QIC

Protecting aviation's social license on the decarbonization runway

Aviation is one of the primary drivers and facilitators of economic growth, supporting trade and commerce that is crucial to economic development in all regions of the world.

Most recently, its importance at a human level was highlighted through its indispensable role in repatriating people who were stranded in foreign countries at the outset of the COVID-19 pandemic, and then in the logistics of distributing COVID-19 vaccines around the world at a scale and pace previously unimaginable.

Airports, however, like all infrastructure assets, depend heavily on their social license to operate. Gaining the trust of its stakeholders that it will act in line with their interests – beyond complying with legal, regulatory and contractual obligations – is imperative and needs careful consideration.

While aviation's carbon footprint is the next frontier with the potential to impact its social license, the aviation industry is familiar with and has responded to external challenges over the years. Since the advent of commercial aviation, the industry has endured numerous shocks, followed by equally strong rebounds. While these events have been varied in nature – oil shocks, severe acute respiratory syndrome (SARS), geopolitical conflicts, terrorist attacks – none has remotely approached the extent or duration of the near-global shutdown experienced in recent years. The COVID-19 pandemic tested the system to a much greater extreme, yet since mid-2023, parts of the industry are already ahead of pre-COVID levels.

Reducing aviation's carbon footprint, however, is a significantly more challenging task to address from a cost and technological perspective than noise pollution, or indeed any of the other external challenges faced by the aviation sector previously. It is estimated aviation's contribution to global CO2 emissions is in the range of 2.5 percent to 3.0 percent[1], with the highest emitters concentrated in higher-income jurisdictions.[2]

While airports are addressing their own scope 1 and 2 emissions, the bulk of emissions produced by the aviation sector are driven by aircraft fuel consumption. Airports do not directly control these scope 3 emissions and are largely removed from decisions relating to fuel or aircraft selection. Nevertheless, as an asset owner, airports have an important role to play in influencing, facilitating and promoting solutions that will reduce scope 3 emissions.

Why is a social license important?

The relevance of a social license for infrastructure stems from its tendency to particularly affect those that live or work in close proximity to it, and whose benefits are shared on a far wider scale. In the case of emissions, the environmental impact is further reaching in the form of global warming and climate change.

Aviation produces a wide range of externalities, many of which impact the communities served by the industry. Positive externalities include its contribution to local and national economic activity, specifically through facilitation of trade and tourism, as well as direct and indirect employment of many thousands of people in related and co-located businesses at airports.

Aviation also creates negative externalities, including noise and air pollution, and traffic congestion.

To preserve its social license and to minimize the potential for regulatory intervention, the industry has made substantial progress in mitigating noise pollution through technology (e.g., quieter aircraft), insulating residential properties in close proximity to airports, improved airspace planning to facilitate equitable "noise sharing" and actively engaging with impacted communities. Despite this, in some jurisdictions there has been regulatory intervention in the form of night curfews and movement caps that have limited the capital efficiency of impacted airports.

The scale of the challenge

As other industries with viable and available technologies to decarbonize today progressively do so, aviation's share of global emissions is only anticipated to increase, leading to increased attention on the sector.

Aviation is one of the most challenging transport modes to decarbonize. This is because fuel energy density (amount of energy in a given mass/volume) is fundamental to a commercial aircraft's ability to fly. There is currently no substitute to jet fuel with sufficient scale to meet global demand – SAF presents compelling characteristics, as it has the same energy density as A1-jet fuel; however, important barriers remain.

Industry experts have explored various pathways and scenarios for aviation to reach net zero by 2050. What is clear under any proposed scenario is that a combination of levers is required to achieve the target.

With 94 percent of global aviation emissions attributable to airlines, according to ICF's Sustainable Aviation Guide, we believe emissions reduction will most likely be achieved through a mix of technologies, dominated by SAF in the air, and hydrogen/electric on the ground:

- SAFs are a readily available drop-in alternative to fossil-based jet fuels, either produced from:
  - Renewable energy (eSAF): carbon neutral with no CO2 increase in the lifecycle
  - Or biomass (SAF): lower carbon net increase versus jet fuel, with some CO2 increase in the lifecycle
- Hydrogen provides a complementary alternative to power aircrafts (either as a substitute fuel for a jet engine, or through fuel-cell conversion to electricity) and ground-handling equipment.
- Electric also provides a potential alternative, either through batteries or fuel cells.

What can airport owners do?

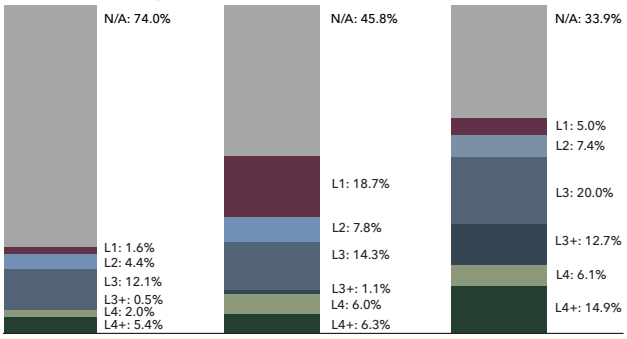
Engaging all levers for emissions reduction

The aviation industry has a history of continued growth focused on lowering the cost of travel to increase propensity to fly, which in turn fuels skepticism as to whether it can deliver on the low-carbon transition.

For the industry to succeed in this energy transition, in our view, it must work together with all partners. It is here that investors in airports can support and be part of the transition.

Airports can support the energy transition on two fronts: first, by accelerating transition to net-zero carbon (NZC) for their scope 1 and 2 emissions, and secondly (and most importantly),

Figure 1: Airport carbon accreditation certification, by region (% of passengers)



ACA LEVEL	DESCRIPTION
N/A	N/A
1: Mapping	Footprint measurement
2: Reduction	Carbon management toward a reduced carbon footprint
3: Optimization	Third-party engagement in carbon footprint reduction
3+: Neutrality	Carbon neutrality for direct emissions by offsetting
4: Transformation	Transforming airport operations and those of its business partners to achieve absolute emissions reductions
4+: Transition	Compensation for residual emissions with reliable offsets

Source: Airport Carbon Accreditation (airportcarbonaccreditation.org), October 2023

by facilitating investment in the infrastructure that will make alternative energy fuels a reality.

For scope 1 and 2, the journey has shown rapid progress, with Europe leading the way. The Airport Carbon Accreditation (ACA) program independently assesses airports' efforts to manage and reduce their CO2 emissions. European airports representing more than 50 percent of passenger volumes have already reached the "optimization" stage of ACA's framework. The optimization stage is achieved when the scope of the carbon footprint reduction includes third-party emissions (airlines, ground handlers, catering, air traffic control, etc.). See Figure 1.

With regard to accommodating alternative fuels, SAF, hydrogen and electricity all require specific supply and, in some cases, storage infrastructure, which airports and their investors are best placed to invest in and finance. This is subject to a commercial and/or regulatory framework that appropriately remunerates investors for such investments.

Driving technological change for scope 3 emissions

Infrastructure owners play a key role in enabling the availability of alternative fuels, and many are already trialing the use of alternative energy sources in live operations to develop a deeper understanding of future investment requirements. Today, airport infrastructure requirements to supply jet fuel necessitate a single logistics chain. Airlines procure jet fuel from the oil companies, which is typically delivered to the airport via pipeline. The airport's responsibility is then limited to building or facilitating storage and fuel delivery facilities.

Looking forward, airports will need to work with airlines to determine the fuel requirements for future aircraft, especially with regard to alternative fuels. It is difficult for airports to commence building import and storage facilities for these different fuel types without knowing what types of aircraft will be in use. Engagement and collaboration across airports, airlines and other aviation partners is crucial to ensure alignment of alternative fuel supply and demand.

The scale of change and, therefore, investment at an airport will be dependent on the type and scale of operation it supports, with the large international hubs requiring the greatest investment. The total cost of infrastructure, however, is expected to be comparable to existing airport expansion projects. To facilitate the energy transition, the majority of investment and infrastructure required will be off airport (not on airport property or land, but close by). With fuel price impacted by demand and proximity to production (transportation cost), there is an opportunity to colocate renewables platforms and airport assets, to minimize the current cost disadvantage of eSAF over jet fuel. Embracing the energy transition in conjunction with appropriate regulatory incentives will minimize the risk of constraints being imposed on the industry.

Industry collaboration is the key to success

It is widely recognized that aviation provides significant economic and social benefits. Airports and airlines are no different than other businesses and depend on their social license to operate in order to maintain and grow their operations. We believe the interdependency between these two parts of the commercial aviation supply chain is obvious, and in this context, it is imperative the emissions externality of the entire industry be addressed to the satisfaction of its broad set of stakeholders.

Notes: [1] "Climate change and flying: What share of global CO2 emissions come from aviation?", Our World in Data; [2] "Where in the world do people have the highest CO2 emissions from flying?", Our World in Data

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About QIC

QIC is a long-term specialist manager in alternatives offering infrastructure, real estate, private capital, liquid strategies and multi-asset investments. It is one of the largest institutional investment managers in Australia, with A$106.0 billion ($70.0 billion) in funds under management. QIC has more than 800 employees and serves approximately 115 clients (as of Dec. 31, 2023). Headquartered in Brisbane, Australia, QIC also has offices in Sydney, Melbourne, New York, San Francisco and London. **www.qic.com**

About QIC Infrastructure

QIC is a long-term infrastructure investor with an established international platform, an active-management approach and a proven 17-year track record. With an international team of 87 professionals across five offices, QIC Infrastructure manages A$32.8 billion ($21.7 billion) across 22 international direct investments and has realized in excess of A$15.2 billion ($10.0 billion) back to its clients. QIC is a market leader in the Australian energy transition, managing A$7.1 billion ($4.7 billion) in Australian energy assets since 2007 across the energy value chain (as of Dec. 31, 2023).