fixed line. Therefore, all other things being equal, the penetration rate for full fiber in the UK should be significantly higher than in Austria.

Mobile or fixed wireless access (FWA) substitution is a risk but the magnitude depends on the region that you operate in. Figure 5 shows that at a global level, most 5G mobile and FWA solutions use an existing low or mid-band spectrum, which will not be able to deliver equivalent speeds or reliability to fiber. It will, however, be sufficient for a certain cohort and this should be considered when assessing an opportunity.

Figure 5: Most 5G networks are using low and mid-band spectrum



Source: S&P Global Market Intelligence, July 2019

Top three US market trends

Sorting through the 2020 US election noise

With the upcoming 2020 elections, we will most likely see an increasing number of headlines about government infrastructure spending, as politicians love to make speeches full of platitudes about the country's "crumbling infrastructure", without offering any realistic solutions.

For example, there has been a lot of hype around President Trump's trillion dollar infrastructure plan since 2016, as it is one of the few areas within politics that has bipartisan support. Yet nothing has happened, despite the Republican Party having control over Congress for two of those years.

Even now, Democratic Party candidates have thrown out some large numbers for infrastructure spending, with little details on where the money is from (usually a vague combination of corporate tax cut reversals and wealth tax). Given the recent lack of success by the Republicans, we are skeptical that the Democrats would do better even if they win the White House and Congress.

The truth is that the private infrastructure industry has thrived without broad federal support. If anything, private infrastructure investors should be wary of an ill-devised federal infrastructure plan. If the government is simply directing a trillion dollars into uneconomic infrastructure projects while reversing corporate tax cuts, private investors will see their returns compress, as opportunities get crowded out while corporate tax rates increase.

On the other hand, any policies that increases the amount of privatizations, public-private partnerships and financial incentives would be positive for investors, as it increases the investable universe, and helps utilize the large amounts of dry powder that is currently sitting on the sidelines. Unfortunately, none of the current infrastructure proposals appear to be heading towards this direction.

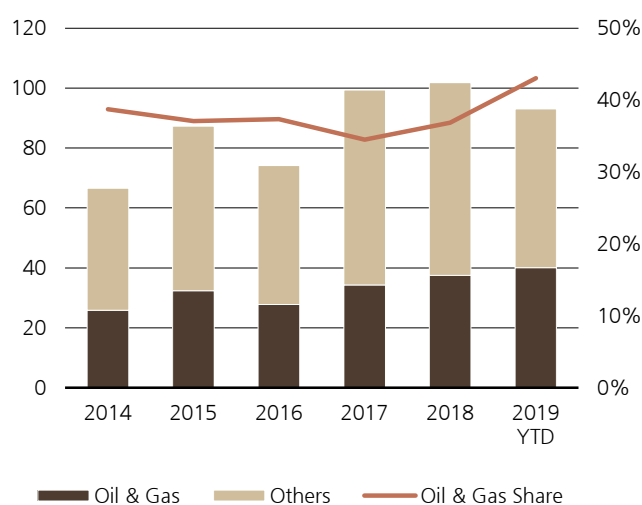
This does not mean the elections are irrelevant to infrastructure investors. There are several specific industries that have entered the spotlight (or crosshairs), which we highlight below:

Oil and Gas:

A number of Democratic Party candidates have talked about banning fracking (hydraulic fracturing) in the US completely, which will adversely impact oil and gas infrastructure such as pipelines, power stations and export terminals.

We believe an outright ban would be difficult to achieve politically, given its importance to the broader economy. Oil and gas infrastructure investments totaled almost USD 200 billion in North America since 2014, accounting for around 40% of all infrastructure investments (Figure 6).

Figure 6: North America infrastructure deals
(USD million)



Source: Inframation, November 2019

The state of Colorado offers an interesting case study. Despite being a left-leaning state where Democrats control both chambers of the state assembly, and with a Democratic governor who wants the state's electricity to be 100% renewable by 2040, state residents actually voted against having more restrictions on fracking near schools and homes during the 2018 mid-term elections.

The debate around fracking is therefore clearly not black and white, as there are socioeconomic – and even geopolitical – arguments beyond just the environmental. However, even if there is no outright fracking ban, regulations can certainly still tighten further, which is a risk that investors will have to price in when investing in this sector.

Telecommunications:

US politicians are broadly supportive of the roll-out of high speed internet via technologies such as 5G and fiber, as the US has arguably already fallen behind other parts of the world in some of these areas. There is now political consensus for the US to regain and maintain its technological edge, especially since countries like China are looking to dominate the next generation of technological standards.

On a more local level, politicians are also supportive of high speed internet development, especially in rural areas where there is currently a severe urban-rural divide. 97% of the US population in urban areas can access high speed internet vs. 65% in rural areas. Bridging this digital divide is therefore politically appealing, especially since rural populations also tend to be swing voters.

Renewables:

In 2019, a bipartisan group of lawmakers introduced a bill to congress to extend the Investment Tax Credit (ITC), an important subsidy for the renewable energy industry. This bill will likely come under more focus in 2020 or after the elections in 2021.

Although such bipartisan support for clean energy may surprise those who are not familiar with the US, we would point out that the top three wind power generating states are Texas, Iowa and Oklahoma – states that voted for Donald Trump in the 2016 election. As we have noted in the previous example of Colorado, clean energy and fossil fuels are not necessarily seen as mutually exclusive in the US. Both sources of energy appear to have a role in the current energy transition, although renewables face fewer regulatory risks.

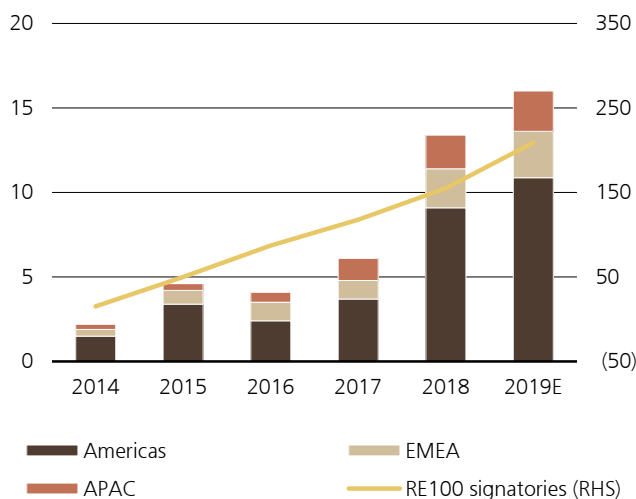
The people have spoken, and they demand clean energy

The bipartisan support that politicians have given to the renewable energy sector is simply a reflection of their constituents' views – people want cleaner energy.

One interesting development is that employees and investors of large corporations are also demanding more focus on sustainability. Many large corporates have therefore signed up to the RE100 initiative – where they commit to buy electricity from renewable sources through power purchase agreements (PPAs) – which provides a stable cash flow to renewable energy developers and investors.

We estimate that US corporates are on pace to sign 11GW of renewable energy PPAs in 2019 (Figure 7), accounting for a majority of global PPAs (although Europe has also experienced significant growth in recent years). The number of RE100 signatories has also increased by 35% in 2019, a positive leading indicator for the future demand of corporate PPAs.

Figure 7: Renewables corporate PPA capacity signed (GW) and number of RE100 signatories



Source: Bloomberg, Greentech Media, RE100, November 2019

Another important development for the renewables sector is the recent increase in extreme weather events. According to the National Centers for Environmental Information¹, 2019 is the fifth consecutive year in which the US has seen more than ten natural disaster events (costing at least a billion dollars each and adjusted for inflation) vs. an average of four such events per year back in the 1980s and 1990s.

The impact of climate change has become more tangible, as millions of families have to grapple with the fallout of these disasters. For example, wildfires in California in the last two years have driven the local utility, Pacific Gas and Electric Company, into bankruptcy. This has led to constant blackouts across communities, which are expected to last another 10 years. As their utility can no longer provide a reliable essential service, resident have chosen to install solar panels and battery packs in their homes, not as a result of their political or environmental views, but for their own survival.

Although the climate change movement in the US has not reached the same level of fever pitch as Europe, there is still significant demand for both utility-scale and distributed renewable energy, which investors can capitalize on.

¹ www.ncdc.noaa.gov/billions/

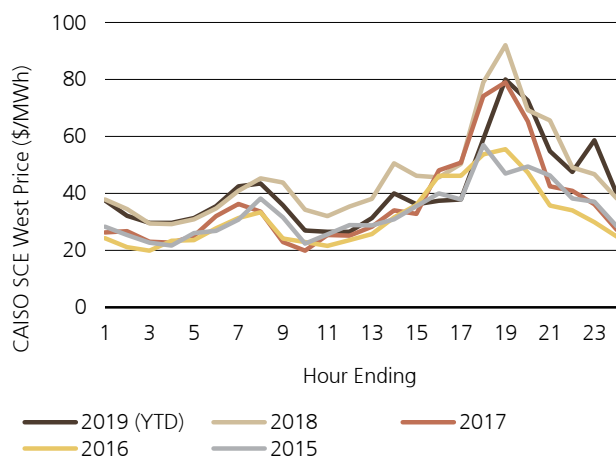
Emerging technologies in energy... looking for the next big infrastructure opportunity

As competition rises for infrastructure assets, investors are looking to identify the next big opportunities. Just as renewables experienced a global renaissance a decade ago, there are a number of emerging technologies in the energy sector that has significant potential in the next decade. We highlight several below:

Energy storage:

The biggest issue facing renewable energy is the unpredictability of wind and solar, and batteries have become the obvious solution to solve this problem. For example, the large amount of solar panels in California create an oversupply of electricity around noon when the sun is shining the brightest and demand is relatively weak, which leads to very low power prices around those hours. After 5pm, as people return home from work and turn on their appliances, demand jumps while solar generation wanes after sunset (leading to a spike in prices at around 6pm – see Figure 8). A battery can therefore charge itself when prices are cheap, and discharge when prices are higher, thus earning an arbitrage revenue.

Figure 8: California average electricity prices



Note: Based on South California Edison West real-time prices
Source: Bloomberg, CAISO, November 2019

Consumers can also install smaller batteries at home to supplement the electricity that they already generate from their rooftop solar panels. As discussed, this offers an attractive value proposition in places like California, where electricity from the grid has become unreliable.

Regulatory changes in the past two years and the falling costs of lithium-ion batteries have pushed energy storage projects to the fore, and we believe we will see an exponential number of projects coming online in the next few years.

Electric vehicle charging stations:

With the proliferation of electric vehicles (EVs), the US, Europe and China will need 40 million additional EV chargers through 2030, or around USD 50 billion of investments, according to McKinsey. This opens up opportunities for infrastructure investors, although there are some issues that investors must consider.

First, location matters as residents in different places will likely have different charging habits. For example, in areas with multiple solar panels, customers will charge their vehicles during the day; ie. at their workplace when power prices are low. In other areas, customers may prefer charging overnight at home. Next, picking the right technology is important, as the industry is still standardizing charging and payment mechanisms. Investors must watch out for technological obsolescence risk.

Finally, investors should scrutinize the potential revenue models and ask questions; eg. (i) is there is exposure to electricity price volatility?; (ii) are there long-term contract opportunities with municipal or private vehicle fleets?; and (iii) are rent discounts or government subsidies available?

Smart meters and grids:

In an increasingly connected world where data is king, smart meters and grids are gaining popularity as they collect and share data across all stakeholders along the energy supply chain, including power stations, batteries, grids, households, EVs and charging stations. This means that supply and demand can quickly adapt in real-time to changing conditions and power prices, as there is now full information transparency.

In one prominent example, the city of Houston in Texas credited smart meters in helping them during Hurricane Harvey in 2017, when smart meters automatically transmitted critical consumption data, helping the grid company identify outages even before residents knew.

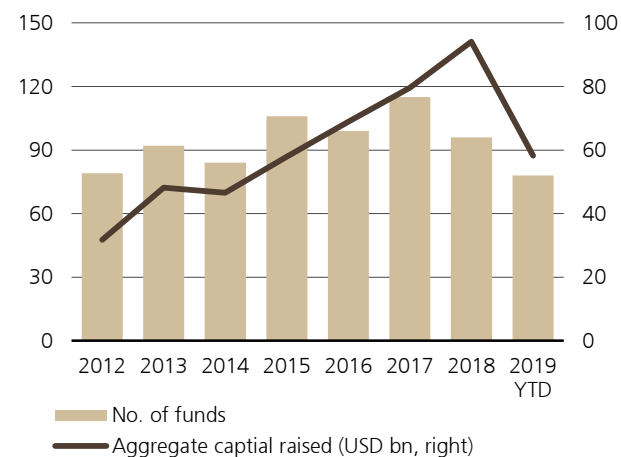
For investors, potential revenues can come from services such as the installation, maintenance, data collection and data analysis, or from lease payments under an equipment leasing model. It is also possible to receive revenue guarantees or regulated returns from governments, depending on local policies. The US currently lags behind Europe in the adoption of these technologies, but with the recent rise of extreme weather events, the call for grid modernization is gaining traction.

Private infrastructure markets

Infrastructure equity

Infrastructure fundraising has, so far, failed to live up to a bumper 2018 with capital raised to date of USD 58.3 billion (versus USD 94.1 billion for the 2018 calendar year – see Figure 9). Some mega-funds are targeting final closes in 4Q which may bump the numbers up, perhaps to 2017 levels of circa USD 80 billion. Nonetheless, investors remain positive about the asset class. Preqin's 2019 survey reported that 84% of investors felt the asset class has met or exceeded their expectations while 50% expect to increase their long-term allocation vs. 6% looking to reduce their exposure.

Figure 9: Infrastructure fundraising trend



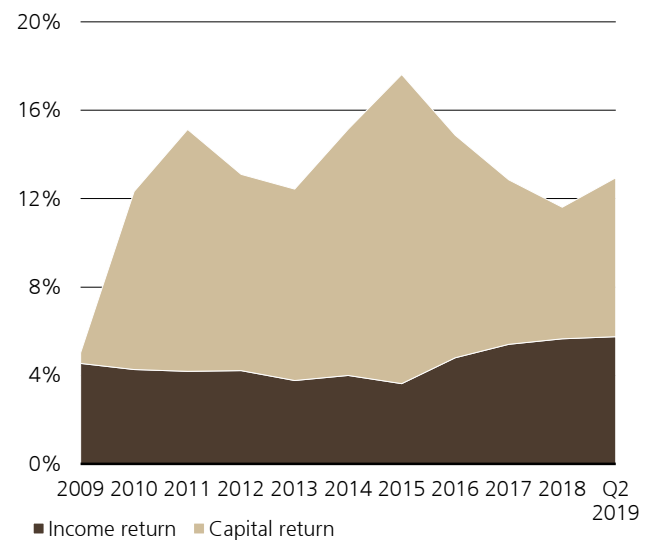
Source: Preqin, November 2019

We observe that the increased capital flowing into the infrastructure sector is causing a shift in investment style to more non-core strategies: around 50%² of the funds raised for 2018 and 2019 vintages were for non-core strategies.

It can sometimes be difficult to read through the real estate nomenclature of core, core+, value-add and opportunistic. It is perhaps easier to think about style in terms of the income and capital composition of total returns.

Figure 10: Infrastructure performance

(Gross total return %, local currency³)



Source: MSCI Global Quarterly Private Infrastructure Index, September 2018

Core strategies tend to be more income focused whereas value-add and opportunistic strategies rely more on capital growth to meet total returns. The move from non-core strategies can be seen in Figure 10 which shows that over the past five years, the capital component of total returns makes up around 65% of total returns.

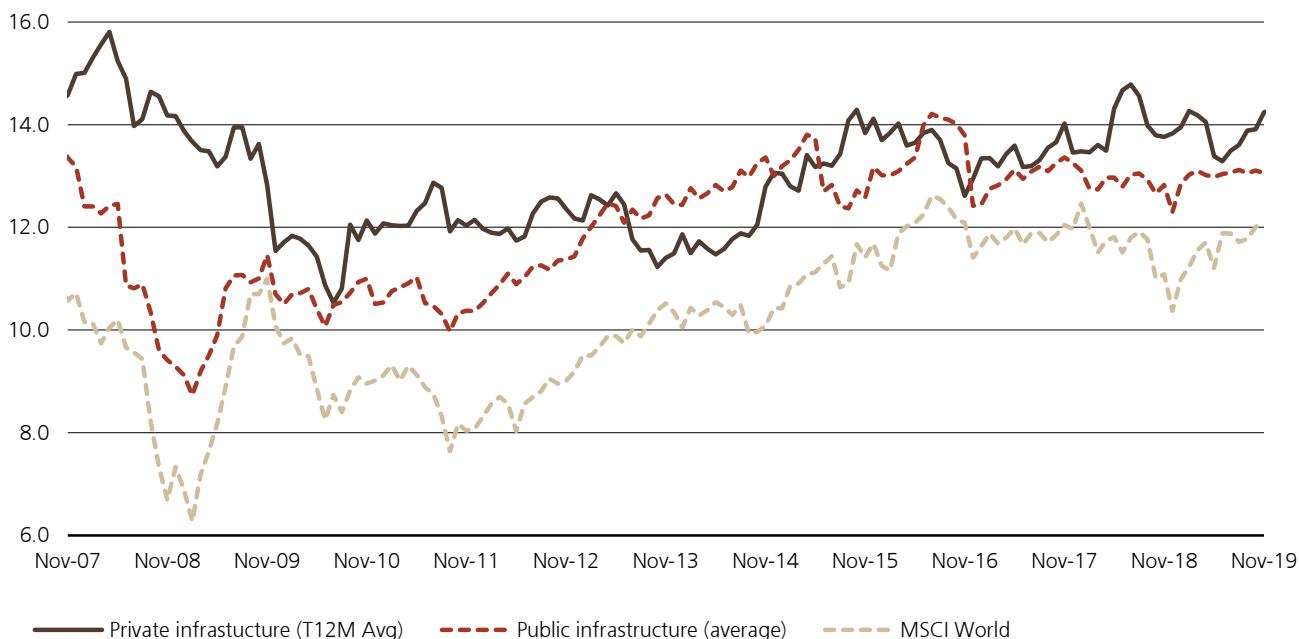
Gross absolute returns were strong for the 12 months to June 2019 at 13.2% versus 12.5% over the same period in 2018. The transportation sector delivered 16.5% over the period while returns for power were 11% to June 2019.

In addition to the shift to riskier strategies, the inflows into private markets have also resulted in valuations that are high by historical standards. Looking at the EV/EBITDA multiples in Figure 11, valuations remain elevated (near pre-financial crisis levels). However, the risk-free rate in late 2007 was around 4% versus circa 1% today. Interest rate expectations have also fallen significantly since the beginning of 2018, as central banks around the world have become more cautious about the state of the global economy.

² Preqin, November 2019

³ The MSCI index is calculated in local currency and weighted towards Australia (45% at December 2017). Risk-free rates in Australia over the past 5 years have exceeded the G7 average by around 1.2%, resulting in higher overall returns versus a USD-denominated index.

Figure 11: Private infrastructure EV/EBITDA multiples remain elevated, especially versus public markets



Source: UBS-AM Proprietary Database (based on 1,300 transactions), Mergermarket, InfraNews, Infrastructure Journal, Infrastructure investors, Bloomberg; November 2019

This has implications for both the cashflow of an infrastructure asset and the attractiveness of the asset class. Infrastructure assets are typically highly leveraged so the impact of lower rates on an infrastructure company's cashflow can be material. However, as EBITDA is calculated pre-debt service, the EV/EBITDA multiple does not adjust for the impact of lower rates making the overtime comparison less meaningful.

The low yield environment has contributed to the attractiveness of private markets with investors seeking to capture the premium which private markets can offer. Infrastructure has further benefited from its strong performance (see Figure 10).

The increased interest in the asset class has led to return compression; however, relative to risk-free rates, which have been trending down, infrastructure continues to provide an attractive premium. Additionally, the market is four times larger than 2007 with many new market participants and an increased understanding of the resilience of the asset class through economic cycles – which may mean that valuations have further to run.

In our view, what is more concerning is not where the multiples trade relative to history, but the fact that private multiples continue to trend above public market valuations, which is certainly not helped by the rising number of publicly-traded companies being taken private at a premium by mega-funds. The risk of further correction in public markets provides a potential headwind to private infrastructure valuations.

Figure 11 shows that public valuation multiples have not increased since 2016 whereas private infrastructure valuations continued to grow. Overall, we believe that if listed infrastructure continues to have flat-to-declining valuations, then private markets should adjust, albeit with a lag.

Infrastructure debt

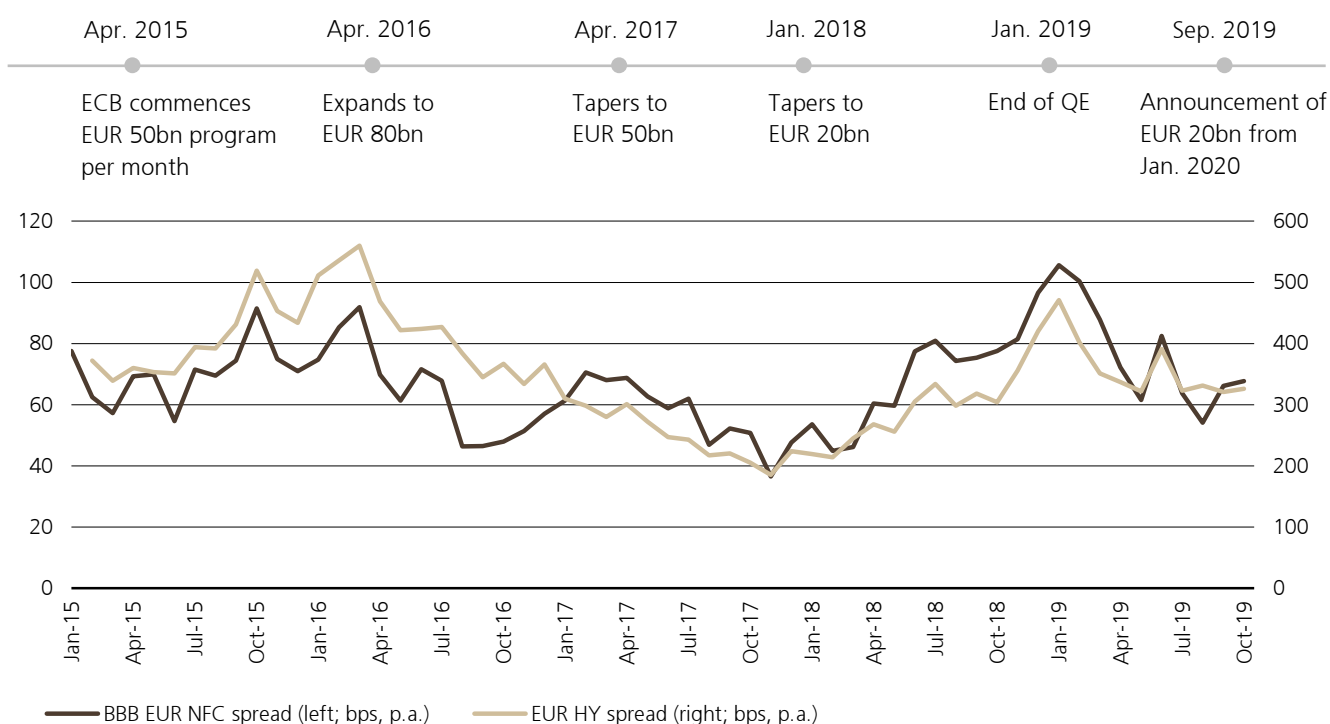
Infrastructure debt is increasingly becoming an important part of institutional investors' allocations. However, it is worth noting that bank financing still makes up 80-90%⁴ of total financing in the infrastructure market.

The infrastructure debt fund market is growing in Europe with 19 senior debt strategies launched over the past two years, raising a cumulative EUR 5.4 billion. However, this is still small in the context of the size of the European private infrastructure debt market of EUR 118 billion⁴.

Fixed income yields have compressed significantly over the past 12 months. The 10-year swap rate has reduced from

0.8% at the start of the year to around 0.1%. At the same time, investment grade spreads have fallen by around 50bps (Figure 12), in part driven by slowing European economy and expectations of further rate cuts and QE. We expect rates to continue to come under pressure in 2020 with the ECB committed to ongoing purchases. Although high yield bonds are ineligible for purchase under the ECB's program, spreads are indirectly impacted by the compression in investment grade bonds as investors move up the risk curve to seek yield. Spreads in the infrastructure market have also reduced over the past 12 months; however, as described above, the market is still predominantly bank financed and so the reduction in spreads is less pronounced than in the public markets.

Figure 12: Restarting of ECB bond purchasing program likely to compress spreads on public bonds



Source: ECB, Bloomberg, November 2019

⁴ Average size of private infrastructure market (2016-2018); Infra Deals, November 2019

Infrastructure Research & Strategy Team

Declan O'Brien
Alex Leung

For more information please contact

UBS Asset Management

Real Estate & Private Markets (REPM)

Declan O'Brien
Tel. +44-20 7567 1961
declan.obrien@ubs.com

Alex Leung
Tel. +1-212 821 6315
alex-za.leung@ubs.com

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