

# RESILIENCE & SUSTAINABILITY



Sustainability Report 2019/20

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# RESILIENCE & SUSTAINABILITY

Sustainability has always been a focus at CAG. More than our business, we strive to safeguard our people, our community and the future of our planet. This year, we experienced great resilience due to COVID-19. Anchored on six pillars, the strong foundation built over the years stands as a testament to our commitment and drive.

We are not content to rest on our laurels. In an ever-changing world, we constantly seek to augment our processes and operations, building on our past efforts for the good of all. In doing so, we advance our quest and drive greater sustainability in the next decade and beyond.

### ABOUT CHANGI AIRPORT GROUP

Changi Airport Group (Singapore) Pte Ltd (CAG) was formed on 16 June 2009 and the corporatisation of Changi Airport followed on 1 July 2009. As the company managing Changi Airport, CAG undertakes key functions focusing on airport operations and management, air hub development, commercial activities and airport emergency services.

#### FEEDBACK

We warmly welcome all stakeholders to share their feedback, insights and perspectives about our approach to sustainability and sustainability reporting. These may be directed to sustainability@changlairport.com.

Changi Airport Group 2019-20



Corporate Governance



notices of non-compliance with applicable laws and regulations



employee work-related fatalities





**RANKED** TOP 3

most attractive employer by Randstad for the 6th consecutive year



**VOTED WORLD'S BEST AIRPORT** 

for the 8th consecutive year



**COMMUNITY CHEST VOLUNTEER PARTNER AWARD** 



HR EXCELLENCE **AWARDS** -**EXCELLENCE IN CSR STRATEGY (GOLD)** 







**Environmental** 



APEX
CORPORATE
SUSTAINABILITY
AWARD



JEWEL RECEIVED THE GREEN MARK GOLD PLUS AWARD



5,604 kg

of electronic waste collected



13.5%

waste diverted from incineration



## **CEO's Message**

## STAYING TRUE TO OUR SUSTAINABLE CHANGI COMMITMENT

The Covid-19 pandemic has disrupted the lives of communities world-wide and put a pause to global air travel. Singapore Changi Airport, a major international air hub, has invariably been buffeted by these headwinds. In hindsight, the theme of Sustainable Changi for our inaugural Sustainability Report in 2018 was prescient, for the essence of sustainability is to create a lasting and beneficial impact – in our case, for the airport community, the travellers whom we serve and Singapore residents.

This report affirms Changi Airport Group's (CAG) sustainability focus in support of the United Nations' Sustainable Development Goals. Our foundations across the economic, environmental, social and corporate governance aspects will help CAG and Changi Airport emerge even stronger when air travel normalises post-pandemic. These efforts include creating a greener Changi Airport by reducing our carbon Footprint, ensuring that Changi's infrastructure and operations are resilient to future climate impacts, and leveraging technology to promote a digital-ready and safe work culture. We have also overcome social distancing restrictions, such as transitioning from face-to-face to virtual volunteering with our community partners and leveraging e-learning to upskill the CAG family.

### FLOURISHING PLANET

The consolidation of flight operations to Terminal 1 and Terminal 3 has challenged us to review our electricity consumption patterns. We took the opportunity to trial innovative ways to optimise our key airport systems, including air-conditioning and mechanical ventilation (ACMV) and lighting systems, with the intent to be more energy-efficient when all four passenger terminals are back in operation.

CAG stands in solidarity with our Airports Council International member airports to optimise our carbon footprint. We are accredited at Level 3 of the Airport Carbon Accreditation scheme and are committed to help our airport partners reduce carbon emissions at Changi Airport. For instance, CAG has progressively installed over 120 electric vehicle charging points to enable ground-handlers, SATS and dnata, to transition from diesel-powered to electric baggage tractors. We have also initiated and co-funded a multi-party assessment of the commercial viability of sustainable aviation fuel, which would pave the way for lower carbon emission flights at Changi Airport.

Changi Airport is not immune to the effects of climate change. CAG has protected critical infrastructure from higher mean sea levels and intensive rainfall through a series of flood-prevention barriers and by raising building foundations.

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residents."

We are conducting an enterprise-wide assessment of additional climate risks, including higher ambient temperatures, wind pattern changes and increased lightning strikes, to ensure business continuity and safeguard the well-being of airport workers who are exposed to the weather elements.

### **FULFILLING CAREERS**

Our CAG family of over 2,000 airport professionals responded swiftly to the operational and organisational challenges brought about by the pandemic. To help our colleagues embrace new modalities of working, digital and future-readiness learning opportunities were added to CAG's Learning and Development suite of programmes.

Our talents have always been the basis of CAG's sustainable success. In this regard, CAG continues our efforts with our key talent programmes to identify and nurture passionate students before they enter the workforce, and we continue to develop a pipeline of talents for Changi Airport's longer-term growth and airport developments.

As a testament to our employee development efforts, CAG was ranked amongst the Top 3 Most Attractive Employers in Singapore by Randstad for the sixth consecutive year.



### **SAFEGUARDING LIVES**

A core value of CAG is that "integrity is at the heart of everything we do". There is zero tolerance for bribery and the company's Anti-Bribery Management System (ABMS) was assessed by external auditors to conform to ISO 37001:2016 standards in 2019. We commit to regular surveillance and compliance audits, in order to reduce the risks of bribery occurring in our business and operations.

We leverage CAG's SWEET (Service Workforce Empowerment and Experience Transformation) mobile phone application to inform the airport community of the latest safety practices as well as hazard reporting. This many-eyes approach to hazard reporting yielded over 1,700 hazard reports for Financial Year 2019/20, each of which represented a hazard which was mitigated in a timely manner.

Beyond the current disruptions, we are laying the groundwork for Changi Airport to handle increased aircraft movements. In this regard, our colleagues who are in the Runway 3 Certification Workgroup have been preparing for the safe opening of Changi Airport's third runway, including undergoing certification audits based on international aviation standards.

### **ENRICHING COMMUNITIES**

Changi Foundation was established by CAG in 2012 with the vision of "Connecting with youths today, Empowering them for a better tomorrow". More than 3,000 youths were touched through the support from Changi Foundation in 2019. In addition to employee volunteerism and social outreach activities, Changi Foundation coordinates a job attachment programme where the student beneficiaries are paired with airport organisations and tenants. There were over 140 of these attachments in 2019.

The Social Competence Learning Programme gives the student beneficiaries an opportunity to acquire independent living skills, such as purchasing groceries and visits to the clinic. This year, students were given the opportunity to try out tele-medicine with our Raffles Medical Group partner, in lieu of on-site clinic visits, and the experience was a rewarding one for everyone involved.

## SUSTAINABILITY AND RESILIENCE

Sustainability is integral to CAG's long-term survival and relevance to the aviation industry. As an indication that we are heading in the right direction, CAG received the United Nations Global Compact Singapore's Apex Sustainability Award in 2019.

The evolving pandemic situation is a timely reminder that CAG has to be ready for fast-moving and unexpected external shocks. With our equally committed airport partners, we stand ready to increase our resilience together.

We will stay true to course on our sustainability journey, to ensure that future generations of travellers and Singaporeans to enjoy the Changi experience.

2 ....

**LEE Seow Hiang**Chief Executive Officer

#### **ABOUT THE REPORT**

CAG's intent is to capture, measure progress and drive overall sustainability action across Changi Airport. This report is intended to be useful to stakeholders as it communicates CAG's shared Sustainable Changi vision, approach and performance.

### **REPORTING SCOPE**

The report covers the assets and operations under CAG's business control at Singapore Changi Airport for the period of 1 April 2019 to 31 March 2020, unless otherwise stated. The scope covers the activities of the four passenger terminal buildings and at the 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. The GRI Standards have been selected as they are a leading global standard for sustainability reporting. CAG 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 is also disclosing Changi Airport's impact on, and contributions to, the United Nations (UN) Sustainable Development Goals (SDGs). 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.

## **BOARD OF DIRECTORS**

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

## **MANAGEMENT COMMITTEE**

Management validates CAG's material sustainability matters and sets directions on sustainability strategies, policies, practices and targets.

They monitor CAG's sustainability performance and provide periodic updates to the Board.

# CAG'S SUSTAINABILITY APPROACH

## **Sustainability Governance**

CAG believes that operating in a sustainable manner is a natural extension of its business and principles. Sustainability has to be integrated across all levels of the organisation and every individual in CAG plays an important role in contributing to sustainable development. This is why CAG's Sustainability Governance structure largely mirrors that of its Organisation Structure, with its leadership being the vanguard of positive change.



## **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
ô Q	Employee well-being	<ul> <li>Recognition schemes (e.g. Core Value Awards)</li> <li>Employee Engagement Survey</li> <li>Participatory dialogue – Townhall</li> <li>Health programmes</li> <li>In.Touch Mobile App – Intranet</li> </ul>
	Employee development	<ul> <li>Staff orientation sessions</li> <li>Formal skills training, learning trips</li> <li>Annual performance review</li> <li>In.Touch Mobile App and Electronic Direct Mailers</li> <li>Community volunteering</li> </ul>
N-Y7)-11 (1	Innovation	• Innovation workshops and in-house talks
CAG Employees	Occupational health and safety	<ul> <li>Safety Management System</li> <li>Emergency drills (e.g. Exercise Northstar, Exercise Bobcat)</li> <li>Safety audits</li> </ul>
	Corporate governance and internal controls	<ul> <li>Key and ad-hoc committees and working groups</li> <li>Internal audits and inspections</li> <li>Anti-bribery Management System</li> </ul>
	Compliance with statutory/ legal requirements	Compliance with statutory/legal requirements
Contractors & Suppliers	Compliance with legal requirements and CAG's standards Service performance standards Supply chain management	<ul> <li>Procurement policy and tendering procedures</li> <li>Compliance audits</li> <li>Quality Service Management training</li> <li>Recognition awards (eg. Annual First Class Service Act)</li> <li>Supplier evaluation</li> </ul>
Airport Business Partners	Airport planning and development Business continuity planning	<ul> <li>Forums and conferences (e.g. Changi Aerodrome Operational Safety Forum, Changi Airport Community Environment Forum)</li> <li>Regular and needs-based meetings (e.g. Changi Airport Airside Operational and Safety Committee meetings)</li> <li>Consultations (e.g. Singapore Changi Airport Operations Committee)</li> </ul>
	Airport safety and security	<ul> <li>24/7 in-house Airport Emergency Services</li> <li>Online safety reporting and incursion apps (In.Touch, iFeedback, SWEETmini, RIPPLE)</li> <li>24/7 hazard reporting hotline</li> </ul>
	Recognition of contributions from the airport community	<ul><li>Annual Airport Celebration</li><li>Airport Safety Awards</li><li>Extra Mile Awards</li></ul>
	Collaborative innovation	Trials to test-bed new technologies
	Compliance and corporate governance	<ul><li> Airport orientation programmes</li><li> Control centres</li><li> Aerodrome safety audit</li></ul>
	Customer feedback and consumption trends	Sharing of survey results and findings

Key Stakeholder Groups	Key Interests	Key Engagement Methods
Passengers & Visitors	Passenger experience and satisfaction	<ul> <li>Customer service (e.g. information counters, mobile Changi Experience Agents)</li> <li>Real-time Instant Feedback System for swift action</li> <li>iChangi one-stop app for flight, airline and airport information</li> <li>Fault reporting hotline</li> </ul>
	Airport attractions	<ul> <li>Festive and themed events</li> <li>Retail and F&amp;B offers and incentives</li> <li>Web and social media platforms (Changi Media Centre)</li> </ul>
Government & Regulators	Airport planning and development	<ul><li>Dialogue with government ministries and agencies</li><li>Participating in regional groups</li></ul>
	Compliance	Reporting to CAAS and statutory agencies in compliance with regulatory requirements
	Contribution to Singapore's national objectives	<ul> <li>Consultative meetings and briefings with CAAS and Ministry of Transport and relevant government agencies</li> </ul>
Non-Governmental Organisations (NGOs)	Networking	Forums and conferences
	Collaboration and partnerships	Joint exhibitions and meetings
NEWS Media	Airport developments and features	<ul> <li>Media briefings and airport visits</li> <li>Meetings with key media outlets</li> <li>Press releases and publications (e.g. Annual Report)</li> </ul>
Community	Contributing to our wider community	<ul> <li>Changi Foundation programmes</li> <li>Employee volunteering at various charity and social service agencies</li> <li>Curriculum advisory support for tertiary education institutions and the Singapore Aviation Academy</li> </ul>

## **Materiality Assessment**

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

CAG undertook the process of identifying, prioritising and validating the important sustainability matters that are material to CAG and its stakeholders.



## 1. Identification

AN EXTENSIVE LIST OF POTENTIAL MATERIAL SUSTAINABILITY TOPICS WAS DETERMINED THROUGH THE FOLLOWING TESTS OF MATERIALITY.

### Media analysis

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

### Stakeholder engagement

- Internal focus group discussions with CAG's Sustainability
   Working Group to understand the sustainability impact on as well as the key and key interests and expectations of stakeholders
- Understanding the needs and concerns of external stakeholders through day-to-day interactions

### Value chain review

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

### Industry scan and peer evaluation

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

## 2. Prioritisation

CAG'S MANAGEMENT COMMITTEE PRIORITISED THE TOP SUSTAINABILITY MATTERS THAT ARE IMPORTANT TO US AND OUR STAKEHOLDERS.

### Materiality workshop

- Internal focus group discussion to prioritise material sustainability matters based on their significance to CAG at a strategic level, as well as their pertinence to stakeholders and society
- These are economic, environmental, social and governance matters that substantively influence the assessments and decisions of of stakeholders

INTERNAL FOCUS GROUP DISCUSSION BY CAG'S MANAGEMENT COMMITTEE

## 3. Validation

A TOTAL OF 10 SUSTAINABILITY MATTERS WERE VALIDATED AS MATERIAL AND ALIGNED UNDER SIX SUSTAINABILITY THRUSTS THAT RESONATE WITH CAG.

### Management validation

 The Management Committee works closely with the various divisions to validate, communicate and embed sustainability priorities within CAG

# CAG's Contribution to the Sustainable Development Goals

Evaluating the impact arising from the management of its material topics from a value chain perspective, CAG has identified 5 SDGs (and 18 SDG targets) as its key priority and impact areas, and 9 SDGs (and 24 SDG targets) as 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.

STRATEGIC THRUSTS	MATERIAL MATTER(S)	TARGETS	PERFORMANCE FY19/20
Flourishing Planet	Energy and Emissions Management	Maintain ISO 14001:2015 certification	Achieved
	Water and Effluents Management		
	Waste Management		
	Energy and Emissions Management	Maintain Airport Carbon Accreditation (ACA) Level 3 certification	Achieved
	Waste Management	Achieve 8.5% waste recycling rate by FY2019/20	Surpassed
Fulfilling Careers	People Development	Employees attending at least 1 training programme, yearly	On track
Safeguarding Lives	Good Corporate Governance	Zero tolerance for corruption	Existing Policy
		Zero notices of non-compliance with applicable laws and regulations, yearly	Achieved
		Zero number of fines, yearly	Achieved
	Airport Safety	Zero employee work-related fatalities, yearly	Achieved
		Deficiency-free rating from the International Federation of Air Line Pilots' Associations (IFALPA), yearly	Achieved
Enriching Communities	Community Investment	Achieve 25% employee volunteerism yearly by FY2020/21	On track
		Achieve 3,000 volunteer hours yearly by FY2020/21	On track
		To offer minimally 80 job attachments to youth beneficiaries yearly from FY2020/21 onwards	On track





As an international air hub, CAG connects the world sustainably and responsibly. Amidst the challenges that COVID-19 brought about, CAG still remains steadfast in our environmental commitments and continues to strengthen our internal systems to ensure that we reach our goals. We persist in environmental innovation as an investment in a future with a flourishing planet.

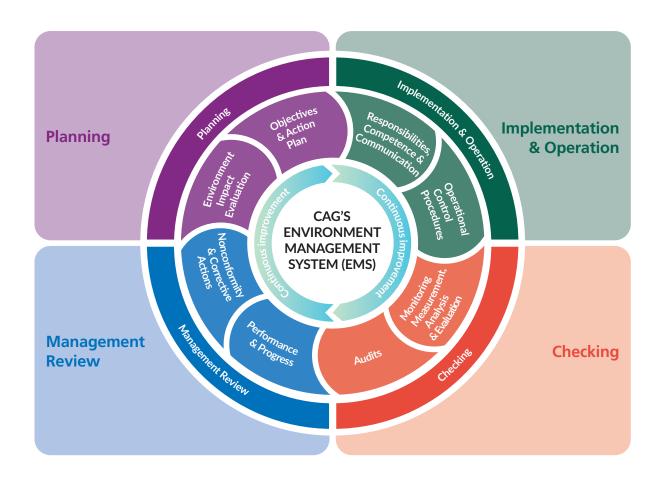
## **Our Environmental Footprint**

## **Changi Airport Group**

The proactive management of our environmental footprint enables us to protect human health, increase resource and energy efficiency, lower GHG emissions and minimise our impact to the wider community.



- † FY2019/20 energy and GHG emissions data is subject to validation in accordance to the Airport Carbon Accreditation methodology
- # Average air quality indicators across Terminals 2 and 3 from the Industrial Hygiene Monitoring study in 2019/20.



## OUR ENVIRONMENTAL POLICY

CAG's commitment to the sustainable development of Changi Airport is demonstrated through the close engagement of the airport community in effecting our environmental policy through our procurement preferences, compliance tools, supplier code of conduct and guidelines to airport users. This ensures that high environmental standards are maintained by CAG and our partners in:

 conducting activities responsibly while lowering pollution to safeguard the local community;

- continually improving our environmental performance to meet our targets through innovative technologies and behaviour shifts; and
- adhering to all environmental legal and compliance obligations

## OUR ENVIRONMENTAL MANAGEMENT SYSTEM (EMS)<sup>1</sup>

CAG's Environment Steering
Committee oversees and drives
CAG's environment performance
to reach our targets. Our EMS
consists of a documented
EMS manual that consists of
CAG's environmental system
procedures and operational
control procedures to facilitate
the effective implementation of
our environmental management
system.

Our EMS is ISO 14001:2015 certified with annual internal and external audits conducted with continual improvements seen over the years in accordance to the Plan-Do-Check-Act (PDCA) cycle. Every CAG employee plays a key role in upholding these standards and creating a culture of identifying environmental risks and opportunities in their everyday work. Our contractors, suppliers and airport stakeholders are subject to these environmental audits and enforcement of environmental requirements to ensure a pleasant environment for all.

<sup>1</sup> CAG's EMS covers airport management and operations, development and construction at Changi Airport within CAG's control and sphere of influence.



## Our Priorities

Airports worldwide are setting long-term carbon reduction targets with multiple trajectories for various future scenarios. CAG's emissions reduction target for 2030 drives our transition to a low carbon future. CAG prioritises investment in reducing its largest source of emissions – energy used to cool our buildings. This includes building design, highly efficient systems and strategies to reduce our building load.

CAG is tackling the cause of Climate Change at its source in reducing our emissions footprint. Yet, we are also adapting our infrastructure and systems in light of the climate change projections for Singapore. CAG collaborates with partners who innovate and develop sustainable alternatives that enable the airport community to build its climate resilience and reach its emission reduction goals.

## Our Processes



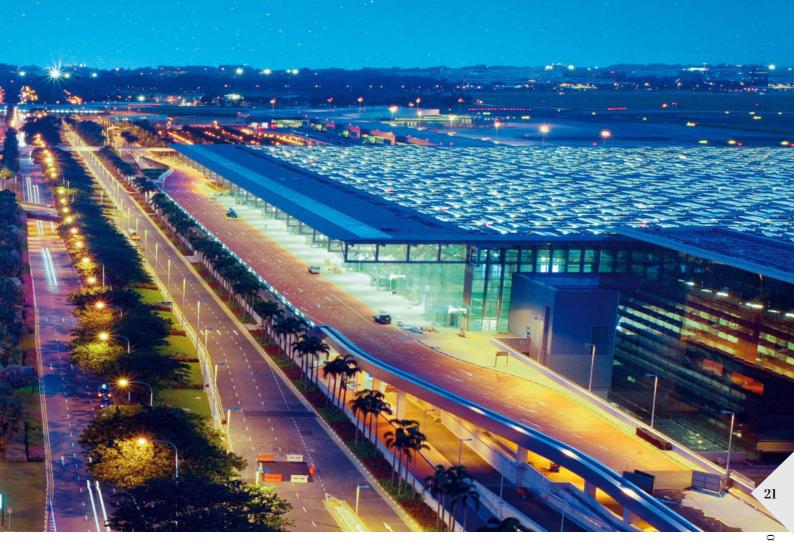
### **POLICIES**

- 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



## **ACHIEVED**

Maintain ACI Airport Carbon Accreditation Level 3 certification



## **ACHIEVED**

Maintain ISO14001:2015 certification

## Our Change Agents



## Our SDGs













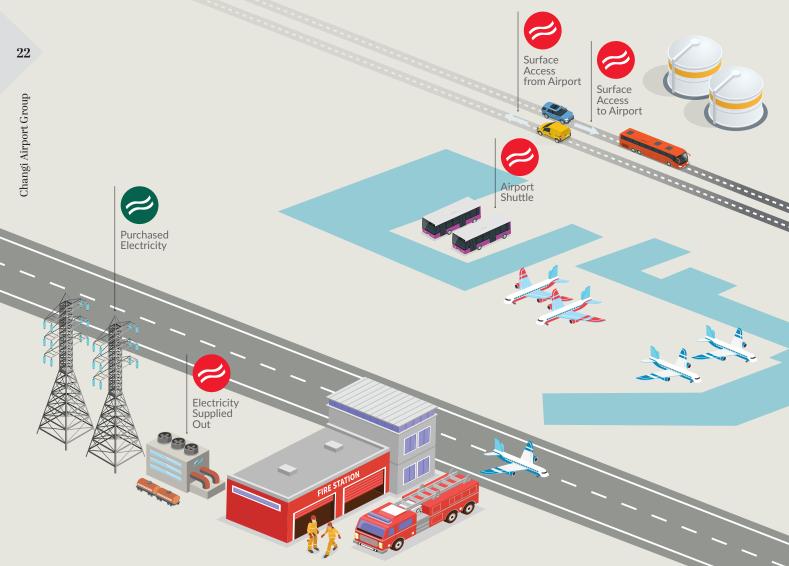


## **CAG's Carbon Footprint**

305-1 305-2 305-3

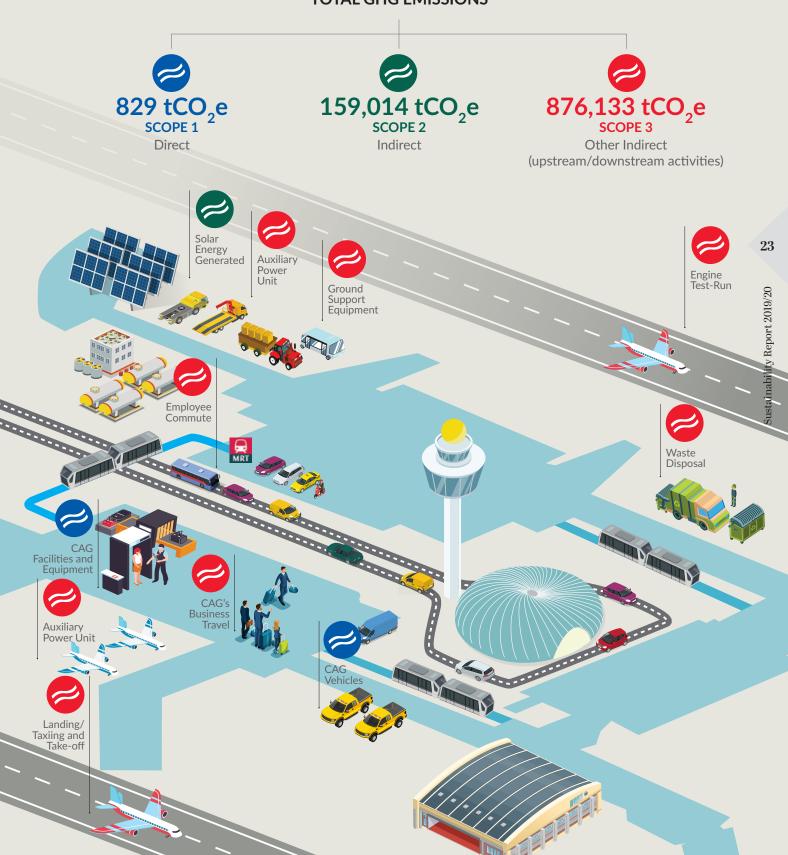
Our carbon footprint is mapped in accordance to the GHG Protocol and ACI's Airport Carbon Accreditation methodology. Our carbon accounting includes:

- Scope 1: All direct GHG emissions including airport fleet vehicles and stationary sources that are owned and controlled by the airport
- Scope 2: Indirect GHG emissions from the consumption of electricity procured by the airport
- Scope 3: Other indirect emissions including tenant, airline and ground handling emissions as well as public transport



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. FY2019/20 data is subject to validation and excludes T4 and emissions under CAG's operational control in Jewel in accordance to the ACA calculation methodology. Data for T4 and CAG Jewel is being measured and will be included in subsequent reports after 2 full years of accounting.

## 1,035,976 tCO<sub>2</sub>e



## Carbon Management

Singapore effected the carbon tax as part of its goal to transform Singapore into a low-carbon economy and to sustain a liveable environment. The carbon tax translates into an increased price of electricity procurement for Changi Airport. CAG and the airport community will be increasingly compelled to reduce energy usage and improve energy efficiency. Alongside the carbon tax, CAG proactively encourages collective action with its airport partners to develop and deploy low-carbon technologies.

Singapore has once again pushed its boundaries to explore opportunities to tap on regional power grids for access to cleaner energy resources, given our land constraints. This would lower our nation's grid emissions factor and significantly reduce CAG's carbon footprint.

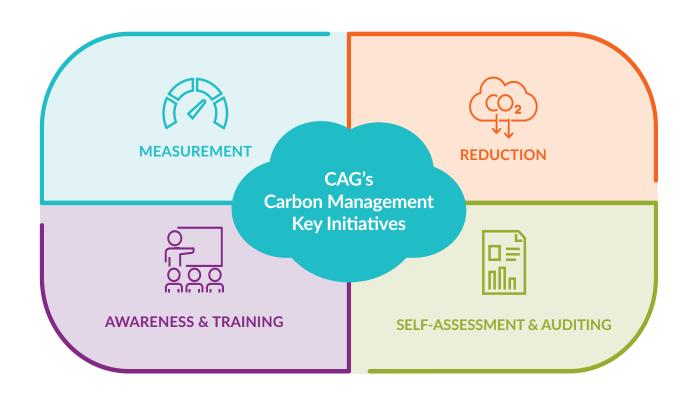
CAG adopts a four-pronged approach towards managing our carbon emissions together with our airport partners.

### **MEASUREMENT**

CAG is actively tracking its energy usage in mapping its Scope 1, 2 and 3 emissions.

We update our emissions inventory annually with monitoring and reporting methods that will ensure a reasonable level assurance for ISO14064-3:2006 standard, the Greenhouse Gas Protocol (GHG Protocol) and the Airport Council International (ACI) Airport Carbon Accreditation (ACA) scheme.

To ensure accuracy in our measurements, CAG has a digital Energy Management System to track our energy usage at a systems level for the common areas in our terminals.



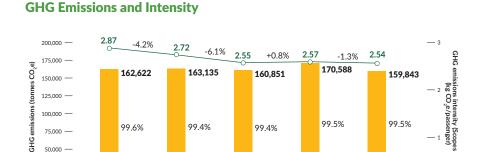
<sup>2</sup> CAG's EMS covers airport management and operations, development and construction at Changi Airport within CAG's control and sphere of influence.

## Carbon Management: Measurement

### **GHG EMISSIONS**

A total of 1,035,976 tonnes  $CO_2e$  of GHG emissions<sup>2</sup> was recorded in FY2019/20, with Scope 1 and 2 accounting for 0.1% and 15.3% respectively. Scope 3 emissions form the largest proportion of our footprint at 84.6%.





0.6%

FY2017/18

0.5%

FY2018/19

0.5%

FY2019/20

Scope 1 Scope 2 --- GHG emissions intensity

0.4% FY2015/16

GHG emissions (Scopes 1 and 2)

159,843

tCO<sub>2</sub>e GHG emissions

2.54

Emissions intensity
(kgCO<sub>2</sub>e/passenger)

Emissions over the average of the past 3 years

0.6%

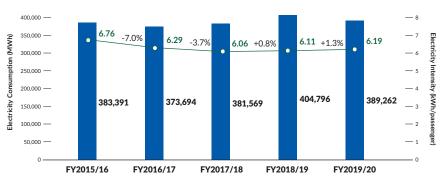
FY2016/17

### **ELECTRICITY CONSUMPTION**

Electricity consumption constitutes 99.5% of CAG's Scope 1 & 2 emissions with the majority being used to power our air-conditioning systems followed by terminal lighting and baggage handling systems.

In FY2019/20, total electricity consumption<sup>3</sup> across T1 to T3 was 389,262 MWh, a 1.3% increase in electricity intensity from FY2018/19.

### **Electricity Consumption and Intensity**



Electricity Consumption -O- GHG emissions intensity

389,262
Total electricity consumption (MWh)

**6.19**Electricity intensity (kWh/passenger)

- 2 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. FY2019/20 data is subject to validation and excludes T4 and emissions under CAG's operational control in Jewel in accordance to the ACA calculation methodology. Data for T4 and CAG Jewel is being measured and will be included in subsequent reports.
- 3 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), T4 and CAG's electricity usage in Jewel, from the total electricity imported. The full methodological approach can be found in Appendix A.

## Carbon Management: Reduction & Assessment

## CARBON REDUCTION MEASURES

305-5

CAG prioritises and constantly looks for ways to reduce Scope 1 and 2 GHG emissions that are directly within our direct control and influence. Majority of our emissions stem from air-conditioning and mechanical ventilation (ACMV), and lighting, which constitute around 70% of our electricity consumption. CAG's energy reduction strategy focuses on reducing the baseline consumption of these existing systems and sourcing for energy innovation that can reduce our building cooling load.

CAG has also seized every opportunity to reduce our carbon footprint, especially at the onset of COVID-19 and extremely low passenger traffic. The energy conservation measures of our ACMV and lighting systems during off-peak timings were implemented and extended during the COVID-19 months.

## AIRPORT CARBON ACCREDITATION



CAG is accredited at Level 3 of the Airports Council International's Airport Carbon Accreditation, which represents CAG's commitment to continuously engage airport partners to lower carbon emission across Changi Airport. Pushing boundaries to create an even more sustainable Changi Airport can only be achieved by working with airport community proactively.

In order to maintain the integrity of carbon accounting amidst COVID-19 impacts to the aviation sector, ACI has issued guidelines in the extension of the ACA reporting period to two years instead of one year.

This allows for the exclusion of carbon emissions data that have been skewed by COVID-19 impacts. CAG will however still continue to measure and track our carbon footprint for FY19/20. CAG also reports our energy data annually in accordance to the Energy Conservation Act.

Field audit in June 2019 with our ACA Verifier and CAG Engineering and Facilities Management teams to validate the scope of equipment and assets reportable under ACA.



Left: Poh Hong Wee (Facilities Management Planning) Right: Samuel Phua (ACA Verifier)



Left: Samuel Phua (ACA Verifier) Right: Abdul Karim Bin Taib (CAG Airfield Systems) Behind: Win Kyaw Tun (ENGIE Services)

### **AWARENESS AND TRAINING**

CAG invests in training programs for its employees to further their competence on issues related to the environment, energy and emissions. An ACA Workshop was conducted to enable various airport community stakeholders to quantify carbon reduction measures, identify the availability of capital expenditure for implementing these measures and acquire additional competencies in emissions operational control and boundary assessment.

CAG also continues to engage more widely with the airport community and public sector in fostering partnerships to accelerate sustainability outcomes in Changi Airport. Our annual Changi Airport **Community Environment** Conference in 2019 brought together a broad range of experts sharing industry best practices on Climate Resilience, Circular Economy and Energy Innovation. Over 190 stakeholders across 62 organisations (from CAG, Changi Airports International, government agencies, airlines, airport ground handlers, technology providers, engineering, logistic and waste management companies) came together to collectively map the environmental goals for Changi Airport.

## AIR QUALITY Indoor Air Quality

We consistently monitor and improve our indoor terminal







"Our destination is a shared future" brought the airport community and other industries together to explore possible areas of synergies for collaboration

air quality in accordance with the Singapore Standard Code of Practice for Indoor Air Quality (SS554:2016). These parameters – air temperature, relative humidity, air movement, carbon dioxide, carbon monoxide, formaldehyde, volatile organic compounds, respirable suspended particles, PM2.5 and viable bacterial count – are monitored across 2,000 points to secure high air quality standards within our terminal buildings.

### **Ambient Air Quality [A05]**

We continue to conduct third-party Industrial Hygiene Monitoring tests annually in our baggage handling areas with an additional parameter, Nitric Oxide, included this year to further safeguard the health of our airport workers. All parameters are well within the Permissible Exposure Limits stipulated by the Ministry of Manpower (MOM) with most measurements showing an improvement in air quality compared to last year's data. This can be attributed to the reduction in vehicles fumes due to the increased conversion of diesel to electric vehicles in the airside. Also, more frequent replacement of air circulation filters to improve the ventilation and air flow beyond requirements.

## Carbon Reduction

## **ENERGY SAVINGS THROUGH DYNAMIC SYSTEM RESPONSIVENESS DURING COVID**

The onset of COVID-19 caused aircraft and passenger traffic to drop more than 99% of pre-covid levels. CAG reacted quickly to the impact by implementing prudent measures across the terminals to consolidate access to dedicated zones and dial back systems no longer planned for near-term use. This dynamic response to changing demands on our systems have resulted in massive energy savings whilst ensuring that safety and air quality standards are met.

### **Air-conditioning Systems**

When T2 and T4 were closed, and with T1 and T3 operating at less than 50% of capacity, the air conditioning systems saw a reduction in the operational cooling load that resulted in energy cost savings of 40-50% compared to pre-COVID times.



Chillers operating at reduced capacity in T3 due to lower cooling demand

### Lighting

General lighting across the terminals was reduced by 50% or more depending on the time of the day or night. Half of the existing circuitry was switched off and light intensity has been dimmed by half. All lighting for aesthetic purposes are switched off. The lighting control schedule has also been optimised to extend the duration of lower lighting levels.

All these lighting adjustments were carried out ensuring safety standards are still maintained for our airport community.

### **Lifts, Escalators & Travellators**

Lifts, escalators and travellators in non-operational areas of the terminals are shut off. Selected lifts per cluster area are kept operational at all times to ensure accessibility for all.





Light intensity dimmed by half in T3 transit area

### Departure Façade Uplighters



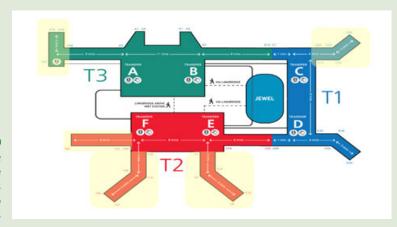
Aesthetic uplighters for T1 Façade switched off

### Departure Hall Daylighting & Binnacle



Dimming of lights in T3 Departure Hall during low-use periods at night and switching off nonessential Binnacle lighting

### **ENERGY SAVINGS THROUGH DYNAMIC SYSTEM RESPONSIVENESS DURING COVID**



Travellators that serve passengers to and from the extreme ends of our terminals have been shut down due to closure of these finger piers

## Baggage Handling System (BHS) and Hold Baggage Screening System (HBS)

The phased dialing back of our BHS, HBS and Inter-Terminal Transfer Baggage System from being on Power Save mode due to the reduced throughput and finally to being shut down has resulted in significant energy savings.

Regular health checks on our BHS are still being carried out despite being shut down to ensure operability during demand recovery.



Baggage handling system in T4 in shut down mode

### **Passenger Loading Bridges (PLB)**



Electrical systems have been shut down at the PLBs and aircraft stands that do not have flight operations

CAG has been careful on the selection of systems to shut down, especially in adhering to safety and regulatory requirements. CAG also pre-empts the maintenance requirements of certain equipment and continues to keep selected systems powered where electrical components may turn faulty if power is lost for a prolonged period of time.

More than 70% energy savings have been achieved compared to pre-covid operations with these measures.

### **People Mover Systems**

With the significant drop in ridership of Changi's Skytrains especially on routes serving the transit area, there has been a reduction on the frequency and operating hours of skytrains serving the public areas and full closure of trainlines serving certain transit areas. These have resulted in more than 90% energy savings.



Skytrains that are not in use are parked in their docking station

During this period, CAG remains agile and adaptable for on-demand operations and is actively maintaining the airport equipment and systems to be ready for recovery as green lanes and travel bubbles open up with other countries.

# **Energy and Water Monitoring**

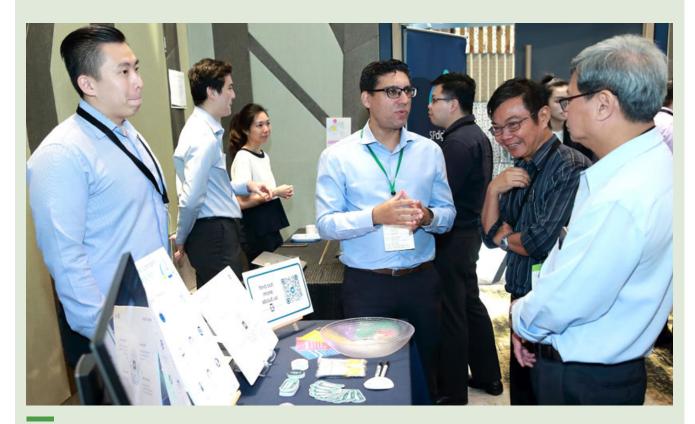
### **EMPOWERING TENANTS IN OPERATIONAL AND ENERGY EFFICIENCY**

Tenants use about 20% of the energy consumed in Changi Airport. We have seen a growing demand in energy consumption from our tenants with more retail and F&B spaces being added to the ever-expanding Changi Airport real estate.

As a building owner, CAG tested smart metering at T3 with the aim of working more closely with tenants in optimising their energy consumption.

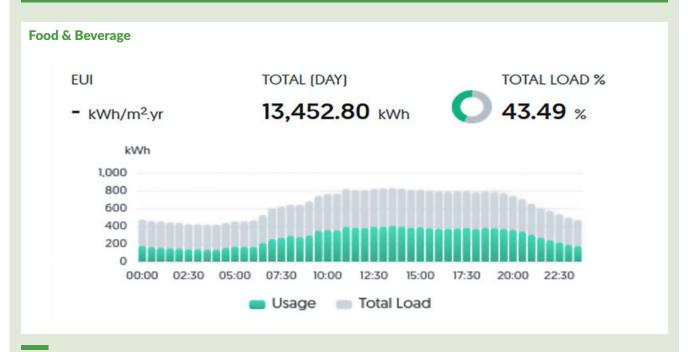
An emerging strategy for building owners is to proactively monitor tenants' electricity and water consumption through a robust and accurate metering system. With the acquisition of holistic and granular utility data, CAG can then better measure consumption and tailor our tenant engagement programmes, energy and water management policies to drive optimisation toward our sustainability goals.

The smart metering system also acts as an enabler to automate and digitalise the labour-intensive, manual meter reading process that is prevalent in most commercial premises. The productivity gain from automating over 600 electricity and water meters in 250 tenants outlets in Terminal 3 will be significant.



Sharing digital energy and water solutions with airport partners to promote sustainability

### **EMPOWERING TENANTS IN OPERATIONAL AND ENERGY EFFICIENCY**



Dashboard showing the energy consumption profile of selected tenants in Terminal 3

Increasingly in the future, smart meters will enhance CAG's capabilities in data analytics and increase our operational efficiency alongside our tenants' by allowing us to:

- Establish the utility consumption trend for each tenant
- Track meter status and detect consumption anomalies
- Generate reports for utility billing and analysis
- Develop consumption benchmarks and engage tenants in optimising their energy and water usage





Smart electricity (left) and water (right) meters installed in tenant premises at T3



## Our Priorities

Working towards a Zero Waste airport, CAG strives to integrate its waste management practices and works with partners to improve its waste recycling rate, constantly look out for opportunities that efficiently uses its resources and technologies that could help minimize 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
- Exploring and trialling technologies to reduce waste volumes
- Building stakeholder awareness



## Our Targets



## **ON TRACK**

Surpassed waste diversion from incineration rate of 8.5% for passenger terminals by FY2019/20

## Our Change Agents



- PEOPLE TEAM

- ENGINEERING & DEVELOPMENT

**ENVIRONMENT & STABILITY** 

## Our SDGs











## Waste Management





## 16,213 tonnes

Total waste disposed at four terminal buildings

## OPERATIONAL CONTROL PROCEDURES

(103-2) (103-3)

At CAG, we have set in place rigorous procedures to ensure that waste generated are properly segregated to the different waste streams and disposed or recycled through licensed waste contractors. The review of processes against alignment with local statutory requirements, potential risk assessment and mitigation controls are part of these procedures. Together with consistent communication with our waste contractors, all these processes are regularly audited and guided by our Facilities Management team.

## WASTE DISPOSAL AND DIVERSION

(306-2)

In FY19/20, 16,634 tonnes of waste was disposed from the four terminal buildings and the amount of waste diverted from incineration increased from 8.5% to 13.5%. This was mainly due to the increased amount of glass bottles and carton boxes recycled and the impact on passenger traffic from the Covid-19 pandemic. Currently, we have exceeded Singapore's national recycling rate of 8.7% for malls and are constantly pushing the boundaries to set higher waste diversion targets.

## PARTNERING OUR STAKEHOLDERS

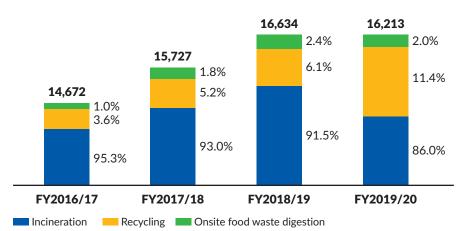
Efficient waste management processes and responsible resource consumption requires the holistic effort of an airport community. CAG recognises the importance of continuously engaging our stakeholders in this aspect and actively explore different ways to do so. Every year, we invite airport partners, tenants, cleaners and other vendors to attend our Green Christmas event lined up with talks, exhibits. hands-on workshops and interactive games that promote environmental awareness. In 2019, the Christmas event focused on waste management to encourage recycling, upcycling and repurposing of materials amongst 1,000 over attendees.



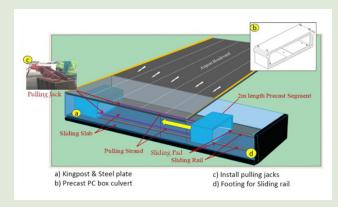


Sustainability-themed Christmas event in December 2019

## Non-hazardous Waste Disposed, by Disposal Methods Weight of waste (tonnes)



#### **BUILDING FOR THE FUTURE WITH LESS WASTE**





At CAG, besides building the airport on higher platforms above the mean sea level to guard against effects of climate change, the other precaution that we take is to increase the capacity of the airport's drains, to reduce the risk of flooding during intense rain. This is to ensure that Changi Airport continues to operate uninterrupted to serve passengers and customers.

In the upgrading of the airport drainage network, a new drain of 530m in length was planned to be built along Changi's Airport Boulevard, with 50m of it stretching across the road. The major road with high-traffic volume leads to all 4 terminals throughout the year. In the past, a traditional "open-cut" construction method would be used to construct the drains. This would mean that every night over a period of months,

the road surface of Airport
Boulevard will have to be hacked
and removed for drainage works
to be carried out underneath
and temporarily reinstated with
asphalt before allowing traffic
to resume. In order to maintain
the structural integrity of the
road for vehicles to safely drive
through, a new batch of asphalt
will have to be used to resurface
the road each time.

Seeing the opportunity to improve productivity and overcome material wastage, we decided to adopt an innovative "Pull and Rail" method together with our contractor using prefabricated segments of culvert drains which are made off site. A tunnel was excavated under the road with the segments lowered into the entry point of the tunnel and then pulled using a mechanical jack, till it reached the other side of the road. This eliminated the need to

repeatedly resurface the road and minimised the impact to traffic flow. In addition, it has helped to reduce the usage of asphalt by 42% and improved productivity by 20% compared to the traditional construction approach.

Together with our partners, we continue to seek new and innovative ideas in sustainable construction methods, processes and products.

- Eliminated repetitive works on the road with minimal impact to traffic flow
- 5,110 manhours saved
- 384 tonnes of asphalt waste saved
- Shorter lead time to complete works
- Safer working environment for workers and road users

# Waste Management

#### **REPURPOSING OF LANDSCAPE MATERIALS**

With cost cutting measures during the Covid-19 pandemic and getting a head start on planned upgrading works for Terminal 2, Changi suspended the operations of Terminal 2 for expansion works to commence earlier. Current landscape materials such as plants, rocks, driftwood and other ornaments initially used at the Terminal were re-used at other areas of the airport to avoid any wastage of the material.







Pumice stones, garden slabs and rocks were saved from disposal for reuse at the Airport Boulevard and Terminal 3

Over 1,000 plants have been salvaged from Terminal 2 Arrival Hall and reused to Terminal 3 Baggage Belt Landscape and Greenwall.

Re-using landscape ornaments displayed from previous festival decorations has also been regularly practised. This is done through in-house upcycling, mass-producing of ornaments and setting up of displays using the nursery plants. Such efforts have shown to not only reduce the airport's waste outflow but also resulted in cost savings, while ensuring that passenger experience is continued with vibrant floral displays in the terminals.







Terminal 1 and 3 displays for this year's National Day of Singapore were pieced together with refurbished materials used previously and colourful plants from the Nursery

Horticulture staff conducting workshops for other departments on how to make Christmas ornaments from waste materials from the airport gardens

#### **ENCOURAGING E-WASTE RECYCLING**



**5,604 kg** e-waste collected from the airport community



Recycling bins for E-waste at CAG office

CAG also recognizes the potential of e-waste recycling. While e-waste contains valuable materials, there are also harmful substances that could potentially harm our environment and health if not

handled properly. Over the years, we have introduced a number of e-waste recycling initiatives that include e-waste collection from CAG departments, yearly e-waste collection drive with airport partners and textile

donation drives. With the implementation of e-waste bins in the office and increased awareness of e-waste recycling amongst employees, the collection rate quadrupled as compared to the previous year.

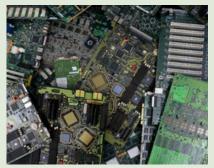
#### **STRETCHING LIFESPANS OF DEVICES**

In the past, utility meters owned by tenants were usually decommissioned after their tenancy period have ended. These meters had compatibility issues that required replacement within a short span of time resulting in inefficient use of resources. The introduction of smart meters however, enabled more robustness through regular software updates of the smart meters. As the metering system is owned by CAG, tenants no

longer need to replace the meters when tenancy expires. The meters are retained for use by the next tenant. This enables the extension of meters use till its full lifespan of 10 years.

In the process of converting conventional meters to smart meters at Terminal 3, CAG worked with an e-waste recycling company to collect the old meters and recovered 314kg of valuable metals and plastics.









# FULFILLING CAREERS

Our people stand at the heart of all we do. Every award and accolade is a testament to the teamwork, integrity and spirit of excellence demonstrated by each individual.

At CAG, we aspire for our people to have fulfilling careers. By continually investing in them and shaping a work environment anchored on diversity and equal opportunities, we support our people towards achieving their potential and fulfilling their aspirations within our organisation.



#### 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 1

• CAG's Learning Policy



#### **PRACTICES**

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



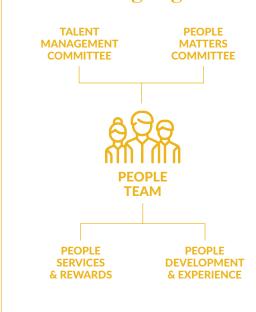
## Our Targets



#### **ON TRACK**

Employees to attend at least 1 training event, yearly

### Our Change Agents



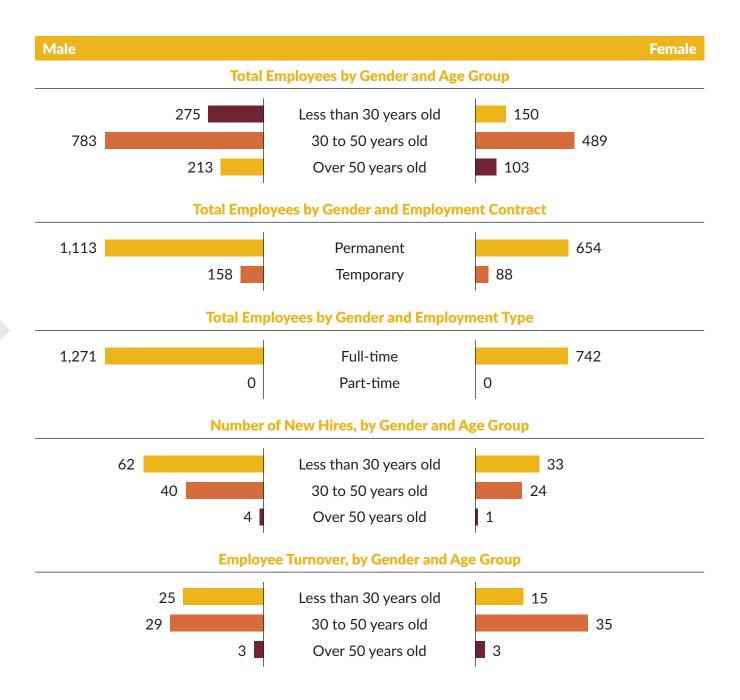
### Our SDGs





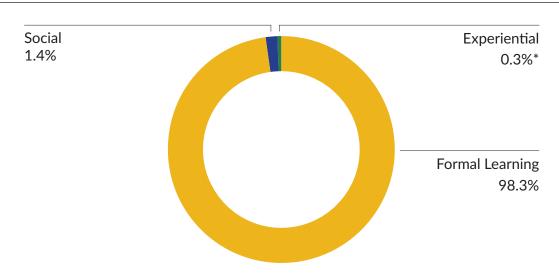


# Sustainability Indicators for the Social Aspects



#### PEOPLE DEVELOPMENT MATERIAL MATTER

#### **Percentage of Learning and Development Programmes, by Category**



\* Percentage for experiential learning excludes On-the-Job Training which are not tracked in our Learning Management System

Male		Female
	Average Training Hours, by Gender	
54.3	FY 2019/20	39.3
Support Staff		Professional Staff
	Average Training Hours, by Gender	
45.0	FY 2019/20	50.1

44

# Amidst the digital and

# **Equipping Our People** for the Digital Future of Work

Amidst the COVID-19 pandemic, digital and future-readiness took centre-stage on the Learning & Development agenda as we continued our efforts to help our employees embrace new ways of working and expanded our training platforms to the digital realm. The FutureReadyME initiative is part of our next phase of Organisational **Capability Transformation** to help employees develop mindsets and skillsets to succeed in the digital world and build basic knowledge and skills in key digital areas.

#### **Growth Mindset Programme**

The Growth Mindset Programme focuses on building our capacity to learn and grow, by first recognising our fixed mindset triggers and then developing strategies to build our personal agility to thrive in change and get better.

#### **FutureReadyME Programme**

The FutureReadyME Programme provided a framework to baseline our workforce with skills and awareness in the areas of data-driven thinking, customer-centred design, and

agile ways of working. Beyond the programme, we provided opportunities for upskilling based on individual needs across 6 key areas (refer to diagram below), supported by a FutureReadyME fund.

To facilitate the new modes of learning, we expanded our online learning resources through the onboarding of LinkedIn Learning to our Learning Management System, giving CAG employees access to over 8000 online courses to learn anytime, anywhere.

Data-driven thinking

Digital Technologies

Agile Way of Working

Customer-centricity

Collaboration & Critical Thinking

Risk Management

6 key training areas which are eligible for FutureReadyMe funding

# UPHOLDING CAG'S REPUTATION FOR OPERATIONAL EXCELLENCE AND INTEGRITY

In CAG, compliance is our line of defence. Each employee is in the frontline of upholding CAG's reputation for operational excellence and integrity. It is important to ensure that all CAG employees are trained in the key laws and regulations that apply to our roles, including the key CAG policies and procedures.

All CAG employees have to complete a mandatory CAG Compliance Training Curriculum which comprises 6 modules:



Understand CAG's Anti-Bribery Management System (ABMS), and your role in upholding CAG's zero tolerance for bribery. Cybersecurity is everyone's responsibility. Be aware of the cyber threats, CAG's cybersecurity policies, and what every CAG employee should know and do to protect CAG's information assets.

Whether coming to the office, attending meetings or going home, good cyber hygiene and computing practices are key to protecting CAG's information. Learn about these best practices and how to apply them in our daily lives.

#### **CAG Code of Conduct**

#### **Personal Data Protection**

#### **Aviation Security 101**

AvSec 101



Learn about the Code of conduct and related policies that set the standards of conduct expected of every CAG employee. It forms the principles that we should act

according to on a daily basis.



Understand CAG's obligations under the Personal Data Protection Act of Singapore (PDPA), the key CAG policies and procedures that support personal data protection, and your role.

Be aware of your role in safeguarding the security of Changi Airport and learn about the responsible use of your airport pass, what to note when entering restricted areas, identification of security incidents and how to respond to such incidents.





We place top priority on human lives. At Changi Airport, we uphold high safety standards that safeguard our passengers, the public and airport staff. Behind the scenes, we establish good governance and prudent risk management strategies to defend against the increasingly complex and interconnected risks that threaten Changi Airport and our stakeholders.

In today's dynamic world, we are constantly rethinking and revamping our approach in the face of evolving risks. In doing so, we fortify our assets, while protecting everyone who enters our doors.



#### 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



#### **ACHIEVED**

Zero tolerance for corruption



#### **ACHIEVED**

Zero notices of non compliance with applicable laws and regulations, yearly



#### **ACHIEVED**

Zero fines





### Our SDGs







### 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
- Annual Airport Safety Awards
- Safety briefings
- Induction trainings



## Our Targets



#### **ON TRACK**

Zero employee work-related fatalities, yearly



#### **ON TRACK**

Deficiency-free rating from the International Federation of Air Line Pilots' Associations (IFALPA), yearly

## Our Change Agents



OPERATIONAL RISK AND SAFETY COMMITTEE

### Our SDGs





# Corporate Governance

# DRIVING ZERO TOLERANCE FOR BRIBERY

In September 2019, the CAG Anti-Bribery Management System (ABMS) was assessed by external auditors to conform to ISO 37001:2016. This provides assurance that CAG has effectively implemented international good practices to reduce the risks of bribery occurring in our operations.

We have continued to review and enhance the ABMS, in order to drive a zero tolerance for bribery, and to keep integrity at the heart of everything we do. Some of the recent enhancements include the following:

- 1) The appointment of additional representatives from several CAG Clusters to a standing ABMS Working Committee which monitors the continuing adequacy and effectiveness of anti-bribery policies and procedures. Each member of the Working Committee is nominated by the head of the Cluster and is an experienced member of the team.
- 2) The development and publication of the CAG Donations & Sponsorships Policy. This policy provides guidance to employees on the proper review and processing of financial or in-kind contributions to charities, social causes or to CAG's external stakeholders. This will mitigate the risk that such contributions are deemed or perceived to be bribes.
- 3) In-person and online antibribery briefings have been developed and are being provided to personnel from CAG Service Providers whose scope of work requires them to exercise discretion on CAG's behalf.
  - These include work site engineers or safety officers who inspect the sites where construction or other works are being conducted by contractors for CAG. The briefings highlight how bribery may arise in these interactions and CAG's expectations of how the Service Provider personnel should respond.
- 4) Outreach and communication with key partners that operate in Changi and Seletar Airports, and with CAG's key vendors, to exchange best practices on how to prevent, detect and respond to bribery.

# **Airport Safety**

## CAG'S SAFETY MANAGEMENT SYSTEM

CAG works closely with our airport partners, including ground handling agents, airlines, and the Civil Aviation Authority of Singapore, to build a proactive and robust safety environment.

Safety is our core value and we achieve this through 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. As part of the journey for continuous improvement of the SMS, CAG through the Aerodrome Safety Unit is committed to the periodic review and assessment of the system to ensure that it remains current and in-line with the company's mission and values.

#### **AERODROME SAFETY**

CAG is committed to ensuring the safety of every person who works or uses Changi Airport and that all aircraft operations are conducted in safe manner based on international guidelines. CAG is recognised by the International Federation of Air Line Pilots' Association ("IFALPA") as a dependable airport operator, where the provision and management of aviation infrastructure and services are safe and of a high standard. In this regard, Changi Airport has not received any deficiency reports from IFALPA since its establishment in 1981.

To meet Changi Airport's future growth and capacity, a key focus for FY 19/20 has been on the preparation and eventual lead up to the Certification and safe opening of Runway 3. The Runway 3 certification workgroup that was formed in 2018, has worked diligently and tirelessly with CAG's internal stakeholders and CAAS to prepare for Runway 3 certification audits.

## WORKPLACE SAFETY AND HEALTH

The safety and health of our Changi community are of utmost importance to CAG. The SMS establishes our commitment to prevent all work-related injuries and illness. Through this policy, we identify and reduce risks in our operations, implement safe work practices, and provide relevant training to our employees. We have therefore set a challenging target of zero workplace fatalities and achieved this for FY19/20.

Each year, CAG undergoes an external OHSAS 18001 audit to verifying that our practices are aligned with international standards for Occupational Health and Safety Management. CAG has also committed to migrating to the ISO 45001: 2018 certification for Occupational Health and Safety Management System by 2021.

#### 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 email
- 24/7 safety hotlines
- CAG In.Touch, SWEET, OneChangi mobile apps



Safety Promotion cards distributed to the airport community

# **Airport Safety**

The online hazard reporting form is readily available on CAG's e-Services portal and the corporate safety email are voluntary and confidential reporting channels managed by the ASU. For hazards which require immediate attention, users can report them via 24/7 hotlines.

In FY2019/20, the SWEET mobile app on-boarded 9,000 new users and received 1,700 hazard reports. The many eyes approach to hazard identification, which is augmented by prompt actions to resolve these hazards, has contributed to a safer airport environment for both travellers and airport staff.

#### **AIRPORT SAFETY AWARDS**

CAG's Airport Safety Awards recognise exceptional safety contribution by members of the airport community. The community continues to strive in innovating novel projects and initiatives to prevent safety occurrence and improve the safety environment of our airports. The projects showed our partners drive towards innovation and building a culture of knowledge-sharing and collaborative learning.

Many have also continued to demonstrate gumption by going beyond their call of duty when encountered with unsafe situations. These individuals and teams whom exemplify our safety culture are awarded based on three broad categories - Safety Awareness & Courageous Act, Innovation & System Thinking, and Safety Promotion & Culture Building. In FY2019/20, CAG and the airport community have come together to honour and recognise 70 deserving award winners from both individual and team categories.

The key safety message of the year is "Safety Takes You Further". The current COVID- 19 situation has posed severe challenges to aviation and could potentially divert attention from safety. As such, staying focused on safety is even more important as deterioration in safety standards could have adverse impact





SWEET mobile phone application





Trophies and Certificates awarded to our Airport Safety Champions

Award Winners for the Quarterly Airport Safety Awards for Q2 2019/2020

and erode confidence in the sector. Embracing new norms, the Airport Safety Awards are now celebrated via online broadcasts whilst maintaining its effectiveness and with greater outreach amongst the airport community.

By staying safe, it will take us through challenging times as we emerge stronger and further as One Changi.

#### **Safety Documentation**

The ASU has also launched a new Safety Documentation initiative, entitled 'Nexus'. Nexus is a safety publication e-library which is accessible for all CAG staff. It gives employees instant access to a host of safety

documentation, both internal and external, on their mobile devices, wherever and whenever, in a secure and convenient manner. The launch was timely as it was during the onset of the circuit breaker with the implementation of work-fromhome arrangements.





Interface for the Nexus Safety Publication e-library





Beyond our people and partners, we embrace the potential of the less fortunate within our community. With sincerity and passion, we seek to uplift them towards success. Together with our employee volunteers and partners, we inspire them to dream and transform aspirations into reality.



### 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



#### **ON TRACK**

Achieve 25% employee volunteerism yearly by FY2020/21



#### **ON TRACK**

Achieve 3,000 volunteer hours yearly by FY2020/21



#### **ON TRACK**

Engage 35 airport partners in Changi Foundation programmes yearly by FY2020/21



#### **ON TRACK**

To offer minimally 80 job attachments to youth beneficiaries yearly from FY2020/21 onwards

## 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











# **Enhancing our Social Competence Learning Programmes**

# ENHANCING OUR SOCIAL COMPETENCE LEARNING PROGRAMMES

In 2019, we added a new programme to our series of Social Competence Learning Programmes with Metta School where the students get to practise independent living skills at various Changi Airport facilities run by our airport partners.

The earlier series of Social **Competence Learning** Programmes included grocery shopping at NTUC Fairprice supermarket; ordering of food and tray return at Kopitiam; and e-ordering at McDonalds. 20 students and over 20 volunteers participated in this initiative. In 2019, CAG took on the request from Metta School and co-curated a programme to allow students to practise seeking medical consultation at the T4 clinic operated by the Raffles Medical Group ("RMG").

CAG volunteers guided the students through the clinic visit process, and accompanied the students through each of the steps, namely patient registration, waiting for consultation, the medical consultation and bill payment. The volunteers were on hand to assess the students' level of independence in completing each step of the clinic visit process and provided feedback for the school teachers to reiterate the lessons learnt.

Over at the RMG clinic, the nurse registered the students, guided them through the payment process, and issued "medication" (RMG medicine bottles filled with water which have been coloured with food dye). The doctor at the clinic saw each student (as if they were real patients) and went through the consultation process with the students who would describe their "symptoms", with

the school teachers informing students of what symptoms to state to the doctor beforehand.

# TRANSFORMING FROM FACE-TO-FACE TO VIRTUAL VOLUNTEERING

With safety and social distancing considerations paramount with the Covid-19 situation, CAG pivoted to tele-medicine consultation. Our partner, RMG stepped up to this challenge and continued the programme digitally. CAG co-curated the digital format with Metta School and RMG. and ran various virtual sessions in August and September 2020, with CAG volunteers roleplaying as nurses and doctors to practise with the students prior to their actual sessions with RMG.

The digital runs have been successfully completed and we intend to continue with this programme in the following year.

#### REFLECTIONS OF A CAG EMPLOYEE VOLUNTEER SENG KEE

One CAG employee volunteer, Lim Seng Kee, who has volunteered for both the faceto-face consultation at Terminal 4 Raffles Medical Group (RMG) clinic and the virtual telemedicine sessions shares his experience:

"The tele-med programme with Metta School was a brand new experience for me. Due to the Covid-19 situation, the CSR team introduced an alternative volunteering opportunity via an e-programme. It was the first time I did an online volunteering programme and honestly, I was initially sceptical at how real and helpful such sessions can be in helping the students. After participating in a few sessions, the tele-med programme has changed my views and I began to appreciate the benefits it has over the traditional face-to-face programme.

The tele-med programme offers a progressive way in preparing the students for the "real test" in time to come. Through the use of video calls, the students were able to role-play with the volunteers online; thus providing an opportunity for the teachers to assess the readiness of the students in visiting a clinic in person. So, instead of sending the student straight to the clinic (which may not be beneficial especially if he/she is not ready),

students can practise repeatedly through the tele-med programme until they are more ready for the actual virtual session with the RMG nurse and doctor.

Logistically, I feel that the e-programme is easier to manage for the school, CSR team and volunteers. The programme can be carried out virtually without concerns over transport arrangement, moving around in large numbers or managing the student's safety in public. In short, the programme can be conducted in a safe environment for all. Given the current situation. safety for individual will be in everyone's mind. So I believe volunteering through the e-programme still allows us to fulfil our mission in Making a Difference in someone's life: albeit in a different manner.

At a personal level, I would still go for face-to-face programmes as it allows closer interaction between the volunteer and student. In my opinion, it is through such interaction that relationship is fostered. However, it may turn out to be the new normal moving forward when it comes to visiting a doctor. So, why not put it into good practice now in preparing for what's coming."



Pre-Covid days when the practice sessions were held at the RMG clinic in Terminal 4:

Seng Kee coaches a student to use his calculator to confirm if the money he received from the nurse was correct (one programme component was the deliberate return of the wrong amount of change from the nurse to the student, and coaching the student on the follow-up action)



# **Pivoting to tele-medicine:**Based on a script provided by RMG, Seng Kee role-plays as a doctor to practise with the student, which includes confirming the symptoms the student is experiencing

# 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 (CO2) emissions for all three scopes.

Data for GHG emission calculations includes T1 to T3. It excludes emissions from T4 and 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 FY2019/20:

FY2019/20: FY2016/17; FY2017/18, FY2018/19 and FY2019/20 – 1 April 2019 until 31 March 2020, 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 FY2019/20 have been disclosed with verified FY2018/19 data for comparability. Verified FY2018/19 energy and emissions data will be published in CAG's subsequent Sustainability Report FY2020/21.

#### **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 methodology 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.

<b>Emissions Sources</b>	<b>Emission Factors</b>	Unit
SCOPE 1 EMISSIONS		
Stationary source		
Diesel stationary	2.6850	kgCO₂e/litre
Jet A-1 stationary	2.4995	kgCO₂e/litre
Mobile source		
Diesel mobile	2.6760	kgCO₂e/litre
Gasoline mobile	2.2720	kgCO₂e/litre
SCOPE 2 EMISSIONS		
Electricity Consumption		
FY2019/20 National Grid (Location-based)	0.4085	kgCO₂e/kWh
FY2017 National grid (Location-based)	0.4192	kgCO₂e/kWh
FY2016 National grid (Location-based)	0.4244	kgCO₂e/kWh
FY2015 National grid (Location-based)	0.4224	kgCO₂e/kWh
SCOPE 3 EMISSIONS		
Ground support equipment		
Diesel mobile	2.6760	kgCO₂e/litre
Gasoline mobile	2.2720	kgCO₂e/litre
Surface access		
Coach	0.0342	kgCO₂e/vehicle-km
Minibus/van	0.3014	kgCO₂e/vehicle-km
Motorcycle	0.1187	kgCO₂e/vehicle-km
Private charter	0.2206	kgCO₂e/vehicle-km
Private hire car	0.2206	kgCO₂e/vehicle-km
Private hire shared ride	0.2206	kgCO₂e/vehicle-km
Privately owned car	0.2206	kgCO₂e/vehicle-km
Taxi (Grab taxi)	0.2206	kgCO₂e/vehicle-km
Taxi (Phone booking)	0.2206	kgCO₂e/vehicle-km
Taxi (Street hail)	0.2206	kgCO₂e/vehicle-km
Mass Rapid Transit (MRT)	0.0746	kgCO₂e/passenger-km
Public bus	0.0342	kgCO₂e/passenger-km
Electricity re-sold		
FY2016 National grid (Location base)	0.4244	kgCO₂e/kWh
FY2015 National grid (Location base)	0.4224	kgCO₂e/kWh
Waste management		
0% load	0.6627	kgCO₂e/km
50% load	0.2476	kgCO₂e/tkm
100% load	0.1459	kgCO₂e/tkm

#### **REFERENCES FOR EMISSION FACTORS**

- 1. Airports Council International (ACI), Airport Carbon and Emissions Reporting Tool (ACERT) version 6.0
- 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) (2020), Singapore Energy Statistics
- 6. Energy Market Authority of Singapore (EMA) (2018), Singapore Energy Statistics
- 7. Energy Market Authority of Singapore (EMA) (2017), Singapore Energy Statistics
- 8. Energy Market Authority of Singapore (EMA) (2016), Singapore Energy Statistics
- 9. International Civil Aviation Organization (ICAO), Carbon Emissions Calculator version 10,
- 10. United States Environmental Protection Agency (US EPA) (2015), Emission factor for greenhouse gas inventories
- 11. UK Government Conversion Factors for Greenhouse Gas (GHG) Reporting (2016)

# APPENDIX B

# **UN SDG Index**

In 2018, 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.



# APPENDIX C

## **GRI Content Index**

CAG's Sustainability Report 2019/20 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 FY 2019/20 AR: CAG Annual Report FY 2019/20

#### **GENERAL DISCLOSURES**

Disclosures		Reference(s) or Reasons for Omission (if applicable)
GRI 102	: General Disclosures (2016)	
102-1	Name of the organisation	SR: p1
102-2	Activities, brands, products and services	SR: p1 AR: p3
102-3	Location of headquarters	CAG is headquartered in Singapore
102-4	Location of operations	AR: p3, 45-47
102-5	Ownership and legal form	SR: p1
102-6	Markets served	AR: p29-31
102-7	Scale of the organisation	SR: p22-23
102-8	Information on employees and other workers	SR: p42
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	AR: p1-13
102-11	Precautionary principle or approach	SR: p48-55 AR: p25
102-12	External initiatives	Detailed throughout the Sustainability Report
102-13	Membership of associations	SR: p10-11
102-14	Statement from senior decision-maker	SR: p4-6
102-16	Values, principles, standards, and norms of behaviour	SR: p22-25, 34, 52-55
102-17	Mechanisms for advice and concerns about ethics	SR: p48-55
102-18	Governance structure	SR: p8-9 AR: p8-16

#### **GENERAL DISCLOSURES**

GENERAL DISCLOSORES		
Disclosu		Reference(s) or Reasons for Omission (if applicable)
GRI 102	: General Disclosures (2016)	
102-22	Composition of the highest governance body and its committees	AR: p8-16
102-23	Chair of the highest governance body	AR: p10
102-29	Identifying and managing economic, environmental and social impacts	SR: p12-13
102-30	Effectiveness of risk management processes	AR: p25
102-31	Review of economic, environmental and social topics	SR: p12-13
102-40	List of stakeholder groups	SR: p10-11
102-42	Identifying and selecting stakeholders	SR: p10-11
102-43	Approach to stakeholder engagement	SR: p10-11
102-44	Key topics and concerns raised	SR: p10-13
102-45	Entities included in the consolidated financial statements	AR: p64-66
102-46	Defining report content and topic boundaries	SR: p7
102-47	List of material topics	SR: p15
102-50	Reporting period	SR: p7
102-51	Date of most recent report	SR: p7
102-52	Reporting cycle	SR: p7
102-53	Contact point for questions regarding the report	SR: p73
102-54	Claims of reporting in accordance with the GRI Standards	SR: p7
102-55	Content Index	Appendix C



#### MATERIAL TOPIC: ENERGY AND EMISSIONS MANAGEMENT

Disclosu	ires	Reference(s) or Reasons for Omission (if applicable)
GRI 103	: Management Approach (2016)	
103-1	Explanation of the material topic and its boundaries	SR: p20-21
103-2	The management approach and its components	SR: p20-25
103-3	Evaluation of the management approach	SR: p24
GRI 302	: Energy (2016)	
302-1	Energy consumption within the organisation	SR: p25
302-3	Energy intensity	SR: p25
302-4	Reduction of energy consumption	SR: p26-31
GRI 305	: Emissions (2016)	
305-1	Direct (Scope 1) GHG emissions	SR: p23, 62-64
305-2	Energy indirect (Scope 2) GHG emissions	SR: p23, 62-64
305-3	Other indirect (Scope 3) GHG emissions	SR: p23, 62-64
305-4	GHG emissions intensity	SR: p23, 62-64
305-5	Reduction of GHG emissions	SR: p23, 62-64
GRI-G4	Airport Operators Sector Disclosures: Emissions	(2011)
AO5	Ambient air quality levels	SR: p27
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#### **MATERIAL TOPIC: WASTE MANAGEMENT**

Disclosu	res	Reference(s) or Reasons for Omission (if applicable)
GRI 103: Management Approach (2016)		
103-1	Explanation of the material topic and its boundaries	SR: p32-33
103-2	The management approach and its components	SR: p32-37
103-3	Evaluation of the management approach	SR: p34
GRI 306:	Effluents and Waste (2016)	
306-2	Waste by type and disposal methods	SR: p34



#### 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: p40-41
103-2	The management approach and its components	SR: p40-45
103-3	Evaluation of the management approach	SR: p44-45
GRI 404: Training and Education (2016)		
404-1	Average hours of training per year per employee	SR: p43
404-2	Programmes for upgrading employee skills and transition assistance programmes	SR: p44-45



#### MATERIAL TOPIC: GOOD CORPORATE GOVERNANCE

GRI 103: Management Approach (2016)  103-1 Explanation of the material topic and its boundaries  103-2 The management approach and its components SR: p52  103-3 Evaluation of the management approach SR: p52  GRI 205: Anti-corruption (2016)  205-3 Confirmed incidents of corruption and actions taken  GRI 307: Environmental Compliance (2016)  307-1 Non-compliance with environmental laws and regulations  GRI 419: Socioeconomic Compliance (2016)  419-1 Non-compliance with laws and regulations SR: p2  in the social and economic area	Disclosures		Reference(s) or Reasons for Omission (if applicable)
boundaries  103-2 The management approach and its components SR: p52  103-3 Evaluation of the management approach SR: p52  GRI 205: Anti-corruption (2016)  205-3 Confirmed incidents of corruption and actions taken  GRI 307: Environmental Compliance (2016)  307-1 Non-compliance with environmental laws and regulations  GRI 419: Socioeconomic Compliance (2016)  419-1 Non-compliance with laws and regulations SR: p2	GRI 103:	Management Approach (2016)	
103-3 Evaluation of the management approach SR: p52  GRI 205: Anti-corruption (2016)  205-3 Confirmed incidents of corruption and actions taken  GRI 307: Environmental Compliance (2016)  307-1 Non-compliance with environmental laws and regulations  GRI 419: Socioeconomic Compliance (2016)  419-1 Non-compliance with laws and regulations SR: p2	103-1	·	SR: p51-52
GRI 205: Anti-corruption (2016)  205-3 Confirmed incidents of corruption and actions taken  GRI 307: Environmental Compliance (2016)  307-1 Non-compliance with environmental laws and regulations  GRI 419: Socioeconomic Compliance (2016)  419-1 Non-compliance with laws and regulations  SR: p2	103-2	The management approach and its components	SR: p52
205-3 Confirmed incidents of corruption and actions taken  GRI 307: Environmental Compliance (2016)  307-1 Non-compliance with environmental laws and regulations  GRI 419: Socioeconomic Compliance (2016)  419-1 Non-compliance with laws and regulations  SR: p2	103-3	Evaluation of the management approach	SR: p52
actions taken  GRI 307: Environmental Compliance (2016)  307-1 Non-compliance with environmental laws and regulations  GRI 419: Socioeconomic Compliance (2016)  419-1 Non-compliance with laws and regulations  SR: p2	GRI 205	Anti-corruption (2016)	
307-1 Non-compliance with environmental laws SR: p2 and regulations  GRI 419: Socioeconomic Compliance (2016)  419-1 Non-compliance with laws and regulations SR: p2	205-3	·	SR: p2
and regulations  GRI 419: Socioeconomic Compliance (2016)  419-1 Non-compliance with laws and regulations SR: p2	GRI 307:	Environmental Compliance (2016)	
419-1 Non-compliance with laws and regulations SR: p2	307-1	•	SR: p2
· · · · · · · · · · · · · · · · · · ·	GRI 419:	Socioeconomic Compliance (2016)	
in the social and economic area	419-1	Non-compliance with laws and regulations in the social and economic area	SR: p2



#### **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: p50-51
103-2	The management approach and its components	SR: p50-51, 53-55
103-3	Evaluation of the management approach	SR: p53



#### MATERIAL TOPIC: COMMUNITY INVESTMENT

Disclosures		Reference(s) or Reasons for Omission (if applicable)	
GRI 103	GRI 103: Management Approach (2016)		
103-1	Explanation of the material topic and its boundaries	SR: p57-58	
103-2	The management approach and its components	SR: p57-61	
103-3	Evaluation of the management approach	SR: p58-59	
GRI 413	: Local Communities (2016)		
413-1	Operations with local community engagement, impact assessments, and development programmes	SR: p60-61	





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