



Live more,
Bank less

OUR PATH TO

NET ZERO

SUPPORTING ASIA'S TRANSITION
TO A LOW-CARBON ECONOMY

AVIATION

Disclaimer

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List of abbreviations

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Abbreviations (alphabetical order)	
AER	Annual efficiency ratio
AR6	IPCC's Sixth Assessment Report
BF-BOF	Blast furnaces-basic oxygen furnace(s)
CCUS	Carbon capture, utilisation and storage
CIX	Climate Impact X
CO ₂	Carbon dioxide
CRREM	Carbon Risk Real Estate Monitor
DCM	Debt capital markets
DRI-EAF	Direct reduced iron-electric arc furnace(s)
EAF	Electric arc furnaces
EAF-Scrap	Scrap-based electric arc furnace(s)
ECM	Equity capital markets
EU	European Union
EV	Electric vehicle(s)
GDP	Gross domestic product
GHG	Greenhouse gas(es)
IATA	International Air Transport Association
IBG	Institutional Banking Group
ICE	Internal combustion engine
IEA	International Energy Agency
IEA NZE	International Energy Agency's Net Zero Emissions by 2050 Scenario
IMO	International Maritime Organization
IPCC	Intergovernmental Panel on Climate Change
kgCO ₂ /MWh	Kilograms of CO ₂ emissions per megawatt hour of power produced
kgCO ₂ /p-km	Kilograms of CO ₂ emissions per passenger kilometre travelled
kgCO ₂ /vehicle-km	Kilograms of CO ₂ from tailpipe emissions per vehicle kilometre travelled
kgCO _{2e} /kg	Kilogram of CO ₂ equivalent per kilogram of crude steel produced
LLE	Loans and loan equivalent(s)
MPP	Mission Possible Partnership
MtCO _{2e}	Million tons of CO ₂ equivalent
N/A	Not applicable
NGFS	Network for Greening the Financial System
NZBA	Net-Zero Banking Alliance
O&G	Oil & Gas
OEM	Original equipment manufacturer(s)

List of abbreviations

PCAF	Partnership for Carbon Accounting Financials
REIT	Real estate investment trust(s)
SAF	Sustainable aviation fuel
SGX	Singapore Exchange
SPV	Special purpose vehicle(s)
TCFD	Task Force on Climate-Related Financial Disclosures

2.5. Aviation

“ The aviation sector has done more than any other to make the world a smaller and more interconnected place, while flying today is also very safe due to regulations and rigorous safety testing. We now need technological improvements to use lower emissions fuels and design more efficient aircraft, without compromising on this connectivity and safety. This may take some time, but the aviation industry as a whole has committed to this endeavour. DBS will play its part by working with our clients to promote cleaner fuels and adoption of better technology, while facilitating access to carbon offsetting solutions until low emissions technologies mature.

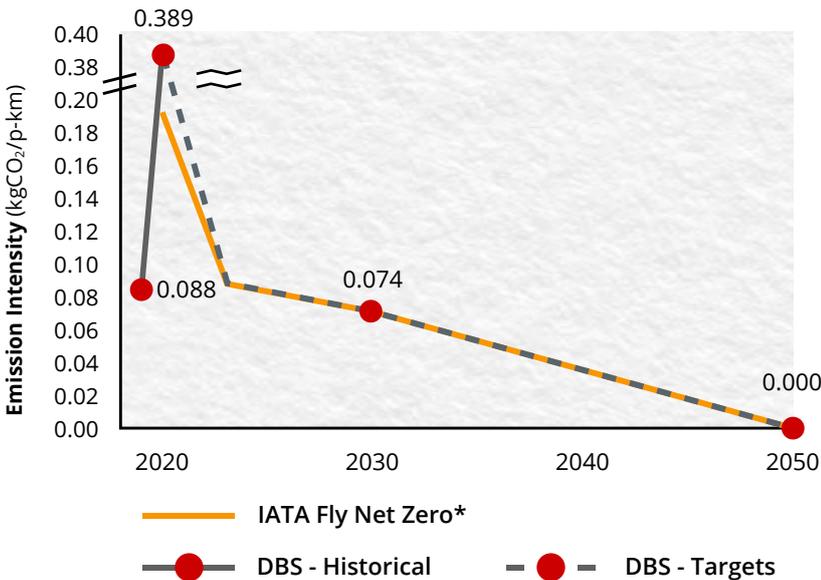
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Max Lim

Group Head of Shipping, Aviation, Logistics and Transportation

Aviation Targets



Year	IEA NZE reference (kgCO ₂ /p-km)	DBS targets (kgCO ₂ /p-km)	% Reduction vs. 2019
2019	-	0.088	-
2020	0.191	0.389	-
2030	0.074	0.074	16%
2050	0	0	100%

What's included?

- Scope 1 emissions for airlines and secured aircraft financing
- Scope 3 emissions for aircraft leasing companies
- Airline operators and lessors
- Secured aircraft financing

Reference scenario

- IATA Fly Net Zero* - global reference scenario

How we will achieve our targets

- Helping our clients to achieve their existing plans, and encouraging those that have not yet made meaningful decarbonisation plans to do so
- Financing more energy efficient aircraft
- Supporting the growth and adoption of sustainable aviation fuel
- Financing novel aviation technologies, as they come to market (likely post 2030)
- Helping clients to access high-quality offsets

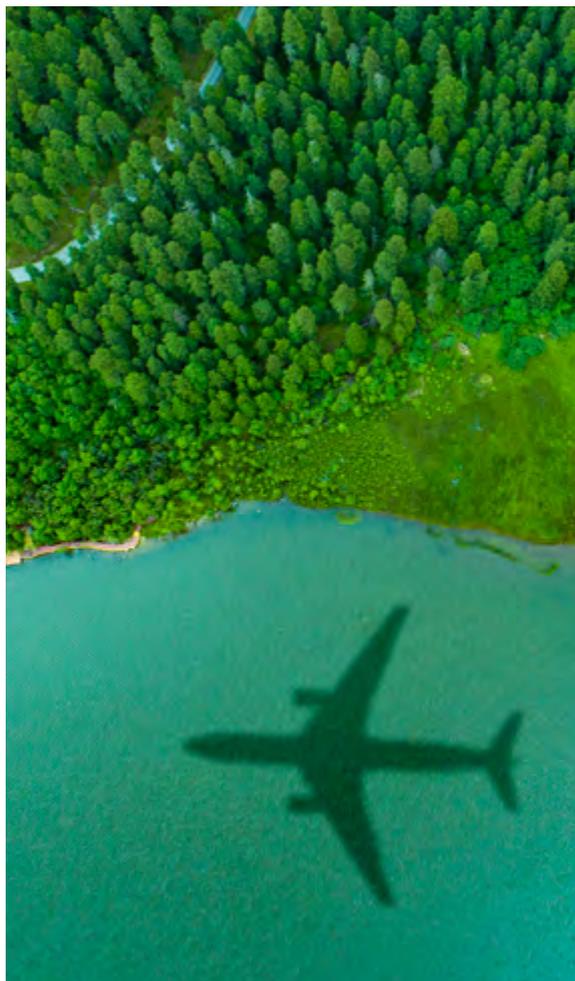
* IATA's Fly Net Zero scenario was rebased to the same starting point for aviation in the IEA NZE, as IATA does not provide a 2019 starting point, nor number of kilometres travelled

02 | Our net zero aligned emissions reduction targets

2.5.1. Net zero in Aviation

Aviation is responsible for about 2% of total global GHG emissions⁴⁵, with most of these coming from the combustion of aviation fuel. For airline operators, this represents about 98% of their total Scope 1 and Scope 2 GHG emissions⁴⁶. Demand for air travel, as predicted by the International Air Transport Association (IATA), is expected to increase to 5.6 billion scheduled passengers in 2030⁴⁷, up from 4.5 billion in 2019 and 1.8 billion in 2020⁴⁸. Much of this will be driven by increased demand in emerging markets, especially in Asia and specifically Southeast Asia, where rail alternatives are mostly unviable. We have adopted a physical emissions intensity metric based on kilograms of CO₂ emissions per passenger kilometre travelled (kgCO₂/p-km).

Currently, aviation is considered a hard-to-abate sector. Novel aircraft designs and technologies that may greatly reduce the emissions intensity of flying are firmly in the design stages. However, most are unlikely to be commercially viable until the 2030s at the earliest, in part due to the sector's rigorous safety standards. Nonetheless, there are various ongoing efforts to develop advanced aircraft configurations with radical new aerodynamic designs to improve energy efficiency. Meanwhile, other industry efforts are focused on overhauling the source of energy used by aircraft, by for example the use of (green) hydrogen or the use of batteries to power fully electric or hybrid aircraft. Based on currently available technologies, decarbonisation of aviation in the near future, especially this decade, largely depends on three enablers:



- **Renewing the global fleet with best-in-class energy-efficient aircraft.** The process of renewing the global fleet and retiring older aircraft has improved fuel efficiency by 80% compared to 50 years ago, and is expected to continue to yield approximately 1% annual improvement in fuel efficiency per year⁴⁹.
- **Use of lower GHG-emitting fuels.** The key lever here is the use of SAF, which is a type of biofuel that can provide similar calorific value to traditional jet fuel while emitting less CO₂. According to IATA, SAF can reduce emissions by up to 80% during its full lifecycle as compared to traditional jet fuel⁵⁰. Although SAF is already available, it has yet to be produced at a scale for wide use, or as a commercially viable wholesale alternative to fossil fuel based jet fuel. Ramping up the supply of SAF, reducing its cost and increasing usage will be essential to decarbonising the sector.
- **Use of high-quality carbon offsets.** IATA is transparent in its *Net zero carbon 2050 resolution*⁵¹ that decarbonising the aviation sector relies on the use of approved offsets including carbon capture and storage technology. This is especially so in the short term while SAF and novel aircraft technology are being developed and scaled.

⁴⁵ World Resources Institute (2022). World Greenhouse Gas Emissions in 2019. <https://www.wri.org/data/world-greenhouse-gas-emissions-2019>

⁴⁶ Management Quality and Carbon Performance of Airlines: March 2019. (2019). Transition Pathway Initiative (TPI). <https://www.transitionpathwayinitiative.org/publications/35.pdf?type=Publication>

⁴⁷ IATA Fly Net Zero Fact sheet

⁴⁸ Statista - Number of scheduled passengers boarded by the global airline industry from 2004 to 2022

⁴⁹ IATA's Fly Net Zero scenario expects the aviation industry to improve fuel efficiency by 15-25% over the next two decades

⁵⁰ IATA - Sustainable Aviation Fuel

⁵¹ https://www.iata.org/contentassets/b3783d24c5834634af59148c718472bb/factsheet_netzeroresolution.pdf

2.5.2. DBS' targets for the Aviation sector

Aviation clients included in our targets are the airline operators and lessors to which we provide secured aircraft financing and general financing. In our financed emissions baselining exercise for this sector, we primarily sourced data from reports publicly disclosed by airline operators and lessors. Most of our airline operator clients are signatories to the IATA Fly Net Zero – a commitment to achieve net zero by 2050 – and consequently report their GHG emissions. Additionally, we adopted a bottom-up approach to determining emission intensity based on aircraft ownership, fuel efficiency and fuel consumption, as well as passenger load factors.

The IATA Fly Net Zero scenario is the industry standard with 292 signatories from airlines as of July 2022⁵². DBS supports the industry effort by adopting its reference scenario.

Choosing the baseline year was complex given that 2020 was an extraordinary year due to COVID-19 lockdowns and border restrictions – all of which significantly impacted air travel demand and led to reduced absolute GHG emissions. However, airlines were still operating either at a lower capacity or operating air freight, using converted aircraft. As a result, emissions intensity measured per passenger kilometre rose dramatically, as evidenced from the significant increase in our portfolio emission intensity between 2019 and 2020. We therefore do not believe that 2020 emissions intensity was representative of a normal year, nor can be a realistic starting point from which to measure. Instead, our stance is that 2019 would be representative of the last “normal” year, so we have chosen that year as our starting point.

In line with IATA, our interim decarbonisation target for the Aviation sector is a 16% reduction of GHG emissions intensity through our financing by 2030. This will be achieved by:



- **Helping our clients achieve their existing plans and encouraging those that have not yet made meaningful decarbonisation plans to do so.** Given that most of our airline operator clients have already committed to IATA Fly Net Zero, we believe that their achievement of nearer term targets that are aligned to this will be pivotal to meeting the 2030 target.
- **Financing more energy efficient aircraft.** Our financing will help clients to be at the forefront of efforts to introduce more energy efficient aircraft and thereby lower the emissions intensity of their fleets. We will continue to focus on supporting our clients in replacing their aircraft with more energy efficient ones. These efforts on aircraft should help lower the emissions intensity of the fleet we finance.

⁵² IATA - Fly Net Zero

02 | Our net zero aligned emissions reduction targets

- **Supporting the growth and adoption of SAF.** This will be done through our efforts in the O&G sector to increase the supply of SAF, while working with airline operators to encourage its adoption.
- **Financing novel aviation technologies.** We will consider the financing of novel technologies as they come to market, including hydrogen and electric aircraft. However, we are unlikely to rely on this until well after 2030.
- **Helping clients to access high-quality offsets.** We will continue to encourage our clients to responsibly use offsets wherever emissions prevention or reduction is possible. However, where offsets are required, we will help our clients access them. This is one of the reasons we jointly created CIX – a global carbon credit exchange and marketplace for high-quality carbon credits.

While the 16% reduction may seem less aggressive than our targets for the other sectors, this reflects the current technological challenges in decarbonising aviation. SAF is one of the key levers needed to decarbonise aviation – IATA's Fly Net Zero scenario attributes 65% of aviation sector decarbonisation to use of SAF rather than fossil fuel-based jet fuel. However, SAF is currently neither available in sufficient volume nor at a competitive price. Furthermore, technological solutions are either limited as further progress in aircraft design is needed or are still at an experimental stage, as seen with hydrogen-fuelled aircraft.

2.5.3. Future development and dependencies

To achieve our interim target by 2030, we depend on airline operators formulating and executing their decarbonisation strategies, as well as achieving their near-term targets. This largely hinges upon their ability to bounce back strongly from COVID-19-induced turmoil. For instance, near-term decarbonisation requires continued investment in improving fleet efficiency and increasing the use of SAF, as well as the procurement of high-quality offsets. The costs of such activities may be prohibitive when companies are in recovery mode. In addition, as demand for air travel grows and new routes are opened, the balance between short-haul versus long-haul is likely to change. This will affect the sector's emissions intensity because short-haul aviation is more emissions-intensive per passenger-kilometre. Our ability to achieve our targets will therefore be affected by the shape of demand for air travel in coming years. Our clients cannot transition alone and will require the support from their ecosystem partners, including energy players and aircraft manufacturers. Our aviation clients – and consequently our targets – are dependent on the timely development and scaling of SAF to ensure sufficient supply at a commercially viable cost, as well as the continued innovation in aircraft design. Through our strategy to support the O&G sector to diversify into alternate fuels, we will be helping to scale SAF sufficiently through transition finance and therefore materially decarbonise the aviation sector. In addition, our work in setting up CIX demonstrates our commitment to helping our clients access high-quality offsets.

We have set our targets in the wake of the COVID-19 pandemic, which had a seismic impact on the sector. We recognise that the industry is still recovering and the support that we give to our clients to help with that may, in the short term, cause misalignment with our 2030 interim target. We will monitor closely and may revise our 2030 target if COVID-19 induced turmoil takes longer than expected to subside.

“ **C**ommitting to net zero by 2050 and setting our 2030 interim targets mark an important milestone of DBS. Navigating this transition will be a long-term endeavour. Much needs to be done in order to fulfil our commitments set out in this report. It will entail a fundamental change in how we do business – both internally and externally. We will enhance the monitoring and reporting of our targets, review our targets and methodologies at regular intervals, and most importantly, support our clients on their transition to adapt to a net zero world.

“ **A**s we continue on our journey to supporting a just transition, we are working hard to integrate sustainability into everything we do. To achieve this, our employees are our greatest asset and we are enabling them to deliver new solutions to our clients. We will be very focussed on creating a robust ESG data architecture, develop new analytics tools, and above all, invest in our people by offering the relevant learning and development tools so that they can effect a fair and just transition with confidence.

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Yulanda Chung
Head of Sustainability,
Institutional Banking Group



Helge Muenkel
Group Chief Sustainability Officer



The way forward

1 Monitoring and reporting annually our progress against our targets – As an early adopter of the TCFD, we have been reporting under the recommendations since 2018. Now as a signatory to NZBA, we remain committed to being transparent about our efforts and will report annually our progress against both our 2030 interim targets and 2050 net zero targets within our sustainability reports. For the seven sectors of which we have set emissions reduction targets, this will entail updating the annual financed emissions for the sectors and analysing the progress against previous years and the respective targets.

2 Reviewing periodically and, if appropriate, updating our targets and methodologies – We expect the reference scenarios against which we have calibrated our emissions reduction targets to continually evolve. Precedent suggests that organisations that own these reference scenarios typically update them periodically. However, we do not intend to update our interim targets for 2030 each time these reference scenarios are revised or updated. Doing so would potentially create business uncertainty, both internally for our business planning and externally in our client engagements. However, we intend to review and, if necessary, revise our targets at least once every five years hereafter. Building on the foundation of this round of target setting, we look forward to the next round with more confidence of our approach.

04 | The way forward

3 Supporting our clients on their transition journey – Our ability to achieve our net zero ambition relies heavily upon the success of our clients in delivering their own transition plans. Hence, we are committed to engaging with our clients and supporting them to transition their businesses through sustainable and transition finance. In the past few years, we have seen a significant increase in the demand for sustainable

finance solutions, such as sustainability-linked and green loans. To accelerate the transition and meet the vast investment needs in the next few decades, we will proactively partner our customers, providing them with financial advisory and transition finance solutions, as we collectively work towards a low-carbon future.



- **To our clients:** we applaud your efforts to transition to net zero, and we stand shoulder-to-shoulder with you in those journeys.
- **To our investors:** we hear your demand for us to support the transition to net zero and we want to lead the way.
- **And to the wider community:** we are ready to support you in your decarbonisation efforts and realise a fair and just transition by 2050 in a world where no one is left behind.