CHANGI
airport group

SUSTAINABILITY REPORT
2020/21

ADVANCING SUSTAINABILITY IN A GLOBAL CRISIS

COVID-19

CAST A
DARK CLOUD
ON US

SOCIAL DISTANCING

BECAME THE SOCIALLY RESPONSIBLE THING TO DO

* All the photos in this report have been taken in accordance with Safe Management Measures guidelines.


GLOBAL TRAVEL AND
AVIATION WERE
DISRUPTED AROUND
THE WORLD
DEPARTURES
3
4


BUT EVERY
CLOUD HAS A
SILVER
LINING

WE KEPT CHANGI AIRPORT FULLY OPERATIONAL FOR THE SAFE PASSAGE OF TRAVELLERS

READ MORE ON PAGE 60

WE MAINTAINED OUR CARGO NETWORK TO SECURE OUR SUPPLY CHAIN

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WE ARE

EMPOWERING

EMPLOYEES, PARTNERS AND COMMUNITIES TO LEARN, GROW AND ACHIEVE THEIR BEST

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CAG CONTINUES TO ADVANCE SUSTAINABILITY TO CREATE POSITIVE IMPACT

CONTENTS

ABOUT THE REPORT

This report communicates CAG's sustainability vision, approach and outcomes for Financial Year 2020/21. It is intended to capture, measure progress and drive overall sustainability actions across Singapore Changi Airport, as we work with our stakeholders to achieve our sustainability goals and build a sustainable future.

Reporting Scope

The report covers the assets and operations under CAG's business control at Singapore Changi Airport for the period of 1 April 2020 to 31 March 2021, unless otherwise stated. The scope covers our activities across the four passenger terminal buildings, Changi Airfreight Complex and aircraft operating areas of Changi Airport. The four terminal buildings as referred to as Terminal 1 (T1), Terminal 2 (T2), Terminal 3 (T3) and Terminal 4 (T4) in this report.

Reporting Framework

This report has been prepared in accordance with the Global Reporting Initiative (GRI) Standards: Core Option and the GRI Reporting Principles for Report Content and Report Quality. CAG has selected the GRI Standards as they are a leading global standard for sustainability reporting. We have also applied the additional disclosure requirements and guidance set forth by the GRI Airport Operators Sector Disclosures, which covers key aspects that are relevant to the sector.

CAG continues to map and report Changi Airport's sustainability impact and contributions to the United Nations Sustainable Development Goals (UN SDGs), which seek to address the most significant challenges in our world today. Reference has been made to two guidance documents, namely (i) Business Reporting on the SDGs, published by the GRI and UN Global Compact; and (ii) Aviation: Benefits Beyond Borders, published by the Air Transport Action Group which shows how the aviation industry can support and achieve the SDGs.

CAG'S SUSTAINABILITY APPROACH

Sustainability Governance

Sustainability considerations are integrated across all levels of the organisation and every individual in CAG plays an important role in contributing to sustainable development.

Board of Directors

The Board sets the tone from the top and holds ultimate accountability for the integration of sustainability efforts across CAG.

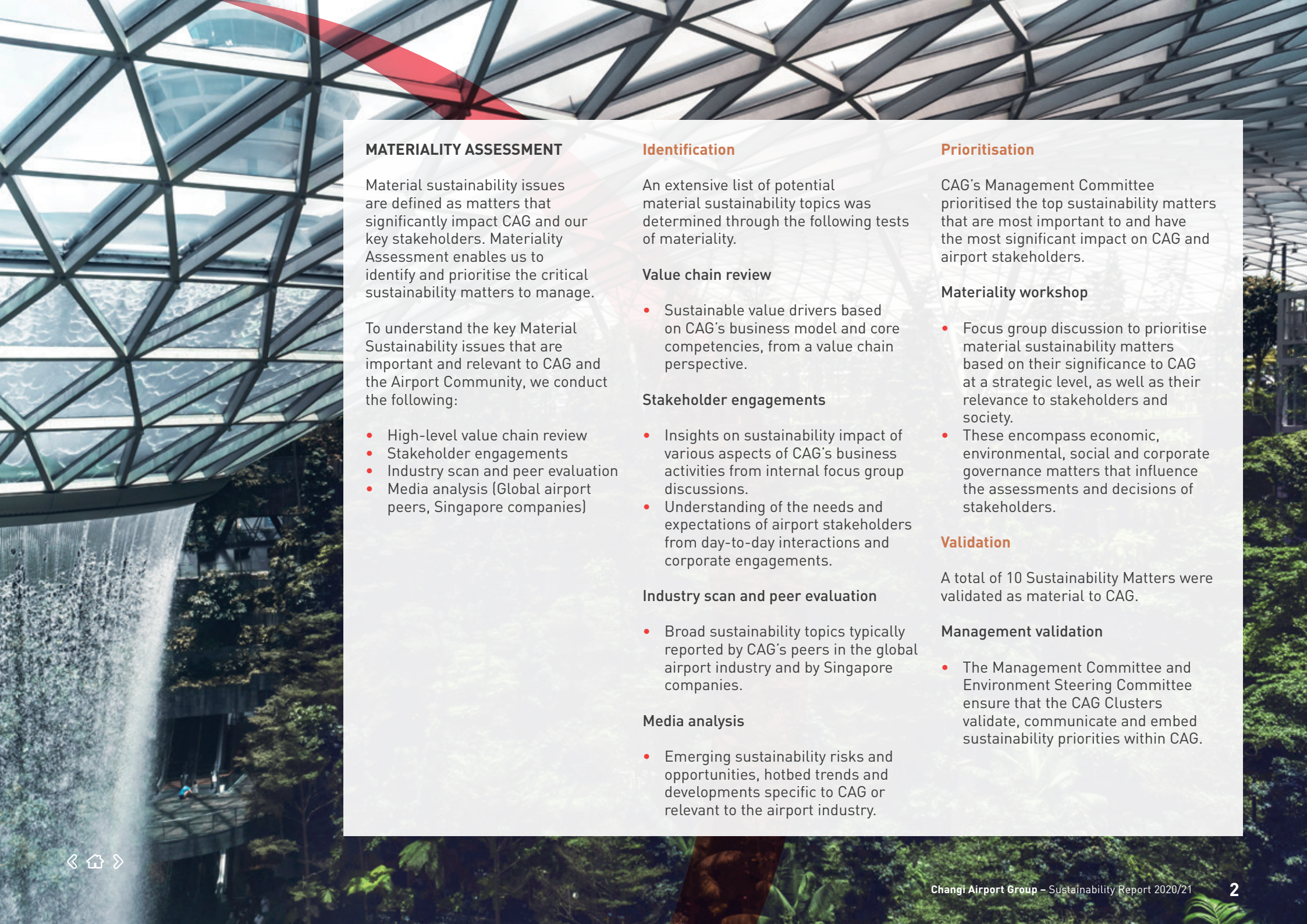
Management Committee

Management validates CAG's material sustainability matters and sets directions on sustainability strategies, polices, practices and targets. They monitor CAG's sustainability performance and provide periodic updates to the Board.

Environment Steering Committee

Chaired by Managing Director, Engineering & Development, the Environment Steering Committee (ESC) comprises senior representatives across CAG's Clusters and Divisions.

The ESC endorses sustainability initiatives, reviews CAG's sustainability performance and drives continual improvements to CAG's sustainability processes. The ESC also oversees and provides key sustainability updates to senior management on a regular basis.



MATERIALITY ASSESSMENT

Material sustainability issues are defined as matters that significantly impact CAG and our key stakeholders. Materiality Assessment enables us to identify and prioritise the critical sustainability matters to manage.

To understand the key Material Sustainability issues that are important and relevant to CAG and the Airport Community, we conduct the following:

- High-level value chain review
- Stakeholder engagements
- Industry scan and peer evaluation
- Media analysis (Global airport peers, Singapore companies)

Identification

An extensive list of potential material sustainability topics was determined through the following tests of materiality.

Value chain review

- Sustainable value drivers based on CAG's business model and core competencies, from a value chain perspective.

Stakeholder engagements

- Insights on sustainability impact of various aspects of CAG's business activities from internal focus group discussions.
- Understanding of the needs and expectations of airport stakeholders from day-to-day interactions and corporate engagements.

Industry scan and peer evaluation

- Broad sustainability topics typically reported by CAG's peers in the global airport industry and by Singapore companies.

Media analysis

- Emerging sustainability risks and opportunities, hotbed trends and developments specific to CAG or relevant to the airport industry.

Prioritisation

CAG's Management Committee prioritised the top sustainability matters that are most important to and have the most significant impact on CAG and airport stakeholders.

Materiality workshop

- Focus group discussion to prioritise material sustainability matters based on their significance to CAG at a strategic level, as well as their relevance to stakeholders and society.
- These encompass economic, environmental, social and corporate governance matters that influence the assessments and decisions of stakeholders.

Validation

A total of 10 Sustainability Matters were validated as material to CAG.

Management validation

- The Management Committee and Environment Steering Committee ensure that the CAG Clusters validate, communicate and embed sustainability priorities within CAG.

Sustainability Highlights

Changi Airport Group 2020-21

CORPORATE GOVERNANCE

Zero
significant fines for non-compliance with applicable laws and regulations

Zero
employee work-related fatalities

SOCIAL

Ranked Top 3
most attractive employer by Randstad for the 7th consecutive year

S100
Leading Graduate Employers Awards

Winner in Hospitality, Leisure, & Tourism Category

HR Excellence Awards
Excellence in Workplace Wellbeing (Bronze)

Community Chest Volunteer Partner Award

Community Chest Charity Gold Award

ENVIRONMENTAL

CAG commits to
Zero
carbon growth to 2030, capping our absolute emissions at 2018 levels

48
energy-efficient EC fans installed in air conditioning systems to replace AC fans, reducing energy consumption by 25%

Smart photocell sensors
installed across T1, T3, and T4

11.7%
waste diverted from incineration

66%
of our water consumption was NEWater

CEO Message

FY20/21 was a year like no other for Changi Airport Group (CAG). Faced with numerous disruptions that tested Changi Airport's strength and resolve, we saw nothing short of a tremendous display of resilience and creativity from all quarters of our extended community.

CAG's ability to respond nimbly and decisively to these unprecedented events clearly reflected the commitment of our employees and our airport community. It also underscored the importance of establishing CAG's sustainability framework - this gave us the impetus to advance CAG's environmental, corporate governance, social and economic priorities, despite the extreme circumstances of the Covid-19 pandemic. A common thread that has anchored CAG's efforts and accomplishments this past year is the strong collaborative community spirit across Changi Airport.

Advancing Sustainability in a Global Crisis

Our airport partners stepped up to take on the dual challenge of keeping the airport open round-the-clock for flight operations and ensuring the safety of the airport community by mitigating Covid-19 transmission risks. We joined hands with our air cargo community through the Changi Ready Task Force to facilitate the safe and efficient transportation of Covid-19 vaccines into Singapore and the region to battle the pandemic.

To build a sustainable future, we are committing to a target of zero carbon growth from 2018 to 2030, with longer-term aspirations towards net zero by 2050. We also pivoted to virtual platforms as part of ongoing efforts to engage with, develop and empower the CAG family, our airport community and Changi Foundation beneficiaries.

We recognised the value and importance of working seamlessly across different functions and with local and global partner organisations to spur innovation, drive meaningful change, and increase our impact to make a difference to our stakeholders.

> "CAG's ability to respond nimbly and decisively to these unprecedented events clearly reflected the commitment of our employees and our airport community."

CEO Message

Covid-19 has had an impact on our business but our employees have been deployed to handle more aspects of CAG's activities. We constantly engaged them and continued on our investments to develop our people as we pressed on with our digital transformations and investments for the longer term.

By working together, we delivered notable milestones in all key areas of CAG's sustainability framework.

Enabling Safe and Stress-Free Travel

As CAG navigated through the Covid-19 crisis, our topmost priority has been to safeguard the health and safety of our airport community and travellers. We deploy innovative technologies and solutions in our operations to achieve this.

During the year, we installed infrared proximity sensors at the automated check-in kiosks and bag-drops in Terminals 1, 3 and Jewel to enable contactless check-in, to minimise risk of transmission. Passenger lifts in our terminals were also fitted with contactless call and floor selection buttons to minimise fomite risk whilst automatic sanitising equipment were used to disinfect escalator and travellator handrails within the transit area continuously.

We developed ChangiQ, a digital queue management tool, for passengers to book their preferred time slots in advance to minimise crowding at gate holdrooms when they board their flights.

We also launched the Safe Travel Concierge mobile application, a one-stop portal to enable arriving travellers to easily verify the latest government regulations and pre-travel requirements, such as swab test procedures.

Reducing our Environmental Footprint

In addition to health and safety, we focused on initiatives to enhance air and water quality as well as reduce emissions and waste. These are key to supporting continuous improvement in our airport operations and our environmental goals.

In line with health authorities' recommendations, we maximised hourly indoor air change and fresh air intake into our passenger terminals soon after the outbreak of Covid-19. We also upgraded our building air-conditioning system filters from MERV-7/8 to MERV-14[1] standards, which removes 85% of droplets in the air that are 0.3 - 1.0 micrometres in size – smaller than the size of aerosolised Covid-19 droplets. CAG also installed portable air purifiers with hospital grade High-Efficiency Particulate Air (HEPA) filters in more contained higher-risk spaces, such as at the gate holdrooms, staff canteens and rest areas. This offers increased protection as cooled air that has been scrubbed by the MERV-14 filters is channeled through the portable air purifiers for further localised cleaning action, removing over 99.97% of droplets down to 0.3 micrometres.

Looking ahead, with the expansion of Terminal 2 to cater for future air travel growth and as the aviation industry recovers, CAG is preparing to serve more passengers while committing to the target of zero carbon growth from 2018 to 2030. We will push the boundaries for energy-saving innovations and partner our stakeholders in support of Singapore's commitments under the Paris Climate Change Agreement.

CAG has also promoted circular economy practices for our core operations to generate value from what would traditionally be considered waste streams. We initiated electronic waste (e-waste) collection drives, an example of which was the replacement and upcycling of 800 point-of-sales systems across our retail and food and beverage outlets. CAG recycled 14,944kg of e-waste in FY20/21, an increase of 68% from the previous year.

> "We recognised the value and importance of working seamlessly across different functions and with local and global partner organisations to spur innovation, drive meaningful change, and increase our impact to make a difference to our stakeholders."

1 Minimum Efficiency Reporting Value, or MERV, indicates a filter's ability to capture air particles of various sizes.

CEO Message

Supporting the Economy

Throughout the period of disrupted travel, Changi Airport remained operational to sustain people and trade flows. We established new business continuity plans and rosters to manage the passenger and cargo flights that kept Changi connected to the rest of the world. We also worked closely with partners and stakeholders to facilitate the operation of Passenger Aircraft for Cargo Conveyance (PACC) flights, highlighting the airline community's adaptability to cater to increased cargo demand. In December 2020, we handled a three-fold increase in air cargo flights, including PACC flights, compared to December 2019.

CAG and the Civil Aviation Authority of Singapore jointly established the 18-partner Changi Ready Task Force to enable Changi Airport to serve as a reliable and efficient transit hub to safely transport Covid-19 vaccines into Singapore and the region. The public-private team, comprising government agencies, freight forwarders, airline partners and cargo handlers, ensured that each element of the supply chain was rapidly put in place. Cold-chain integrity was maintained by activating certified temperature-controlled facilities, airside temperature protection equipment and qualified cold chain specialists.

Empowering our People to Shape the Future of CAG

Recognising the importance of motivating and empowering our employees during the pandemic, CAG explored innovative ways to chase new ideas and pivot to emerging business opportunities. Project Starship, a skills-exchange platform was launched, where CAG employees could work on projects outside of their primary job responsibilities. Starship represents CAG's journey towards a One-CAG collaborative work environment, where diverse talents across the company are engaged for short-term assignments to tackle business challenges.

In line with our commitment to make every experience count, we leveraged our online platform to run a virtual Learning Festival with the theme of "Be a CAG Leader" to develop our CAG family. We also introduced an Augmented Reality module to enhance the orientation experience of new CAG joiners, giving them the opportunity to learn about terminal operations in a safe environment.

Enriching Communities

In a year marked by challenging operating conditions, CAG remained committed to engaging with the communities we serve. As part of our dedicated initiative known as Changi Foundation, we continued to reach out to our beneficiaries. We put into action our vision of "Connecting with youths today, empowering them for a better tomorrow" by transitioning from physical to virtual volunteer activities and to align with social distancing requirements.

To support the Changi Foundation's beneficiary schools, CAG curated online versions of our Youth Passport Programme which exposed students to different airport vocations and the Career Development Programme for graduating students to learn more about Customer Service roles. We also partnered Raffles Medical Group (RMG) to conduct a series of tele-medicine sessions, where RMG and CAG staff jointly guided students on the steps required for medical consultations.

Sustainability is Critical to Changi Airport

Covid-19 has reminded us of the importance of two fundamentals for Changi Airport as we renewed out commitment to advance sustainability at CAG and in the global aviation industry.

The first is the need for CAG to maintain a wide international passenger and air cargo network, which is vital to sustaining an operationally and financially well-managed organisation. This forms the critical foundation to create new opportunities and ensures our ability to deliver long-term value to our stakeholders, our employees and the communities we support.

The second is the need to prioritise the safeguarding of the health and wellbeing of airport workers, travellers and visitors to create a lasting and beneficial impact to those we serve. Together with the airport community, we are committed to strengthening our efforts to transform Changi Airport into an even more sustainable and welcoming aviation hub.

We thank our public and private sector partners, airport workers, CAG staff and other stakeholders for their continued support and contributions on our sustainability journey. With them, CAG will continue to touch lives, protect our environment, and create long-term value for Singapore's economy, society and community.

Lee Seow Hiang
Chief Executive Officer

FLOURISHING PLANET

CAG deepened our resolve to connect the world sustainably and responsibly, despite the challenges brought about by Covid-19. Led by the environmental goals and strategies we had set in motion prior to the pandemic, we strengthened our systems and processes and unlocked innovations to reduce our environmental impact. Close collaborations with our partners and government agencies to implement clean energy and environmental policies are enabling us to make big strides as an international air hub that is committed to building a thriving, flourishing planet.

Our Environmental Footprint

CAG adopts a life-cycle approach to minimise our environmental footprint upstream. To reduce our environmental impact, CAG prioritises sustainable design, reuse of materials, thoughtful procurement decisions, enforcement of eco-friendly operational procedures and, as a last resort, pollution and waste management solutions.

WASTEWATER*
904,000 m^3

WASTE
2,920 tonnes

AIR #
1.2 ppm
Carbon Monoxide

0.0004 mg/m^3
Lead

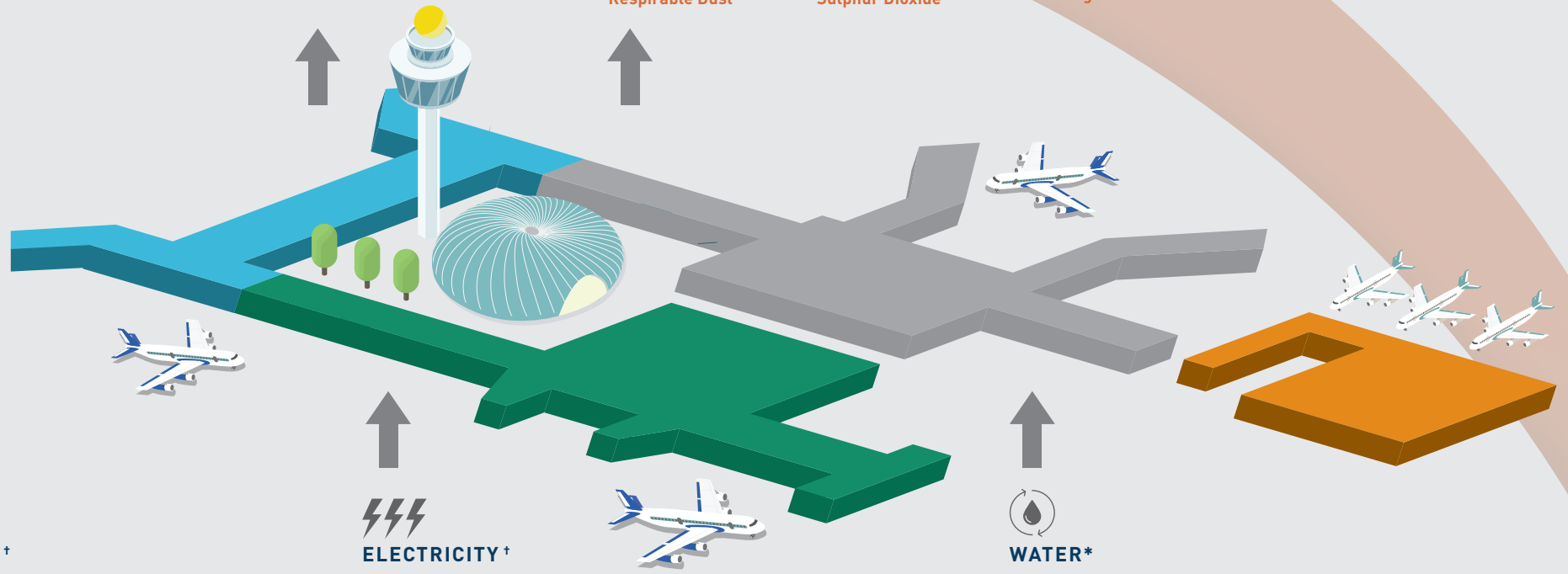
0.004 mg/m^3
Nitric Oxide

0.0001 mg/m^3
Respirable Dust

0.003 mg/m^3
Sulphur Dioxide

0.006 mg/m^3
Nitrogen Dioxide

OUT



IN

FUEL †
252,013 litres
Diesel

3,150 litres
Jet Fuel

11,334 litres
Gasoline

ELECTRICITY †
235,767 MWh

WATER*
448,000 m^3
Potable Water

861,000 m^3
NEWater

+ FY20/21 energy and GHG emissions data is subject to validation in accordance to the Airport Carbon Accreditation methodology
# Air quality indicators from CAG's annual Industrial Hygiene Monitoring for FY20/21.
* rounded to the nearest 1000 m^3

Our Environmental Policy

To drive sustainable development at Changi Airport, CAG focuses on proactive engagements and open communications across the airport community. Successful implementation of our environmental policy requires the continual integration of environmental developments into CAG's guidelines and policies for all airport stakeholders, including tenants, contractors and suppliers.

Timely communications about our environmental goals, policies and best practices, via stakeholder events and regular circulars, enable CAG to build a well-informed community and galvanise environmental actions.

During the year, CAG's Legal & Compliance, Engineering and Development and Corporate Information Technology teams hosted several Supplier Days to ensure that our partners understand the legal and compliance requirements. Our tenants and concessionaires also attended regular CAG retail and F&B Quality Service Management training.

Within CAG, we encourage environmental action by promoting green procurement decisions and conducting staff engagement activities on environmental conservation.

CAG participates actively in various global airport working groups which focus on sustainability development, including:

- Airports Council International (ACI) World Environment Standing Committee, which interfaces with the International Civil Aviation Organisation on environmental issues across the aviation industry;
- ACI Asia-Pacific Regional Environment Committee, where CAG's Director of Environment & Sustainability is currently serving as Vice-chair; and,
- ACI Airport Carbon Accreditation Taskforce.

To ensure that our environmental policy is driving action, CAG uses our Environmental Management System to monitor our environmental performance and progress across the Changi Airport community.

Our Environmental Management System

CAG's Environmental Management System (EMS) is a systematic and robust process that adopts a risk-based approach to identify, manage and control environmental risks holistically within the airport and across our supply chain.

Audited annually, CAG's EMS is ISO 14001:2015 certified and follows the ISO 'Plan-Do-Check-Act' management principle. This process of continual system improvements enables us to achieve a high standard of environmental management by incorporating the latest innovative developments.

As achieving environmental sustainability requires broad-based support, CAG is a strong advocate for environmental stewardship throughout the airport community. Instilling a strong culture of shared ownership amongst employees and key airport stakeholders has enabled CAG to effectively manage and minimise the impact of environmental risks across its operations. CAG employees are also given responsibility to source for and procure more sustainable systems and products.

CAG's Environment Steering Committee drives the integration of environmental efforts into Changi's core mainstream operations, in line with our sustainability targets. The cross-cluster working group meets quarterly to track CAG's progress and direct our long-term environmental strategic planning to reach our targets.

Stakeholder Engagement

Our key stakeholders are entities and individuals that affect, and are affected by, CAG. Through day-to-day conversations and regular interactions, we hear their concerns and matters that impact them most. These valuable inputs enable us to identify the critical sustainability matters to focus on.

KEY STAKEHOLDER GROUPS	KEY INTERESTS	KEY ENGAGEMENT METHODS
CAG EMPLOYEES 	• Employee well-being	• Recognition schemes (e.g. Core Value Awards) • Employee Engagement and Pulse Surveys • Participatory dialogue — Townhall • Wellness Programmes • In.Touch Mobile App — Intranet
	• Employee development	• Staff orientation sessions • Formal skills training • Annual performance & development review • Self-directed online learning • In.Touch Mobile App and Electronic Direct Mailers
	• Innovation	• Innovation workshops and in-house talks
	• Occupational health and safety	• Safety Management System • Emergency drills (e.g. Exercise Northstar, Exercise Bobcat) • Safety audits
	• Corporate governance and internal controls	• Key and ad-hoc committees and working groups • Internal audits and inspections • Anti-bribery Management System
	• Compliance with statutory/ legal requirements	• External audits
CONTRACTORS & SUPPLIERS 	• Compliance with legal requirements and CAG's standards • Service performance standards • Supply chain management	• Procurement policy and tendering procedures • Compliance audits • Quality Service Management training • Recognition awards (eg. Annual First Class Service Act) • Supplier evaluation

Stakeholder Engagement

KEY STAKEHOLDER GROUPS	KEY INTERESTS	KEY ENGAGEMENT METHODS
AIRPORT BUSINESS PARTNERS 	• Airport planning and development • Business continuity planning	• Forums and conferences (e.g. Changi Aerodrome Operational Safety Forum, Changi Airport Community Environment Forum) • Regular and needs-based meetings (e.g. Changi Airport Airside Operational and Safety Committee meetings) • Consultations (e.g. Singapore Changi Airport Operations Committee)
	• Airport safety and security	• 24/7 in-house Airport Emergency Services • Online safety reporting and incursion apps (In.Touch, iFeedback, SWEETmini, RIPPLE) • 24/7 hazard reporting hotline
	• Recognition of contributions from the airport community	• Annual Airport Celebration • Airport Safety Awards • Extra Mile Awards
	• Collaborative innovation	• Trials to test new technologies
	• Compliance and corporate governance	• Airport orientation programmes • Control centres • Aerodrome safety audit
	• Customer feedback and consumption trends	• Sharing of survey results and findings
PASSENGERS & VISITORS 	• Passenger experience and satisfaction	• Customer service (e.g. information counters, mobile Changi Experience Agents) • Real-time Instant Feedback System for swift action • iChangi one-stop app for flight, airline and airport information • Fault reporting hotline
	• Airport attractions	• Festive and themed events • Retail and F&B offers and incentives • Web and social media platforms (Changi Media Centre)

Stakeholder Engagement

KEY STAKEHOLDER GROUPS	KEY INTERESTS	KEY ENGAGEMENT METHODS
GOVERNMENT & REGULATORS 	• Airport planning and development	• Dialogue with government ministries and agencies • Participating in regional groups
	• Compliance	• Reporting to CAAS and statutory agencies in compliance with regulatory requirements
	• Contribution to Singapore's national objectives	• Consultative meetings and briefings with CAAS and Ministry of Transport and relevant government agencies
NON-GOVERNMENTAL ORGANISATIONS (NGOS) 	• Networking	• Forums and conferences
	• Collaboration and partnerships	• Joint exhibitions and meetings
MEDIA 	• Airport developments and features	• Media briefings and airport visits • Meetings with key media outlets • Press releases and publications (e.g. Annual Report)
COMMUNITY 	• Contributing to the wider community	• Changi Foundation programmes • Employee volunteerism and collaborative CSR through partner engagement • Curriculum advisory support for tertiary education institutions and the Singapore Aviation Academy

CAG's Contribution to the Sustainable Development Goals (SDGs)

KEY PRIORITY AND IMPACT AREAS

HIGH PRIORITY AND IMPACT AREAS

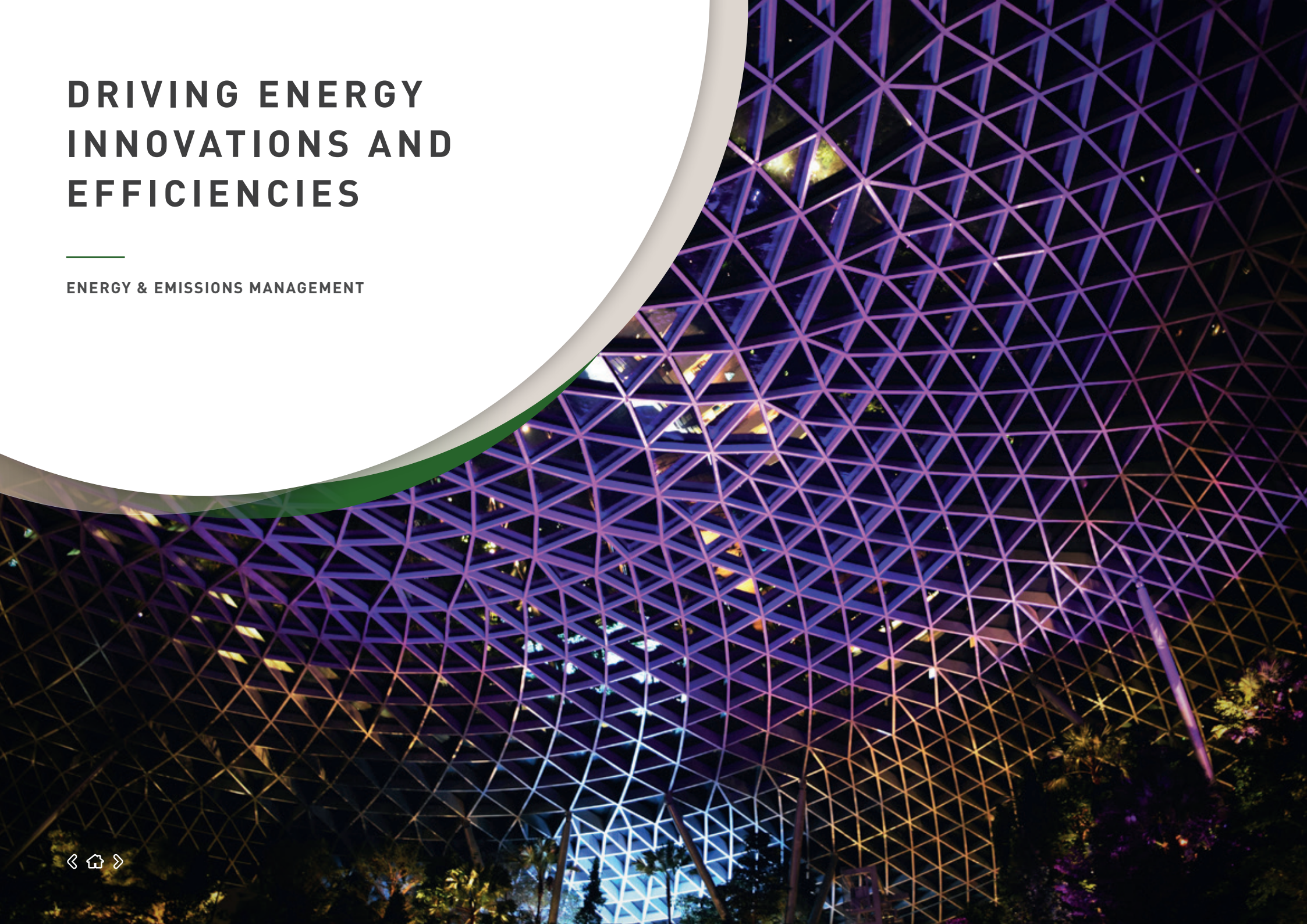
CAG's Sustainability Targets

Aligning our sustainability targets with national and global goals, we want to continue our sustainability journey to drive real progress on the ground.

MATERIAL MATTER(S)	TARGETS	PERFORMANCE FY20/21
ENERGY AND EMISSIONS MANAGEMENT	Zero carbon growth to 2030, capping absolute emissions at 2018 levels	On track
	Maintain Airport Carbon Accreditation (ACA) Level 3 certification	Achieved
ENERGY AND EMISSIONS MANAGEMENT	Maintain ISO 14001:2015 certification	Achieved
WATER MANAGEMENT		
WASTE MANAGEMENT		
PEOPLE DEVELOPMENT	Employees attend at least 1 training programme, yearly	On track (97.6%)
COMMUNITY INVESTMENT (Covid-19-affected)	Achieve 25% staff volunteerism yearly by FY2021/22	(5.5%)
	Achieve 1,000 volunteer hours yearly by FY2021/22	(431.5 hours)
	To offer minimally 80 job attachments to youth beneficiaries yearly from FY2021/22 onwards	(4)
	Engage 35 Airport Partners in Changi Foundation programme by FY2021/22	(1)
AIRPORT EXPERIENCE & PASSENGER SATISFACTION	Good yearly performance for the Customer Satisfaction Index of Singapore (CSISG)	Achieved (81.7 in 2020)
AIRPORT SAFETY	Zero employee work-related fatalities, yearly	Achieved
	Deficiency-free rating from the International Federation of Air Line Pilots' Associations (IFALPA), yearly	Achieved
GOOD CORPORATE GOVERNANCE	Zero tolerance for corruption	Existing policy
	Zero significant fines for non-compliance with applicable laws and regulations	Achieved
CONTRIBUTION TO THE ECONOMIC DEVELOPMENT OF SINGAPORE	Completion of T2 Expansion Project	On track
	Build capacity ahead of growth with Terminal 5 planning and development	Ongoing effort

DRIVING ENERGY INNOVATIONS AND EFFICIENCIES

ENERGY & EMISSIONS MANAGEMENT



Our Priorities

We work closely with our airport stakeholders to reduce carbon emissions, increase resource efficiency in the areas of water conservation and waste management, innovate with sustainability solutions, and increase Changi Airport's resilience to climate impacts.

Our Processes

Policies

- CAG's Environment Policy
- CAG's Environmental Management System

Practices

- CAG's Carbon Management Plan
- Airport Carbon Accreditation (ACA)
- Annual energy reporting
- Carbon reduction initiatives
- Internal assessment and auditing
- Training and awareness

Our Targets

- Zero carbon growth to 2030, capping absolute emissions at 2018 levels **ON TRACK**
- Maintain ACI Airport Carbon Accreditation Level 3 certification **ACHIEVED**
- Maintain ISO14001:2015 certification **ACHIEVED**

Our Change Agents

Our SDGs

CAG's Carbon Footprint[1] // 305-1 // 305-2 // 305-3 //

Our carbon footprint is mapped in accordance to the Greenhouse Gases (GHG) Protocol and ACI's Airport Carbon Accreditation methodology.

426,909 tCO_2e
TOTAL GHG EMISSIONS

329,887 tCO_2e
SCOPE 3 (77.3%)

96,311 tCO_2e
SCOPE 2 (22.6%)

711 tCO_2e
SCOPE 1 (0.2%)

1 CAG's overall carbon footprint includes significant emission sources and have been prepared in accordance with ISO 14064, GHG Protocol and ACA guidelines, verified by an independent, third-party accredited verifier. The full methodological approach can be found in Appendix A.

FY20/21 GHG emissions is subject to validation, and excludes Jewel in accordance to the Airport Carbon Accreditation methodology.

Our Environmental Management System

Our Environmental Management System

CAG's Environmental Management System (EMS) is a systematic and robust process that adopts a risk-based approach to identify, manage and control environmental risks holistically within the airport and across our supply chain.

Audited annually, CAG's EMS is ISO 14001:2015 certified and follows the ISO 'Plan-Do-Check-Act' management principle. This process of continual system improvements enables us to achieve a high standard of environmental management by incorporating the latest innovative developments.

As achieving environmental sustainability requires broad-based support, CAG is a strong advocate for environmental stewardship throughout the airport community. Instilling a strong culture of shared ownership amongst employees and key airport stakeholders has enabled CAG to effectively manage and minimise the impact of risks across its operations. CAG employees are also given responsibility to source for and procure more sustainable systems and products.

CAG's Environment Steering Committee

CAG's Environment Steering Committee drives the integration of environmental efforts into Changi's core mainstream operations, in line with our sustainability targets. The cross-cluster working group meets quarterly to track CAG's progress and direct our long-term environmental strategic planning to reach our targets.

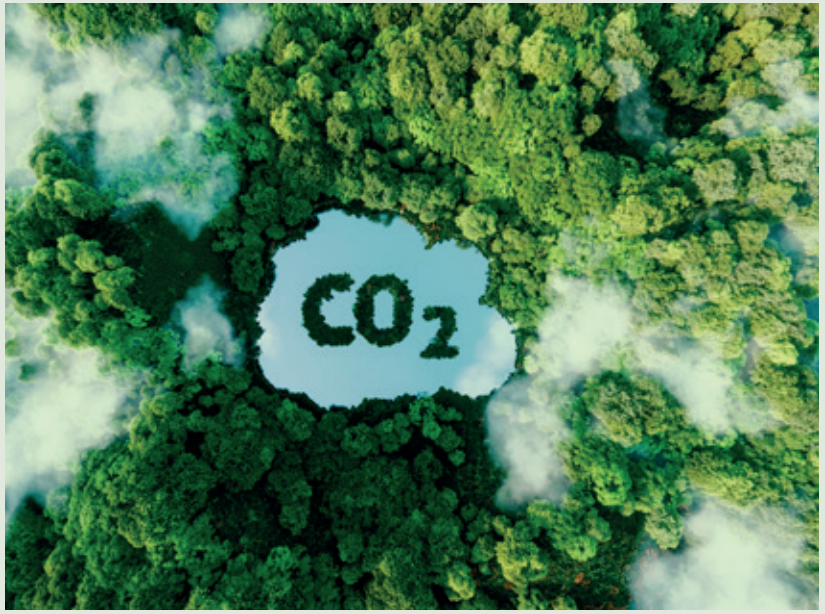
Driving Energy Innovations and Efficiencies

Our Priorities
// 103-1 //
CAG recognises that climate change is a major threat to our planet, and is committed to monitoring and reducing our carbon emissions.

CAG has taken actions to develop our emissions reduction target to a more ambitious goal and stand with airports globally in our long-term commitment to slow climate change.

CAG is committed to collaborating with partners and suppliers who prioritise innovation and develop sustainable alternatives, as this will enable Changi Airport and our wider community to collectively support emissions reduction, adapt to climate change and emerge more resilient.

> "CAG recognises that climate change is a major threat to our planet, and is committed to monitoring and reducing our carbon emissions."



CAG's Emissions Target:

CAG commits to zero carbon growth to 2030, capping our absolute emissions at 2018 levels

> CAG pledges to pursue sustainable growth – even after recovery from Covid-19, we commit to growing Changi Airport and serving more passengers whilst capping absolute carbon emissions at 2018 levels.

This target reaffirms CAG's continued commitment to the environment, as we push ahead with innovations and partnerships to support Singapore's overall goal to halve absolute emissions by 2050.

CAG pledges to pursue sustainable growth – even after recovery from Covid-19, we commit to growing Changi Airport and serving more passengers whilst capping absolute carbon emissions at 2018 levels.

CAG is adopting a 4-pronged approach to reduce our carbon emissions collectively with our partners.

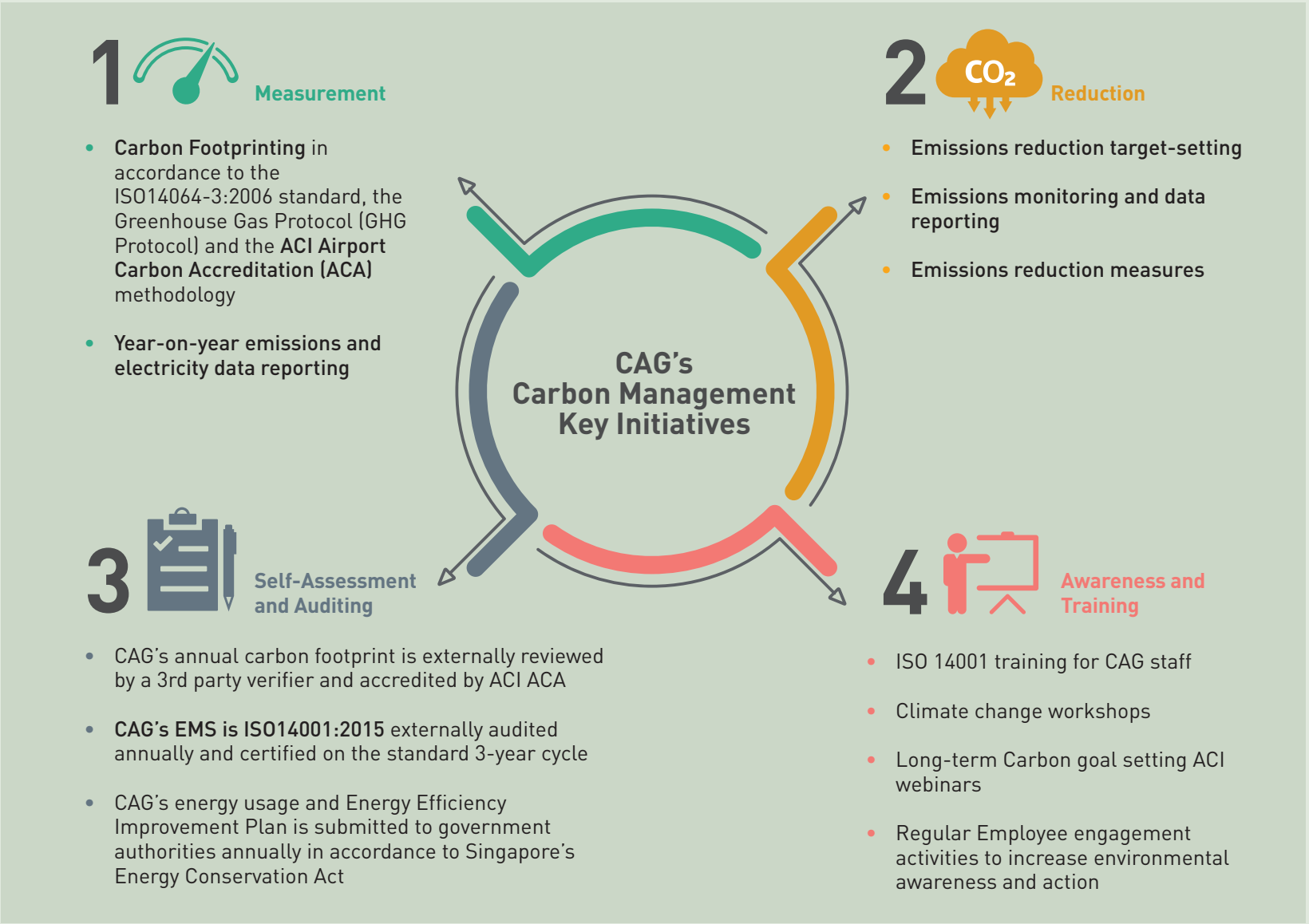
ACI Global Long-term Carbon Goal

As an Airports Council International (ACI) global member, CAG is committed to support ACI's newly-announced Global Long-term Carbon Goal for global airports to achieve net zero carbon emission by 2050.

CAG will do our part to contribute towards the attainment of this ambitious global target by working with the wider aviation community, including key stakeholders and the government.

Carbon Management

Carbon Management Plan
To reduce carbon emissions and mitigate environmental impact, CAG's is working closely with our partners to implement a four-pronged action plan. The four key carbon management initiatives are: Measurement, Reduction, Self-Assessment and Auditing, and Awareness and Training.



Carbon Management: Measurement

GHG Emissions[1]

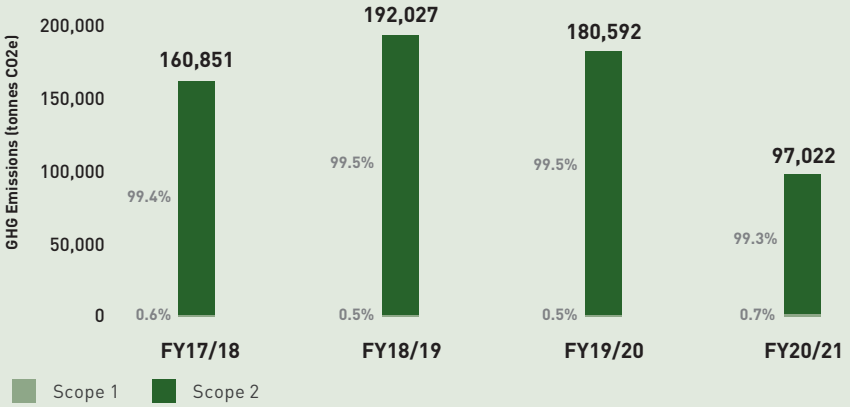
// 305-1 // 305-2 // 305-3 // 305-4 //

A total of 426,909 tonnes CO_2e of GHG emissions[1] was recorded in FY20/21, with Scope 1 and 2 accounting for 0.2% and 22.6% respectively. Scope 3 emissions form the largest proportion of our footprint at 77.3%.

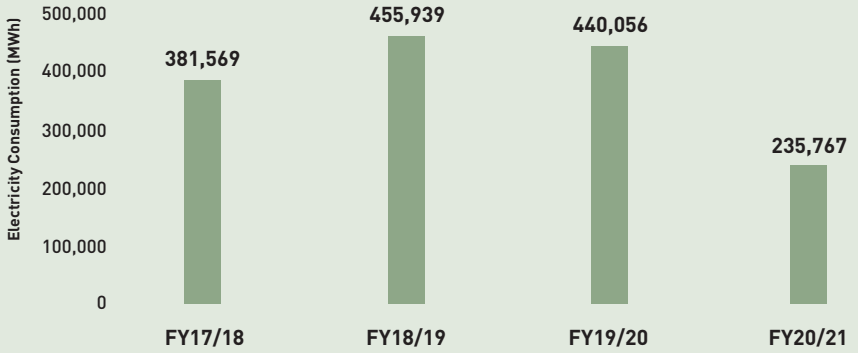
Electricity consumption

Electricity consumption constitutes 99.3% of CAG's Scope 1 & 2 emissions. In FY20/21, total electricity consumption[2] across T1 to T4 was 235,767 MWh, almost half of that in FY19/20. This is attributed to the drastic drop in passenger traffic and closure of Terminals 2 and 4.

GHG Emissions



Electricity Consumption



GHG Emissions (Scopes 1 and 2)

97,022

tCO2e GHG Emissions

235,767

Total Electricity Consumption (MWh)

1 GHG emissions values have been prepared in accordance with ISO 14064, GHG Protocol and ACA guidelines and verified by an independent, third-party accredited verifier. The full methodological approach can be found in Appendix A. FY20/21 data is subject to validation and excludes emissions under CAG's operational control in Jewel in accordance to the ACA calculation methodology. Data for Jewel is being measured for 2 full years of baselining and will be included in subsequent reports.

2 Estimation of the net electricity usage is achieved by deducting electricity supplied out to tenants, private developers (i.e. companies who have leased their own piece of land on the airport property), and CAG's electricity usage in Jewel, from the total electricity imported. The full methodological approach can be found in Appendix A.

Our Environmental Management System

Carbon Reduction Measures
// 305-5 //

Control, Guide and Influence Approach
CAG has adopted a control, guide and influence approach to effectively reduce our carbon emissions. In line with this, our priority is on reducing Scope 1 and 2 emissions as these are within CAG's direct control and influence. We also guide our partners through contracts and agreements to support the appointment of energy-efficient suppliers. We also make provisions in our planning that enable our airport community to reduce their emissions.

Strategies for 'Zero Carbon Growth to 2030' Target
To reach our target of Zero Carbon Growth to 2030 with emissions capped at 2018 levels, CAG is taking active steps to minimise additional electricity consumption from automation and new airport activities. The following strategies will further extend our ability to achieve this target:

- Undertake asset replacement and upgrades to establish more energy-efficient systems
- Actively monitor and explore new technologies that boost building energy efficiencies
- Reduce reliance on fossil fuels through electrification
- Review and improve operational workflows and processes to conserve energy
- Increase employee communications and engagement to raise awareness of energy reduction measures

As 99.5% of our emissions are drawn from the electricity grid, national grid decarbonisation efforts will be a key lever to drive significant reductions in CAG's carbon footprint. Singapore's grid emission factor is expected to decline further with its four switches to transform our energy supply - consisting of natural gas, solar power, regional power grids for access to renewable energy, and low-carbon alternatives such as hydrogen power and carbon capture, utilisation and storage. CAG will engage closely with government agencies to advance our strategic emissions reduction efforts.

Emerging Technologies for Reducing Emissions
CAG is also monitoring emerging energy-efficient technologies that optimise energy consumption and reduce carbon emissions. Examples include:

- Cooling films are materials applied on building facades to reflect external heat, and absorb and release internal heat. These reduce the heat loads in the building that need to be removed by the air-conditioning system, and thereby reduce the energy consumption of air-conditioning systems.
- Predictive Internet of Things (IOT) / Artificial Intelligence (AI) technology can be used to optimise the use of building systems and equipment and save on unnecessary energy consumption. For example, smart lighting systems can achieve auto-dimming based on human traffic rates, and smart air-conditioning systems can automatically adjust temperature settings based on time of day, weather and other factors like occupancy loads.

Air Quality: Ambient Air Quality
// A05 //

We conduct annual Industrial Hygiene Monitoring checks on air quality in the baggage handling areas to ensure a safe and healthy work environment for our airport employees. Results obtained were well within the Permissible Exposure Limits stipulated by Singapore's Ministry of Manpower.

> "We also make provisions in our planning that enable our airport community to reduce their emissions."

FEATURE STORY

LIGHTING THE WAY TO SUSTAINABILITY

Changi Airport's passenger terminals are not simply gateways for travel, they are also activity hubs for retail, business and hospitality. To satisfy the diverse requirements of airport users, ranging from travellers to tenants, CAG deploys a range of lighting to create appropriate ambience at different locations. Varied light effects, ranging from illuminance, colour quality and glare limitations, are adjusted to match the purpose of the facility or the time of day.

As lighting is the second largest consumer of electricity at Changi Airport, upgrading to lighting systems that feature both multi-functional and energy-efficient technology is critical to advance CAG's sustainability efforts whilst creating an airport environment that is conducive for different activities.

LIGHTING THE WAY TO SUSTAINABILITY

CONT'D

Progressive Lighting Upgrades

A major initiative that CAG embarked on is its Terminal LED project to progressively replace traditional lamps in Terminals 1, 2 and 3 with energy-saving Light Emitting Diode (LED) lighting. Terminal 4 had been fitted with the latest LED lighting when it commenced operations. The replacement of traditional fluorescent, halogen and metal halide lamps with energy-efficient LED lamps would enable CAG to cut energy consumption by 50%, while replacing older LED lamps with newer LED lamps would result in up to 20% energy savings.

Terminal LED project was implemented in two phases. The first phase in 2015 focused on converting traditional lamps to new LED lighting. This resulted in 2,775,080 kwh of electricity savings annually, representing a 4.7% reduction across Terminals 1 to 3 in 2017.

The second phase in 2018 saw the conversion of traditional lamps and end of life LED lamps to new LED lighting. This resulted in 13,000,000 kwh of electrical savings annually, representing a 23% reduction across Terminals 1 to 3.

At the Changi Airfreight Centre (CAC), a total of 5800 traditional lamps were replaced in the Cargo Agent Buildings C, D, E and Megaplex, and the ICA Checkpoint Building. Since its full upgrade to new LED lighting was completed in 2020, the CAC has reduced electricity consumption by a massive 51%, which translates to about 1.4 GWh annually.

Responsible Lamp Disposal

CAG also ensured the proper disposal of the replaced fluorescent lamps, which contain trace amounts of mercury that can be hazardous to health and the environment. CAG went above and beyond compliance requirements to appoint a CE-marked local plant that provides reliable recycling and disposal services in accordance with EU laws, for the task. The plant removed the Mercury in the discarded lamps for reuse by other manufacturers, before recycling 80% of the lamp materials.

Lighting Control

CAG also progressively upgraded our lighting control systems to enhance control and regulation of lighting levels at Changi Airport. These energy-efficient lighting help drive energy efficiency and cost savings for CAG.

As part of this initiative, CAG installed photocell sensors at terminal areas where there is natural light. These areas include terminal finger piers, passenger loading bridges, coach stands, carparks, the T1 glass façade facing the aircraft apron, T3 and T4 Departure Hall.

These photocell sensors are designed to detect the amount of daylight entering the building and regulate the artificial lighting to maintain optimal lighting and efficient use of energy. Use of artificial lighting can be reduced at areas where there is sufficient natural daylight infusing the terminal.

Features such as dimming and timer controls are also effectively deployed in many passenger-servicing areas to create the desired ambient lighting and achieve energy cost-savings. For example, lighting in the airport departure halls is dimmed between off-peak hours of 12am and 6am when passenger activity level tends to be low.

We have also installed motion sensor lightings in gatehold rooms, toilets, offices and stairwells to leverage automated lighting control for energy savings.

FEATURE STORY

LIGHTING THE WAY TO SUSTAINABILITY

CONT'D

> To fulfil our commitment to maximising energy savings to build a flourishing planet for the next generation, CAG continues to explore new technologies like Artificial Intelligence for lighting demand, as well as different business models, such as Lighting-as-a-Service, to achieve greater efficiencies in the area of lighting.

Stakeholder Engagement

Our CAG Engineering team has established good working relationships with our lighting suppliers, partners and contractors. Ongoing collaborations include projects to trial the latest energy innovations in the industry, such as the LED framework agreement with our lighting project contractors and suppliers to explore innovative airport lighting solutions. These include the use of energy-efficient motion sensors to control groups of lightings that allow the dimming of carpark lighting during off-peak hours to minimise energy usage; and, an automated lighting monitoring system to replace manual checks. CAG is also joining hands with our airport tenants to manage and reduce electricity consumption by using the Lighting Power Budget in CAG's Renovation Guidelines.

CAG's Commitment

CAG's lighting systems have enabled us to respond with agility to unexpected conditions brought about by the Covid-19 pandemic. The significant drop in passenger traffic offered the opportunity to reduce the energy consumption by our lighting systems in the airport. As the borders start to reopen, CAG is gearing up our systems for a progressive recovery to support the step-up in airport operations and our tenants' businesses while ensuring the operations remain energy efficient.

To fulfil our commitment to maximising energy savings to build a flourishing planet for the next generation, CAG continues to explore new technologies like Artificial Intelligence for lighting demand, as well as different business models, such as Lighting-as-a-Service, to achieve greater efficiencies in the area of lighting.

Jonathan Seah (CAG Engineering Management & Systems Planning), using a lux meter to measure the light intensity of LED lamps to ensure compliance to CAG's lighting standards.

Moe Thandar Htay, CAG Engineering Management & Systems Planning

FEATURE STORY

PARTNERING FOR POWERFUL PERFORMANCE

Optimising air-conditioning systems is vital not only to creating comfortable and pleasant environments in airport terminals, but also to maximising energy efficiencies.

CAG's Mechanical and Electrical (M&E) Engineering team maintains this fine balance between enhancing user experiences and ensuring environmental sustainability at Changi Airport. To achieve this, the team oversees the monitoring and review of the airport's air-conditioning systems, equipment and operating conditions for prudent replacements and upgrades, as well as collaborates with industry solution providers and contractors to trial innovative technologies for optimising energy consumption.

In 2020, Ms Moe Thandar Htay, CAG Engineering Management & Systems Planning Officer, led an air-conditioning systems enhancement project, working with CAG partner, ENGIE Services Singapore. She shares with us insights into this initiative.

Q **How did this project idea come about?**

A It started from our team's regular review of the airport's existing air-conditioning systems to find ways of improving operations and reducing environmental impact.

Our team saw an opportunity for improvements to be made in the Air Handling Units (AHUs). A key component of centralised air-conditioning systems, AHUs have fans installed in them to extract fresh outdoor air, which is filtered and centrally cooled before re-distribution into terminal spaces. With technological improvements, the conventional alternating current (AC) fans which were installed in the AHUs were identified as being inefficiently powered, challenging to maintain, and susceptible to single-point failure and long repair times.

As an alternative solution, we decided to look at Electronically Commutated (EC) fans.

Electrically Commutated AHU modular fan

FEATURE STORY

PARTNERING FOR POWERFUL PERFORMANCE CONT'D

Q **In what ways do AC & EC fans differ? And, more importantly, how do they impact sustainability?**

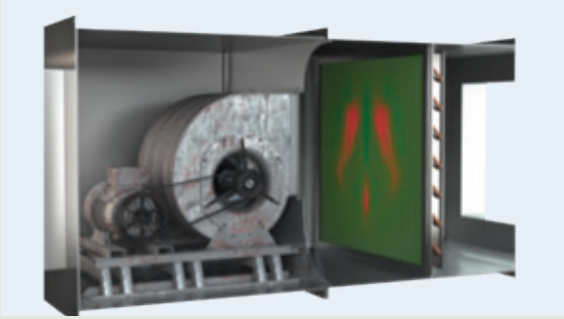
A The fans are quite different. For starters, conventional belt-driven AC fans run on 'brushless' DC motors using AC voltage, which is less energy efficient than Direct Current (DC) voltage. With more moving parts that create mechanical friction, AC fans need regular greasing and maintenance. AC induction motors are also larger as they have electrical windings in the stator that are supplied with alternating current to produce a rotating magnetic field.

In comparison, the EC fans combine the best of AC and DC technologies by having permanent-magnet DC motors that run on AC voltage. The AC input coming into the EC motor is rectified to a high voltage DC for maximum efficiency. As EC fans need fewer operating components, and feature low mechanical friction, motor temperature, noise and vibration, they are more reliable and easier to install and maintain. EC fans are space-saving too, as all power conversion and drive electronics are compactly integrated within each motor.

The line-fed EC fans offer further advantages over AC fans by enabling greater controllability, efficiency, and a longer lifespan. Built-in variable speed controls enable EC fan speeds to be adjusted in smaller increments, and power usage is proportionate to the operational fan speed - this results in significant energy and cost savings.

In contrast, AC fan motors have a limited speed range and are designed to operate at the peak efficiency point on their performance curve. As they would typically run on full power regardless of the operational fan speed, AC fans are highly inefficient.

From our in-depth review of the different technologies and their benefits, we recommended replacing conventional AC fans with EC fans in the AHUs to increase energy savings and reduce operational costs, whilst supporting CAG's cooling needs and sustainability efforts.



A conventional AHU fan is AC belt-driven, requires more space and has less uniform air flow (shown in red and green).

The Electrically Commutated AHU Fan uses less components and materials, takes up half the space and has a more uniform air flow.

> "As EC fans need fewer operating components, and feature low mechanical friction, motor temperature, noise and vibration, they are more reliable and easier to install and maintain."

FEATURE STORY

PARTNERING FOR POWERFUL PERFORMANCE CONT'D

Q **What were the key project milestones for the EC fan installation?**

A We commissioned our partner, ENGIE Services Singapore, to install and test EC fans manufactured by ebm-papst. One of the project highlights was our collaboration with ENGIE and ebm-papst to develop the FanGrid concept. Comprising 4 to 10 modular EC fans arranged in a grid and designed to operate in parallel, each FanGrid is smaller and lighter than a conventional AC fan unit.

The first EC FanGrids were installed in 7 AHUs in Terminal 3. As the trial harnessed positive results, we continued its roll-out across Terminals 1, 2 and 3. To date, a total of 48 EC fans have been installed in 9 AHUs, which distribute cool air to gatehold rooms, high ceiling areas in the transit zone, and public sky train lobbies across Terminals 1 to 3.

Selected AHU in Terminal 3 with the EC FanGrid installed

Q **What outcomes and benefits has the project delivered?**

A The installed EC fans have delivered successful outcomes, including:

- Enhanced AHU redundancy and operational reliability: Unlike single AC fan AHUs which stop operating entirely when a component breaks down, the FanGrid compensates easily for airflow loss from one faulty fan to keep the AHU running.
- Positive environmental and cost impact: A 25% reduction in energy consumption and reduced space needed for the smaller AHU footprint has resulted in cost savings and operational efficiencies.
- Improved airport ambience and operations: As the aerodynamically-designed impeller creates a more uniform airstream with reduced flow loss compared to the single AC fan, EC fans deliver a 15% increase in airflow, as well as reduced unwanted air turbulence, pressure loss, vibration, noise, and energy consumption in the AHU. Together, these create a quieter and more pleasant experience for all Changi Airport users.

Strong partnerships are essential to CAG's success as we continue to explore and invest in new technologies to drive performance and sustainability improvements. Collaborating with innovative equipment and service providers will enable us to create even more impactful experiences for the extended airport community.

> "Strong partnerships are essential to CAG's success as we continue to explore and invest in new technologies to drive performance and sustainability improvements."

Terminal 3 Arrival Immigration areas are pleasantly cooled by AHUs with EC FanGrids

FEATURE STORY

INNOVATING TO ENHANCE OUR TERMINAL INDOOR AIR QUALITY AND DEFENCE AGAINST COVID-19

To ensure the safety and well-being of passengers, airport workers and visitors, we have put in place added layers of protection in our passenger terminal mechanical ventilation and air-conditioning systems to keep the more transmissible Covid-19 variants at bay.

Even before the pandemic, Changi's passenger terminal buildings, which incorporate high ceilings and wide-open spaces in its design to create an airy ambience, feature ventilation systems that are calibrated to completely refresh the indoor air every six to ten minutes. The air change in washrooms takes place even more frequently, at three-minute intervals, which exceeds the specifications stipulated in the national code.

Our passenger terminals' air-conditioning system is designed to provide thermal comfort and good indoor air quality through a comprehensive process that first pumps centrally-chilled water into Air Handling Stations and Air Handling Units (AHUs) located throughout the building to cool the mixture of fresh air intake and returned air from localised indoor zones. The cooled air mixture is then filtered to remove contaminants before being supplied to the indoor zones they serve.

Upgraded Minimum Efficiency Reporting Values (MERV) filters

Since the onset of Covid-19, CAG has upgraded the air-conditioning system filters across the passenger terminals from MERV-8-rated models to MERV-14-rated ones. These higher-grade filters can remove approximately 85% of particles in the air of 0.3 to 1.0 micrometres in size – which is smaller than the size of a coronavirus respiratory droplet particle.

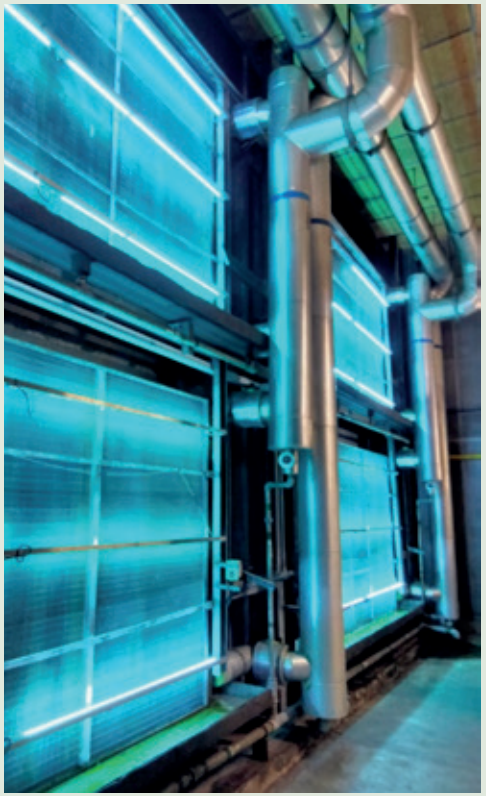
We also replace the MERV-14 rated filters every one to two months, depending on the condition of use, to ensure that they operate at effective efficiency. All used filters are sealed for proper disposal by maintenance workers donning hospital-equivalent personal protective equipment for safe handling. In addition, we maximise fresh air intakes for the air-conditioning systems by fully opening the dampers to admit outdoor air.

MERV 14 filters used in Terminal 2's Air Handling Station

> "These higher-grade filters can remove approximately 85% of particles in the air of 0.3 to 1.0 micrometres in size – which is smaller than the size of a coronavirus respiratory droplet particle."

FEATURE STORY

INNOVATING TO ENHANCE OUR TERMINAL INDOOR AIR QUALITY AND DEFENCE AGAINST COVID-19 CONT'D



UVC Sanitisation of T3 Air Handling Unit cooling coils – this inactivates virus and irradiates the cooling coils to reduce mold and bacteria growth on its wet surface

Ultraviolet-C sanitisation

As a further layer of protection, CAG is progressively installing ultraviolet-C (UV-C) sanitisation equipment in the AHUs of air-conditioning systems across all terminals. As the UV-C kills remnant virus traces in the fresh and returned air passing through the cooling coil, it provides a second level of defence after the MERV-14 rated filters. We have completed the first round of UV-C installations in selected AHUs which supply air to mission-critical control rooms and higher risk zones.

New Air-Handling Systems Designed to Defend Against Covid-19

To further minimise the spread of Covid-19 and ensure the health and well-being of the airport users, CAG continues to proactively review, plan for and invest in safety measures and innovative solutions that will our boost our defence against the virus.

A priority for CAG's Engineering & Development team in our future terminal planning is the continued enhancement of processes for indoor air cleaning. Mindful that AHUs are not designed to use high efficiency filters, they need to ensure the effectiveness of AHUs for this task, by taking into account factors such as space requirements, air flow and static pressure. AHUs also consume more energy when using finer filters, such as MERV 14 or higher, to process air flow.

As public health safety is of critical importance and cannot be compromised, CAG is implementing added layers of protection in the AHUs whilst carefully balancing energy conservation. This effort will encompass making spatial provisions for AHUs to accommodate a 2-stage filtration process plus Ultraviolet-C sanitisation and the installation of appropriate filters.

Air Quality: Indoor Air Quality

At the design stage, CAG ensures that our air-conditioning and ventilation systems in our terminals are built to deliver ideal indoor air quality and achieve high energy efficiency levels. This is in accordance with the Singapore Standard Code of practice for air-conditioning and mechanical ventilation in buildings (SS553:2016) and Code of practice for indoor air quality for air-conditioned buildings (SS554:2016). CAG engineers liaise closely with the authorities to understand the latest guidelines for indoor air quality against Covid-19, as this enables us to optimise our systems to ensure the safety and comfort of all airport users.

We continually monitor and improve our indoor terminal air quality, in accordance with Singapore Standard Code of Practice for Indoor Air Quality (SS554:2016). For quality assurance, CAG also conducts regular checks on all indoor air quality parameters, including air temperature, relative humidity, air movement, carbon dioxide, carbon monoxide, formaldehyde, volatile organic compounds, respirable suspended particles, PM2.5 and viable bacterial count.

CO_2 levels are a good proxy of whether there is sufficient indoor air ventilation. CAG measures CO_2 levels at critical areas on a quarterly basis to ensure we adhere to requirements in SS 554:2016.

FEATURE STORY

INNOVATING TO ENHANCE OUR TERMINAL INDOOR AIR QUALITY AND DEFENCE AGAINST COVID-19 CONT'D

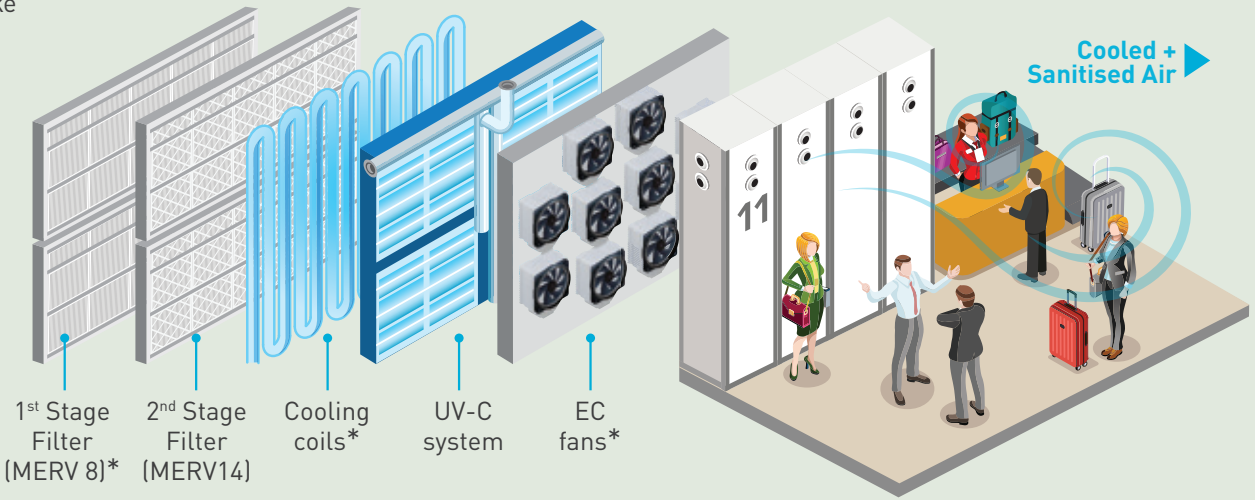
Air dampers set to allow maximum fresh air intake

Fresh Air

Returned Air

Return & fresh air mixing

Enhanced Air Handling Unit Design



* Original Air Handling Unit Design – provided only Cooled Filtered Air

Outdoor fresh air and indoor air from the terminal flows into CAG's air-handling units and is channelled through:
(1) 1st stage filter (MERV 8 or higher),
(2) 2nd stage filter (MERV14 or higher),
(3) UVC Sanitisation,
to supply cooled, sanitised air into our terminal buildings

Portable air purifiers with HEPA filters

CAG has installed portable air purifiers with hospital grade High-Efficiency Particulate Air (HEPA) filters in contained areas frequented by passengers and staff, such as gatehold rooms, staff canteens and food courts, staff rest areas in the segregated zones across the terminals and at heath scanning stations. This move increases protection and further mitigates the risk of airborne transmission of the Covid-19 virus by directing air that has been scrubbed by the MERV-14 filters through portable air purifiers with HEPA filters for further cleaning, before it is distributed into the terminal building interiors. This removes more than 99% of any remaining particles. Depending on their capacity, portable air purifiers can clean surrounding air in an area of between 30 to 110 sqm.

Measuring Indoor Air Quality

With multi-layers of protection in place, the Carbon Dioxide (CO2) concentration in Changi Airports' terminals remains constantly low, at less than 500ppm or parts-per-million. This is at least 30% better than the allowable CO2 level stipulated in the Code of Practice for Indoor Air Quality. Visitors can be assured of good ventilation and high-quality indoor air at Changi Airport. CAG worked with health agencies to perform several smoke diffusion tests to ascertain that our indoor air flow design does not contribute to any adverse movement of air from higher risk to lower risk zones.

Innovative trials

In planning ahead, CAG is committed to its multi-pronged approach of pursuing innovative solutions and deploying multiple layers of protection that can mitigate transmission of the evolving Covid-19 virus.

A prime example of this is CAG's ongoing research and assessment of the latest indoor air cleansing technologies, including injecting bi-polar ions to inactivate ambient virus and bacteria elements lingering in the air to render them harmless. Ongoing trials at T1 Arrival Immigration Hall are aimed at measuring their effectiveness.

To drive operational excellence and safety, CAG will continue to explore the effectiveness of a broad spectrum of new solutions, including filters, disinfectants, portable air purifiers at the air-conditioned areas, ionisation technology in AHUs, and other innovations. This will fulfill our aim of ensuring that Changi Airport continues to be a sustainable and resilient key infrastructure that supports the long-term growth of the Singapore economy.

INNOVATING SOLUTIONS FOR WATER MANAGEMENT

WATER MANAGEMENT

Our Priorities

CAG is committed to building a water-resilient future, in support of Singapore's national water management strategy. Our efforts encompass ensuring good water management centred on reducing water consumption across our terminals, strengthening our wastewater recycling capabilities, and harnessing water-efficient management systems and technologies.

Our Processes

Policies

- CAG's Environment Policy
- CAG's Environmental Management System

Practices

- CAG's Water Optimisation Strategy
- SMART metering of water consumption
- Certified Water Efficient Building by the Public Utilities Board (PUB)

Our Change Agents

Environment Steering Committee

- Facilities Management
- Engineering & Development
- Environment & Sustainability
- People Team

Our SDGs

CAG is committed to building a water-resilient future, in support of Singapore's national water management strategy. Our efforts encompass ensuring good water management centred on reducing water consumption across our terminals, strengthening our wastewater recycling capabilities, and harnessing water-efficient management systems and technologies

Strategies deployed at Changi Airport to reduce....

Potable water usage

- Retrofit with water-efficient devices, such as water thimbles, at water taps
- Establish highly-responsive leakage and repair management with more convenient fault reporting
- Engage the public and staff through water conservation messages

Non-potable water usage

- Conduct regular monitoring of cooling tower performance and maintenance of cooling towers, including water treatment system and controls, to ensure water efficiency
- Adopt higher water efficiency cooling tower design during replacement, where feasible
- Explore technologies that reduce building cooling load and reliance on air-conditioning systems, which lowers water usage in the cooling towers
- Harvest rainwater for irrigation
- Recycle condensate water for use in cooling towers

CAG's Water Optimisation Strategy

In adopting a Water Optimisation Strategy to prepare for a water-resilient future, CAG's approach is focused on reducing water consumption and improving efficiencies in water usage. Reducing potable and non-potable water usage across areas such as building cooling, toilets, irrigation and external cleaning, is key to optimising water consumption in Changi.

(nearest 1000 m^3)	FY18/19	FY19/20	FY20/21
Potable Water	1,050,000	818,000	448,000
NEWater	2,176,000	2,454,000	861,000
Total water consumed	**3,226,000**	**3,272,000**	**1,309,000**

%	FY18/19	FY19/20	FY20/21
Potable Water	33%	25%	34%
NEWater	67%	75%	66%

(nearest 1000 m^3)	FY18/19	FY19/20	FY20/21
Water discharged*	2,273,000	2,064,000	904,000

* CAG has adopted a new methodology to compute water discharge. The historical discharge data for FY18/19 and FY19/20 have been adjusted accordingly for a like-for-like comparison.

> "CAG's approach is focused on reducing water consumption and improving efficiencies in water usage. Reducing potable and non-potable water usage across areas such as building cooling, toilets, irrigation and external cleaning, is key to optimising water consumption in Changi."

Water Withdrawal

In FY20/21, CAG used a total of 1,309,000 m3 of water at the four terminal buildings. This year-on-year 60% decline was due to reduced business activities.

NEWater, a highly treated reclaimed wastewater produced by Singapore's Public Utilities Board, continued to form the majority of CAG's water consumption in FY20/21. As NEWater is used for non-potable activities such as cooling tower water make-up and toilet flushing, the use of NEWater at the airport decreased at a faster rate than potable water usage during the year, in line with scaled-down terminal operations.

Water Discharge

With the decrease in overall water consumption, our total estimated water discharge to the sewage system for the year stood at 904,000 m3 which is a 56% decrease compared to the previous year.

Installation Of Water-Efficient Taps

As part of an upgrading exercise for the washrooms located at the airside of Terminals 1, 2 and 3, CAG replaced 172 manual taps with contactless taps. The new taps discharge only 2 litres of water per minute, compared to 5 litres per minute for the older manual taps. This translates to nearly 3,600 m^3 of water saved annually across the upgraded toilets! Furthermore, unlike conventional electric-powered sensor taps, the new contactless taps are charged with hydro power generated from water flowing through the taps. This reduces electricity consumption as the tap can store this energy and requires no electricity from external sources. By recycling the manual taps, we also collected close to 100kg of brass.

> "NEWater, a highly treated reclaimed wastewater produced by Singapore's Public Utilities Board, continued to form the majority of CAG's water consumption in FY20/21."

FEATURE STORY

CLOSING THE WATER LOOP

DID YOU KNOW

Did you know that creating Changi Airport's lush garden landscapes requires caring for more than 600,000 plants?

From its signature tree-lined Airport Boulevard to the flora in the passenger terminals, CAG's green efforts are meticulously managed by our in-house Horticulture team. A key support for CAG's horticultural operations comes in the form of a 2.2-hectare nursery located near the airport.

At the Changi nursery, our Horticulture team adopts a circular practice in its watering cycles. Its open-surface drainage system has been designed to direct rainwater and surface runoff into two collection ponds, which have a combined capacity of 6,900 m^3. Water from these ponds is used in the daily irrigation of the nursery plants.

CLOSING THE WATER LOOP

CONT'D

Maintaining a balanced ecosystem

Regular maintenance is critical to stabilise and sustain the ecological balance in the rainwater collection ponds. A proliferation of algae in the pond water can quickly deplete oxygen supply and present unfavorable conditions for plant irrigation.

CAG employs a comprehensive bio filtration system which funnels the collected water through four layers of filter membranes, filtration stones, and UV light to effectively remove algae and other impurities. Additionally, the nursery uses aquatic plants to create natural filtration. Not only do these plants absorb carbon dioxide and release oxygen into the water, they also absorb nitrates, phosphates and other nutrients to keep algae growth in check while maintaining water clarity.

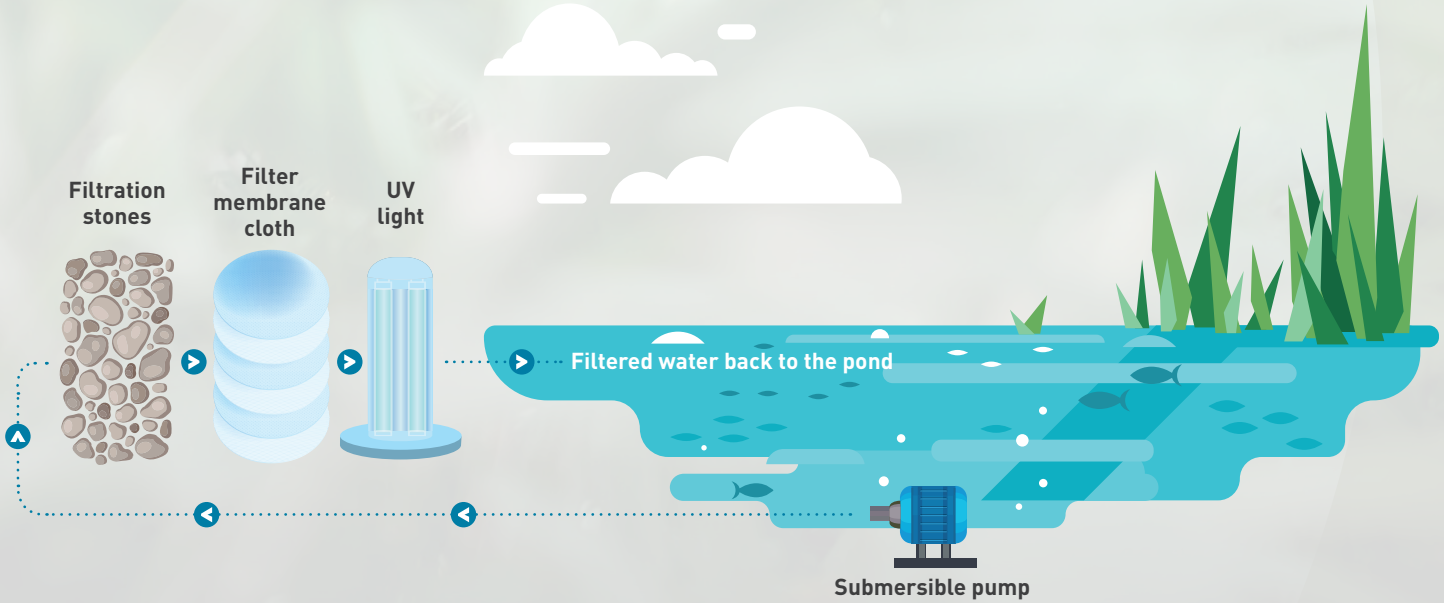
Routine testing and monitoring of the full process ensures that water quality is maintained in the ponds and for nursery irrigation.

Safeguarding public health

Another maintenance focal point for the team are the nursery drains. Keeping these drains clean and dry is a perennial challenge in Singapore's tropical climate which experiences frequent rainfall during the year.

As the removal of stagnant drain water is vital for safeguarding public health from vector-borne diseases and the use of toxic pest control chemicals, the team conceptualised a smart flushing and cleaning solution to improve the efficiency of the cleaning process. In addition to a daily automatic flushing schedule, weather sensors are also used to calibrate the flushing process based on changing environmental conditions.

The smart flushing system has also successfully controlled and prevented the breeding of mosquitoes on the nursery grounds. On top of this, the smart solution has effectively replaced the use of power jet systems which run on diesel for frequent cleaning, reducing emissions as well. The automated system has enabled the team to save up to 170 man-hours, which is equivalent to 21 man-days, per cleaning cycle.



MANAGING OUR WASTE RESPONSIBLY

WASTE MANAGEMENT

Our Priorities

Working towards becoming a Zero Waste airport, CAG strives to integrate its waste management practices and works with partners to improve its waste recycling rate. CAG actively looks out for opportunities to use resources more efficiently, as well as technologies that can help minimise waste being sent to Singapore's incineration plants.

Our Processes

Policies

- CAG's Environment Policy
- CAG's Environmental Management System

Practices

- Operational control procedures for proper waste disposal
- Onsite food waste digestion
- Monitoring technologies to reduce waste volumes
- Building stakeholder awareness

Our Change Agents

Environment Steering Committee

- Commercial
- Facilities Management
- People Team
- Engineering & Development
- Environment & Sustainability

Our SDGs

Working towards becoming a Zero Waste airport, CAG strives to integrate its waste management practices and work with partners to improve its waste recycling rate. We focus on identifying opportunities to use resources more efficiently and technologies that can minimise waste being sent to Singapore's incineration plant.

2,920 tonnes

of waste were generated from the four terminal buildings (-82% from FY19/20).

11%

The proportion of waste diverted from incineration decreased from 13.5% to 11% as some of the waste diversion initiatives, such as food waste digestion, were suspended.

At CAG, we ensure that general terminal waste is segregated to the different waste streams and disposed or recycled through licensed waste contractors. Our waste control procedures are reviewed annually in alignment with local statutory requirements, risk assessment and mitigation controls. Our Facilities Management team is responsible for managing our operational workflows and communications with waste contractors and airport partners.

In FY20/21, 2,920 tonnes of waste were generated from the four terminal buildings, a decrease of 82% from the previous year due to a reduction in business activities. The proportion of waste diverted from incineration decreased from 13.5% to 11% as some of the waste diversion initiatives, such as food waste digestion, were suspended.

In 2021, the Singapore Government announced a national target to reduce waste sent to landfill per capita per day by 30% by 2030, as part of Singapore's Green Plan 2030. To support this national effort, CAG will be reviewing its waste reduction targets and develop a roadmap towards greater recycling and waste diversion from incineration. CAG looks forward to working with all our airport users and partners in this journey.

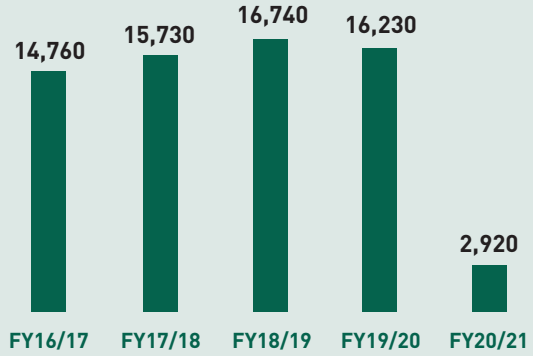
Supporting E-waste Recycling

Electronic-waste ("e-waste") recycling is another important pillar of CAG's waste management strategy. Whilst e-waste contains valuable materials that can be collected for re-purposing, it also contains harmful substances that could potentially harm our environment and health if not handled properly.

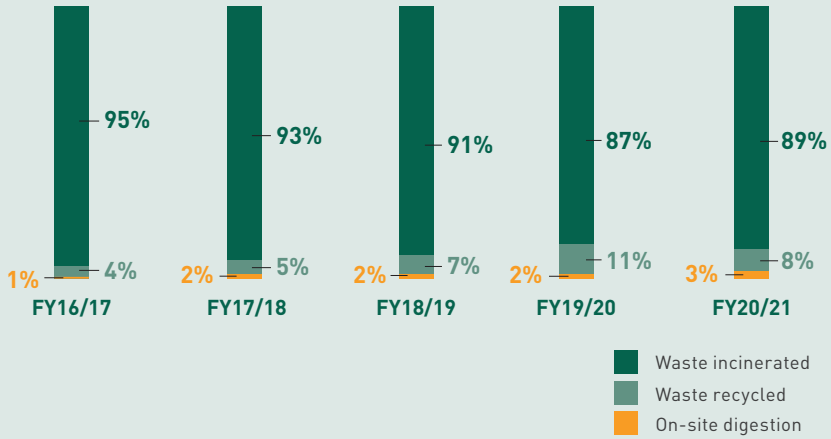
Over the years, we have introduced several e-waste recycling initiatives, including annual e-waste collection drives involving our airport partners as well as the placement of e-waste collection bins within our CAG offices to increase awareness of recycling amongst employees.

In FY20/21, an end-of-life replacement exercise for point-of-sales (POS) systems was conducted across Changi's retail as well as food and beverage outlets. We recycled more than 800 units of POS machines and their associated accessories, such as printers, monitors and cashboxes, which resulted in a record of nearly 15 tonnes of e-waste recycled in FY20/21 – a 68% jump from the previous year.

TOTAL WASTE GENERATED (TONNES)



% OF WASTE DIVERTED FROM INCINERATION



FEATURE STORY

ENGINEERING GOOD – E-WASTE RECYCLING FOR A GOOD CAUSE

At CAG, end-of-life laptops were previously collected as part of our e-waste recycling drive.

With Engineering Good's Computers Against Covid-19 initiative, we saw an opportunity to lengthen the useful life of these laptops while enabling fellow Singaporeans to continue their learning journey during this challenging period.

In April 2021, CAG's Engineering & Development team delivered a batch of donated laptops to Engineering Good. For security reasons, hard drives were removed from the laptops prior to donation.

The Engineering Good team subsequently installed replacement hard drives and the necessary software before distributing them to the beneficiaries.

> "With Engineering Good's Computers Against Covid-19 initiative, we saw an opportunity to lengthen the useful life of these laptops while enabling fellow Singaporeans to continue their learning journey during this challenging period."

DID YOU KNOW

- When the Circuit Breaker was introduced in April 2020, many students had to switch to Home Based Learning (HBL).
- Engineering Good's Computers Against Covid-19 initiative was launched during this challenging time to collect, refurbish and distribute laptops to students who could not afford one for their HBL needs.
- Beneficiaries include students from primary schools to Institutions of Higher Learning. This was subsequently expanded to include individuals contributing to the economic health of Singapore who need a laptop for online learning and purposes, such as job search.

EMPOWERING OUR PEOPLE TO SHAPE THE FUTURE OF CAG

FAIR EMPLOYMENT PRACTICES

Our Priorities

Our people play vital roles as value creators within and outside the airport community. By supporting them with the right people strategies, we drive employee morale, staff engagement and retention, while grooming future leaders to secure CAG's continued growth.

Our Processes

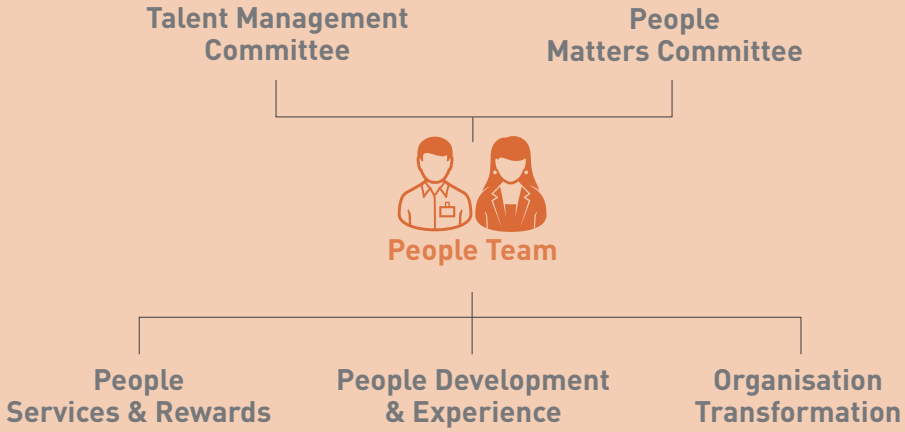
Policies

- CAG's Employment Philosophy

Practices

- Freedom of association and collective bargaining
- Grievance mechanism and non-discrimination
- Employment benefits and welfare

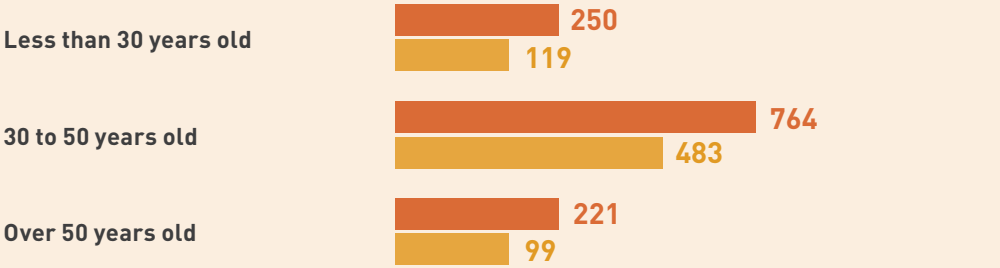
Our Change Agents



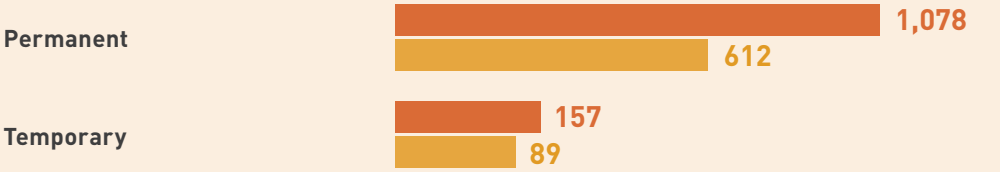
Our SDGs

FAIR EMPLOYMENT STATISTICS

TOTAL EMPLOYEES BY GENDER AND AGE GROUP

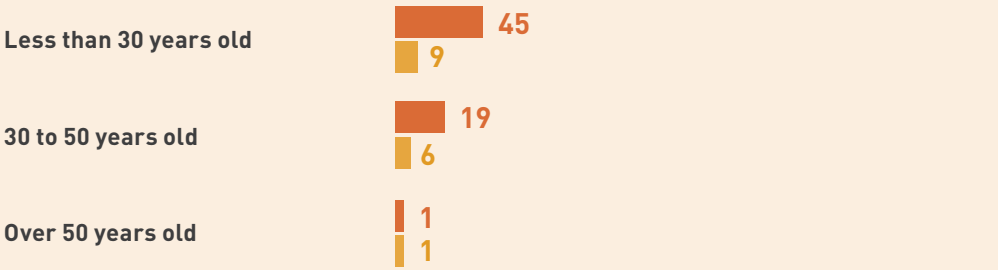


TOTAL EMPLOYEES BY GENDER AND EMPLOYMENT CONTRACT

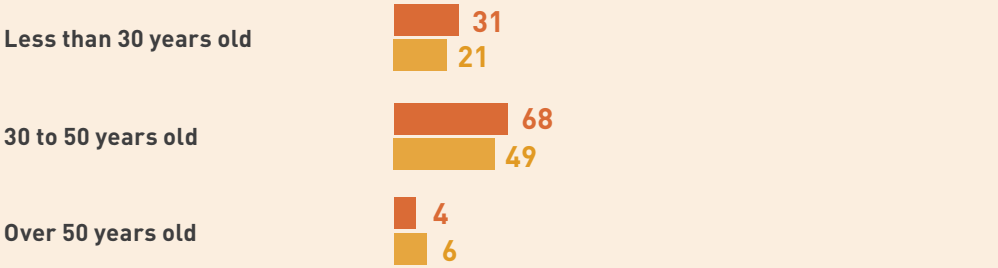


TOTAL EMPLOYEES BY GENDER AND EMPLOYMENT TYPE

NUMBER OF NEW HIRES, BY GENDER AND AGE GROUP



EMPLOYEE TURNOVER, BY GENDER AND AGE GROUP



TOTAL NO OF REPORTED INCIDENTS OF DISCRIMINATION DURING THE REPORTING PERIOD

Male
Female

2020 PROJECT STARSHIP LAUNCH

Unprecedented disruptions to aviation industry business operations and traditional job roles in April 2020 as a result of Covid-19 steered CAG's People Team to proactively engage our workforce to pivot to new business and career opportunities. At the same time, several CAG divisions expressed their need for an infusion of new talents with different skills and mindsets to help them design and run new projects.

These became catalysts for CAG to launch its first-ever skills-exchange platform: Project Starship. The whimsical name choice was inspired by the space vessel, 'Starship Enterprise', in the movie 'Star Trek' and, in particular, its mission "to boldly go where no one has gone before".

By effectively connecting project owners with individual employees across CAG and brokering the exchange of skills and time, Project Starship was envisioned to propel the organisation towards achieving its 'One CAG' collaboration goal. Diverse talents from different clusters were given the opportunity to solve challenges and create new dreams together.

Norizan Bte Ismail (left) with another Project Starship participant, Azura Johari (right).

Reinventing CAG's Workforce: A CAG employee embraces skills-exchange

Norizan Bte Ismail, an Assistant Manager at Changi East, jumped at the chance to join a new initiative, ChangiEats - a newly-launched delivery consolidation platform for orders across various F&B and retail merchants in Changi Airport.

In her new role, Norizan was responsible for coordinating the delivery fleet, runners and customer service teams to support the smooth-running of ChangiEats' consolidation and delivery operations. She also ensured timely and satisfactory management of customer feedback.

Q **What made you decide to select this project?**

A I was feeling really confined during the circuit-breaker period when I happened to see this role published on Project Starship. It was very different from the other opportunities as it involved handling operations and required the person to be on-site twice a week on weekdays and once a month on a weekend. At the same time, our bosses were also encouraging all employees to upskill and explore learning new roles. All these lined up and made this role a perfect opportunity for me to pursue.

Q **What challenges did you face and how did you overcome them?**

A When I was accepted for this role, I felt really excited but also apprehensive. My work experience up until then was mostly managing administrative duties. What really helped me was the on-the-job training provided by the ChangiEats team. I am also extremely grateful for the support from team members who were all really helpful and friendly.

Q **How did you feel after you completed the exchange programme?**

A When I completed the six-month commitment, my first thought was "Yes, I did it!". It was simply surreal! I recall the whole experience fondly, starting from being really busy on Day One when I had to move around quickly whilst shadowing the runners, and at the same time, having to understudy the Operations Manager and Fleet Manager roles. There was so much I had to learn in order to understand the entire flow of operations.

Q **Any memorable experiences to share?**

A Whilst delivering food to a Terminal 2 office, I bumped into several colleagues who were surprised to see me on the move around the airport. They all wanted to know what I was doing, which I found rather hilarious. Moving from one 'CE' (Changi East) to another 'CE' (ChangiEats), I've made many new friends and learnt so much from the whole experience!

Rotation of Ground Operations to new roles

Another key pivot at CAG amidst Covid-19 was the creation of new learning and development opportunities for our Ground Operations team. This unique initiative at the Jewel Aviation Facilities (JAF), which includes the Changi Lounge, Changi Experience Studio and Gift by Changi Airport at Jewel, was specially designed to provide Ground Operations employees with insights to different aspects of customer service and also open doors to temporary deployment stints to gain hands-on experience.

Since July 2020, 10 Ground Operations employees have taken on roles at JAF. Amongst them is Noraneeta Binti Mohd Hassan, who was a Public Announcement Officer with the Ground Operations Team prior to her taking on the role of Ambassador at JAF. She reflects on her journey:

I didn't have any Retail, Food and Beverage or Attractions experience when I decided to take a leap of faith to explore moving to a new role within CAG. With so much to learn about the three business areas, my initial thought was that I wouldn't be able to make it.

However, with the tremendous support, teamwork and encouragement from my teammates, as well as my reporting officer Gareth and JAF General Manager Ching Wern, I braved on. Fast forward to today, I can't help but look back at my journey over this past year and feel proud that I have successfully pivoted. The knowledge and experience I have gained has instilled much more confidence in me.

JAF has given me the opportunity to expand my skill sets to become an Ambassador at the Changi Gift Shop, Changi Experience Studio and the Changi Lounge. Supportive teammates who made me feel like I'm part of the JAF family since my very first day has made this experience truly educational and fulfilling. Having exposure to new business areas has developed me holistically and will go a long way in supporting my career growth.

Noraneeta Binti Mohd Hassan
(Ground Operations Team)

INSPIRING OUR PEOPLE TO DREAM BIG, BET SMALL AND MOVE FAST

PEOPLE DEVELOPMENT

Our Priorities

At CAG, we understand that learning and development is a continuous journey. In ensuring every knowledge milestone remains fun, refreshing and relevant, our People Team scans the corporate training landscape and explores new learning platforms that go beyond the classroom.

Our Processes

Policies

- CAG's Learning Policy

Practices

- Training programmes
- Performance Management Framework
- Annual Potential Assessment Exercise

Our Targets

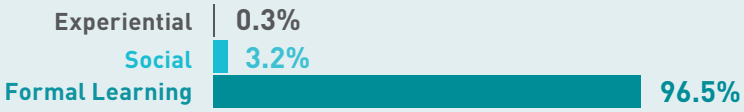
Employees attending at least 1 training programme, yearly

ON TRACK (97.6%)

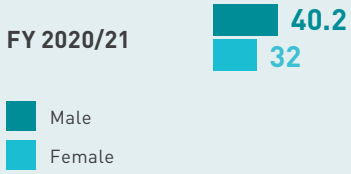
Our Change Agents

Our SDGs

PERCENTAGE OF LEARNING AND DEVELOPMENT PROGRAMMES, BY CATEGORY

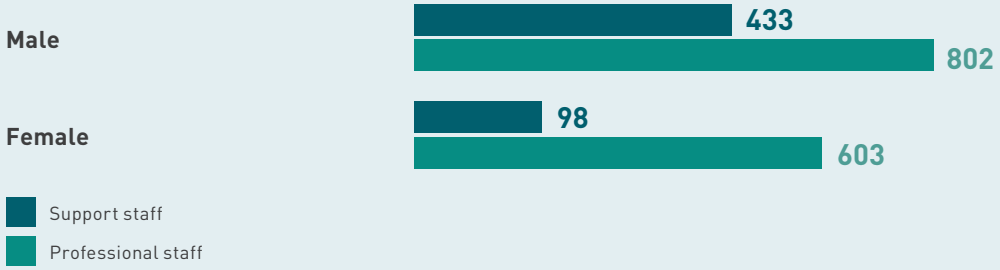


AVERAGE TRAINING HOURS, BY GENDER



AVERAGE TRAINING HOURS, BY EMPLOYEE CATEGORY

TOTAL EMPLOYEES BY GENDER AND EMPLOYEE CATEGORY WHO RECEIVE REGULAR PERFORMANCE AND CAREER DEVELOPMENT REVIEW DURING REPORTING PERIOD.



DID YOU KNOW

This was the first ever Learning Festival held virtually since it started in 2011.

DEVELOPING A DIGITAL-READY WORKFORCE

Amidst the Covid-19 pandemic, CAG continued to expand its online learning platforms and capabilities to support the development needs of our employees. Inculcating digital skills and mindsets will be essential for our people to thrive and succeed in today's increasingly digital workplace and economy.

Virtual Learning Festival 2020 - "Be A CAG Leader"

CAG's annual learning festival for employees, LearnFest, was held virtually for the first time in 2020, due to Covid-19 measures for workplace arrangements. CAG's People Experience team decided to create a fun online learning event that would not only support its objective of promoting continuous learning, but also encourage active engagement and community sharing.

The 2020 festival, themed "Be A CAG Leader", set the stage to reinforce the Leadership Transformation journey that CAG had embarked on earlier in the year. With support from CAG's senior management across various Clusters and Divisions, the event put the spotlight on leadership principles that guide our way of working at CAG, and how every employee is a leader, with a stake in shaping CAG's future.

One of the highlights of the e-learning festival was the 'live' open mic talk shows, where CAG leaders and colleagues candidly shared their stories of personal growth through managing projects and overcoming work challenges.

Employees also bolstered their knowledge, skills and capabilities by attending live virtual webinars and accessing digital content in CAG's learning management system. Among its comprehensive resources are self-directed online modules and short virtual workshops, covering a wide array of topics ranging from technical to soft skills.

> "One of the highlights of the e-learning festival was the 'live' open mic talk shows, where CAG leaders and colleagues candidly shared their stories of personal growth through managing projects and overcoming work challenges."

Continuing Our Efforts to Develop Digital-Ready Employees

In FY20/21, the People Development team continued to roll out regular FutureReadyME programmes to upskill CAG employees to succeed in the digital world.

Beyond FutureReadyME, CAG continues to explore and tap on innovative learning technologies and methodologies to keep pace with the profile of today's learners. An example of this is the development of a beta version of an Augmented Reality (AR) module for our Terminal 4 Orientation Tour, which would enable new employees to explore and learn about the terminal from virtually anywhere. Conceptualised amidst the Covid-19 pandemic, the use of marker-less AR delivered through an app would enable CAG to continue the onboarding of new hires despite terminal closures.

> "Beyond FutureReadyME, CAG continues to explore and tap on innovative learning technologies and methodologies to keep pace with the profile of today's learners."

Reflections from Jacky Tan, Project Lead for AR Module Development

The idea of introducing a new technology (Augmented Reality) into CAG's learning and development space was very exciting for our team. At the same time, however, we had to overcome several challenges, two of which stood out.

The first was getting funding for our "experimental" initiative. With the support of our Managing Director, Justina Tan, our team quickly put together a proposal, which we pitched successfully to secure the critical seed funding in CAG for this innovative experiment.

Our second major challenge emerged when Covid-19 happened as we proceeded to develop the AR module. We found ourselves having to work from home and unable to advance to the on-site deployment stage. Without any idea of how long the pandemic would last, the team decided that we had to shift our focus to find an alternative virtual solution, so that the app development could advance to the next stage. Determined, we worked together and pivoted successfully by integrating a marker-less AR version of the project into the app.

We are very proud that we were able to deliver this working AR application under such challenging circumstances to support our new hires. The app can be accessed from anywhere, albeit with limited features. We look forward to deploying the full version for onsite use in the final phase.

MAKING A DIFFERENCE BY HELPING OTHERS SUCCEED

COMMUNITY INVESTMENT

Our Priorities

We believe in the potential of people. Through various community efforts including employee volunteerism, corporate philanthropy and stakeholder partnerships, we go beyond our business to empower young lives within our community.

Our Processes

Our Corporate Social Responsibility (CSR) efforts comprise diverse initiatives, including outreach and development programmes, corporate philanthropy, employee volunteerism, stakeholder partnerships and impact assessments, among others.

Policies

- Changi Foundation (CF) Framework

Practices

- CSR activities
- Airport partner engagement

Our Targets

- Achieve 25% staff volunteerism yearly by FY2021/22 5.5%*
- Achieve 1,000 volunteer hours yearly by FY2021/22 431.5 hours*
- To offer minimally 80 job attachments to youth beneficiaries yearly from FY2021/22 onwards 4*
- Engage 35 Airport Partners in Changi Foundation programme by FY2021/22 1*

* Compared to previous years, these KPIs have been affected by Covid-19.

Our Change Agents

Armed with a mandate to build a culture of lively volunteerism at CAG, a dedicated CSR unit within the People Team champions our Community Investment efforts.

Our SDGs

Face-to-face interactions have always been central to CAG's corporate social responsibility (CSR) efforts. When the Covid-19 pandemic outbreak brought our regular volunteer activities to a sudden standstill, we decided to pivot to virtual volunteering. The introduction of our Go M.A.D (Make A Difference) From Home initiative spurred CAG employees to continue meeting the needs of our beneficiaries, from wherever they are.

To support the students from NorthLight School, CAG curated online versions of our signature programmes. These include the Youth Passport Programme, which exposed Year 2 students to different airport vocations; and the Career Development Programme, for Year 3 students to learn more about Customer Service.

Highlights of our virtual programmes with Metta School included conducting online presentation and interview practices with their graduating students as part of the School-to-Work transition programme, and our continued partnership with Raffles Medical Group to run the tele-medical consultation programme.

Hwee Peng, an employee volunteer, who supported Metta School students with their online presentation sessions via virtual practice sessions

DID YOU KNOW

Due to Covid-19, the usual "Go M.A.D" (short for Go Make A Difference) tagline, which was used in internal communications to rally employees to volunteer, was adapted to "Go M.A.D from home".

Partnering to Enhance Virtual Volunteering

CAG's partners play an invaluable role in our virtual volunteering initiatives as they contribute unique expertise and resources that enrich the learning experiences of our beneficiaries. One such partner is Raffles Medical Group (RMG).

CAG-Metta School-RMG: A Meaningful Collaboration

Jeffrey Teng, RMG's Associate Director of Operations, is a strong supporter of CSR collaborations with CAG. The Tele-med programme partnership started in 2019 with the aim of helping Metta School students learn the process of seeking medical consultation. Accompanied by a CAG volunteer buddy, the students would make multiple visits to the RMG clinic in Terminal 4 to practise, as they developed knowledge best through iterative learning.

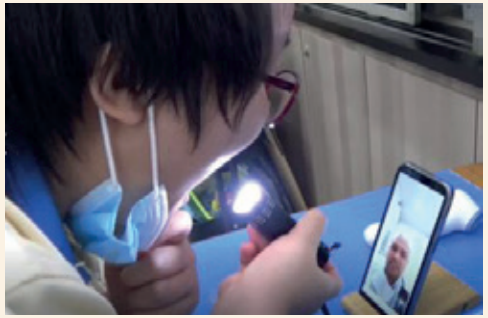
An incident which happened over two years ago left a deep impression on Jeffrey. He shared, "We had rostered a different doctor for the programme that day and had not anticipated the disappointment this would cause for one of the students who was expecting to see the doctor from his previous session. It was such a bitter-sweet moment. We were very touched to find out that the students look forward to seeing us."

With Covid-19, CAG asked RMG if they would consider supporting the programme via a virtual set-up. Jeffrey agreed without hesitation.

Jeffrey explained, "RMG is always keen to do charity work. This partnership with CAG is particularly meaningful and relevant for current circumstances. RMG's Tele-med platform is well suited to support virtual teaching of students, especially those with special needs, to seek medical attention. Not having to leave home minimises their risk of contracting the virus."

Jeffrey and his team collaborated virtually with Metta School and CAG to develop a programme from scratch that would be conducted using WhatsApp video calls as a start. As part of the roll-out, the team ran a full simulation of a virtual consultation for the Metta School teachers and CAG team to help them understand the learning process. This included teaching students to show their NRIC onscreen to confirm their identity as well as their thermometer readings for temperature-taking.

To create realistic scenarios and role-play scripts, RMG roped in an RMG nurse and doctor to assist with the training. The scripts would help Metta School guide students in the learning and practice of communications skills for interacting with nurses and doctors, whilst the CAG team used them to train volunteers to role-play nurses and doctors during the practice sessions, prior to their actual test consultation with nurses and doctors from RMG. Feedback provided by volunteers after each practice session enabled Metta School teachers to work with students on specific areas of development.



Dr. Dinesh Visva Gunasekeran, who was the RMG doctor on duty at the session, found the initiative especially meaningful as he was able to engage the students.

RMG, Metta School and CAG are committed to continue this collaboration and are making plans for the next phase.

"RMG is always keen to do charity work. This partnership with CAG is particularly meaningful and relevant for current circumstances. RMG's Tele-med platform is well suited to support virtual teaching of students, especially those with special needs, to seek medical attention. Not having to leave home minimises their risk of contracting the virus."

Daniel encouraging the MWA artists to use a kitchen roll to see if they can spot different shapes of clouds in the sky.

Impacting our community with skilled-based e-volunteerism

The Covid-19 situation was a catalyst for one CAG colleague to leverage his talents to help special needs artists.

A Reflection by Daniel Foo - Senior Manager, Design Management

Daniel Foo takes care of Changi Airport's art collection. He was curating a tour of the airport's art installations for the special needs artists at Metta Welfare Association (MWA), one of Changi Foundation's beneficiaries, when Covid-19 hit. As groups could no longer gather at the airport and the tour had to be put on hold, Daniel and his colleagues pivoted to design a virtual art programme.

Q **How did the project come about?**

A It started with a simple desire to use my passion for art to give back to the community. I had not volunteered with Changi Foundation before but Covid-19 changed that. As they say, "in every crisis, there is opportunity". As the MWA artists couldn't visit Changi Airport, we decided to bring the world of art to them, virtually. Skill-based e-volunteerism allowed me to give back to the community in ways I could not have imagined in the "old normal".

Q **What went through your mind when the project was given the go-ahead?**

A My initial worry was that without face-to-face communication, response to the online programme would be lukewarm. This turned out to be unfounded as the programme was very well received. The MWA artists looked forward to our weekly Friday lessons and never failed to complete their homework ahead of time! I was heartened to learn that that the artists even remembered nuggets of information I had shared a few weeks earlier.

Q **What were some challenges you faced and how did you overcome them?**

A For a start, we had to fulfil our objective of exposing the artists to more genres of art through observing their natural surroundings. To do this, we designed an online art module with three one-hour classes. Held weekly, each lesson would feature a single topic of specially-curated bite-sized content to allow sufficient time for art appreciation and practice. For instance, in our class about clouds, we identified different types of clouds, discussed how they are depicted in various art forms, and inspired the artists to create their own cloud artwork. I showed photos and videos of artworks in our Changi collection, like Terminal 4's kinetic artwork, Petalclouds, and the installation process for Crystal Clouds at Jewel Changi Airport.

As the eight resident artists had to be split into two groups due to safe management measures, we conducted the three-week online art module weekly twice, over six weeks.

Prior to this programme, I hadn't interacted much with persons with special needs. Hence, I felt it was important to consult with MWA for feedback to refine the course materials. We also sought help from our Changi Foundation colleagues during our rehearsals. Together, we checked for 'blind spots' in areas such as choice of words, speed of delivery, the presentation colours and font-types used, and even the music choice and length of our videos. I tried to put myself in the artists' shoes to see if the content was interesting.

The responses to the lessons often surprised me. For instance, when I commented that dark clouds might mean rain, Chee Meng, one of the more outspoken artists, responded by saying, "White clouds can also rain". This simple but profound observation became an "aha" moment for me. In a subsequent chat, he also shared his hope of being able to join the workforce and be treated like any other person. I applauded him for having this ambition and wished him well.

At the end of the programme, I introduced art journaling to them and gifted each artist with an art journal to encourage them to record their spontaneous inspirations.

Q **What were your post-activity sentiments?**

A I was simply sharing what I know with others, but the satisfaction and joy I received from the entire process made it an immensely fulfilling experience. I thoroughly enjoy sharing my passion for art and I hope to inspire the MWA artists to continue pursuing their interest in art.

In January 2021, a month after the virtual art programme, I visited the art exhibition "Colours of Life" at JetQuay where the MWA artists were selling artworks and souvenirs to raise funds. It warmed my heart to learn that one of the artists, Fadhil, was inspired by our "art is everywhere" discussion and had created an art piece that was successfully sold!

Crepuscular Rays, Batik Painting by Fadhil
Through the virtual art sessions with Changi Airport Group in 2020, Fadhil learnt that 'art is everywhere'. Fadhil observed crepuscular rays and how it brought light into the sky. In Fadhil's masterpiece, he portrays the butterflies and leaves akin to bringing light into the sky, just like the crepuscular rays.

Q **How has this initiative shaped your thinking?**

A When giving back, you often gain more than you give. I thought I was using art to broaden their horizons; instead, they taught me to appreciate the simplicity and beauty of life.

I believe there are many other charities like MWA in Singapore that have support programmes for artists to make a living through art. These platforms are important for connecting persons with special needs to the arts on a more sustainable basis. They have powerful stories to tell that connect others through their craft. The barriers to entry are low, and what matters is giving this special group of artists a chance to advocate for and showcase promising young talents in Singapore.

Q **What are the next steps?**

A I am grateful that plans are underway to take this virtual programme forward in its second year. One idea we have is to equip the MWA Artists to tell great stories about their art. At its core, storytelling is about making authentic, human connections. Inviting people to be part of your artistic process and journey will make them more likely to support your work and root for you. Even though I interacted with the MWA artists for only a short time, I was touched by their earnest outlook in life.

Like all great artists, what these artists need are opportunities as well as people to uplift and believe in them. I believe that by volunteering, our actions can help improve public perception towards differently-abled persons and provide support for their unique perspectives.

I am glad that I took my first step to volunteer.

ENABLING SAFE AND STRESS-FREE TRAVEL

AIRPORT EXPERIENCE
AND PASSENGER SATISFACTION

Our Priorities

Embracing Changi Airport's unique position as the gateway to Singapore, we work hard to create amazing first impressions and lasting memories for all passengers as they arrive and leave our shores. Each day, we strive to do better than the last, driven by a fervent commitment to service excellence, innovation and operational efficiency that inspires all we do. As travel takes on a different form amidst the current Covid-19 pandemic, Changi Airport is dedicated to deliver a safe and stress-free journey for our passengers.

Our Processes

Policies

- Changi Quality Service Management

Practices

- Creating a WOW passenger experience
- Harnessing technology and innovation
- Bringing out the best of ONE Changi

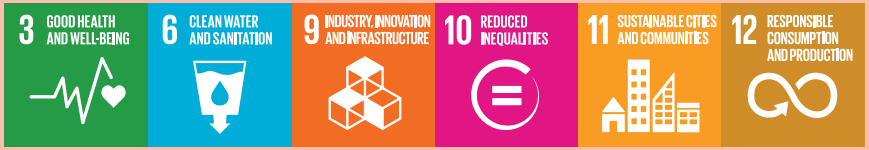
Our Targets

Good yearly performance for the Customer Satisfaction Index of Singapore (CSISG) **ACHIEVED; 81.7 in 2020**

Our Change Agents

Airport Operations and Management

Our SDGs



Throughout FY20/21, CAG remained fully operational as we focused on delivering the award-winning Changi Experience. The driving force behind CAG's response to Covid-19 has been our unwavering commitment to service excellence, operational efficiency and innovation. CAG introduced various initiatives during the year to ensure passenger safety and peace of mind whilst travelling during this pandemic.

Stepping Up On Cleaning Regime for Safer Journeys

CAG's Facilities Management team spearheaded the implementation of heightened cleaning and disinfecting processes, which included the installation of contactless hand-washing and sanitising facilities at touchpoints throughout the airport.

Among the technology solutions deployed to enhance bio-safety around Changi Airport were:

- Anti-microbial coating applied on high-touch surfaces to reduce the risk of virus transmission;
- Autonomous cleaning equipment for daily cleaning of floors and carpets, some of which were equipped with a misting attachment for disinfecting carpets after cleaning;
- Ozone-infused water to enable thorough toilet-washing and disinfecting; and,
- UVC equipment for enhanced disinfection of toilet cubicles, urinals and wash basin areas.

To ascertain cleaning efficacy, we conducted monthly bioluminescence tests on high-touch areas using swabs and meters provided by Temasek Foundation.

CAG was awarded the SG Clean Certification by the National Environment Agency (NEA), recognising its efforts to achieve an elevated level of cleanliness and public hygiene. Changi Airport was also the first airport in the Asia Pacific region to be certified by the Airports Council International (ACI) Airport Health Measures Audit Programme, demonstrating compliance with health and safety measures recommended by national and international authorities.

“To ascertain cleaning efficacy, we conducted monthly bioluminescence tests on high-touch areas using swabs and meters provided by Temasek Foundation.”

Innovative Contactless Touchpoints Enhance Seamless Travel

To safeguard the health of passengers and visitors as we prepare for safe resumption of air travel, CAG looked to contactless technology to minimise risk of exposure to the virus.

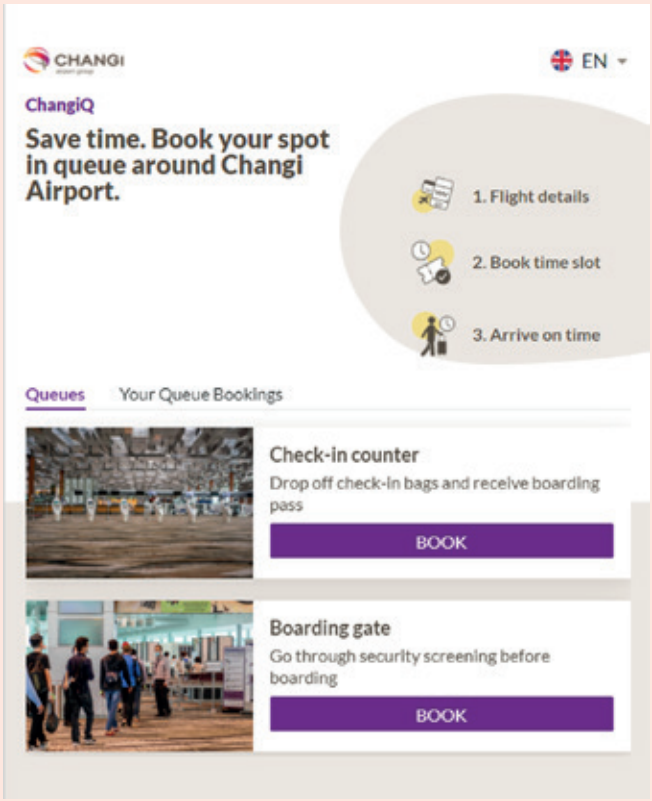
By installing infrared proximity sensors on 192 automated check-in kiosks and bag-drops across Terminals 1 and 3, as well as Jewel Changi Airport, CAG enabled passengers to complete the Fast and Seamless Travel (FAST) check-in safely by hovering their finger over the console to make their selection, without having to touch the screen.

We also worked closely with the Immigration & Checkpoints Authority (ICA) to expedite the launch of ICA's multi-modal biometric system (MMBS). The MMBS uses facial and iris recognition to verify travellers' identity. As compared to the previous fingerprint scanning system, this new system provides travellers with greater assurance and a seamless immigration experience.

A Novel Approach to Promote Safe Distancing

Another innovative solution developed by CAG is ChangiQ - a digital queue management tool which alleviates queue-bunching at airport touchpoints and enhances traveller safety by enabling allowing passengers to pre-book airport procedure timings.

ChangiQ was piloted first at pre-board security screening for flights with high passenger loads. With the successful integration of ChangiQ with the iChangi app, users can now complete and access their pre-bookings conveniently in one place.



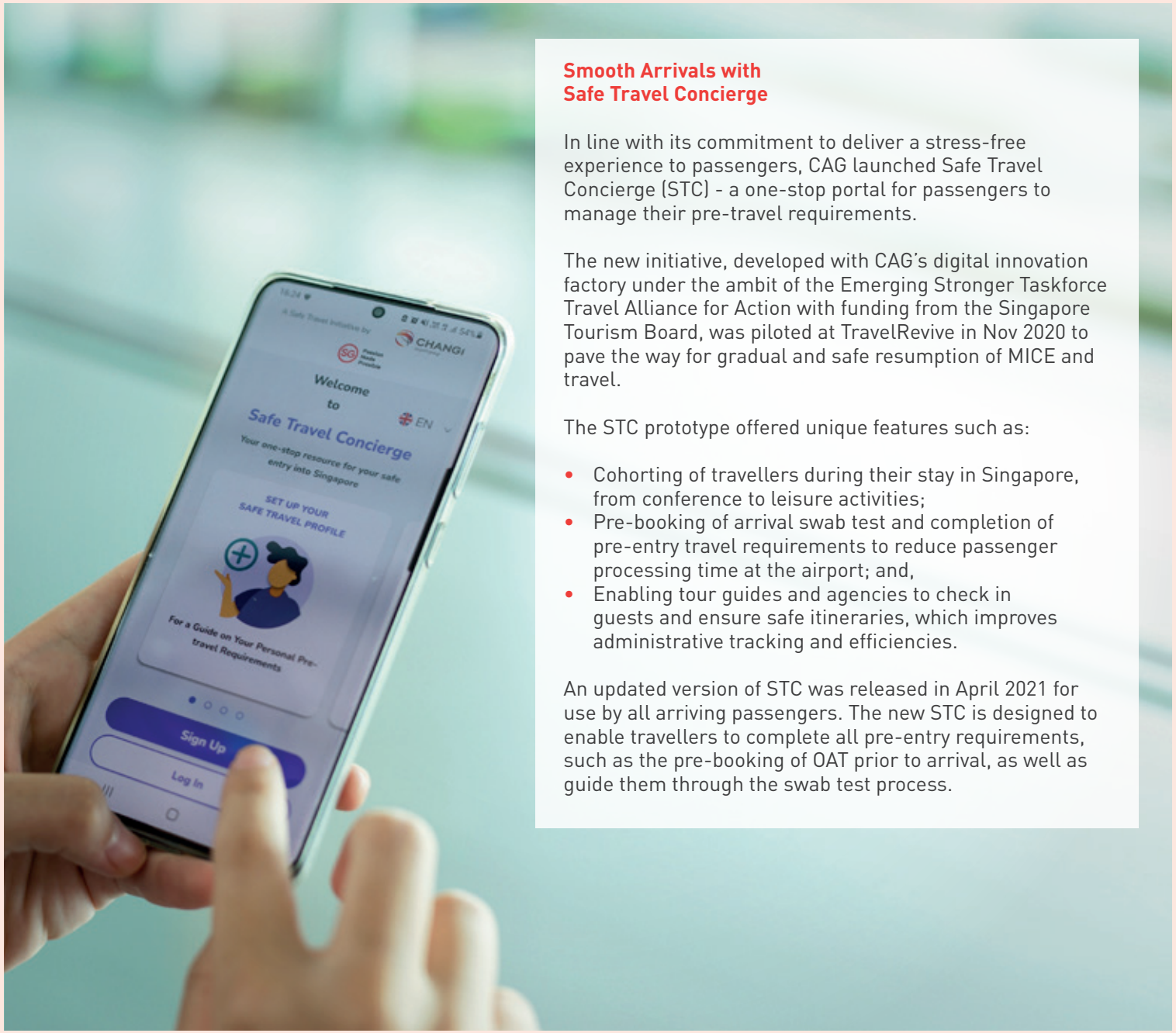
> "With the successful integration of ChangiQ with the iChangi app in Q4 2020, users can complete and access their pre-bookings conveniently in one place."

On-Arrival Testing Key to Safe Re-Opening of Borders

Mandating Covid-19 On-Arrival Testing (OAT) at Changi Airport for all passengers has been a critical process in enabling the safe re-opening of Singapore's borders. When the Reciprocal Green Lane (RGL) was established with China, CAG quickly set up Covid-19 Testing Facilities (CTFs) at Terminals 1 and 3.

The testing facilities welcomed their first short-term visitors from China on 22 June 2020 and have since been progressively scaled up to have a handling capacity of up to 20,000 passengers each day.

Further planning to expand the testing facilities and trial new OAT methodologies, such as breath analysers, are underway, with continued improvements to enhance the efficiency of OAT and CTFs.



Smooth Arrivals with Safe Travel Concierge

In line with its commitment to deliver a stress-free experience to passengers, CAG launched Safe Travel Concierge (STC) - a one-stop portal for passengers to manage their pre-travel requirements.

The new initiative, developed with CAG's digital innovation factory under the ambit of the Emerging Stronger Taskforce Travel Alliance for Action with funding from the Singapore Tourism Board, was piloted at TravelRevive in Nov 2020 to pave the way for gradual and safe resumption of MICE and travel.

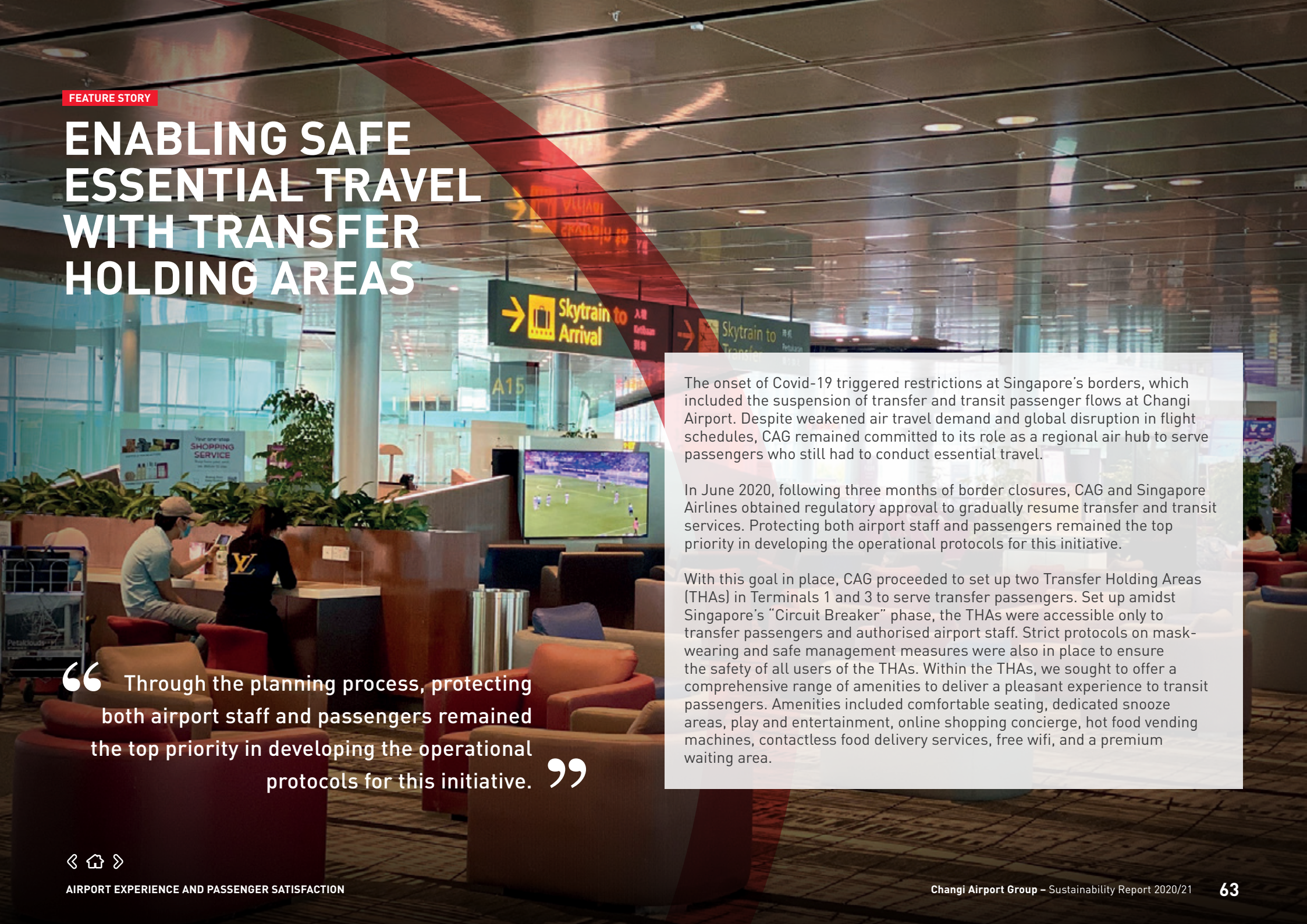
The STC prototype offered unique features such as:

- Cohorting of travellers during their stay in Singapore, from conference to leisure activities;
- Pre-booking of arrival swab test and completion of pre-entry travel requirements to reduce passenger processing time at the airport; and,
- Enabling tour guides and agencies to check in guests and ensure safe itineraries, which improves administrative tracking and efficiencies.

An updated version of STC was released in April 2021 for use by all arriving passengers. The new STC is designed to enable travellers to complete all pre-entry requirements, such as the pre-booking of OAT prior to arrival, as well as guide them through the swab test process.

FEATURE STORY

ENABLING SAFE ESSENTIAL TRAVEL WITH TRANSFER HOLDING AREAS



> “Through the planning process, protecting both airport staff and passengers remained the top priority in developing the operational protocols for this initiative.”

The onset of Covid-19 triggered restrictions at Singapore’s borders, which included the suspension of transfer and transit passenger flows at Changi Airport. Despite weakened air travel demand and global disruption in flight schedules, CAG remained committed to its role as a regional air hub to serve passengers who still had to conduct essential travel.

In June 2020, following three months of border closures, CAG and Singapore Airlines obtained regulatory approval to gradually resume transfer and transit services. Protecting both airport staff and passengers remained the top priority in developing the operational protocols for this initiative.

With this goal in place, CAG proceeded to set up two Transfer Holding Areas (THAs) in Terminals 1 and 3 to serve transfer passengers. Set up amidst Singapore’s “Circuit Breaker” phase, the THAs were accessible only to transfer passengers and authorised airport staff. Strict protocols on mask-wearing and safe management measures were also in place to ensure the safety of all users of the THAs. Within the THAs, we sought to offer a comprehensive range of amenities to deliver a pleasant experience to transit passengers. Amenities included comfortable seating, dedicated snooze areas, play and entertainment, online shopping concierge, hot food vending machines, contactless food delivery services, free wifi, and a premium waiting area.

FEATURE STORY

BUILDING RESILIENCE WITH THE SETTING UP OF A VACCINATION CENTRE AT TERMINAL 4

Changi Airport recognised from the outset that prioritising the vaccination of our airport workers would be essential to enhance the safety and well-being of our airport community and passengers.

In addition to safe management measures to mitigate spread of the virus, vaccinating the airport community would enable Singapore to keep its air borders and links to the outside world open.

To support its vaccination drive, CAG made the move to convert Terminal 4 into a vaccination centre (VC@T4). Detailed planning and close collaboration involving CAG, the Ministry of Health, and Raffles Medical Group, enabled the centre to be set up swiftly. Special attention was given to the proper storage and preparation of vaccines as well as ready access to medical assistance, if needed.

Stringent planning and operations management of VC@T4 enabled more than 90% of frontline aviation workers to complete their full vaccination regimen by May 2021, just four months after the start of the vaccination drive in January 2021. At its peak, VC@T4 processed more than 3,000 people daily.

SAFEGUARDING LIVES

AIRPORT SAFETY

Our Priorities

Safety is paramount at CAG. We are committed to upholding it as a core value and a basic right for every employee and individual. We believe that safety is everyone's business. Any act or inaction on our part may have consequences for ourselves and our colleagues. As such, we are dedicated to infusing a strong safety culture across CAG to create a safe environment for all.

Our Processes

Policies

- CAG's Safety Policy
- CAG's Safety Management System
- CAG's Fire Safety Manual

Practices

- Airport Emergency Plan
- Safety Hazard Reporting
- Airport Safety Awards
- Safety briefings
- Induction trainings

Our Targets

- Zero employee work-related fatalities, yearly **ACHIEVED**
- Deficiency-free rating from the International Federation of Air Line Pilots' Associations (IFALPA), yearly **ACHIEVED**

Our Change Agents

Operational Risk and Safety Committee

Risk Committee

Our SDGs

CAG's Safety Management System

Safety is one of our core values at CAG. To build a proactive and robust safety environment, CAG works closely with our airport partners, including ground handling agents, airlines, and the Civil Aviation Authority of Singapore, to ensure the effective implementation of our Safety Management System (SMS). The SMS seeks to continually improve safety performance and safety risk management, encourage an open and learning culture, provide necessary resources and training, and foster close teamwork with our partners. To drive continuous improvement, CAG, through the Aerodrome Safety Unit (ASU) is committed to periodic review and assessment of the SMS to ensure that it remains current and in-line with the company's mission and values.

0

work-related employee fatalities

2.37*

Employee Injury rate

* per million man-hours worked. For work-related injuries that resulted in more than three days of medical leave or 24-hour hospitalisation.

Aerodrome Safety

The International Federation of Air Line Pilots' Association (IFALPA) recognises CAG as a dependable airport operator based on our ability to provide and manage aviation infrastructure and services safely and in line with international guidelines. 2021 marks the 40th consecutive year that Changi Airport has been given a deficiency-free rating by IFALPA. This continues to affirm Changi Airport as one the safest airports in the world since 1981.

Workplace Safety and Health

The safety and health of our Changi community are of utmost importance to CAG. The SMS for Workplace Safety and Health establishes our commitment to prevent all work-related injuries and illness. CAG sets a challenging target of zero workplace fatalities. We achieved this for FY20/21 by continually identifying and reducing occupational risks in our operations, implementing safe work practices, and providing relevant training to our employees.

CAG undergoes external management system audits to verify that our work practices are aligned with international standards. Since April 2020, line divisions at CAG have started to migrate to the ISO 45001 certification for Occupational Health and Safety Management System.

Safety Hazard Reporting

CAG is committed to the proactive identification and management of safety hazards that may weaken its safety defences and compromise safe operations. The airport community is encouraged to report hazards through multiple channels:

- CAG e-Services portal
- Corporate safety e-mail
- 24/7 safety hotlines
- CAG InTouch, OneChangi, SWEET mobile application

ASU manages several voluntary and confidential reporting channels, including the corporate safety e-mail and the hazard reporting online form which is easily accessed via CAG's e-Services portal. Hazards which require immediate attention can be reported via the 24/7 hotlines and mobile application known as SWEET (Service Workforce Empowerment and Experience Transformation). In FY20/21, the SWEET mobile app on-boarded 5,000 new users and received 1,125 hazard reports.

This 'many eyes' approach to hazard identification, which is augmented by prompt action to avert potential consequences, has contributed to a safer airport environment for both travellers and airport staff.

Airport Safety Awards

The airport community came together to honour and recognise more than 300 deserving individuals and teams at CAG's annual Airport Safety Awards. CAG adopted the tagline "Safety Takes You Further" for the Annual Airport Safety Awards to instil a strong culture of safety at our airports. This award is the highest form of recognition given to members of the airport community for exceptional safety contributions. These individuals and teams received awards based on three broad categories:

Safety Awareness & Courageous Act, Innovation & System Thinking, and Safety Promotion & Culture Building. Many had demonstrated gumption by going beyond the call of duty when faced with potentially unsafe situations.

Safety is paramount, especially amidst the ongoing Covid-19 situation which posed severe challenges to the aviation industry. Any degradation in safety standards would further erode confidence and have an adverse impact on the sector.

Embracing new norms, the Annual Airport Safety Awards was broadcasted online. A new initiative to have management representatives from respective companies present the awards to winners lends greater appreciation and recognition of the winners' efforts.

FEATURE STORY

STRENGTHENING CHANGI'S EMERGENCY PREPAREDNESS & SERVICES

In FY20/21, we continued to strengthen the emergency response preparedness of the Changi Airport community despite reduced air traffic due to Covid-19.

Exercise Bobcat

Together with 23 airport and government agency partners, including airlines, ground handling agents, the Singapore Civil Defence Force and Singapore Police Force, CAG held its annual Exercise Bobcat on 18 November 2020 to test the robustness of their aircraft emergency procedures. Whilst the International Civil Aviation Organisation recommends that airports conduct full-scale emergency exercises at least biennially, CAG's efforts to organise Exercise Bobcat annually reflects its deep commitment to airport safety.

This year's full-scale exercise simulated a crash landing on Runway 3 to test coordination and processes in tackling a crisis within this new operating environment (see other Feature Story, Page 70). Measures were implemented to minimise physical interactions between exercise participants, such as the replacement of volunteer role-players with dummies and description cards detailing injuries, as well as the use of video-conferencing in place of face-to-face interactions for briefings and interviews.

Airport Emergency Service (AES)

CAG's Airport Emergency Services (AES) is a highly-trained specialist unit with sophisticated technology to handle aircraft-related fast-action rescue and fire protection operations, as well as respond to emergency situations such as chemical, biological and bomb threats.

CAG operationalised a new Fire Station 3 in 2020 to enable more rapid response to aerodrome emergencies. We also acquired new vehicles, such as the Foam Carrier and Water Tender, to enhance our firefighting capabilities. To train AES officers in large-scale firefighting scenarios and the rescue of passengers and crew during aircraft incidents, AES procured a new Mobile Aircraft Simulator (MAS). Its features include a 180 degrees rotatable interior (90 degrees to each side) for challenging rescue scenarios, an in-built smoke generator for low visibility search and rescue, and a heater to simulate the intense temperatures in a burning aircraft.

Furthermore, the simulator can be kept on airport grounds which minimises vehicle movement to and from Selarang Fireground, located 15km away from our furthest fire station.

Looking ahead, transformation is a key focus for AES as it looks to continually strengthen its team and technology capabilities to handle airport emergencies. Amidst the Covid-19 pandemic, AES officers actively acquired new skills and varied experience, by taking on additional roles such as aircraft stand inspection, counter-drone operations, wildlife dispersal, terminal closure security patrol and increased frequency for fire safety inspection walkabouts. These new perspectives on airport operations will help in their firefighting and rescue operations. Future-proofing AES teams by developing specialist skills, as seen in the Airport Fire Vehicles and Equipment Specialist group, will augment CAG's capabilities in safeguarding passengers and staff!

* The above picture was taken before the coronavirus pandemic

FEATURE STORY

SAFE OPERATIONALISATION OF RUNWAY 3

The major structural upgrade of Changi Airport's third runway was well underway when the Covid-19 outbreak occurred in 2020.

Previously used by the Republic of Singapore Air Force, Runway 3 was earmarked for development as a vital infrastructure for sustaining Changi Airport's long-term growth. Work had commenced on converting the runway to meet stringent international and national aerodrome standards for civilian aircraft operations. CAG collaborated closely with the Civil Aviation Authority of Singapore and key stakeholders through various stages of planning, design, and operational review, as well as safety risk assessments and aeronautical studies. The final step was a comprehensive certification programme to verify that the infrastructure, operational systems, maintenance programme and emergency response procedures were properly established across Runway 3 to support safe aircraft operations.

With the onset of Covid-19, CAG, together with our stakeholders, took extraordinary steps to implement strict Covid-19 Safe Management Measures in order for Runway 3 development and certification activities to continue. No effort was spared in ensuring all workers' safety and well-being.

Intensive tests and checks on airfield systems, emergency response exercises, aircraft movement area inspections, and live flight trials were conducted leading to the operationalisation of Runway 3. The annual Exercise Bobcat (see other Feature Story, Page 69) was specially arranged to take place on Runway 3 to familiarise its key stakeholders. CAG coordinated extensive cross-agency checks to ensure that all runway operations were performed safely and effectively.

CAG received the new aerodrome certificate for Runway 3 on 27 November 2020, and had its first civil aviation flight, a Singapore Airlines Airbus A350, taking off at 10:26am.

SUPPORTING THE ECONOMY

CONTRIBUTION TO THE ECONOMIC DEVELOPMENT OF SINGAPORE

Our Priorities

One of Singapore's key infrastructure assets, Changi Airport influences the nation's economic development. As its manager and operator, CAG partners government agencies and the private sector to design the airport's future-ready strategies. From enhancing Changi's connectivity and attractiveness, to strengthening passenger and cargo traffic development as well as airport capacity, we plan for the long haul to secure Changi Airport's future competitiveness and strengthen Singapore's position as a leading global air hub. As Singapore continues to navigate through the pandemic, Changi Airport together with our partners remains committed to enabling trade and human flows, keeping Singapore connected with the rest of the world.

Our Processes

- CAG actively works with airline partners to drive global connectivity
- CAG also closely partners our trade counterparts in driving Singapore's appeal as a leisure destination, cargo hub and gateway to the rest of the world

Our Targets

- Completion of T2 Expansion Project **On track**
- Build capacity ahead of growth with Terminal 5 planning and development **Ongoing effort**

Our Change Agents

Across all CAG divisions

Our SDGs

Even as the Covid-19 pandemic brought aircraft and passenger movement to a standstill in 2020, Changi Airport continued to play our part in contributing to Singapore's economic development and long-term sustainability. As a key infrastructure and international gateway, we reinforced Singapore's position as a leading global air hub by working closely with our airline partners to provide essential connectivity for sustaining human and trade flows.

The onset of the Covid-19 pandemic marked the start of progressive border closures in Singapore. Without a domestic market, aircraft and passenger movements declined by 80% and 98% respectively in FY20/21, compared to a year ago. While airfreight movements fell 23% year-on-year, our air trade (imports and exports) showed resilience and registered a much smaller decline of 8% year-on-year.

Faced with weakened passenger travel demand and air cargo capacity shortfall, CAG doubled down on our strategy of keeping air cargo flying. This involved working closely with our airline partners to secure critical air connectivity and sufficient capacity to keep our nation's and global supply chains open for essential goods and services.

In December 2020, CAG reported a three-fold increase in weekly cargo flights[1] compared to pre-Covid-19 levels. In FY20/21, more than 60 carriers were operating Passenger Aircraft for Cargo Conveyance (PACC) flights into Singapore, connecting Changi to over 90 cargo city destinations. Cargo conveyed on PACC flights accounted for almost a quarter of Changi's total cargo throughput. In March 2021, Changi Airport registered more than 930 weekly cargo flights, including passenger freighters.

In FY20/21, Changi welcomed the launch of scheduled operations by four new freighter operators, namely Kalitta Air, Sichuan Airlines, YTO Cargo Airlines and SpiceJet. SF Airlines and Turkish Cargo also reinstated scheduled freighter flights to Singapore. Having a record-breaking 30 scheduled freighter operators at Changi strengthened Singapore's air cargo capacity and competitive position as a global air cargo hub amidst the crisis.

These achievements reflect the Changi community's nimbleness and resilience during a very challenging time.

30

scheduled freighter operators at Changi strengthened Singapore's air cargo capacity and competitive position as a global air cargo hub amidst the crisis.

1 Both freighter and passenger aircraft for cargo conveyance (PACC) flights

FEATURE STORY

VACCINE SUPPLY CHAIN

> “The Taskforce leveraged the collective strengths and experience of Changi’s air cargo stakeholders to handle temperature-sensitive pharmaceutical products safely and reliably.”

Around the world, the successful development and distribution of Covid-19 vaccines has been regarded as a critical pillar in the global fight against the pandemic. In addition to boosting people’s well-being and saving lives, the vaccines would also be key to restarting economies as well as restoring confidence and accelerating recovery in the aviation industry.

Towards the end of 2020, as several vaccine candidates started entering the later stages of their clinical trials, Singapore launched into preparations for the mammoth logistical undertaking of transporting and handling Covid-19 vaccines under stringent requirements.

In November 2020, CAG and Civil Aviation Authority of Singapore (CAAS) jointly established the Changi Ready Taskforce, comprising 18 members from across the Changi air cargo community including government agencies, forwarders, airline partners and cargo handlers. Amidst a global air cargo capacity crunch, the Taskforce stood ready to support effective vaccine delivery not only for Singapore, but also the region.

The Taskforce leveraged the collective strengths and experience of Changi’s air cargo stakeholders to handle temperature-sensitive pharmaceutical products safely and reliably. A pool of qualified and experienced cold chain specialists, together with a comprehensive suite of temperature-controlled facilities such as airside temperature-protection equipment and cool dollies, delivers the highest level of cold chain integrity to ensure effective handling of the vaccine shipments.

To further strengthen Singapore’s role as a trusted pharmaceutical air cargo hub in the region, the Taskforce has continued to increase transparency around Changi’s cold chain handling capabilities and capacity. Standard operating procedures are reviewed and enhanced to expedite vaccine shipment processing and mitigate exposure to temperature deviations. Ongoing initiatives focus on identifying and addressing data gaps, as well as forging pharma corridors with other airports on key trade lanes to improve end-to-end shipment visibility.

ADVANCING GOVERNANCE FOR GREATER RESILIENCE

GOOD CORPORATE GOVERNANCE

Our Priorities

With an eye on the future, we seek to build a thriving, sustainable business – one that safeguards our brand and reputation and makes our stakeholders proud. We work hard to achieve and uphold high standards of corporate governance, professionalism and integrity. At the same time, we are resolute in our stand to remain accountable to those in our immediate business and regulatory environment as well as the global community.

Our Processes

Policies

- CAG's Risk Management Policy
- CAG's Enterprise Risk Management Framework
- Code of Conduct
- Anti-Bribery Policy
- Whistle-Blowing Policy

Practices

- Training and awareness (e.g. Anti-Bribery Awareness training)

Our Targets

- Zero Tolerance for Corruption **Existing policy**
- No significant fines for non-compliance with applicable laws and regulations **Achieved**

Our Change Agents

Board

- Audit Committee
  - Internal Auditors
  - External Auditors
- Operational Risk & Safety Committee
  - Management Committee
    - Compliance Functions
    - Risk & Safety Management Functions

Our SDGs

To uphold the highest standards of professionalism and integrity which is vital to CAG's brand, reputation and sustainability, we operate and transact business in accordance with the CAG Code of Conduct and other key policies. These include policies that cover whistle-blowing, anti-bribery, enterprise risk management, cyber security and data protection. With increasing digitalisation of business and operations, cyber security and data protection are areas of particular focus.

Code of Conduct and Whistle Blowing Policy

We are committed to keeping integrity at the heart of everything we do at CAG. Our Code of Conduct sets out the principles and standards that is expected of all employees in their day-to-day activities and decision-making, with a strong emphasis on taking responsibility and accountability for actions. The Code covers all areas of CAG's business and operations, and is to be followed in conjunction with local laws and regulations.

CAG has established a confidential whistle-blowing channel for employees of CAG and its subsidiaries, as well as external parties to report any suspected misconduct in CAG's business and operations. We are committed to protecting any person who makes a report in good faith from any form of retaliation.

Anti-Bribery Management System

CAG has a zero tolerance of bribery and we have operationalised this commitment via the CAG Anti-Bribery Management System (ABMS). To provide assurance that the ABMS incorporates international best practices, CAG obtained the ISO 37001 certification in 2019 and continues to maintain this through annual external audits. Each year, in line with the ISO 37001, all employees must complete anti-bribery e-learning, and all divisions review potential bribery risks in operations, assess the effectiveness of controls to mitigate such risks and determine if further action needs to be taken to mitigate such risks. Employees who are deemed to be in roles with a higher risk of bribery are also required to submit an annual Declaration of Anti-Bribery Compliance.

We recognise that the conduct of third party suppliers can impact CAG. CAG's Supplier Code of Conduct is published on CAG's website and sets out our expectations of suppliers to uphold a zero tolerance of bribery, to comply with applicable laws and regulations and to report suspected misconduct promptly. The Code is incorporated into the terms we sign with suppliers.

Risk Management

At CAG, we define risk as anything that might prevent us from achieving our business goals and objectives. We have developed an Enterprise Risk Management (ERM) framework that guides us in minimising the impact and likelihood of risks through the identification and analysis of risks, implementation of mitigation measures, and monitoring of the effectiveness of these mitigating measures. The key risks and key risk indicators are reported to CAG's Risk Committee and CAG's Board-level Operational Risk & Safety Committee.

Building Cyber Security, Safety & Resilience at CAG

At Changi Airport, we continue to accelerate our digitalisation efforts to enhance operational efficiencies and passenger experience. To realise the full benefits of a connected, digitalised world, CAG recognises the critical importance of, firstly, understanding the growing number of new and emerging risks and threats to our digital infrastructure and assets, including personal data; and, secondly, establishing resilient cyber risk and data protection management frameworks to counter these threats.

Cyber Security

As part of the cyber risk management framework, CAG has adopted a three-pronged approach to raising staff awareness of cyber-threats that may compromise our airport operations and information security.

This involves, firstly, educating employees on cyber hygiene best practices to be incorporated into our day-to-day job processes. Secondly, we require every employee to undergo mandatory cybersecurity awareness e-learning to ensure cybersecurity risks are well understood at every level of the organisation. Finally, we conduct table top exercises to test our cyber response plans along with the business continuity plans.

Looking ahead, we will continue to work closely with our industry partners, regulatory bodies and government agencies to maintain cyber preparedness across Changi's extended community.

Data Protection

We are committed to protecting the privacy and confidentiality of all personal data that we collect and process, including those of our customers, partners and employees.

To ensure accountability and compliance with relevant data protection and privacy laws, including Singapore's Personal Data Protection Act 2012 (PDPA), CAG has established a Data Protection Governance Framework that consists of a set of governance principles, a governance structure, and the CAG Data Protection Management Programme.

The CAG governance principles map out the roles, responsibilities and accountabilities of specific key personnel involved in personal data protection at CAG, including CAG senior management, employees, and the CAG Management Risk Committee.

CAG's governance structure is helmed by the Information Assurance Committee for Personal Data (IAC-PD), which is supported by CAG's Data Protection Officer (DPO), the heads of CAG Divisions and Division Data Protection Officers. This governance structure ensures that personal data protection policies and processes are effectively standardised and implemented across the organisation. The CAG DPO provides regular updates to the CAG Management Risk Committee and senior management on data protection matters.

CAG's Data Protection Management Programme encompasses activities and initiatives to support data protection, including:

- Regular mandatory online training for all staff;
- Regular communications on best practices;
- Risk assessments for systems and processes that handle personal data;
- Pre-contract due diligence of counter-parties that may handle personal data in CAG's care; and
- An incidence response plan to handle suspected threats that may expose personal data in CAG's care.

> "We are committed to protecting the privacy and confidentiality of all personal data that we collect and process, including those of our customers, partners and employees."

APPENDIX A: GHG EMISSIONS QUANTIFICATION METHODOLOGY

This section explains the calculation boundaries, methodologies and assumptions used in the preparation of CAG's Scope 1, 2 and 3 emissions for CAG. The carbon footprint is prepared in accordance with ISO 14064-1, Greenhouse Gas (GHG) Protocol and the Airport Carbon Accreditation (ACA) guidelines.

Reporting Scope and Period

CAG uses an adaptation of the Operational Control Approach, under which the company accounts for 100% of the GHG emissions from operations over which it has control. Following requirements for Level 3 "Optimisation" Airport Carbon Accreditation, this carbon footprint takes into account the sources and activities that are controlled by CAG, namely, Scope 1 and Scope 2 GHG emissions, as well as the sources that the airport can guide or influence through effective partnership (Scope 3 GHG emissions). CAG focuses on calculation of carbon dioxide (CO_2) emissions for all three scopes.

Data for GHG emission calculations includes T1 to T4. It excludes emissions from CAG's direct operational control (Scope 2) in Jewel Changi Airport Trustee Pte Ltd (JCAT), which are being measured and subtracted out for a 2-year baselining. Electricity on-sold to JCAT as a private developer is included in CAG's Scope 3 emissions.

Data from the following reporting periods have been included in Sustainability Report FY20/21:

- FY2017/18, FY2018/19, FY19/20 and FY20/21 – 1 April 2020 until 31 March 2021, for Scope 1, 2 and 3 emissions.

CAG's energy and emissions data will be published when they have been externally verified on an annual basis. In this report, CAG's energy and emissions data for FY20/21 have been disclosed with verified FY19/20 data for comparability. Verified FY2017/18 energy and emissions data will be published in CAG's subsequent Sustainability Report FY2021/22.

APPENDIX A: GHG EMISSIONS QUANTIFICATION METHODOLOGY

Calculation Methodologies

Methodologies are consistent with the ACI Guidance Manual on Airport Greenhouse Gas Emissions Management and the GHG Protocol. Emissions are divided according to ownership and control of the source:

SCOPE 1

Scope 1 emissions are direct GHG emissions which occur from sources that are owned or controlled by CAG. This includes emissions from both stationary sources (power generators, dynamic-uninterruptible power supply (D-UPS), water pumps, electrical switchgears and other stationary equipment) and mobile sources (company-owned cars, trucks, motorcycles and heavy-duty equipment). Activities and process emissions (i.e. from firefighting exercises) contributes to less than 0.01% of total emissions and therefore excluded.

Quantity of Scope 1 GHG emissions is calculated by multiplying the fuel usage (activity data) by their respective emissions factor. The data for fuel usage is accumulated based on invoices of procured and/or topped up fuel.

SCOPE 2

Scope 2 emissions are indirect GHG emissions which occur from the generation of purchased or acquired electricity, heating, cooling and steam consumed by CAG. At CAG, Scope 2 emissions only relate to purchased electricity from the grid.

Quantity of Scope 2 GHG emissions is calculated by multiplying electricity usage (in kWh) by the grid emission factor. Data for electricity usage is derived from receipts issued by the electricity supplier. The grid emission factors used in calculation is based on the grid emission released annually by the Energy Market Authority (EMA) in accordance with the United Nations Framework Convention on Climate Change (UNFCC) guidelines.

SCOPE 3

Scope 3 emissions are other indirect GHG emissions that are a consequence of CAG's activities, but occur at sources not owned or controlled by CAG. Due to the variety Scope 3 GHG emission sources within the scope, a range of methodologies has been used.

For emissions resulting from activities involving aircrafts (landing and take-off cycle, engine test-run and aircraft auxiliary power unit), the ACERT is used. For emissions resulting from ground activities that are carried out by our partners (ground support equipment, surface access, electricity resold, waste management), a similar calculation approach used for quantifying Scope 1 and Scope 2 emissions was used. Emissions from the shuttle bus operations was calculated with the use of the GHG Emissions Calculation Tool. Finally, for business travel, the International Civil Aviation Organization (ICAO) Carbon Emissions Calculator was used. For every calculation tool/model used, CAG has applied suitable assumptions to the input data. Refer to the table below for the respective emission factors used.

APPENDIX A: GHG EMISSIONS QUANTIFICATION METHODOLOGY

Emission Sources	Emission Factors	Unit
Scope 1 emissions		
Stationary source		
Diesel stationary	2.6920	$kgCO_2e$/litre
Jet A-1 stationary	2.5060	$kgCO_2e$/litre
Motor gasoline stationary	2.2860	$kgCO_2e$/litre
Sulfur hexafluoride (SF_6)	23,500	$kgCO_2e$/litre
Mobile source		
Diesel mobile	2.6760	$kgCO_2e$/litre
Gasoline mobile	2.2720	$kgCO_2e$/litre
Scope 2 emissions		
Electricity consumption		
2020 National Grid Emission Factor	0.4085	$kgCO_2e$/kWh
2018 National Grid Emission Factor	0.4192	$kgCO_2e$/kWh

APPENDIX A: GHG EMISSIONS QUANTIFICATION METHODOLOGY

Emission Sources	Emission Factors	Unit
Scope 3 emissions		
Ground support equipment		
Diesel mobile	2.6760	$kgCO_2e$/litre
Gasoline mobile	2.2720	$kgCO_2e$/litre
Surface access		
Coach	0.0348	$kgCO_2e$/vehicle-km
Minibus/van	0.2933	$kgCO_2e$/vehicle-km
Motorcycle	0.2131	$kgCO_2e$/vehicle-km
Private charter	0.2131	$kgCO_2e$/vehicle-km
Private hire car	0.2131	$kgCO_2e$/vehicle-km
Private hire shared ride	0.2131	$kgCO_2e$/vehicle-km
Privately owned car	0.2131	$kgCO_2e$/vehicle-km
Taxi (Grab taxi)	0.2131	$kgCO_2e$/vehicle-km
Taxi (Phone booking)	0.2131	$kgCO_2e$/vehicle-km
Taxi (Street hail)	0.2131	$kgCO_2e$/vehicle-km
Mass Rapid Transit (MRT)	0.0739	$kgCO_2e$/passenger-km
Public bus	0.0348	$kgCO_2e$/passenger-km
Electricity re-sold		
2020 National grid emission factor	0.4085	$kgCO_2e$/kWh
2018 National grid emission factor	0.4192	$kgCO_2e$/kWh
Waste management		
0% load	0.6529	$kgCO_2e$/km
50% load	0.2350	$kgCO_2e$/tkm
100% load	0.1384	$kgCO_2e$/tkm

REFERENCES FOR EMISSION FACTORS

1. Airports Council International (ACI), Airport Carbon and Emissions Reporting Tool (ACERT) version 4.0
2. World Resources Institute (2015), GHG Protocol Tool for Stationary Combustion version 4.1
3. World Resources Institute (2015), GHG Protocol Tool for Mobile Combustion version 2.6
4. Intergovernmental Panel on Climate Change (IPCC) (2007), Fourth Assessment
5. Energy Market Authority of Singapore (EMA) (2018), Singapore Energy Statistics
6. Energy Market Authority of Singapore (EMA) (2017), Singapore Energy Statistics
7. United States Environmental Protection Agency (US EPA) (2015), Emission factor for greenhouse gas inventories
8. UK Government Conversion Factors for Greenhouse Gas (GHG) Reporting (2016)
9. GHG Protocol, GHG Emissions Calculation Tool version 2.6

APPENDIX B: UN SDG INDEX

CAG mapped each of its material sustainability matters to the SDGs targets. This exercise enables CAG to identify areas where its activities have a direct or indirect impact on the SDGs, and CAG's creation of value in the short, medium and long-term.

The United Nations Sustainable Development Goals (UN SDGs)

CAG's Material Sustainability Matter	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Fair Employment Practices					●			●		●							
People Development				●				●									
GoodCorporate Governance												●				●	
Airport Safety and Security			●								●				●	●	●
Airport Experience and Passenger Satisfaction			●			●			●	●	●	●					
Community Investment				●						●							
Contribution to Economic Development of Singapore								●	●								●
Energy and Emissions Management			●				●	●	●		●	●	●				
Water and Effluents Management			●			●		●	●		●	●	●				
Waste Management			●			●		●	●		●	●	●				

APPENDIX C:
GRI CONTENT INDEX

CAG's Sustainability Report FY20/21 has been prepared in accordance with the GRI Standards: Core option. This GRI Content Index is a navigation tool that provides an overview of which GRI Standards have been used, which disclosures have been made, and where these disclosures can be found. The full content of the GRI Standards is publicly available on the GRI portal (https://www.globalreporting.org/standards).

ABBREVIATIONS
SR: CAG Sustainability Report FY20/21
AR: CAG Annual Report FY20/21

GENERAL DISCLOSURES

Disclosures		Reference(s) or Reasons for Omission (if applicable)
102-1	Name of the organisation	SR: p1
102-2	Activities, brands, products, and services	SR: p1
102-3	Location of headquarters	CAG is headquartered in Singapore
102-4	Location of operations	SR: p1
102-5	Ownership and legal form	SR: p1
102-6	Markets served	SR: p73
102-7	Scale of the organisation	SR: p73
102-8	Information on employees and other workers	SR: p1
102-9	Supply chain	CAG procures services and products from various suppliers and seeks to implement sustainable procurement practices throughout its supply chain.
102-10	Significant changes to the organisation and its supply chain	SR: p73
102-11	Precautionary Principle or approach	SR: p76-78
102-12	External initiatives	SR: p53-57
102-13	Membership of associations	SR: p11-12
102-14	Statement from senior decision-maker	SR: p4-6
102-16	Values, principles, standards, and norms of behaviour	SR: p9, 76-78
102-17	Mechanisms for advice and concerns about ethics	SR: p1-2, 76-78

APPENDIX C:
GRI CONTENT INDEX

GENERAL DISCLOSURES

Disclosures		Reference(s) or Reasons for Omission (if applicable)
102-18	Governance structure	SR: p1; AR: p8-16
102-19	Delegating authority	SR: p1; AR: p8-16
102-22	Composition of the highest governance body and its committees	AR: p8-14
102-23	Chair of the highest governance body	AR: p10
102-29	Identifying and managing economic, environmental, and social impacts	SR: p2
102-30	Effectiveness of risk management processes	SR: p76-78
102-31	Review of economic, environmental, and social topics	SR: p2
102-32	Highest governance body's role in sustainability reporting	SR: p1
102-40	List of stakeholder groups	SR: p10-12
102-41	Collective bargaining agreements	SR: p43
102-42	Identifying and selecting stakeholders	SR: p10-12
102-43	Approach to stakeholder engagement	SR: p10-12
102-44	Key topics and concerns raised	SR: p2
102-45	Entities included in the consolidated financial statements	AR: p66-68
102-46	Defining report content and topic boundaries	SR: p1
102-47	List of material topics	SR: Contents page
102-48	Restatement of information	Nil
102-49	Changes in reporting	Nil
102-50	Reporting period	SR: p1
102-51	Date of most recent report	SR: p1
102-52	Reporting cycle	The Sustainability Report is published on an annual basis.
102-53	Contact point for questions regarding the report	sustainability@changiairport.com
102-54	Claims of reporting in accordance with the GRI Standards	SR: p1
102-55	GRI content index	SR: Appendix C
102-56	External assurance	No external assurance has been sought for this report

APPENDIX C:
GRI CONTENT INDEX

MATERIAL TOPIC: ENERGY AND EMISSIONS MANAGEMENT

Disclosures		Reference(s) or Reasons for Omission (if applicable)
GRI 103: Management Approach (2016)		
103-1	Explanation of the material topic and its Boundaries	SR: p16
103-2	The management approach and its components	SR: p16-20
103-3	Evaluation of the management approach	SR: p17-20
GRI 302: Energy (2016)		
302-1	Energy consumption within the organisation	SR: p17
302-4	Reduction of energy consumption	SR:p21
GRI 305: Emissions (2016)		
305-1	Direct (Scope 1) GHG emissions	SR: p17
305-2	Energy indirect (Scope 2) GHG emissions	SR: p17
305-3	Other indirect (Scope 3) GHG emissions	SR: p17
305-5	Reduction of GHG emissions	SR: p21
GRI-G4 Airport Operators Sector Disclosures: Emissions (2011)		
AO5	Ambient air quality levels	SR:p29-31

APPENDIX C:
GRI CONTENT INDEX

MATERIAL TOPIC: WATER AND EFFLUENTS MANAGEMENT

Disclosures		Reference(s) or Reasons for Omission (if applicable)
GRI 103: Management Approach (2016)		
103-1	Explanation of the material topic and its Boundaries	SR: p33
103-2	The management approach and its components	SR: p33
103-3	Evaluation of the management approach	SR: p34-35
GRI 303: Water (2016)		
303-1	Water withdrawal by source	SR: p34
GRI 306: Effluents and Waste (2016)		
306-1	Water discharge by quality and destination	SR: p34

MATERIAL TOPIC: WASTE MANAGEMENT

Disclosures		Reference(s) or Reasons for Omission (if applicable)
GRI 103: Management Approach (2016)		
103-1	Explanation of the material topic and its Boundaries	SR: p39
103-2	The management approach and its components	SR: p39-40
103-3	Evaluation of the management approach	SR: p40
GRI 306: Effluents and Waste (2016)		
306-2	Waste by type and disposal method	SR: p40

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GRI CONTENT INDEX

MATERIAL TOPIC: FAIR EMPLOYMENT PRACTICES

Disclosures		Reference(s) or Reasons for Omission (if applicable)
GRI 103: Management Approach (2016)		
103-1	Explanation of the material topic and its Boundaries	SR: p43
103-2	The management approach and its components	SR: p44
103-3	Evaluation of the management approach	SR: p44
GRI 401: Employment (2016)		
401-1	New employee hires and employee turnover	SR: p44
GRI 405: Diversity and Equal Opportunity (2016)		
405-1	Diversity of governance bodies and employees	SR: p44
GRI 406: Non-discrimination (2016)		
406-1	Incidents of discrimination and corrective actions taken	SR: p44

MATERIAL TOPIC: PEOPLE DEVELOPMENT

Disclosures		Reference(s) or Reasons for Omission (if applicable)
GRI 103: Management Approach (2016)		
103-1	Explanation of the material topic and its Boundaries	SR: p48
103-2	The management approach and its components	SR: p49
103-3	Evaluation of the management approach	SR: p49
GRI 404: Training and Education (2016)		
404-1	Average hours of training per year per employee	SR: p49
404-2	Programmes for upgrading employee skills and transition assistance programmes	SR: p49-51
404-3	Percentage of employees receiving regular performance and career development reviews	SR: p49

APPENDIX C:
GRI CONTENT INDEX

MATERIAL TOPIC: COMMUNITY INVESTMENT

Disclosures		Reference(s) or Reasons for Omission (if applicable)
GRI 103: Management Approach (2016)		
103-1	Explanation of the material topic and its Boundaries	SR: p53
103-2	The management approach and its components	SR: p53
103-3	Evaluation of the management approach	SR: p54-55
GRI 413: Local Communities (2016)		
413-1	Operations with local community engagement, impact assessments, and development programmes	SR: p54-57

MATERIAL TOPIC: AIRPORT EXPERIENCE AND PASSENGER SATISFACTION

Disclosures		Reference(s) or Reasons for Omission (if applicable)
GRI 103: Management Approach (2016)		
103-1	Explanation of the material topic and its Boundaries	SR: p59
103-2	The management approach and its components	SR: p60-64
103-3	Evaluation of the management approach	SR: p60-64

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GRI CONTENT INDEX

MATERIAL TOPIC: AIRPORT SAFETY

Disclosures		Reference(s) or Reasons for Omission (if applicable)
GRI 103: Management Approach (2016)		
103-1	Explanation of the material topic and its Boundaries	SR: p66
103-2	The management approach and its components	SR: p66-67
103-3	Evaluation of the management approach	SR: p66
GRI 403: Occupational Health and Safety (2016)		
403-2	Types of injury and rates of injury, occupational diseases, lost days, and absenteeism, and number of work-related fatalities	SR: p67
GRI 416: Customer Health and Safety (2016)		
416-2	Incidents of non-compliance concerning the health and safety impacts of products and services	SR: p67

MATERIAL TOPIC: GOOD CORPORATE GOVERNANCE

Disclosures		Reference(s) or Reasons for Omission (if applicable)
GRI 103: Management Approach (2016)		
103-1	Explanation of the material topic and its Boundaries	SR: p76
103-2	The management approach and its components	SR: p77-78
103-3	Evaluation of the management approach	SR: p77-78
GRI 205: Anti-corruption (2016)		
205-3	Confirmed incidents of corruption and actions taken	SR: p76
GRI 307: Environmental Compliance (2016)		
307-1	Non-compliance with environmental laws and regulations	SR: p76
GRI 419: Socioeconomic Compliance (2016)		
419-1	Non-compliance with laws and regulations in the social and economic area	SR: p76

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GRI CONTENT INDEX

MATERIAL TOPIC: CONTRIBUTION TO THE ECONOMIC DEVELOPMENT OF SINGAPORE

Disclosures		Reference(s) or Reasons for Omission (if applicable)
GRI 103: Management Approach (2016)		
103-1	Explanation of the material topic and its Boundaries	SR: p72
103-2	The management approach and its components	SR: p72
103-3	Evaluation of the management approach	SR: p73-74
GRI 203: Indirect Economic Impacts (2016)		
203-1	Infrastructure investments and services supported	SR: p73-74
203-2	Significant indirect economic impacts	SR: p73-74
GRI-G4 Airport Operators Sector Disclosures: Market Presence (2011)		
AO1	Total number of passengers annually	SR: p73
AO2	Total number of aircraft movements	SR: p73
AO3	Total amount of cargo tonnage	SR: p73