INFRASTRUCTURE OUTLOOK 2024

IFM Investors

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Driving out emissions:

Decarbonisation of the transport sector

From airports to toll roads and seaports, the pathway to net zero relies on technological change – and the right policy settings to support investment.

In facing the global challenge of decarbonising the economy, many will think of the transition away from energy generated by the combustion of fossil fuels, which is responsible for over 40% of global carbon emissions.[1] Significant investment is being poured into clean energy and the electricity sector, with investment exceeding $1trn for the first time in 2022 and projected to increase further to $1.2trn in 2023, with over $1trn flowing into renewables and grids alone.[2]

The transport sector is also a major emitter and accounts for over one fifth of global carbon emissions, so there also needs to be attention paid to this sector and to how public transport, airports, toll roads and seaports can reduce their carbon footprint. Decarbonising these assets requires an understanding of current and emerging technologies and their trade-offs. Most of all, decarbonisation requires cross-sector collaboration.

Infrastructure investors can play an important role in reducing emissions by working with the operators of heavy-emitting assets to transition the assets and support sector-wide decarbonisation. Many of these transitions will require significant investment in new technologies, such as those to enable the production of new fuels or the efficient charging of autonomous and electric vehicles. At IFM Investors we have long invested in airports, seaports and toll roads, and we have begun transitioning these assets to be ready for the low-carbon future.


Sydney Airport, Australia

Airports

Although aviation accounted for only 2% of global energy-related emissions in 2022, the sector's emissions are increasing faster than those from rail, road and shipping.[3] Demand for air travel continues to recover after the COVID-19 pandemic and longer term, population growth and an increase in the number of middle-class consumers in developing nations will support higher demand for air travel. All this points to rising aviation emissions this decade – and growing pressure on airports and airlines to invest in decarbonisation technologies.

Aviation has been described by the International Energy Agency as 'one of the most challenging sectors to decarbonise'[4], with limits on what can be achieved through shifts to hydrogen fuel and electric planes. With stringent aviation authority testing requirements and long fleet renewal cycles[5], it is also unlikely that significant engine and airframe innovation will be seen in the near term. Given these constraints, increasing the availability and price competitiveness of Sustainable Aviation Fuels (SAF) is the most viable near-term path to decarbonising aviation.

While the decarbonisation of aviation is likely to require a combination of multiple technologies, including engine and aircraft advancements, electrification, and hydrogen, the majority of emissions reductions required for the aviation industry to meet its net zero by 2050 targets is expected to be achieved through SAF. In part, this is due to the compatibility of SAF as a 'drop-in' fuel, allowing it to be blended 50:50 with traditional jet fuel and used in service today without significant alterations to existing aircraft engines and refuelling infrastructure. SAF is currently produced using costly and finite biogenic feedstocks, resulting in low availability and exposure to commodity markets which make SAF prices typically several times costlier than traditional jet fuel. Close collaboration between airport owners, airlines, governments and energy companies is therefore required to sustainably increase the scale and price competitiveness of SAF if aviation sector emissions are to be reduced in a timely manner.

Currencies in this article are in USD, unless otherwise stated.

[1] IEA (2023), Greenhouse Gas Emissions from Energy Data Explorer, IEA, Paris
[2] 2022 IEA data. Electricity - Energy System - IEA.
[3] International Energy Agency (2023), 'Aviation'.
[4] Ibid.
[5] McKinsey & Company, (2023), 'Decarbonizing aviation: Executing on net zero goal.". 16 June 2023.

Sustainable Aviation Fuel

Certified for use in commercial jet aircraft, SAF meets greenhouse gas and other sustainability criteria. Unlike traditional jet fuel made from fossil fuels, SAF can be made from a range of renewable feedstocks, including vegetable oils, sugar crops, waste oils, municipal wastes and agricultural wastes. SAF costs remain significantly higher than those of traditional jet fuels while demand for it far exceeds supply.

IFM has engaged global consultants to aid our understanding of how global airport operators are responding to Scope 3 emissions produced and controlled by airport tenants, airlines, ground-access vehicles and other airport stakeholders. We have also contributed to discussions on the policy frameworks to incentivise SAF production in countries including the UK and Australia.

The chief executives of Manchester Airports Group and Brisbane Airport are also active members of the Jet Zero Council and Australian Jet Zero Council, respectively. The councils are partnerships between government, academia and senior stakeholders from across the aviation sector and its supply chains that have been set up to work with industry to inform the design of policy settings to encourage emissions reduction in the aviation industry, provide senior industry leadership, and promote, mobilise and galvanise industry efforts to decarbonise aviation.

In the UK, the Jet Zero Council has a specific target to deliver at least 10% SAF in the UK fuel mix by 2030, and zero emission transatlantic flight within a generation.

In the US, the Sustainable Aviation Challenge has set a goal for airlines to use 11 billion litres of SAF – about 15% of current fuel demand – by 2030.[6] The US Inflation Reduction Act of 2022 included a two-year tax credit for those that blend SAFs and a three-year tax credit for SAF producers.[7] The US also provided a $297 million grant program for SAF projects, among other initiatives.

Under the RefuelEU initiative, the European Commission announced an obligation for all local aviation fuel suppliers to provide aircraft operators with minimum levels of SAF and synthetic fuels, with the percentage of supplied SAF gradually rising from 2% in 2025 to 70% by 2050, with a similar escalation capped at 35% in 2050 planned for synthetic fuels.[8]

In November 2023, IFM announced that it would be conducting feasibility studies that explore the use of agricultural feedstocks to produce SAF in Australia, through long-term domestic feedstock supply including waste and residues, crop-based oil, and bio-organics. IFM has partnered with leading Australian agribusiness and processing company, GrainCorp Limited, on this important initiative.

[6] International Energy Agency, (2023), 'Biofuel'.
[7] US Government (2022), 'SAF Grand Challenge Roadmap'. September 2022.
[8] RefuelEU aviation initiative: Council adopts new law to decarbonise the aviation sector

Toll Roads

For toll roads, it is widely accepted that electric vehicles (EVs) are the key to decarbonising road transport, which comprised approximately 17% of global carbon emissions in 2021. Toll road owners must ensure their infrastructure can accommodate a critical mass of EVs (which is projected to be reached within 10-15 years).[9] This will require significant investment in extensive charging infrastructure and potentially other technologies that help charge EV batteries while they are driving along the toll roads. Such a rollout could be challenging in countries such as the US and Australia, where sparsely populated regions occasionally give way to significant metropolitan hubs, lacking the population and user density in many regions to warrant such an investment. Government policies, including incentives for EV owners to install charging points at home and changes to building codes to require new construction or substantial remodels to include charging points, have supported the prevalence of private charging (at home and at the workplace). While the development of new battery technology is expected to reduce the additional demand for charging stations, consumer sentiment towards EVs will still rely on the knowledge that there is broad accessibility to reliable charging networks.

Many toll roads have already rolled out rest-stop charging stations, and this early adoption of convenient and efficient charging infrastructure may become an important point of differentiation among toll roads as the adoption of EVs increases. Current global trials include overhead charging rails that can charge vehicles as they move through the corridor and contactless wireless-charging concrete highway pavement. For example, Dynamic Wireless Power Technology (DWPT) uses coils positioned under asphalt to transfer energy directly to electric cars and buses (see case study). If proven viable, DWPT could see toll road owners replace existing asphalt on roads or introduce it to new projects.


Aleatica, Peru

[9] Have booming EV sales crossed the mass-adoption tipping point? (energymonitor.ai)

CASE STUDY

Building the world's first EV-charging highway

IFM has invested in the trial of Dynamic Wireless Power Technology (DWPT) in Italy through Aleatica, its fully owned transport infrastructure operator that focuses on the design and operation of highways in Europe and Latin America.

Aleatica is part of a collaboration that has developed 'Arena del Futuro', a 1050-metre-long circuit that uses DWPT to charge EVs wirelessly. EVs are driven in wired lanes that have a system of coils installed under the asphalt to transfer energy directly to electric cars and buses as part of the trial.

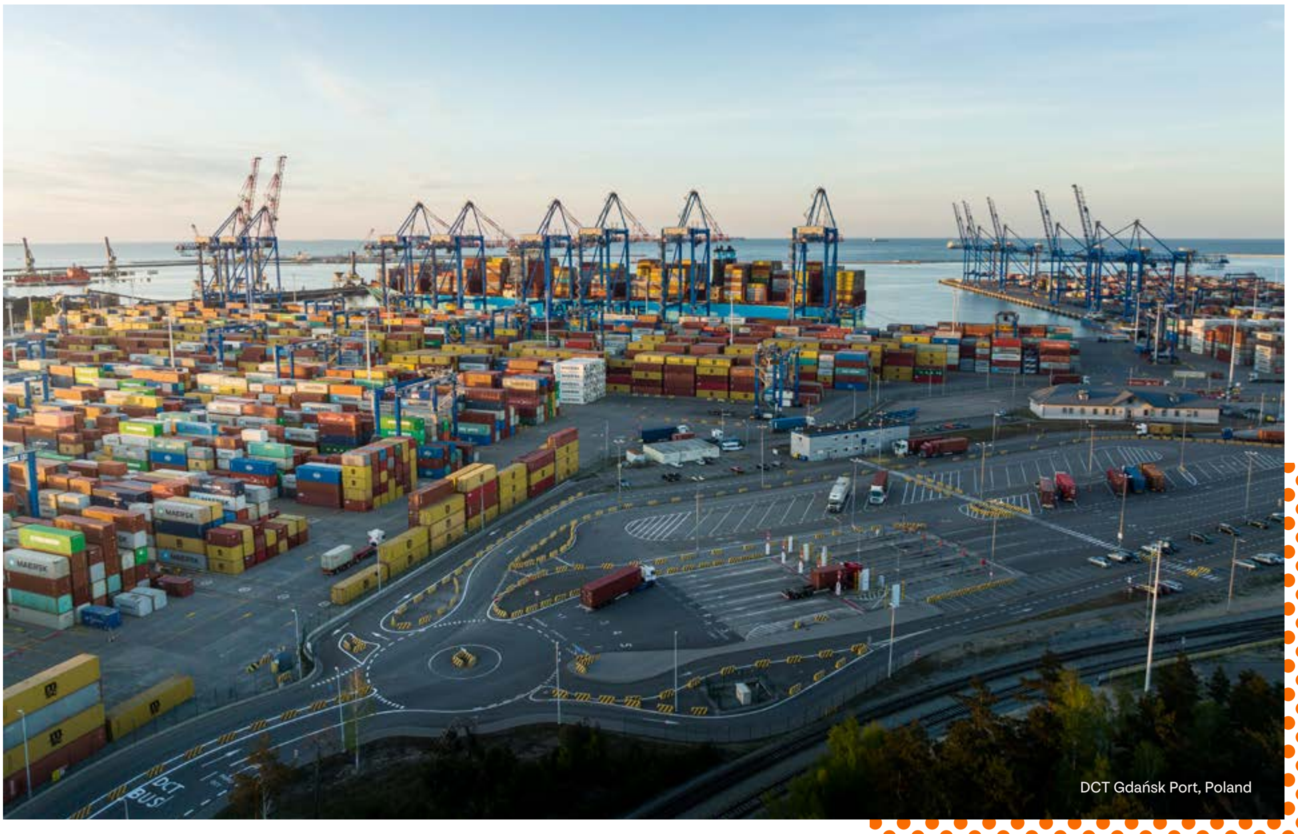
The long-term potential is EVs being charged as they drive on a highway. Through a special receiver, EVs would receive energy from the road infrastructure directly to their electric motor – a revolutionary change for EVs.

If successful, this technology could extend the EV's range and conserve its battery. Tests have shown an EV can travel at normal speeds on the circuit without using its battery energy storage, and that the rate of energy transfer is comparable to that from fast-charging stations.

For some people, battery-range anxiety and concerns about available charging infrastructure are impediments to buying an EV. Knowing their EV is being charged as it's driven on a highway commute could ease their concerns.

DWPT could also aid the development of autonomous vehicles over time. At this stage, the batteries in trucks are too heavy for long-distance freight. As battery technology advances and significant investment and research goes into testing alternate low emissions fuel (such as hydrogen), the advent of self-driving trucks could, for example, improve truck productivity by reducing the number of stops required and enable self-driving trucks to travel longer distances in between refuelling or charging. Trucks may also be able to run overnight with an attendant, releasing capacity during the day for passenger vehicles and deliver safety outcomes.

Like other road-electrification projects, the Arena del Futuro Project is still at an early test stage. But the potential environmental and efficiency gains from charging EVs as they drive on electrified roads is significant – and another way technology could quicken the decarbonisation of toll roads.



DCT Gdańsk Port, Poland

Seaports

International shipping accounted for 2% of global energy-related carbon emissions in 2022. Ships, on average, emit less carbon (per tonne and kilometre) than air transport, rail or trucks that move bulk cargo. However, the majority of international goods trade is moved by ships and most large vessels almost entirely use oil-based fuels.[10]

There is significant consumer interest in carbon-neutral shipping, according to Boston Consulting Group. In surveying 125 shipping customers in 2022, it found 82% were willing to pay a premium for zero-carbon shipping, an increase of 11 percentage points over the prior year. The survey further found that a carbon-neural shipper would enjoy greater customer loyalty.[11]

Like airports, ports have an important role in providing infrastructure and incentives to support the decarbonisation of fleet vessels. One way in which ports are using new technologies to decarbonise their operations is by providing renewable energy to vessels that call. This practice, known as 'cold ironing', involves ports providing shoreside electrical power to ships while they are berthed, allowing them to turn off their main and auxiliary engines and avoid burning fossil fuel. While it is often not feasible to provide 100% of the energy needs of vessels through cold ironing, the practice can significantly reduce the Scope 3 emissions of ports.

Additionally, there is a significant decarbonisation opportunity for ports in facilitating the refuelling of vessels with alternate, low emission fuels. Fleet order books for major shipping lines are increasingly trending towards ships powered by alternate fuels, including hydrogen, LNG and green methanol. With these different fuels will come differing safety, environmental and technological requirements for portside refuelling infrastructure where shippers choose to refuel. As these trends develop, we will work with our port assets to evaluate new opportunities.

[10] International Energy Agency (2023), 'International Shipping'.
[11] Customers' Willingness to Pay to Decarbonize Shipping, BCG.

Aligning opportunity with policy settings

Operational trade-offs with decarbonisation are an important consideration. Airports have much to gain from greater use of renewable energy and through fuel supply models that facilitate and incentivise use of SAF. At the same time, as critical high-throughput assets, airports must continue to function efficiently and safely during this transition to decarbonisation.

Toll road and port owners need to weigh up the long-term benefits of investing in renewable technologies and growth in EVs. A multi-billion-dollar investment in new charging technology and charging stations might not be feasible on a toll road if the uptake of EVs is too slow.

Policy settings are also key. For example, encouraging greater adoption of SAF to support the decarbonisation of the aviation industry will require governments to provide policy settings and signals that encourage the use of domestically grown feedstock and stimulate investment in local refining capacity. Governments, too, must ensure they have the right policy settings to encourage investment in technology for toll roads and seaports.

On balance, IFM and other owners of transport infrastructure must weigh up multiple short- and long-term considerations when investing in new technologies to decarbonise assets. They must seek to maintain their mandated target returns from transport investments in line with investor expectations, while ensuring these assets continue to serve society, amid population growth and changing community needs and expectations about climate change. They must also consider the risk of not decarbonising fast enough. Assets that do not decarbonise are likely to face a backlash from consumers who may favour lower-carbon transport options or increased compliance costs.

Collaboration and stewardship are vital, and to that end we will work with governments and a range of other stakeholders to advocate for the kinds of policy settings that allow for the timely investment of capital to achieve the desired low-carbon future.

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