Transforming Infrastructure: The Opportunity of Transitioning Airports

What significant role can private infrastructure investors play in accomplishing decarbonisation goals within the transportation market?

IN A NUTSHELL

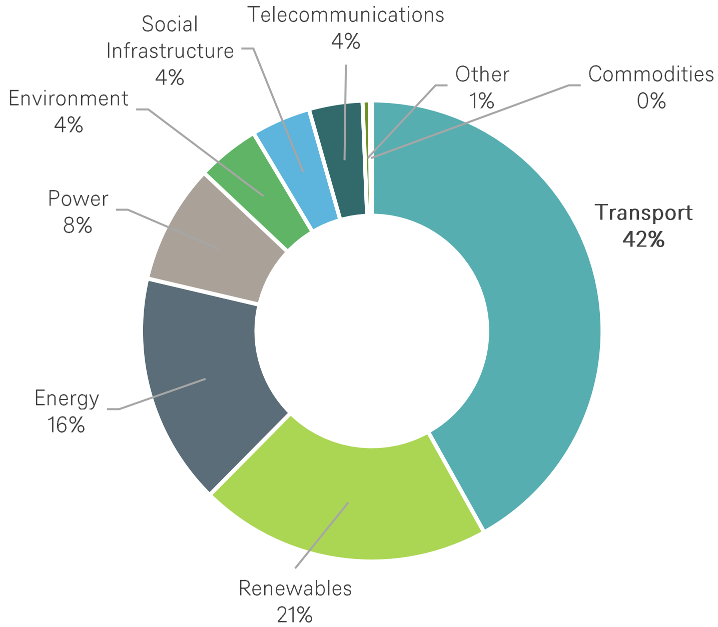
- The Transport segment has been seen as higher-risk since the Covid-19 pandemic, but with demand already at near pre-COVID levels we expect to see more assets come to market in 2024 and 2025.
- While EV charging has been a popular area of investment, much of the transport sector still requires significant capital expenditure with regards to decarbonisation.
- Airport assets are at an important juncture with regards to investor portfolios. While they offer scarcity value, a balanced mix of regulated and unregulated revenues, inflation hedge and well understood returns with recovering performance post-pandemic, airports' decarbonisation strategies will be a focus for certain investors.
- Aligning assets with decarbonisation initiatives will be an important step for asset owners to ensure airports are attractive to the next generation of owners who will take them on a longer term transformational journey towards being net zero assets.

Transport Recovery Bringing Assets Back To Market

Following several years of disruption, the global transport infrastructure market is poised to begin regaining its transaction market share eroded by the Covid-19 pandemic and geopolitical-related disruption. Transport sectors accounted for the largest value share of the global infrastructure transaction market until 2017, when they were superseded by renewables. Looking at the current pipeline of live and planned transactions, transport holds the greatest share of the value of transactions, likely driven by assets having been kept off the market following the pandemic given the increase in investors' risk perceptions towards the sector[1]. With demand recovery now underway across many sectors, we expect that transport assets may return to market at attractive valuations, given the long-term demand across the sector remains robust in our view; there is also an opportunity to reposition many of the larger, more traditional infrastructure assets – such as airports – and align their business plans with net zero emissions targets. Infrastructure investors have played a significant role in enabling the low carbon energy transition across economies thus far and, with the return of larger transport assets to the market, they can continue play a significant role in decarbonising this vital economic sector. Airports exemplify both the return of transport assets to market and the investment opportunity for infrastructure investors, supporting the decarbonisation process and creating additional value.

[1] Infralogic, April 2024

Chart 1: Global Transaction Pipeline By Sector, % Share of Value



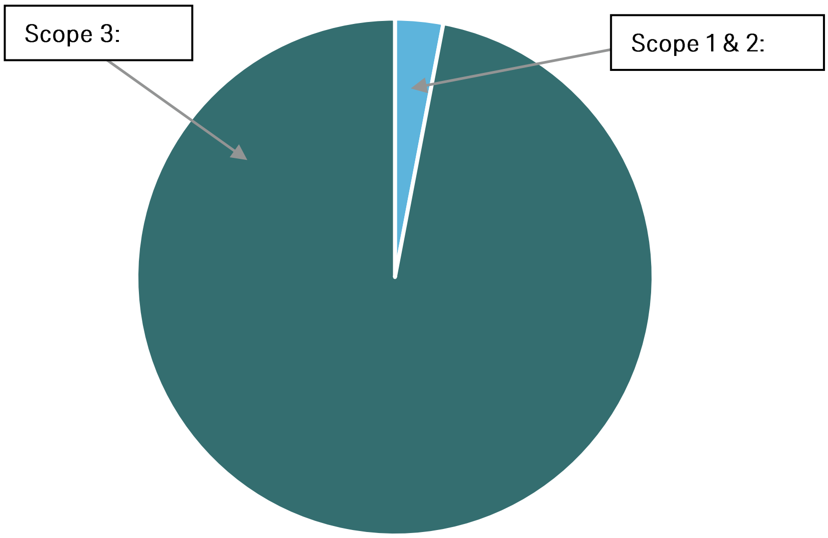
Source: Infralogic Live Transactions, May 2024. Pipeline Value: USD3.2trn. Power includes thermal generation and electricity grids.

Much of investor interest in recent years in the transport sector has been directed towards the electric vehicle (EV) market; for infrastructure investors, servicing the growing passenger and commercial EV fleets with charging infrastructure has been a popular area in which to deploy capital. As we have previously noted, this growing transport market will need a significant amount of investment, although the continued evolution of charging point business models remains challenging for some investors[2].

Solutions to decarbonise other areas of the transport sector are significantly less developed than the energy sector, which threatens transport's overall progress towards a net zero by 2050 target. The global aviation and shipping sectors account for around 4% of global CO2 emissions currently[3] and while airports and ports are themselves not directly responsible for the vast majority of these emissions, it is nevertheless likely that they will have to mitigate the Scope 3 emissions that they enable through the provision of access to alternative low/zero carbon fuels. Indeed, there has been a growing number of large transport infrastructure expansion projects, including in the airport sector, that have been legally challenged by environmental campaigners. Working to enable airlines to lower their own carbon emissions will be a key avenue for infrastructure owners to reduce the emissions profile of the aviation industry, create demand from airlines looking to meet their own carbon-reduction obligations and thus be value accretive to airport businesses.

[2] See DWS - 'Transforming Transportation' - https://www.dws.com/insights/global-research-institute/transforming-transportation/, March 2023
[3] IEA, See 'Energy System – Transport' at IEA.org

Chart 2: Airport Emissions Profiles



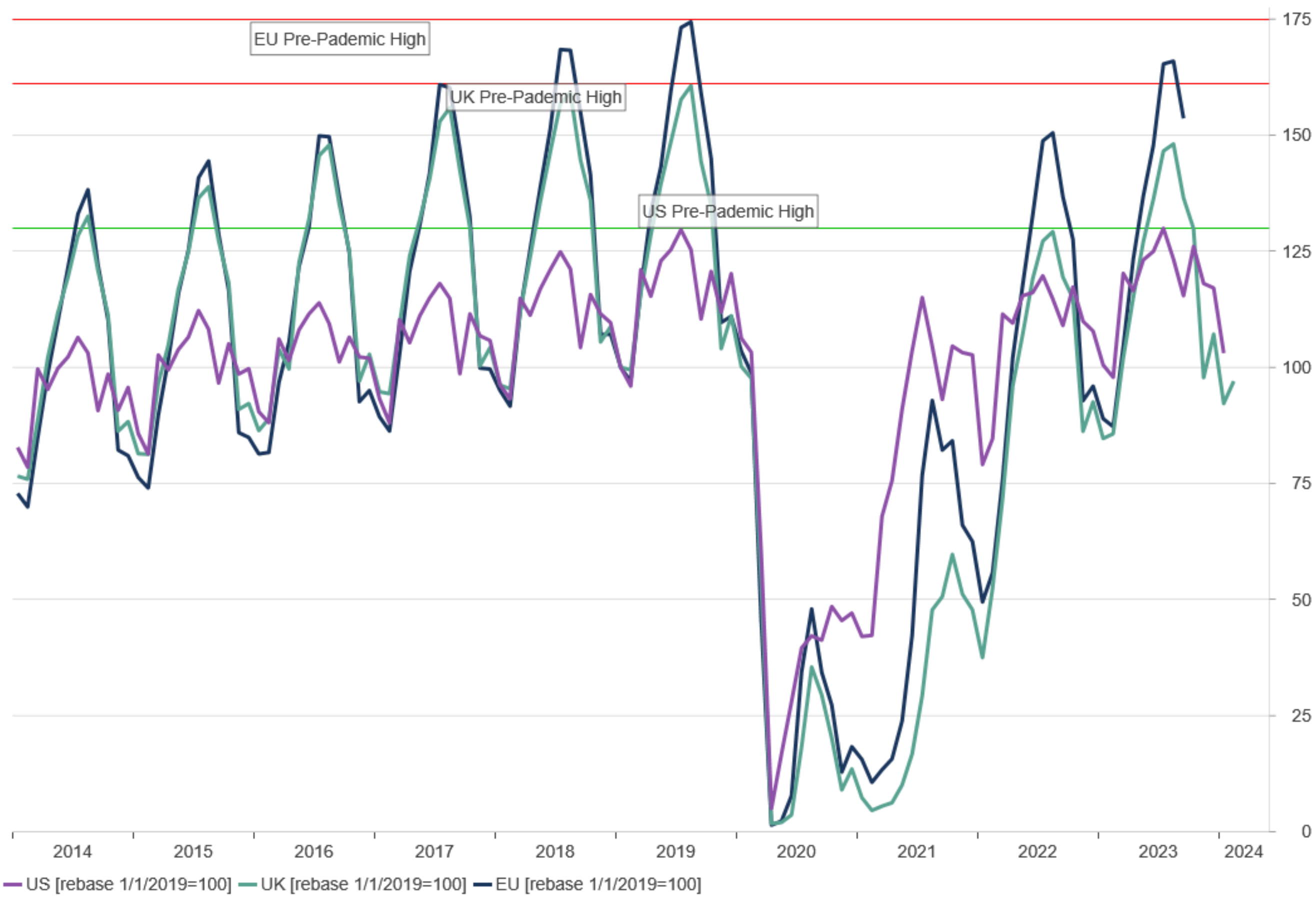
Source: Oliver Wyman, Financing The Airports Of Tomorrow, November 2023.

Airport Demand Recovering, But Longer-Term Questions

As noted in our 2024 Infrastructure Strategic Outlook, many of the world's busiest airports are approaching or have surpassed pre-pandemic passenger levels[4]. The International Air Transport Association (IATA) notes that origin-destination passengers are projected to increase from around 4 billion in 2019 to just over 8 billion by 2040[5], while the Airports Council International (ACI) expects that 2024 will be the year that global air traffic will surpass pre-pandemic levels[6]. While it is not surprising that aviation industry bodies hold a positive outlook for demand and noting that growth in Asian cargo traffic has played a role in the post-pandemic recovery, traffic is on track across Europe, the US, and the UK to breach 2019 levels in 2024 despite expectations for softer economic growth (Chart 3). Further, there continues to be strong demand for air cargo given the increased costs and timescales in the shipping markets given the ongoing disruptions in the Red Sea.

[4] See DWS – 'Infrastructure Strategic Outlook', https://www.dws.com/insights/alternatives-research/infrastructure/infrastructure-strategic-outlook-2024/, January 2024
[5] IATA, Global Outlook for Air Transport: Highly Resilient, Less Robust, June 2023
[6] ACI, Industry Outlook for 2023-2024, September 2023

Chart 3: US, EU & UK – Total Passenger Numbers, Rebased to 2019

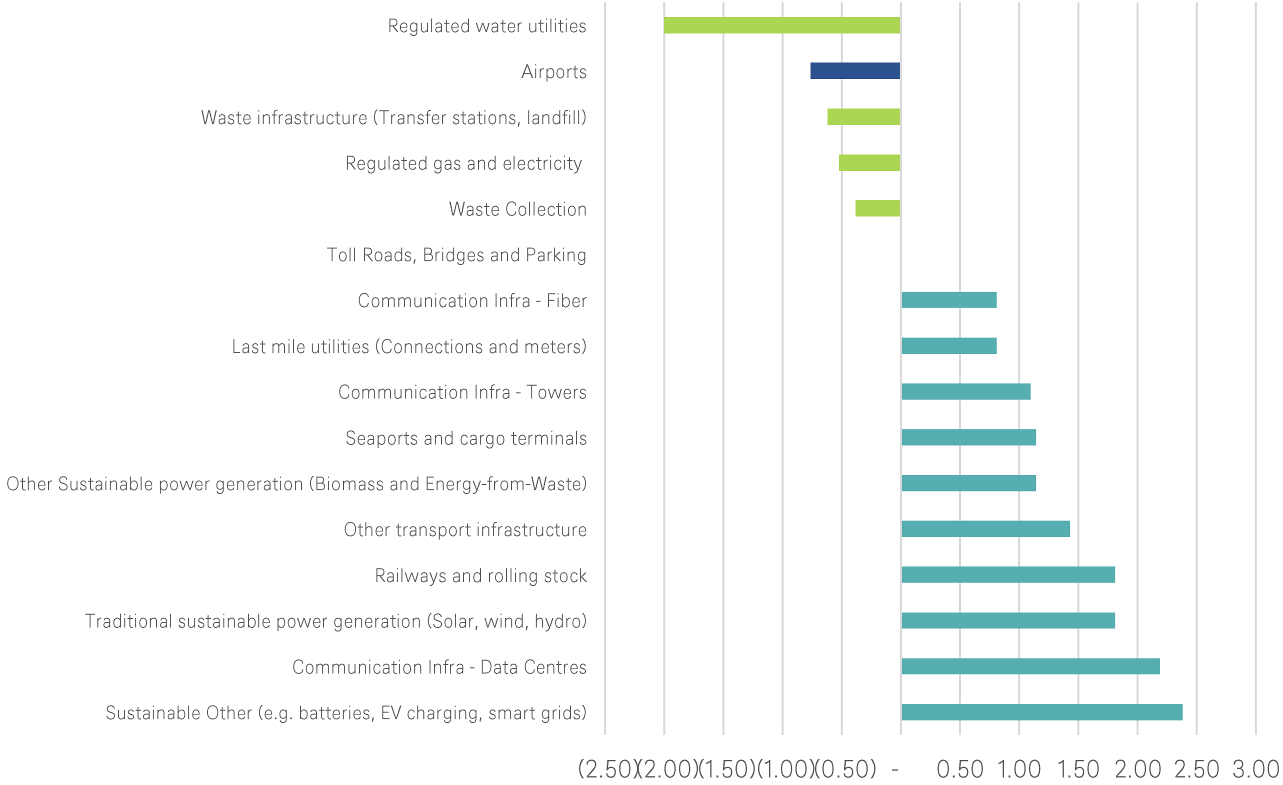


Source: Macrobond. Note: Green represents 2019 passenger numbers having been surpassed.

Over the first half of 2024, we have seen signs that investors are beginning to recognize the value of these recovered assets, with notable transactions including the sale of a majority stake in Edinburgh airport at an EV/EBITDA multiple of 20x. However, there is evidence to suggest that there remains caution towards the sector; the Q4 2023 Global Infrastructure Investor Association (GIIA) Pulse Survey shows that the perception towards airport assets remains marginally negative[7]. Further, of the top ten largest listed airport groups, only half have seen their share price recover to levels above those before the pandemic[8]. However, with the recovery of passenger numbers and revenue generation at airports to pre-pandemic levels we expect this to change. Indeed, 2023 saw Fitch Ratings move all airport entity ratings to Stable Outlook and it is likely that those which had lost investment grade status during the pandemic will recover it[9]. This improving performance situation is beginning to feed through to investor perceptions and will underline the importance of timing when re-entering the airport sector, balancing recovered performance with securing assets that are still lagging on perception.

[7] GIIA, Global Pulse Survey: Europe & The Americas – Q4 2023
[8] Bloomberg, 23.04.2024
[9] Fitch Ratings, Fitch Ratings: Higher EMEA Airports' 2024 Revenue May Support Investments, March 2024

Chart 4: Global Infrastructure Investor Association Pulse Survey: Favourability of Sectors



Source: GIIA Pulse Survey Q4 2023 Europe. Note: Question - What is your / your fund(s) outlook for overall infrastructure opportunities for your fund(s) in the following sectors in the next 12 months? (-5: extremely unfavorable, 0: neutral, 5: extremely favorable).

The long-term demand profile of aviation remains bullish, with the potential for demand-erosion due to environmental concerns offset by; rising incomes and global population growth leading to higher levels of mobility; growth in the availability of low-carbon ticket options; and the potential role airports have in enabling drone businesses.

As the profile of the net zero movement has grown there have also been questions over the long-term demand profile of airports, as more people opt for other modes of travel for shorter distances to reduce their personal carbon footprint. This trend is likely to continue as environmental consciousness becomes embedded, and some jurisdictions are considering legislation to limit internal flights when high-speed train routes exist. We note, however, that where such high-speed rail networks exist, the migration from air to rail has already largely occurred and the impact of these legislations would likely be marginal. We note that there are currently very few markets which have a high-speed rail network that could compete with air travel on a cost or time basis and – as average incomes continue to rise in high-growth markets in the Middle East, Asia, Latin America and Africa – demand for inter-regional aviation will continue to grow robustly.

Furthermore, we note that levels of demand from the larger leisure travel segment seem to be significantly less impacted by environmental consciousness relative to business travel. Intra-regional demand is likely to be more impacted by demand erosion related to environmental concerns, with the Scandinavian region expected to see the weakest growth in passenger numbers globally[10].

[10] Bain & Company, Air Travel Forecast to 2030: The Recovery and the Carbon Challenge, March 2024

Table 1: Global Aviation Passenger Travel Projection

	CAGR (2019-2040)	Additional Passengers By 2040, millions
Africa	3.40%	155.72
Asia Pacific	4.60%	2554.41
Europe	2.10%	665.81
Middle East	3.70%	276.03
North America	2.20%	564.98
Latin America & Caribbean	2.90%	313.47
World	**3.40%**	**3940.8**

Source: IATA Sustainability and Economics, Tourism Economics (March 2023 release).

Airports also have an important role to play in the development of new economic sectors, further bolstering their long-term attractiveness within infrastructure portfolios. Across major economies, regulators and governments are finalising both unmanned aircraft systems (UAS) and manned electric Vertical Take Off and Landing (eVTOL) policies, with last-mile delivery and regional air mobility spaces the most likely areas of use. The European Drone Strategy 2.0 from the European Commission lays out how Europe can pursue large-scale commercial operations, while the UK's Department of Transportation's Future of Flight report notes that, from as soon as 2026, electrified drone flights could be utilising existing commercial aviation infrastructure following the development of unsegregated airspace policies by the aviation regulator (CAA)[11]. As airport asset owners consider the business case for using capital expenditure to facilitate this emerging economic sector, PwC estimates that by 2030 drones could contribute up to GBP45bn (EUR38.4bn) to the UK economy[12].

While some of this emerging sector will be served by dedicated new infrastructure, such as dedicated vertiports, the competitive advantage in the market will be for vertiports within existing airports. Airports have significant space, security, logistics connectivity to regional and national economies, and the controlled airspace which, combined, make them prime locations for firms looking to develop their drone capacity to base their operations. Facilitating airside charging, logistics, maintenance, and ground handling infrastructure could open significant new revenue streams for airports through utilizing largely existing infrastructure in partnership with the growing number of industrial players in the drone sector.

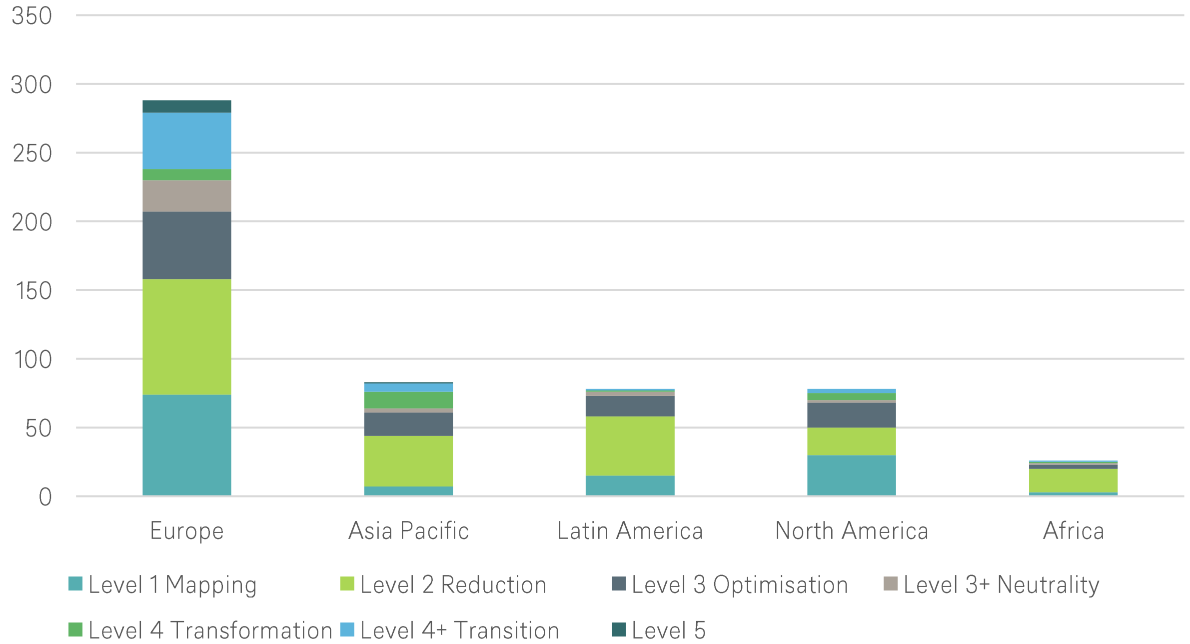
Airports & Carbon Neutrality

While passenger demand for airports has a positive outlook – which will bolster investor interest in the sector – there remain concerns within the investor community with regards to the carbon profile of airport assets. As discussed above, airports themselves are not large emitters, but – as financial reporting standards such as the Sustainable Finance Disclosure Regulation (SFDR) are implemented and tightened with regards to how portfolio company emissions are classified – Scope 3 emissions are of growing importance to an expanding pool of investors. Airports will not be able to immediately reduce their Scope 3 emissions in the same manner as they can reduce Scope 1 & 2 emissions, but airports that actively work with the airlines they service to ensure that airlines can achieve their own decarbonisation goals will be significantly more attractive assets.

[11] UK Department for Transport, UK Future of Flight Action Plan, March 2024
[12] PwC, Skies Without Limits v2.0, July 2022

There are a number of decarbonisation pathways to which airport assets are aligning, both industry specific as well as broader initiatives such as the CDP (formally Carbon Disclosure Project). While such initiatives will have a varying degree of efficacy in achieving net zero, there will be an increasingly distinct dividing line between assets which have not begun such an alignment. The Airport Carbon Accreditation (ACA) initiative is a growing pool of airport companies which have stated aims of mapping and reducing emissions with a goal of reaching neutrality[13]. Particularly in Europe, where the ACA has the highest number of accredited airports, there is now greater transparency on airports that are not on a pathway towards meeting goals, such as the International Civil Aviation Organisation's (ICAO) long-term aspirational goal of net-zero carbon emissions (which covers both airlines and airports), adopted in March 2022. The combination of investor pressure and market transparency will push airport assets towards decarbonisation, requiring higher levels of capital expenditure and associated regulated revenue streams.

Chart 5: Number of ACA Accredited Airports, By Region



Source: ACA. Note: Mapping - Demonstrate robust Mapping of their Carbon Footprint, Reducing - Showing reduction of Carbon Footprint within consecutive years, Optimisation - Optimising their Carbon Footprint through engagement within their supply chain, Neutrality - Offsetting their Carbon Footprint via high quality internationally certified projects, Transformation - transforming airport operations and those of its business partners to achieve absolute emissions reductions, Transition - Compensation for residual emissions with reliable offsets.

Decarbonisation at airports can be achieved through several avenues although, as economic hubs, the airport ecosystem and supply chain is one of the more complex to map. The complexity is also inconsistent, with commuter, global, and cargo hubs and leisure gateways all having distinct carbon profiles[14]. Many airports have begun the process for addressing their Scope 1 & 2 emissions, with investment plans targeting three key areas that they often receive renumeration within the aviation tariff for (regulated assets) as well as help to protect the asset from future energy price fluctuations:

- **Energy Use:** Given the scale of airport facilities, lighting, heating, and cooling systems account for a significant portion of total energy demand, depending on the climatic conditions. Retrofitting facilities to use low-energy

[13] ACA, See 'What is it?' at airportcarbonaccreditation.org
[14] Oliver Wyman Forum, Evolution of Airports – Travel Trends In The Next 30 Years, 2023

alternative lighting such as LEDs or installing modern HVAC and heat pump systems are direct decarbonisation strategies with the added benefits of lowering energy demand and thus providing added long-term cost savings[15].

- Ground Vehicles: The electrification of ground handling equipment, security, fire, and service vehicles, as well as passenger transport buses, will likely be one of the main Scope 1 & 2 decarbonisation strategies, depending on whether an airport is responsible for areas such as aircraft movement and baggage handling, or whether these are contracted out. Given the known hours of operation, routes and charging capacity requirements, the electrification of an airport's vehicle fleet is one of the comparatively lower risk decarbonisation investment strategies[16].
- Energy Supply: As a greater portion of energy demand at airports is electrified, access to significant amounts of renewable energy will become increasingly critical, particularly in the context of the Energy Performance of Buildings Directive (EPBD). There are increasing examples of airports developing self-generation assets given the significant rooftop and land area available. Where self-generation is not possible or cost-effective, securing power purchase agreements, such as those done through the Re-Source Platform in partnership with ACI Europe[17].

However, as with other elements of the energy transition, there is a balance for infrastructure investors and asset owners between the economic, technological or impact merits of an investment. This is most evident when considering Scope 3 emissions. Addressing emissions outside of direct control will require significant external partnerships on the part of airport asset owners; with airlines with respect to usage of low carbon alternative fuels; with industrial partners for the production and transport of those fuels; and with local and regional governments regarding the integration of airports into local public and low carbon transport networks.

Airlines – The Key To Decarbonising Aviation

It is the partnership with airlines which airport owners can most readily develop to have an impact both in terms of carbon reduction, but also increasing asset values through the development of new infrastructure. As with airports, the global airline industry has similarly committed to reaching net zero by 2050[18], and appropriately pacing airport investments to facilitate this process will be crucial in ensuring that demand from airlines is matched with attractive (right technology/fuel) and available (sufficient capacity) infrastructure. While this paper does not cover the merits of various technologies or fuel types for future aircraft, multiple market studies point towards Sustainable Aviation Fuels (SAF) being the key route to decarbonising aircraft movement given its cost and ability to blend into existing aviation fuel[19]. Infrastructure requirements for future aviation propulsion systems such as electricity or hydrogen should be on asset owners' radars, but scenarios for their introduction at commercial scale only start from 2030 onwards for routes which account for less than 96% of aviation CO2[20], with short- and medium-haul flights unlikely to benefit until at least 2035.

[15] DWS, "Energy efficiency policies & investments," April 2024
[16] DWS, https://www.dws.com/insights/global-research-institute/transforming-transportation/ , March 2023
[17] ACI, See – 'ACI EUROPE partners with RE-Source', October 2019
[18] IATA, See – 'Fly Net Zero', October 2021
[19] QIC, Decarbonising Aviation – Protecting Aviation's Social License, December 2023
[20] See – Waypoint 2050 Report, avaiationbenefits.org

Timelines For Uptake of Alternative Aircraft Propulsion

	2020	2025	2030	2035	2040	2045	2050
Commuter » 9-19 seats » < 60 minute flights » <1% of industry CO_2	SAF	Electric or Hydrogen fuel cell and/or SAF	Electric or Hydrogen fuel cell and/or SAF	Electric or Hydrogen fuel cell and/or SAF	Electric or Hydrogen fuel cell and/or SAF	Electric or Hydrogen fuel cell and/or SAF	Electric or Hydrogen fuel cell and/or SAF
Regional » 50-100 seats » 30-90 minute flights » ~3% of industry CO_2	SAF	SAF	Electric or Hydrogen fuel cell and/or SAF	Electric or Hydrogen fuel cell and/or SAF	Electric or Hydrogen fuel cell and/or SAF	Electric or Hydrogen fuel cell and/or SAF	Electric or Hydrogen fuel cell and/or SAF
Short haul » 100-150 seats » 45-120 minute flights » ~24% of industry CO_2	SAF	SAF	SAF	SAF potentially some Hydrogen	Hydrogen and/or SAF	Hydrogen and/or SAF	Hydrogen and/or SAF
Medium haul » 100-250 seats » 60-150 minute flights » ~43% of industry CO_2	SAF	SAF	SAF	SAF	SAF potentially some Hydrogen	SAF potentially some Hydrogen	SAF potentially some Hydrogen
Long haul » 250+ seats » 150 minute + flights » ~30% of industry CO_2	SAF	SAF	SAF	SAF	SAF	SAF	SAF

Source: Waypoint 2050 Report, (www.avaiationbenefits.org)

Given the need to address carbon emissions more rapidly, the airline industry and governments have both significantly backed the ramping up of SAF use, even as SAF costs remain at a premium to jet fuel and the associated cost savings from economies of scale are hard to achieve, given limited sustainable feedstock or renewable electricity[21]. With two key stakeholders following this path, airport infrastructure investment will need to ensure SAF is available if assets are to remain attractive to airlines.

We see airport investments in storage and production of SAFs to be an opportunity to create new revenue streams and entrenching barriers to entry, while addressing long term sustainability concerns. This is likely to focus ensuring adequate bunkering capacity exists for SAF alongside existing fueling capacity, given that aviation fuel production does not typically take place onsite. European airport assets have an advantage in understanding the pace of these infrastructure requirements given the European Union, through the Fit for 55 regulations, has clear mandates for SAF blending: it is expected that 2% in 2025, 5% in 2030 and at least 70% by 2050 of all aviation fuel used for flights departing from EU airports should be SAF. To provide further assurance to investors that capex to facilitate SAF refueling will be utilised, flights departing from EU airports may not be able to fuel beyond the minimum necessary for a particular flight, broadening the market for SAF demand outside of regions where SAF may be cheaper and creating demand in regions where SAF is less available.

There is a role for infrastructure investors in the production of alternative fuels, both biofuels and e-fuels, which we have previously noted in our Transforming European Energy report[22]. In this report, we noted that there is significant risk for infrastructure investors in backing newer standalone infrastructure-style businesses – particularly in the energy transition

[21] EASA, See – 'Current landscape and future of SAF industry'
[22] DWS, https://www.dws.com/insights/global-research-institute/transforming-european-energy-alternative-fuels/ , October 2023

space – given the uncertain nature of how that market will develop. However, given that airports already have visibility on their market – which is airlines' adoption of SAF – investing in infrastructure to facilitate its use is significantly de-risked relative to investing in the alternative fuels space more broadly. Other, lighter, infrastructure investment and operations strategies airports can assist airlines in reducing their carbon emissions include allowing for electric connections when on-stand (again mandated under the EU's Green Deal), more carbon-efficient air traffic management and handling, including tariff incentives for lower-emission landing and take-off trajectories[23].

[23] See – Waypoint 2050 Report, avaiationbenefits.org

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