

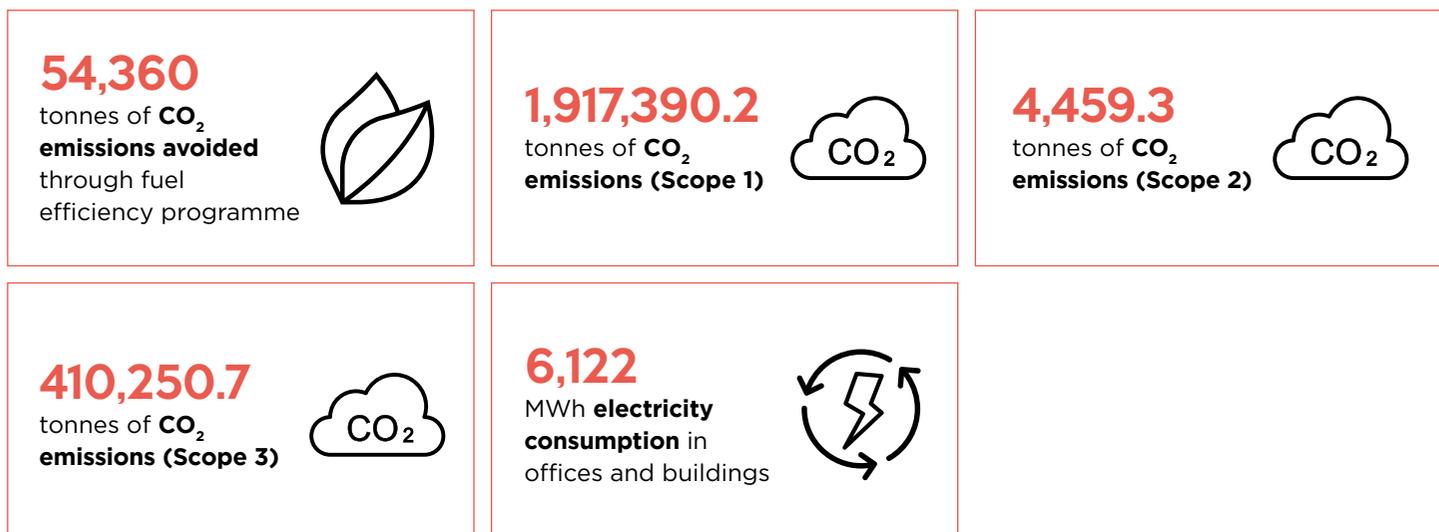
Environmental

Climate Strategy

(GRI 3-3)

As it becomes increasingly critical to address climate change, we acknowledge the need for the Group to be accountable for our climate-related and environmental impacts. We also recognise that there is growing investor demand to embed greener practices into our core business to reduce our carbon footprint. To build back better and responsibly, Capital A has taken actions to strengthen our environmental commitments and prepare for the future.

2022 Performance Overview



Our Management Approach

- Environmental Policy Statement
- Sustainability Policy
- Carbon Offsetting and Reduction Scheme for International Aviation (CORSA) requirements
- International Civil Aviation Organization requirements

- Occupational, Health, Safety and Environment Manual
- Environmental Quality Act 1974

Supporting the UN SDGs



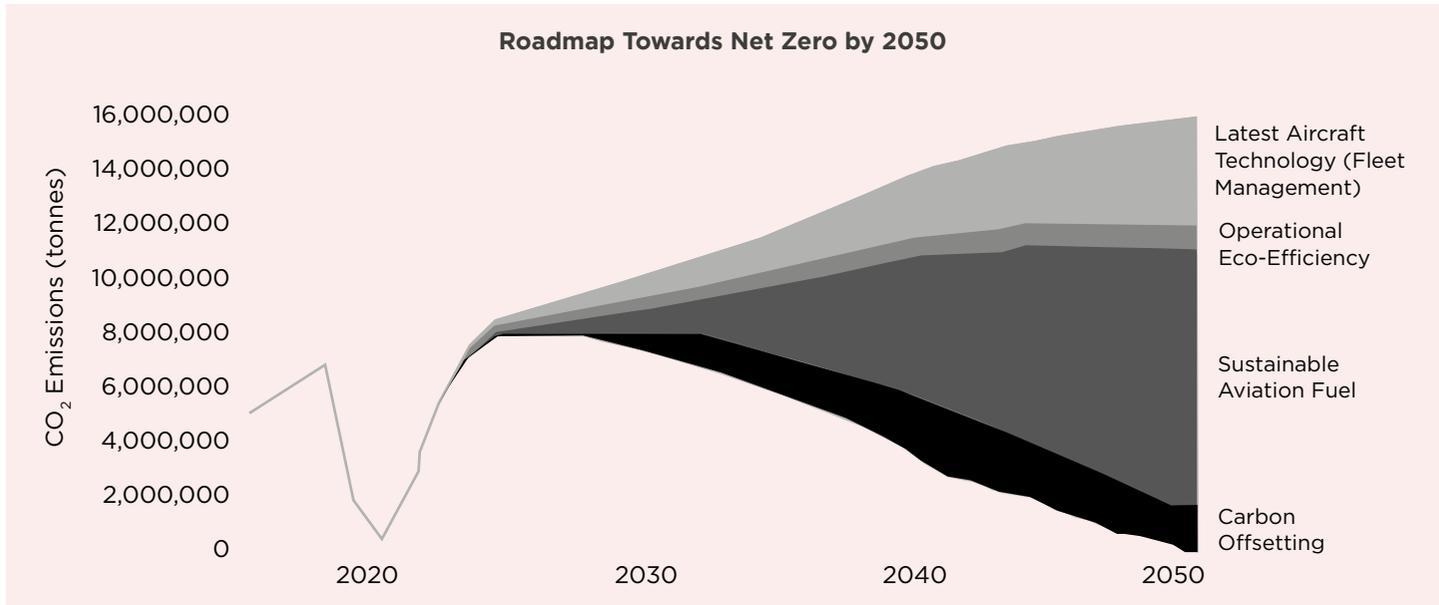
We have positioned ourselves to accelerate our climate strategy by declaring the ambition to achieve net zero carbon emissions by 2050 as well as by aligning with the Task Force on Climate-related Financial Disclosures (TCFD) reporting framework to identify and disclose our climate-related risks and opportunities. This encompasses the management of our greenhouse gases (GHGs), energy consumption and water usage, underpinned by our Environmental Policy. We are guided by our Sustainability Redbook and its targets to advance ongoing efforts to reduce our climate impact across our value chain. In 2022, no sanctions were recorded for any non-compliance with environmental legal requirements.

In previous years, our reporting focused on our aviation business as it generates the bulk of our Scope 1 emissions. In the main, we are continuing with this approach as throughout the year we placed the highest emphasis on strengthening our aviation sustainability strategies to respond to ever-growing interest and intensifying scrutiny from external stakeholders. Our commitment is not only to meet minimum standards but to aspire to industry best practice given the prominence of the AirAsia brand in the global aviation industry.

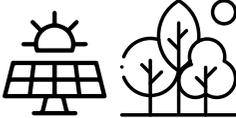
At the same time, we were able to broaden our coverage beyond aviation to account for the environmental impact of Capital A's non-airline businesses. Our first step towards this end was to include Scope 3 emissions in this year's report by encompassing the emissions of Teleport and airasia ride.

NET ZERO BY 2050

To fully align with the global ambition to achieve net zero by 2050, Capital A developed our own net zero roadmap in 2021, identifying four pathways for AirAsia to converge to our long-term emissions reduction goal.



Note: CO₂ emissions for years 2018-2022 are based on actual data. Figures for 2023 onwards are based on AirAsia's projections.

Our Approach Towards Net Zero by 2050	
 <p>Operational Eco-Efficiency Strengthen our fuel efficiency programme to continue delivering optimal outcomes to retain our lead as the airline with the lowest carbon intensity in Asia.</p>	 <p>Use of Latest Aircraft Technology Invest in the Airbus A321neo model for growth and fleet renewal up to 2035. With a 236-seat layout, each A321neo emits 20% less CO₂ per seat compared with an A320 while also producing less nitrogen oxide and noise.</p>
 <p>Sustainable Aviation Fuel (SAF) Explore SAF opportunities with fuel suppliers as biofuel production ramps up and becomes available in Asean.</p>	 <p>Adopting Market-based Measures Purchase carbon credits to close remaining gaps and comply with requirements under the CORSIA developed by ICAO.</p>

In 2022, we made incremental progress in all four areas, although the bulk of our efforts focused on strengthening and expanding our operational eco-efficiency outcomes. By increasing our fuel consumption efficiency, we benefit from cost savings while also reducing our emissions in a way that aids our post-pandemic recovery.

In the following section, we list our key achievements in each of the above mentioned areas.

Environmental (cont'd)

Climate Strategy

Approach 1: Operational Eco-Efficiency

As our main focus, AirAsia's fuel efficiency programme underpins our Scope 1 GHG emissions reduction efforts and represents tangible immediate solutions in our journey to net zero. We maintain some of the lowest carbon intensity measures in the industry through continuous efforts to reduce fuel consumption, both to lower our operational costs and carbon footprint.

In 2022, we undertook two investments to strengthen our fuel efficiency programme. The first was usage of the Honeywell Forge fuel efficiency solution which enables AirAsia to analyse fuel-related data and compute its fuel savings. The system helps in planning the right amount of fuel for every flight, while providing recommendations to improve fuel efficiency performance. Data recorded within the Forge system also helps to track performance of operational eco-efficiency procedures to increase compliance rates.

The second investment made was in the installation of an innovative aircraft software modification known as Descent Profile Optimiser (DPO) on A320 aircraft to minimise the amount of time spent at an inefficient level of fuel burn. The DPO is calculated to reduce our emissions by 0.75% per aircraft, equivalent to an average of 101kg of CO₂ per flight. In the first phase of implementation, DPO has been installed in 32 aircraft, to be followed by the rest of the fleet in 2023.

The DPO is the latest in a series of flight procedures that AirAsia has introduced that deliver emissions savings at every phase of flights. Although small individually, in aggregate, these measures are key to keeping AirAsia's cost and carbon intensity low. Throughout 2022, the Fuel Efficiency Team oversaw more than 20 operational eco-efficiency procedures by all pilots, highlights of which are described in the diagram below.

Initiative	Description	Result/Total CO ₂ avoided in 2022
SafetyLine OptiClimb	Software that reduces fuel consumption during climb, which is the most fuel-intensive phase of a flight. OptiClimb leverages digital data to accurately determine and analyse an aircraft's aerodynamic characteristics.	 64% compliance on procedure implementation (2021: 63%)  CO ₂ emissions avoided = 20,713 tonnes
Reduced Flaps Landing	Procedure that uses a reduced flap configuration during landing to cut aerodynamic drag and fuel burn.	 98% compliance rate on procedure implementation (2021: 91%)  CO ₂ emissions avoided = 5,011 tonnes
One Engine Taxi on Arrival and Departure	Procedure to operate one engine instead of two during aircraft taxi-into and out of the the arrival and departure gates.	 100% compliance on procedure implementation for One Engine Taxi on Arrival (2021: 83%)  44% compliance on procedure implementation for One Engine Taxi on Departure  CO ₂ emissions avoided = 9,967 tonnes
Idle Reverse Landing	Procedure that uses idle thrust instead of full reverse engine thrust upon landing to reduce noise and fuel burn.	 92% compliance rate on procedure implementation (2021: 92%)  CO ₂ emissions avoided = 2,503 tonnes
Idle Fuel Flow Factor	Updates to the Flight Management System that enable optimisation of the flight's descent and approach.	 100% implementation on all aircraft  CO ₂ emissions avoided = 2,481 tonnes
Statistical Taxi-out Fuel Planning	Procedure that projects a more accurate flight plan taxi-out fuel by airport and departure hour using historical data instead of a fixed figure.	 100% implementation for all AOCs  CO ₂ emissions avoided = 1,622 tonnes

Other green operating initiatives under the fuel efficiency programme contributed to 12,063 tonnes of CO₂ emissions avoidance in 2022. The diagram below shows our fuel saving initiatives and the average amount of fuel saved per flight for each.

Fuel Saving Initiatives



<p>71kg</p> <p>OptiClimb Software that reduces fuel consumption during climb.</p>	<p>11kg</p> <p>Reduced Flaps Landings Procedure that uses a reduce flap configuration during landing.</p>	<p>22kg</p> <p>RNP-AR Procedure that uses an aircraft's navigation functions for the shortest landing approach.</p>
<p>5kg</p> <p>Idle Fuel Flow Factor Optimisation of aircraft's descent performance.</p>	<p>5kg</p> <p>Idle Reverse Landing Procedure that uses idle thrust upon landing to reduce noise and fuel burn.</p>	<p>9kg</p> <p>One Engine Taxi on Arrival Procedure to operate one engine during aircraft taxi-in to the arrival gate.</p>

Note: This indicates the average amount of fuel saved (kg) per flight.

Savings from the Operational Eco-Efficiency Programme



Environmental (cont'd)

Climate Strategy

Aircraft Cabin Innovation with High Performance Mirus Hawk Seats

Since 2018, we have retrofitted five A320 aircraft and line fitted two A321neo aircraft with Mirus Hawk seats that are made from carbon fibre, aluminium and genuine leather upholstery to produce lighter seats that will support our ongoing commitment to optimise fuel efficiency and reduce carbon emission. The lighter seats help to reduce fuel consumption by more than 70,000 litres and lower CO₂ emissions by 200 tonnes per aircraft per year. We save approximately 1,400 tonnes of CO₂ per year from the seven Mirus Hawk-fitted aircraft in our fleet.

Under our contract with Airbus, all A321neo aircraft orders from 2021 to 2028 will be installed with the Mirus Hawk seats. We look forward to receiving 16 more A321neo aircraft pre-fitted with the high performance seats by 2024.

To improve our ground vehicles' eco-efficiency, we are updating our contracts to include a clause that highly encourages Ground Handling Agents (GHA) to use electric vehicles where possible.

AirAsia is engaging more intently with civil aviation regulators in our key AOC countries on improving airspace efficiencies. While airline initiatives are important, equally impactful are measures to reduce air traffic congestion and to streamline flight paths for more direct approaches to airports.

While AirAsia's Flight Operations Department has always maintained regular engagements with regulators, this year saw increased interactions between government officials with our Sustainability team. Several meetings were held throughout the year, enabling better understanding and coordination between key stakeholders.

Given the cross-sectoral nature of sustainability, these engagements extended beyond members of the aviation community to include representatives from the Ministry of Natural Resources, Environment and Climate Change, as well as MITI.

Approach 2: Latest Aircraft Technologies

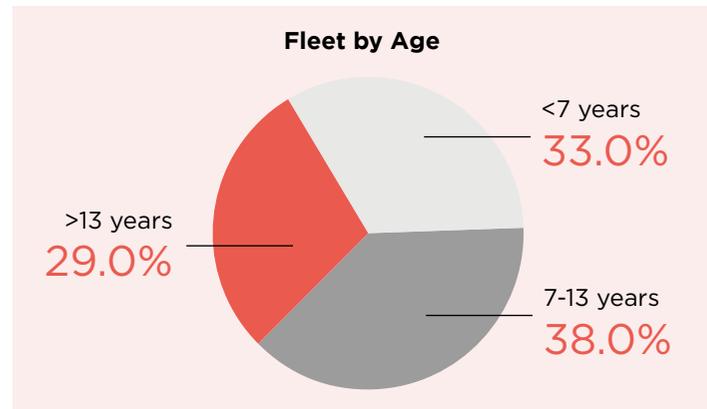
AirAsia invests in and is in the process of renewing our fleet to young, modern and fuel-efficient aircraft to reduce our Scope 1 GHG emissions and contribute significantly to our net zero goal. Our fleet comprises three models of the Airbus A320 family, which are acknowledged to be the most fuel-efficient narrow-body commercial jet aircraft in the market today; as well as one unit of Airbus A330-300 aircraft to meet our capacity requirements. Comprising 155 aircraft, our fleet remains relatively young at an average age of 10.2 years.

This year, AirAsia operated a fraction of its total fleet size due to pandemic restrictions prolonging into 2022, especially in the first half of the year. AirAsia entered 2022 with a registered fleet of 159 aircraft in January and ended with 155 aircraft in December (table below) with the reduction of three aircraft due to aircraft reallocation and lease retirement. However, our operating network started in January with 46 aircraft, growing to 83 aircraft by December 2022 as we returned more planes into service.

In 2023, we will continue to focus on recovering full fleet activity by negotiating solutions to sector-wide shortages in aircraft parts, engines and maintenance hangar slots. Where feasible, our engineering department prioritised the reactivation of aircraft that are younger in age and have a better fuel efficiency record. This will continue to be our approach throughout 2023 as we reactivate the remainder of the AirAsia fleet across Asean.

Fleet Size

Model	Units	Average age of type (years)	Passenger Capacity
A320-200	123	11.5	180/186
A320neo	29	5	186
A321neo	2	3.1	236
A330-300	1	8.1	377



In 2024, our fleet renewal plan will resume with scheduled deliveries of outstanding A321neo order. We currently have four A321neo aircraft in our fleet and in 2024, the Group is planning an increase of 16 additional A321neo aircraft, bringing our total number of this advanced model to 20 aircraft. This will make up around 10% of the total fleet in 2024. Our fleet renewal plan will see the replacement of all existing A320 aircraft with the A321neo model by 2035.

The A321neo aircraft will strengthen AirAsia's competitive advantage by further lowering our per seat cost through the addition of 60 additional seats per aircraft, or addition of 30% more seats compared to the predecessor model A320neo. This will help to increase capacity in congested airports without increasing the number of flights. The switch to an A321neo fleet not only brings economic benefits but also environmental ones as the newer planes operate with greater fuel efficiency and noise reduction. Gains from fuel and emissions efficiencies from 2024 onwards will mainly accrue from latest aircraft technologies as each A321neo emits 24% less CO₂ per seat compared to an A320 and produces less nitrogen oxide and noise.

Furthermore, in the coming years, as more airports introduce measures to penalise carriers operating inefficient aircraft models by applying higher taxes or even not allowing operations with certain aircraft types, AirAsia Group is likely to be minimally impacted as we will already be operating one of the region's youngest and most efficient fleets.

Throughout 2022, we attended three briefings conducted by Airbus on the manufacturer's ongoing programmes to decarbonise aviation. These included updates on latest research and development to develop a commercially viable zero-emission aircraft by 2035, tests to raise the ceiling on SAF utilisation to 100% (Airbus planes are now certified to fly with up to 50% blend of SAF) and new eco-efficiency operating measures.

Spotlight: Welcoming Three New A321 Freighters



Over the next two years, Teleport looks forward to seeing the introduction of three new Airbus A321 Freighters A321F, which is the highest fuel-efficient single-aisle model in its class. Its 27 tonne payload capacity further strengthens Teleport's intra-Asean cargo network with extended connectivity into Asia Pacific countries like China and India. The introduction of these new freighters supports Capital A's goal of net zero emissions.

Approach 3: Sustainable Aviation Fuel

The utilisation of SAF is projected to be *the* key strategic in-sector solution towards AirAsia's net zero roadmap. As the aviation biofuels industry matures, we expect SAF to feature more prominently in our decarbonisation journey in the long term as it can cut the lifecycle GHG emissions of jet fuel by up to 80%. AirAsia's Airbus fleet is certified by aircraft and engine manufacturers to be able to fly with a blend of up to 50% SAF.

Environmental (cont'd)

Climate Strategy

The main obstacles to SAF utilisation remain its high price and non-availability in airports where our AOCs operate. However, we expect this to change in the next two to three years as more companies ramp up biofuel production and supply in the region. AirAsia will leverage Group economies of scale as purchase volume is one of key factors determining SAF pricing.

To gain a broader overview of SAF production and distribution plans in Asean, we participated in multiple engagements with civil aviation authorities, fuel suppliers, aircraft manufacturers and government authorities in the region. These included a three-day ASEAN Workshop on SAF organised by the European Union Aviation Safety Agency (EASA) in January 2022 and a special SAF briefing by Airbus in February 2022.

AirAsia is also a member of the Malaysian Sustainable Aviation Energy Task Force under the purview of the MITI, as well as the Malaysian National Task Force on SAF initiated by CAAM. Through related engagements, AirAsia was able to refine its plans for SAF utilisation by identifying airports where SAF will be first available and forecasting SAF volumes that can be prospectively sourced from each location.

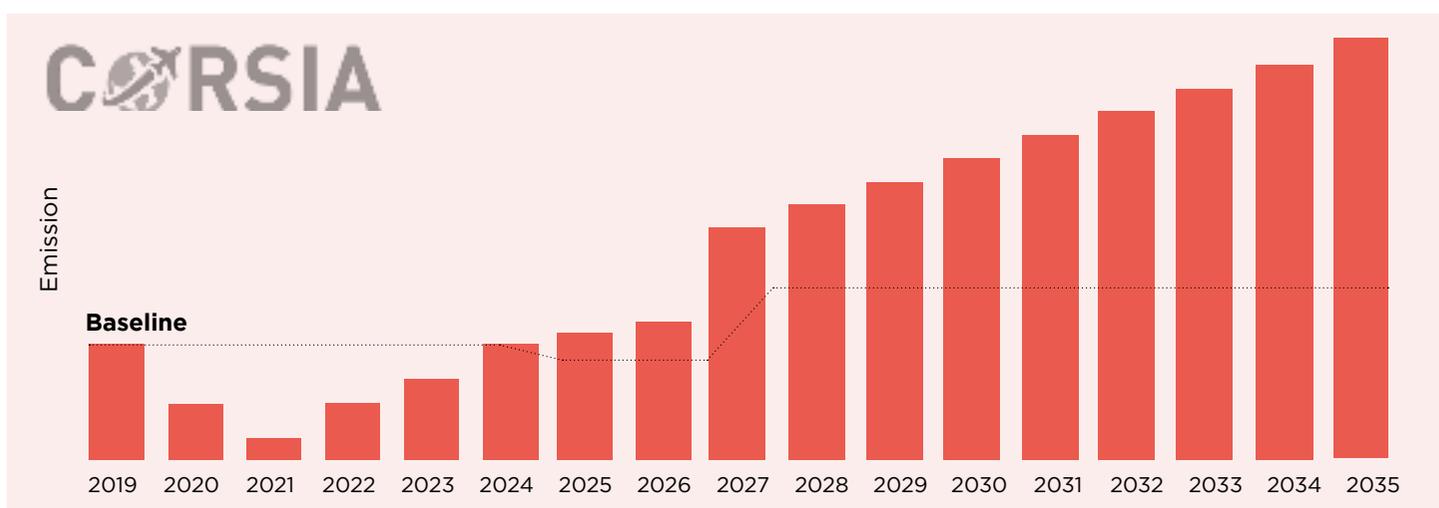
As of January 2023, AirAsia has received its first price quotations to assess the possibility of including SAF into its fuel mix from the second half of the year onwards.

Approach 4: Carbon Offsetting

Market-based measures remain an important approach to manage our residual emissions, pending novel technologies such as zero-emission aircraft. With Malaysia, Indonesia and the Philippines being member states that have voluntarily signed on to participate in CORSIA, we see carbon offsetting as a necessity to close the emissions gap after applying all three in-sector measures mentioned above. Since the scheme came into force, all three AirAsia AOCs are mandatorily required to comply with CORSIA and its progressively ambitious targets to tackle CO₂ emissions from international aviation.

In line with CORSIA requirements, we submitted verified emissions reports to the civil aviation regulatory bodies of the respective AOC countries in April 2022 for their onward submission to the ICAO Central Registry. As global emissions from international aviation remained well below the 2019 CORSIA baseline level, none of our airlines were required to offset our carbon emissions.

An important development that took place in 2022, however, was a decision at the 41st ICAO General Assembly in October to lower the CORSIA baseline to 85% of 2019 level from 2024 onwards. The graph below illustrates the impact of the lowering of the CORSIA baseline from 2024 onwards. This will require offsetting activity, which is expected to spike from 2027 onward as CORSIA becomes mandatory and key economies such as China and India are expected to join the scheme.



Caption: General trend for CORSIA emissions from 2019 to 2035. This is not based on actual emissions data, merely a depiction of the trend.

In preparation for offsetting requirements starting 2024, we fine-tuned forecasting models to determine our exposure under the new CORSIA baseline, as well as under a more ambitious net zero decarbonisation programme to cut our emissions above CORSIA requirements. We are also in the process of developing options for customers to add an offset fee to their fares, not only for flights but also for delivery and ride-hailing services provided by Capital A companies.

Leading the CORSIA Task Force in Malaysia



Capital A's Chief Sustainability Officer was appointed by CAAM in the fourth quarter of 2022 to lead a national task force on CORSIA. The task force aims to identify gaps in Malaysia's current approach and to provide recommendations for the effective implementation of the carbon reduction scheme. Over a period of six months, the task force will develop an updated Malaysia aviation net zero roadmap, taking into account decarbonisation strategies of all key stakeholders, and determine the potential contribution of the sector to Malaysia's carbon economy.

Though in-sector approaches are highly encouraged for carbon emissions reductions, AirAsia's decarbonisation efforts will be highly dependent on the purchase of carbon offsets until SAF becomes more commercially viable in terms of price and supply. We expect carbon offsets to deliver a high proportion of our emissions reduction at the early stages of our net zero journey before tapering down as in-sector solutions become more accessible.

TASK FORCE ON CLIMATE-RELATED FINANCIAL DISCLOSURES

With the exponential intensification of climate change, Capital A acknowledges climate change as one of the most complex risks society and the companies across the globe are facing right now. To demonstrate our commitment towards addressing and managing our climate-related impacts, Capital A became an official supporter of the TCFD in 2022.



TCFD Pillars

Achievement in 2022

Governance

Governance on climate-related risks and opportunities

- Maintain Board and senior management oversight through relevant committees
- Increase Board awareness through quarterly updates on ESG and climate-related matters (please refer to page 94)

Strategy

The actual and potential impacts of climate-related risks and opportunities on our businesses, strategy and financial planning

- Develop Capital A's net zero strategy
- Set internal carbon price (please refer to page 128)

Risk Management

The processes used to identify, assess and manage climate-related risks

- Include ESG and climate related risk in the Group's framework
- Plan to manage climate change as a risk in the Enterprise Risk Management system (please refer to page 104)

Metric and Targets

The metrics and targets used to assess and manage relevant climate-related risks and opportunities

- Monitor Scopes 1,2 and 3
- Commit to net zero emissions by 2050 (please refer to page 129)

Environmental (cont'd)

Climate Strategy

Risk timeframe: **S** short term **M** medium term **L** long term

Risk Type		Risk Timeframe	Climate-related Risk Description	Potential Financial Impact	Mitigation Strategy
Transition Risks	Policy and Legal	S M L	Imposition of new climate change regulation such as carbon taxes, emissions quotas or biofuel mandates	Increase in operating costs and fares which could lead to a dampening of travel demand	<ul style="list-style-type: none"> Regular engagement with civil aviation authorities and government bodies on climate change and decarbonisation plans for the aviation industry. Develop net zero by 2050 strategy which outlines our approaches on latest generation aircraft, operational improvements, SAF and carbon offsetting. Commence discussions with regional fuel suppliers on making SAF available in the region. Our focus will be on maximising efficiency and using SAF in line with mandated requirements. In addition, a purchase commitment by AirAsia will strongly incentivise fuel suppliers to invest and lower the long-term cost of SAF. Set internal carbon price to forecast our cost for carbon offsetting.
			New sustainability reporting requirements	Increase in reporting costs, including manpower expenses, measuring tools and audit fees	<ul style="list-style-type: none"> Leverage existing frameworks and tech tools to meet new data reporting requirements. Use available internal resources to undertake internal assurance before progressing to external assurance.
	Technology	L	New technology developed to deliver low-carbon solutions such as zero emission aircraft may result in asset value loss of existing aircraft and equipment becoming obsolete	New investments needed to upgrade fleet and equipment	<ul style="list-style-type: none"> Negotiate aircraft order contracts that allow for upgrades of unfulfilled deliveries Enhance fleet management strategy to build flexibilities in lease contracts
	Market	S M L	Travellers and businesses respond to climate change by reducing travel demand	Lower demand for air travel will impact revenue	<ul style="list-style-type: none"> Conduct brand campaign to communicate the Group's net zero strategy Implement a carbon offset programme that provides travellers with the option of offsetting their carbon emissions

Risk Type		Risk Timeframe	Climate-related Risk Description	Potential Financial Impact	Mitigation Strategy
Transition Risks (cont'd)	Reputation	S M L	Negative brand impact of being seen as not responding sufficiently to climate crisis	Guests may choose a competitor that they perceive as more sustainable and investors may divest. Financial institutions may also impose a premium on lending	<ul style="list-style-type: none"> Invest in carbon reduction initiatives and communicate decarbonisation efforts actively as part of the company's communications strategy
	Physical Risks	Acute	M L	Aircraft becoming inoperable at extreme high or low temperatures	Increase in cost of flight delays and cancellations
S M L			Increased frequency and severity of climate events such as typhoons and floods	Cost of asset damage, increase in insurance premiums and revenue loss due to travel disruption	<ul style="list-style-type: none"> Maintain robust business continuity plans and dynamic schedule planning at affected hubs
Chronic		L	Longer-term changes in weather patterns that result in rising sea levels rendering some airports inoperable	Higher airport charges at new facilities built to replace at-risk airports. Travel demand will also be impacted if new airports are located far away from city centres.	<ul style="list-style-type: none"> Select hub airports that are shielded from extreme weather events Ensure business continuity plans are effective and up to date Operate to airports that are adequately served by public transport to minimise potential increase to guests' travel footprint

Environmental (cont'd)

Climate Strategy

The following are examples of specific climate-related opportunities we have identified.

Climate-related Opportunities	Potential Financial Impact	Mitigation Strategy
Administrative efficiency	Digitalisation strategy reduces manual paperwork and cost of paper, printing and storage of documents.	Continue to work with regulators to move towards e-documentation for regulatory records-keeping and submissions.
Resource diversification	Shift to SAF utilisation diversifies fuel supply and reduces exposure to rising energy costs and growing carbon regulation.	Commenced discussions with fuel suppliers to supply SAF at Malaysian airports and/or to develop SAF using locally available feedstock.
Resource efficiency	Reduction of fuel utilisation via improvements in air traffic management and A321neo fleet conversion will further reduce operating costs and ensure AirAsia maintains its commercial advantage as the airline with the lowest cost/ASK and CO ₂ /ASK in the industry.	Engage in regular consultations with civil aviation authorities to implement new fuel efficiency and emissions reduction measures, including proposing new measures to be added to national State Action Plans on Emissions Reductions.
Products and Services	Attract travellers keen to minimise their carbon footprint and experience sustainable travel activities. We potentially gain from increased market share among responsible travellers and earn ancillary income from the sale of sustainable travel activities.	Implement a voluntary carbon offsetting programme to enable travellers to contribute to their carbon offsetting. Work with sustainable travel social enterprises to enhance access to sustainable travel activities.
Markets	Recognise that climate impact prone destinations may also be strong revenue generators in the recovery and rehabilitation phase.	Resume commercial flights to affected destinations as soon as it is safe to do so to support rebuilding programmes.
Resilience	Continue to strengthen our network connectivity in hubs such as klia2 with reduced climate risk.	Invest in climate forecasting tools and services to inform fleet planning and route planning strategies.

In 2022, we advanced our TCFD alignment by computing our internal carbon price. We also recognise the latest scientific assessments as set out by the United Nations Intergovernmental Panel on Climate Change (IPCC) and aim to conduct a climate-related scenario analysis based on the IPCC assessment in 2023.

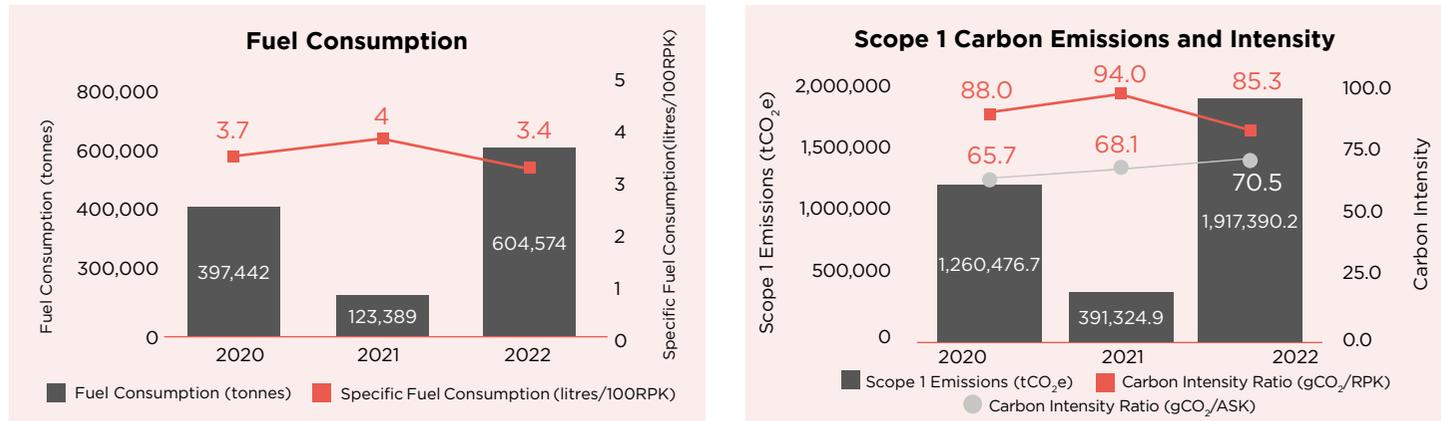
To stay abreast of climate-related risks, three of Capital A's Board members attended TCFD training in March 2022 organised by the UN Sustainable Stock Exchanges Initiative, International Finance Corporation and Carbon Disclosure Project Worldwide (CDP) with Bursa Malaysia. Our Group Sustainability team also attended a two-day programme hosted by Bursa Malaysia on TCFD training to enhance their knowledge and support more robust disclosures.

GREENHOUSE GAS INVENTORY (GHG) (GRI 302-1, 302-2, 302-3, 302-4, 305-1, 305-2, 305-3, 305-4, 305-5)

For our GHG inventory, we follow the approach and guidance defined in the Greenhouse Gas Protocol. We report only Scope 1 emissions from our airline operations, AirAsia, as the direct emissions from our digital business have been assessed to be immaterial. However, we cover the Capital A Group in its entirety for disclosures of Scope 2 and Scope 3 emissions as these cover emissions from all our offices and entities.

Scope 1 Emissions

AirAsia's Scope 1 emissions are from the jet fuel used for our airline operations. Our performance can be seen below:

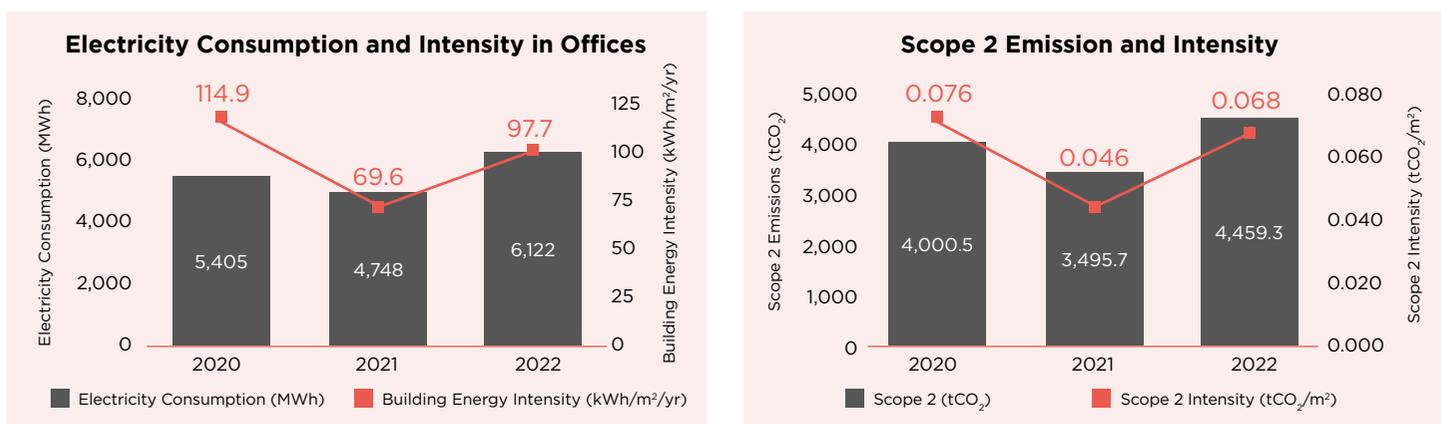


With the gradual recovery and return of air travel and as more countries ease restrictions, AirAsia's total fleet fuel consumption saw a 3.9% increase from 123,389 tonnes in 2021 to 604,574 tonnes in 2022, with a specific fuel consumption of 3.4 litres/100RPK. This trend corresponds with the 3.9% increase in Scope 1 GHG emissions from 391,325.9 tonnes of CO₂ equivalent (tCO₂e) in 2021 to 1,917,390.2 tCO₂e in 2022. We expect our fuel consumption and Scope 1 emissions to gradually approach pre-Covid levels. However, we are optimistic that SAF will play a key role in reducing our Scope 1 emissions in the future. With operations returning to normal, our ground operations fuel consumption increased by 68.2%, from 520.7 tonnes in 2021 to 875.8 tonnes in 2022.

Our carbon intensity per revenue passenger kilometre (RPK) decreased by 9.3% from 94 gCO₂/RPK in 2021 to 85.3 gCO₂/RPK in 2022 as a result of increased load factor, while our carbon intensity per available seat kilometre (ASK) increased by 3.5% from 68.1 gCO₂/ASK in 2021 to 70.5 gCO₂/ASK in 2022 due to increased fleet age. Nevertheless, our carbon intensity remains one of the best in the industry, owing to our robust fuel efficiency programmes.

Scope 2 Emissions

Capital A's Scope 2 disclosures cover emissions associated with energy consumption at all our facilities and offices.



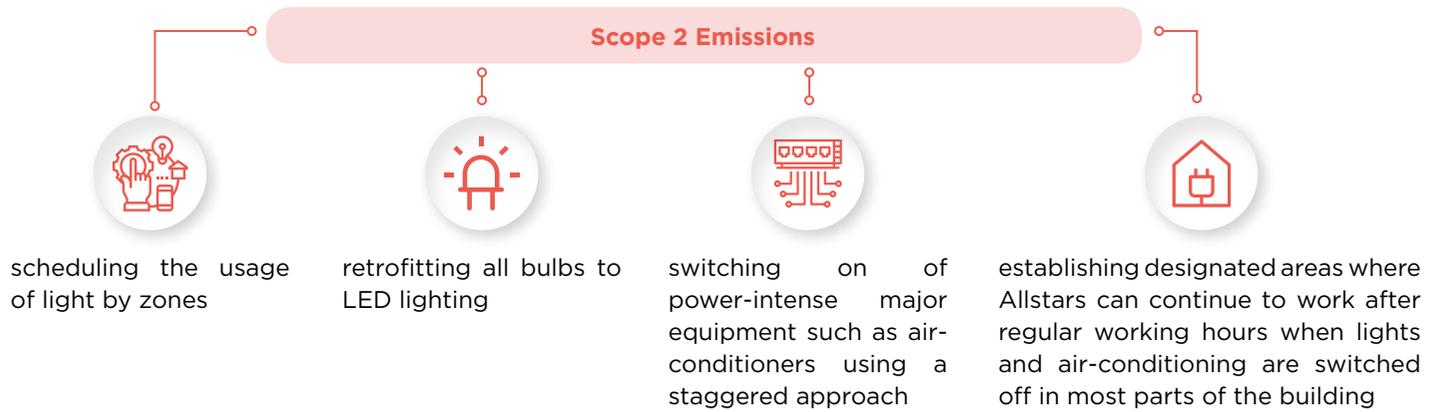
With our Allstars returning to offices as the pandemic restrictions ease, total electricity consumption in our offices was 6,122 MWh in 2022, a 28.9% increase from 2021. This has been accompanied by a corresponding increase in energy intensity as well to 97.7 kWh/m²/year in 2022 from 69.6 kWh/m²/year in 2021.

As Scope 2 emissions are from purchased electricity for our buildings and offices, our Scope 2 emissions similarly increased to 4,459.3 tCO₂ in 2022, a 27.6% increase from 2021, with a Scope 2 GHG intensity of 0.068 tCO₂/m².

Environmental (cont'd)

Climate Strategy

In line with the Group's quest for efficiency, our facilities team has put in place several energy efficient initiatives in our offices to reduce energy usage. These include:



Our total energy consumption, including fuel purchased for aircraft and electricity purchased for offices, was 8,046,956 MWh in 2022, an almost five-fold increase from 2021 brought on by the exponential increase in office activity with Allstars' return to the workplace. As a Group, we are reviewing and exploring ways in which we can optimise our energy management.

Scope 3 Emissions

As part of industry best practices, Capital A began to track our Scope 3 emissions from 2022 and has identified five of the 15 categories highlighted in the GHG Protocol that are applicable to our business, including:



Note:

1. Only business travel on non-AirAsia flights and hotel stays are considered as emissions from AirAsia flights are considered under our Scope 1 emissions.
2. The Technical Guidance for Calculating Scope 3 Emissions published by GHG Protocol is used to calculate our Scope 3 emissions, while the emission factors are sourced from UK Government GHG Conversion Factors for Company Reporting.

In 2022, multiple initiatives were undertaken to minimise our Scope 3 emissions, including:



The identification of Scope 3 emissions allowed us to understand our carbon footprint beyond our Scope 1 and 2 emissions, and we are actively identifying opportunities to reduce our emissions beyond our value chain. As more than 95% of our Scope 3 emissions originate from the extraction and refining of the jet fuel (well-to-tank emissions) for our flights, utilisation of SAF will be the dominant method to reduce our Scope 3 emissions. In addition, we are developing a carbon offsetting programme that will allow guests to offset their carbon footprint from mobility and delivery services. We hope to launch this programme in 2023 to deliver a more sustainable and purposeful service to guests.

We will continue to work closely with our vendors and business partners to track and minimise our Scope 3 emissions, as well as to expand the coverage scope of our Scope 3 emissions monitoring as applicable.

Other Greenhouse Gas Emissions (GRI 305-7)

We recognise that the combustion of jet fuel releases GHGs other than CO₂ into the atmosphere, specifically nitrogen oxides (NO_x), sulphur oxides (SO_x), carbon monoxide (CO), and volatile organic compounds that can negatively impact the quality of air.

Under Annex 16, Volume III of its international standards on environmental protection, ICAO has set acceptable levels of emissions from aircraft engines for the various other GHGs. In compliance with these standards, we work hard to expand our fleet with younger aircraft that use the latest technologies. As of 2022, all of AirAsia's aircraft engines meet with the most stringent ICAO CAEP/8 NO_x emissions standards. As we continue to phase out older aircraft in exchange for new Airbus A321neo models, we aim for 100% compliance with ICAO CAEP/8 NO_x standards.

Indicators	2020	2021	2022
NO _x emissions (tonnes) ¹	725	261	1,191
NO _x emissions intensity (gNO _x /RPK) ¹	0.0508	0.0629	0.0544
SO _x emissions (tonnes) ²	79	29	127
Volatile Organic Compounds (VOC) emissions (kg) ²	274,492	98,752	438,746

Notes:

¹ NO_x emissions and compliance data are obtained from the ICAO Emissions Bank issue 28C dated 20 July 2021. The NO_x emissions value per landing and takeoff (LTO) cycle is based on the weighted average of AirAsia's fleet composition as of 2022.

² According to the US EPA, SO₂ represents the highest composition of SO_x emissions, hence SO₂ is considered as SO_x for the purpose of calculations. SO₂ and VOC emissions data are sourced from US EPA's Generic Aircraft Type Emission Factors table.

NOISE MANAGEMENT

We recognise that noise from our aircraft engines could affect the physical and mental health of the surrounding communities, and that it may cause negative impacts on the natural ecosystem. Accordingly, all AirAsia aircraft comply with ICAO Annex 16 Chapter 4 noise standards and CAAM's directive on aircraft noise, and we will continue to meet or exceed ICAO noise certification standards.

BIODIVERSITY (GRI 304-3)

We believe in conserving the natural environment and biodiversity of the countries where we operate for the benefit of the ecosystem and local communities. As a reputable leader in the region, we are always exploring opportunities to do our part to minimise our ecological impact.

Through our philanthropic arm, AirAsia Foundation, we have supported numerous social enterprises across the region whose goals include biodiversity conservation. The table below summarises their ongoing contributions.

Environmental (cont'd)

Climate Strategy

Past efforts towards wildlife protection include training Allstars to recognise signs of illegal wildlife trafficking and raising awareness on conservation of endangered Malayan tigers. We look forward to exploring more opportunities to support biodiversity and wildlife conservation.

Malaysia



APE Malaysia Hoses for Wildlife

Equips Asean wildlife sanctuaries with tools created using decommissioned fire hoses to aid in rehabilitation and release programmes



Langit Collective

Trains indigenous farmers to phase out chemical fertilisers and pesticides in heirloom rice cultivation



Dusun Merdeka

Supports indigenous farmers in responsible harvesting of naturally occurring cocoa trees and replanting endemic trees in secondary forests bordering Malaysia's National Park.

Thailand



Muser Coffee Hill

Supports hill tribe farmers in converting from monocropping to cultivation of shade-grown coffee that requires rehabilitation of natural forest canopy for the crops to thrive



Folkcharm Travels

Enables cotton weavers to regrow local cotton plants decimated by expanding rubber plantations

Indonesia



Natural Aceh Oyster Farm

Undertakes mangrove rehabilitation and trains women farmers in alternative oyster farming methods to minimise damage to recovering post-tsunami mangrove ecosystems



Limpapeh Natural Dye Songket

Trains women weavers in replacing chemical dyes that pollute and poison rivers with natural dyes derived from local plant material

Vietnam



Sapanapro Red Dao Therapy and Spa

Trains Red Dao hill tribe herbalists in sustainable harvesting of wild shrubs



Dó Paper Revival

Develops a plant nursery and replanting programme that helps protect the Dó plant from extinction

Philippines



Tsaa Laya Premium Teas

Set up a plant nursery for organically grown local herbs



Waste Management

(GRI 3-3, 306-1, 306-2, 306-3, 306-4, 306-5)

Efficient and well-planned waste management is important to avoid unnecessary waste generation and disposal in overflowing landfills which are environmental hazards. Towards this end, we are adopting a circular economy approach in our waste management encompassing the 3R principle to reuse, reduce and recycle resources responsibly.

2022 Performance Overview

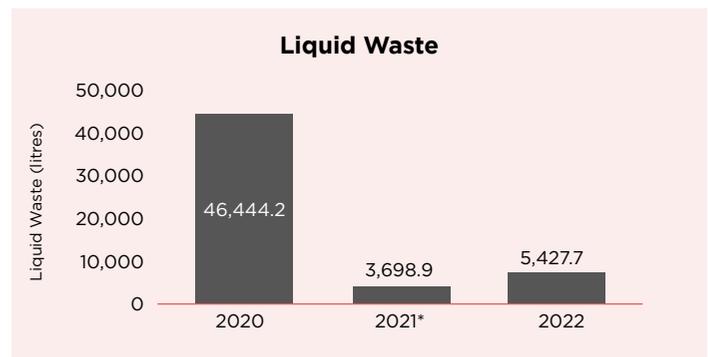
<p>124.4 tonnes of solid hazardous waste generated</p> 	<p>5,427.7 litres of liquid hazardous waste generated</p> 	<p>13.5% of non-hazardous waste recycled</p> 
<p>4,160kg of office waste recycled</p> 	<p>1,395 life jackets upcycled</p> 	<p>75,974 m³ of water consumed</p> 

<p>Our Management Approach</p> <ul style="list-style-type: none"> • Environmental Policy • Sustainability Policy • Environmental Quality Act 1974 • Solid Waste and Public Cleansing Management Act 2007 	<p>Supporting the UN SDGs</p> <div style="display: flex; justify-content: space-around;"> <div style="border: 1px solid white; padding: 5px; text-align: center;"> <p>12 RESPONSIBLE CONSUMPTION AND PRODUCTION</p>  </div> <div style="border: 1px solid white; padding: 5px; text-align: center;"> <p>13 CLIMATE ACTION</p>  </div> </div>
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HAZARDOUS WASTE (GRI 2-4)

Hazardous waste is harmful to the environment and must be handled and disposed of properly. Most of the hazardous waste we produce is from engineering and comprise spent oils/fluids, absorbents, containers, gloves, oil rags and filters. To manage hazardous waste, we engage licensed contractors in compliance with the Environmental Quality (Scheduled Wastes) Regulations 2005 in Malaysia and relevant environmental acts and regulations in other countries where we operate.

In 2022, we generated 124.4 tonnes of solid hazardous waste compared to 1,290 tonnes in 2021. The high level of waste generated in 2021 was due to concentrated aircraft maintenance activities whereas in 2022, we shifted our focus to the reactivation of aircraft. Conversely, we generated 5,427.7 litres of liquid scheduled waste in 2022, a 46.7% increase from 2021, due to aircraft parking and storage maintenance activities which involve draining of aircraft fuel/fluid.



*Restated data to only include Malaysia operations as scheduled waste from AirAsia Indonesia and AirAsia Philippines are managed by airport authorities.

Environmental (cont'd)

Waste Management

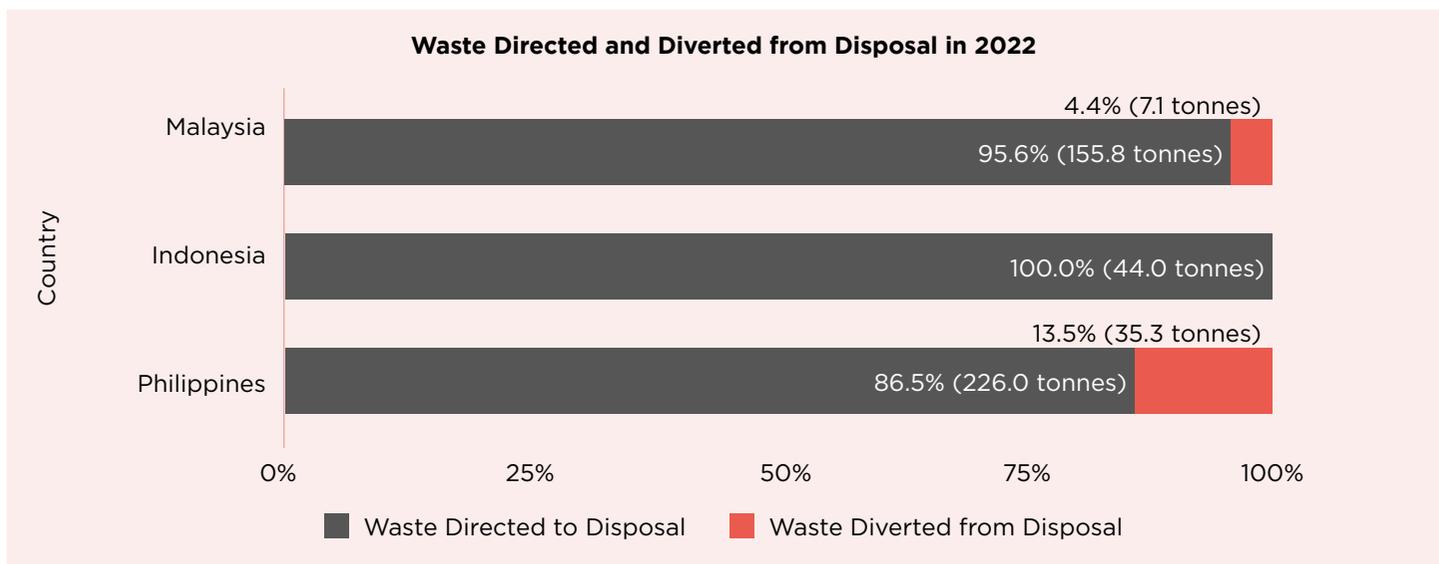
NON-HAZARDOUS WASTE

Our non-hazardous waste includes general waste produced in offices and buildings, recycled waste as well as cabin waste from our flights. We monitor the general waste produced at our office premises in Malaysia (RedQ and RedChain) and Indonesia (RedHouse). In the Philippines, recycled waste is managed by the airport authorities hence we do not have access to monitor and track the relevant data.



Note:

1. Non-hazardous waste for AirAsia Malaysia and AirAsia Indonesia only include general waste from offices as cabin waste is managed by airport authorities.
2. For AirAsia Philippines, office waste is managed by airport authorities, hence non-hazardous waste comprises cabin waste collected.



We saw an overall increase in non-hazardous waste generation primarily due to the return of Allstars to our offices post-pandemic. In Malaysia, we recorded a total of 162.9 tonnes of non-hazardous waste, representing a two-fold increase from 2021 with 95.6% of the waste being directed to landfills and the remaining 4.4% recycled. In Indonesia, waste generation increased by 25.8% from 2021 to 44.04 tonnes in 2022 all of which was disposed of as the office did not have a waste management vendor. It is in the process of engaging a waste management vendor to improve its recycling efforts.

In the Philippines, a total of 261.3 tonnes of cabin waste was produced, more than four times the amount in 2021, with 86.5% being disposed and 13.5% diverted through recycling. This increase was due to the reopening of flight routes and increase in number of guests as pandemic restrictions were relaxed.

Cabin Waste

AirAsia currently does not collect, store or dispose of cabin waste for our Malaysia and Indonesia-based flights. Cabin waste recycling undertaken prior to the pandemic was suspended to comply with national health and sanitary regulations. With the return to normal operations, AirAsia is looking to reintroduce cabin waste recycling taking into account health and safety directives by airport authorities and national waste management regulators. Plans to resume cabin waste recycling towards end 2022 were postponed due to manpower shortages. We are reviewing our timeline in 2023 as the recovery of our airlines stabilises.

In the Philippines, AirAsia Philippines appointed Ecowaste, a Department of Environment and Natural Resources (DENR)-accredited waste contractor, to handle cabin waste in Manila. Cabin waste is segregated and sent to a material recovery facility (MRF) for further processing, while recyclable materials are sent to approved recycling centres across Manila. A total of 35.3 tonnes of recyclable cabin waste was collected in 2022, consisting of plastic, aluminium and paper waste.



Spotlight: Exploring Green Food Packaging Solutions with Santan



Santan is advancing its sustainability agenda through a five-year packaging strategy to explore the use of environmentally-friendly packaging which will not compromise the quality or consistency of its meals. Acknowledging that single-use plastics are the biggest contributor to cabin waste, our team at Santan is working closely with vendors to explore biodegradable options for inflight food packaging and cutlery, taking into account our turnaround patterns and food type.

This year, Santan replaced plastic sandwich boxes with plastic films and plastic ice cream cups with paper cups. It also searched for suppliers with suitable and affordable alternatives to replace plastic cutlery distributed inflight, trialing the use of utensils made of cornstarch and wood. The research is ongoing with continuing trials of replacements that meet cost and quality requirements.

Food Waste

AirAsia began cabin food waste tracking and monitoring in 2019. Due to the pandemic, however, its food waste data and trends were inconsistent and negligible in 2020 and 2021. With the return of travel, a total of 106,536kg of food waste was produced in 2022 versus 1,712.5kg in 2021.

Our food waste target has been reviewed and updated to set a maximum of 30% of total consumption for all AirAsia Malaysia flights. This is supported through the use of a demand planning tool powered by AI to forecast catering demand and promote pre-booked meals.

Environmental (cont'd)

Waste Management

Used Cooking Oil

With the mass production of food for catering and restaurants, we are aware of the high volume of cooking oil that we use. In 2022 we began working with FatHopes Energy to collect, process and refine our used cooking oil to produce high-quality biodiesel. We hope to take this initiative further through centralised collection of used cooking oil from our restaurants by the third quarter of 2023.

Circularity and Material Stewardship

Further promoting circularity, we upcycle as much of our waste as possible. In 2022, we partnered with Kloth Cares, an accredited women-led social enterprise under the Ministry of Entrepreneur Development and Cooperatives (MEDAC), to recycle and repurposed 2,110kg of used uniforms and corporate merchandise into processed engineered fuel (PEF), which is an innovative way of converting waste into energy. This served to avoid the emissions of 3.9 tCO₂e.



Meanwhile, AirAsia Foundation continues to grow its life-jacket recycling project with Nazanin, a social enterprise of Afghan refugees. In 2022, 1,395 life jackets were upcycled into best-selling Soggy No-More accessories, which were sold on AirAsia Foundation’s online social enterprise shop, DestinationGOOD.com and onboard AirAsia flights. The success of this initiative led to new innovations, among others, a pet safety vest collection and a limited edition Soggy No-More 10 collection to celebrate AirAsia Foundation’s 10th anniversary in 2022.

Since the launch of the Soggy No-More project in 2017, AirAsia Foundation has upcycled 2,599 lifejackets, diverting approximately 519.8kg of non-biodegradable plastics from landfills while generating RM287,000 in revenue to support refugee livelihoods and AirAsia Foundation’s social enterprise activities. In 2022, discussions were held with a social enterprise in Manila to produce Soggy No-More items using expired lifejackets from AirAsia Philippines.



Visit our Destination GOOD shop for more information on the life-jacket recycling project, please visit www.destinationgood.com/



Handling Aeronautical Waste

From engine parts to aircraft seats, tyres and carts, we have a diligent system to responsibly manage waste from aircraft and ADE operations. Where possible, we take a circular approach where items are repaired, repurposed and recycled rather than sent to landfills.

At ADE's RedChain Engineering Warehouse, the 3Rs principle is adopted to reduce, reuse and recycle key aircraft components. Some of the ways in which the lifespan of parts is extended are depicted below:



Aircraft Panel, Floorboards and Frames

The structural repair workshop handles the maintenance of aircraft skin, frames, panels, cargo, cabin floorboard, and engine cowlings. Any structural component that exceeds the repairable limits is scrapped and replaced as necessary. Scrapped items are collected by licensed recycling contractors.



Aircraft Tyres

The inhouse wheel workshop focuses on the maintenance of aircraft wheel hubs and tyres including the dismantling and installation, inspection and testing of tyres and wheel hubs. Worn out tyres are sent back to the manufacturer for retreading and testing as required. Once a tyre fails the test or reaches its end of life, the manufacturer repurposes it into other products.



Aircraft Seats

Our aircraft seats are made from carbon fibre, aluminium and genuine leather upholstery to ensure durability over time. The lightweight seats also help to reduce fuel consumption and lower CO₂ emissions by 200 tonnes per aircraft per year. When our aircraft seats reach their end of life, we remove usable parts for repair of other seats. Damaged parts are collected by contractors to be recycled. Where feasible, older seats are also sold to other operators to lengthen their lifespan.



Aircraft Batteries

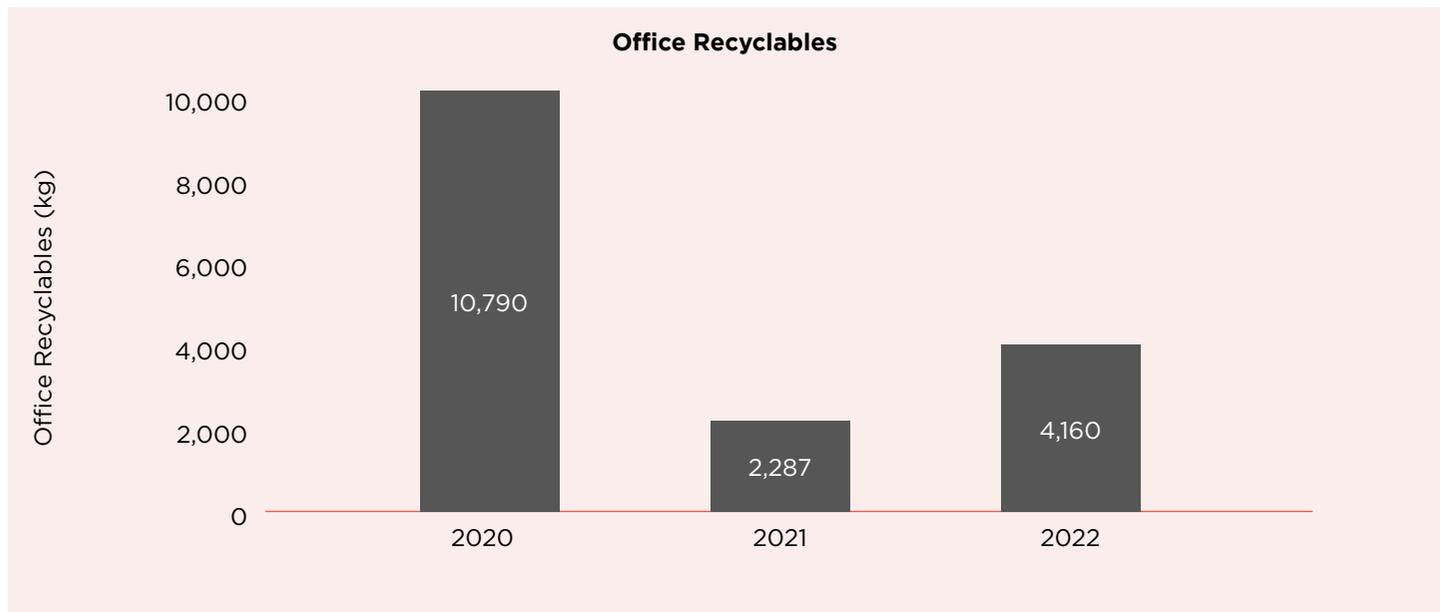
ADE's inhouse battery shop prioritises the maintenance of aircraft batteries including recharging, cleaning, testing, and servicing to extend the battery life. Batteries that have reached their end of life are collected by licensed recycling contractors.

Environmental (cont'd)

Waste Management

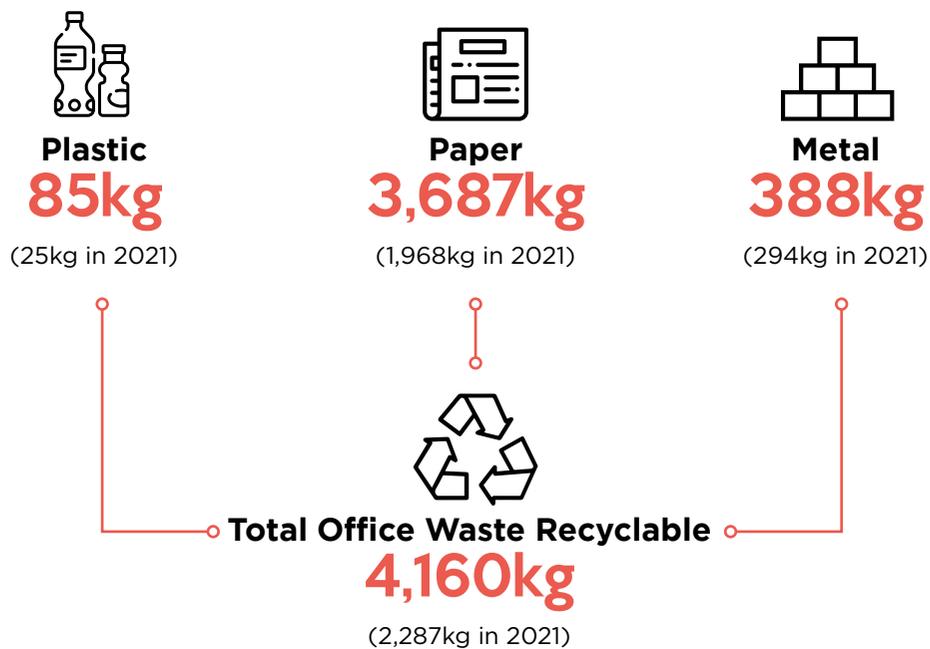
Office Waste

Capital A maintains effective systems to ensure the responsible disposal and recycling of waste in our offices. Recycling bins are provided for the collection of paper, plastic and aluminum items, which are subsequently recycled by appointed licensed contractors. In 2022, the volume of recyclable waste increased by 81.9% from 2,297kg in 2021 to 4,160kg.



Note: The office recyclables disclosed only apply to the RedQ in Malaysia and RedHouse in Indonesia.

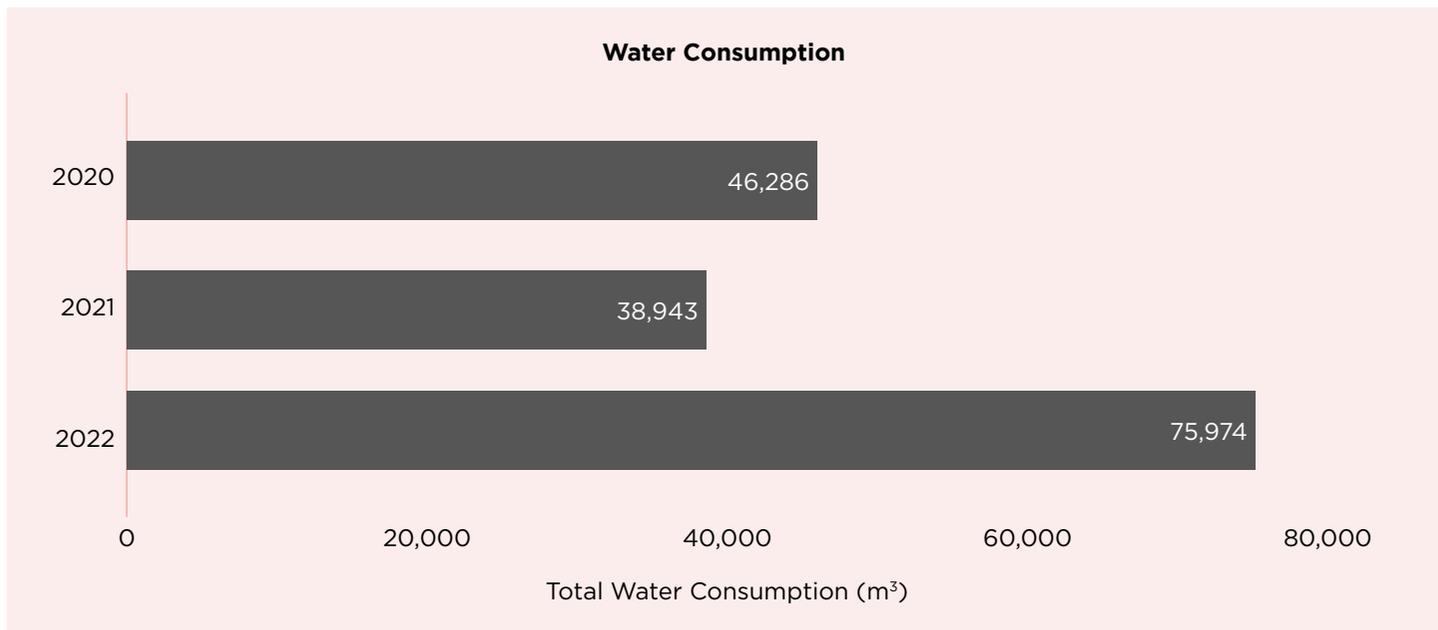
Office Recyclable Waste in 2022



(GRI 303-1, 303-5)

WATER CONSUMPTION

We are putting in place various initiatives to improve water consumption efficiency across our operations. Water supply for all our offices is from municipal potable water sources. As we look to improve our water efficiency, our office in Jakarta, RedHouse, will start harvesting rainwater for gardening use in the third quarter of 2023.



In 2022, we consumed 75,974 m³ of water, marking a 95.1% increase from 2021 primarily due to the return to normal operations. Once our operations stabilise, we will look into new ways to enhance water efficiency.

Wastewater Management (GRI 303-4)

Capital A does not generate industrial effluents from our office activities, hence all waste water from sanitary and washing is discharged to government-operated centralised water treatment plants for treatment.