

HEATHROW CARBON FOOTPRINT 2018



Climate change is the biggest challenge of our age – every government, business and individual needs to take action to adapt to and mitigate it. As a leading hub airport, we take our responsibility for our contribution to the carbon footprint of the global aviation industry seriously and are determined to use our scale and influence to transform the way our sector tackles this challenge. We welcome the Committee on Climate Change’s recommendation to include aviation in the net-zero emissions target by 2050. Just as Heathrow acts as a cornerstone of the UK economy, airports like ours must also be cornerstones of the effort to reduce carbon within the industry and decouple the growth of aviation from the growth in emissions.

Our Heathrow 2.0 sustainability strategy sets out ambitious targets with the potential to create positive change throughout the aviation industry, as well as at the airport itself. As an important step in mapping our journey towards becoming a zero-carbon airport by 2050, we monitor our carbon footprint and report the results on an annual basis. The information in this report reflects the work we have undertaken so far and will help guide our future actions by identifying areas where we need to improve. Our overall carbon emissions increased marginally in 2018. This growth is predominantly the result of scope 3 emissions from passenger and colleague surface access - see p.2 for Heathrow’s future objectives for changing the way people travel to the airport.

EMISSIONS THAT WE CONTROL – SCOPE 1 AND 2

Since April 2017, Heathrow has been powered by 100% renewable electricity and since June 2018, the heating for Terminal 2 has been provided from either biomass or renewable gas. Heathrow has reduced its energy consumption by 9% since 2014 despite a 9% rise in passenger numbers over the same period. In 2018, 6.3% of the energy we consumed at Heathrow was generated at our Energy Centre using renewable sources. We achieved this figure by running the Centre’s biomass combined heat and power plant for longer and at greater efficiency, as well as through the production of on-site solar energy. The winter of 2018 was colder than previous years which slightly increased the gas and oil consumption for heating in some areas. We also experienced power supply issues over several weeks that required the use of back-up diesel power generation.

For operational vehicles that we own or lease, we have seen additional requirements and increased demand for campus security and other activities, resulting in a slight increase in fuel usage of 5% above 2017 levels. Due to essential modifications to the cargo tunnel which resulted in temporary vehicle access changes, we also saw a rise in fuel use from the commensurate lengthening of many on-airfield vehicle journeys. We expect the fuel usage of Heathrow operational vehicles to fall as we introduce more electric vehicles (EVs) to our own fleet and help other operators at Heathrow do the same. With 72 EVs in our fleet in 2018, we are well on our way to meeting our commitment to transition all our own cars and small vans to electric or plug-in hybrid by 2020.

We compare our annual carbon emissions from fixed infrastructure against a 1990 baseline, using both location and market based measures. In 2018 we achieved reductions of 57% (against a target of 34%) for location based emissions and 93% for market based emissions. From 2020, we will set new, [science-based targets](#)¹ to guide further emissions reductions as part of our journey of working towards becoming a zero-carbon airport by the mid-2030s.

SCOPE 1			
EMISSION SOURCE	GREENHOUSE GAS EMISSIONS (tCO ₂ e)		
	2018	2017	2016
Fuel consumption - utilities	23,604	24,779	27,290
Operational vehicles	1,817	1,749	1,889
LPG for fire training	34	9	28
Refrigerants	791	153	1,031
SCOPE 2			
EMISSION SOURCE	GREENHOUSE GAS EMISSIONS (tCO ₂ e)		
	2018	2017	2016
Grid electricity consumption - market based	0	15,680	63,393
<i>Grid electricity consumption - location based</i>	<i>79,921</i>	<i>97,408</i>	<i>121,049</i>
SCOPE 3			
EMISSION SOURCE	GREENHOUSE GAS EMISSIONS (tCO ₂ e)		
	2018	2017	2016
Aircraft in LTO	1,325,101	1,321,566	1,303,238
Passenger surface access	567,106	514,313	547,370
Colleague surface access	128,946	120,164	148,416
Business travel	998	839	992
Third party fuel consumption - utilities	242	297	306
Third party grid electricity consumption - market based	185	10,562	41,580
<i>Third party grid electricity consumption - location based</i>	<i>50,653</i>	<i>67,223</i>	<i>79,337</i>
Third party operational vehicles	37,940	36,495	38,584
Waste	564	799	664
Water	1,814	1,752	1,926
SCOPE 1	26,246	26,691	30,239
SCOPE 2	0	15,680	63,393
SCOPE 3	2,062,895	2,006,786	2,083,077
TOTAL	2,089,141	2,049,157	2,176,708

¹Science-based targets provide companies with a clearly defined pathway to future-proof growth by specifying how much and how quickly they need to reduce their greenhouse gas emissions in line with current climate science.

EMISSIONS THAT WE INFLUENCE – SCOPE 3

In 2018, we saw a 0.3% rise in emissions from aircraft in their landing and take-off (LTO) cycle.

This can be attributed to a significant drop in usage of Pre-Conditioned Air (PCA) by aircraft, leading to greater reliance on onboard Auxiliary Power Units (APUs) that require jet fuel, as well as to a slight lengthening in aircraft taxi times due to the additional ground traffic from the growth in ATMs.

The LTO increases have been balanced, however, by the continued modernisation of aircraft and engines, aircraft reducing the number of engines in-use while taxiing, and through more efficient take-offs and landings. We are investing to substantially improve the availability and functionality of PCA and Fixed Electrical Ground Power across our stands, reducing the contribution to emissions from APUs.

Our Carbon Neutral Growth Roadmap – published in 2018 – sets out more detail on how we will help to reduce and offset carbon emissions by engaging with industry and government and advocating for more ambitious action to address aviation's impact on climate change. At Heathrow, we incentivise airline operators and collaborate across our industry to encourage wider commitment to sustainability; airlines can benefit from landing fees up to 11 times cheaper by utilising cleaner and quieter aircraft, steering them towards better choices for people and planet. Of flights landing at Heathrow, 64% are made by the newest, cleanest, and most efficient aircraft³.

In 2018, we announced that the first electric or hybrid aircraft to operate a commercially viable flight from Heathrow will be rewarded with a year's free landing charges, worth up to £1,000,000. While the technology for electric aircraft is still in development, Sustainable Aviation Fuels (SAFs) will play a key part in helping to reduce carbon, with a net carbon lifecycle more than 60% better than conventional aviation fuel. SAFs will particularly benefit long-haul flights, for which effective electric technologies are still some way off.

Through our Centre of Excellence for Sustainability, we are supporting a university-led project to test the potential for turning unrecyclable plastic passenger waste into sustainable aviation fuel and other useful materials.

In 2018, emissions from both passenger and colleague surface access increased. For passengers, the increase in emissions is attributed to both growing passenger numbers and longer journey distances by those surveyed. For colleagues, the increase reflects the growth in colleague numbers across the airport.

HEATHROW HAS TWO MAIN OBJECTIVES FOR CHANGING THE WAY PEOPLE ARRIVE AT THE AIRPORT:

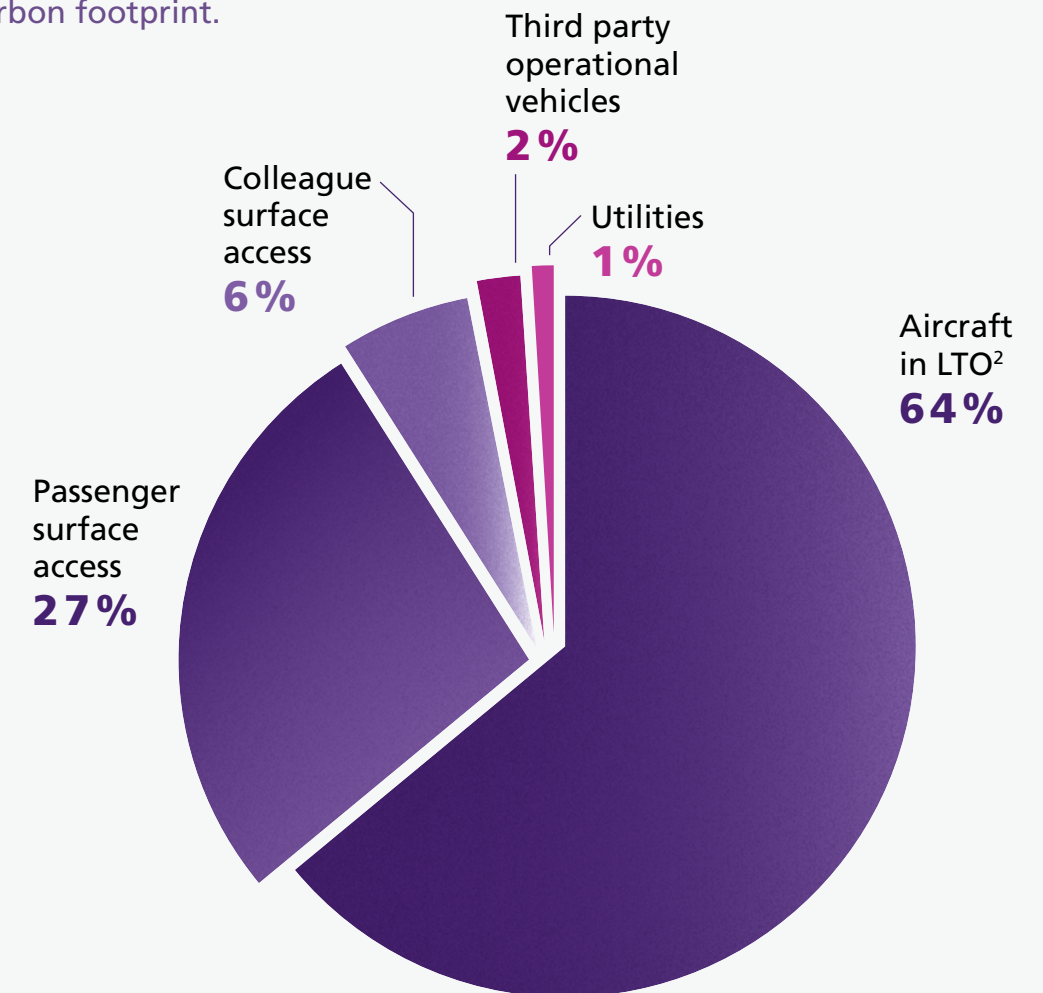
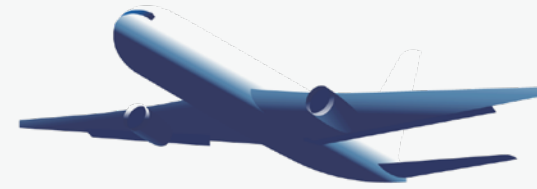
- 1 Increase the proportion of journeys made to the airport by public transport, cycling and walking. By 2030, at least 50% of journeys must meet these criteria, rising to 55% by 2040.
- 2 Reduce the proportion of colleagues who commute to the airport by car. We are committed to reducing colleague car journeys by 25% by 2030 and 50% by 2040.

These are ambitious objectives, but we are working hard with colleagues and other stakeholders in London transport infrastructure to meet future public transport demands. That's why we will be introducing the world's first airport Ultra Low Emission Zone (ULEZ) by 2022, along with an airside ULEZ by 2025, meaning nearly all our airside vehicles will be electric or plug-in hybrid. Over time, with improvements to public transport access to the airport, the Heathrow ULEZ will transition into a vehicle access charge (VAC) on all passenger cars, taxis and private hire vehicles coming to car parks or drop-off areas.



BREAKDOWN OF CARBON EMISSIONS FROM HEATHROW IN 2018

With aircraft in LTO² accounting for the majority of our emissions, small improvements here can make a big difference to our overall carbon footprint.



Notes:

- We continue to use the same footprint boundaries to reflect our operational control both at the airport and offsite – including our parking pod test track and Business Support Centre (BSC) – and to align with the Greenhouse Gas Protocol (GHGP), which provides accounting and reporting standards, as well as sector guidance.
- As of 2017, we have reported LPG for fire training separately. We have continued this practice in 2018 and have rectified the figures for 2016 accordingly.
- The 2017 figures for Scope 1 fuel consumption have been adjusted to account for failures with gas metering.
- The 'market-based' emissions chart shows that our Scope 2 emissions for 2018 were nil. This is because our electricity was sourced using a Renewable Energy Guarantee of Origin (REGO) backed contract. The REGO certificate covers HAL (Heathrow Airport Limited), our parking pod test track and BSC (in Glasgow), all of which fall under Scope 2 electricity. Although relatively minor and not mandatory, the methodology could be enhanced by including the transmission and distribution emissions from this source of electricity, which would fall under Scope 3.
- Grid electricity consumption – market based: Market based emissions for grid electricity have been used to calculate total emissions.
- Scope 3: This footprint does not currently include supply chain emissions, specifically from freight and logistics activity. However, we are currently mapping out these emissions as part of our carbon trust supply chain accreditation.
- Passenger surface access: As we continually seek to improve our method for calculating Heathrow's carbon footprint, following 2016, the methodology used for calculating 'passenger surface access' has altered. Using our current methodology for the 2016 data, the updated passenger surface access tCO₂e would have been 479,364. The passenger km distances used in calculating the 2018 GHG emissions from Passenger Surface Access to Heathrow is representative of the year 2018. The passenger km distance calculations were based on a 2017 dataset (2017 CAA data) then scaled up to represent 2018 using 2018 Heathrow Airport Limited passenger throughput data. The 2017 CAA data was used as this was the latest processed data set available at the outset of the analysis.
- Fuel consumption – utilities: Includes biomass
- Third party fuel consumption – utilities: Market based emissions for grid electricity have been used to calculate total emissions; includes HEX depot.

²An LTO cycle consists of four phases of aircraft operations: approach (down from 3,000ft), taxi, take-off and climb (up to 3,000ft).

³Those achieving the Committee on Aviation Environmental Protection's CAEP 6/ Chapter 14 or better.

WORKING TOWARDS A SUSTAINABLE FUTURE FOR AVIATION

ENCOURAGING CLEANER AND QUIETER AIRCRAFTS

64% of flights landing at Heathrow are made by the newest and cleanest aircraft. Airlines can benefit from landing fees up to 11 times cheaper by utilising cleaner and quieter aircraft, steering them towards better choices for people and planet.



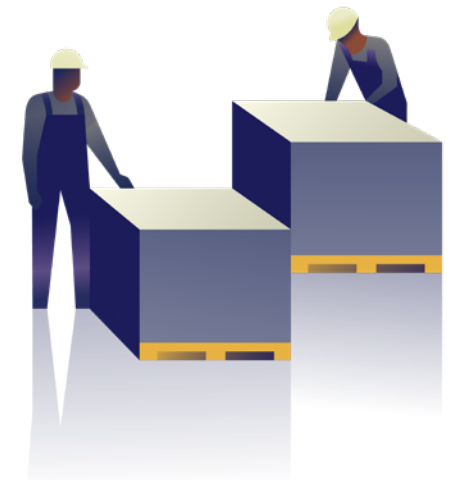
LEADING THE CHARGE TOWARDS ELECTRIC TRAVEL – HEATHROW IS POWERED BY 100% RENEWABLE ELECTRICITY

We want to be at the forefront of helping people travel in a smarter and cleaner way. Heathrow uses only 100%, REGO-certified renewable electricity, with wind as the main source. We also produce more than 6% of our own energy using our onsite biomass boiler.

We have invested over £6 million to build one of the biggest electric vehicle-charging networks in Europe, and we are giving away up to £1million in landing fees to the first airline to fly a commercial, electric flight from Heathrow.

GETTING EVERYONE ON BOARD FOR CHANGE

We welcomed the Committee on Climate Change's recommendation to the UK Government that it should include aviation in the net zero emissions target by 2050.



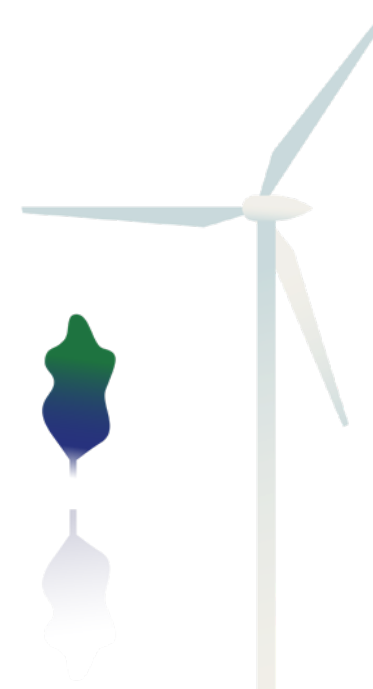
LOWERING EMISSIONS ON THE GROUND

We are working with airlines and National Air Traffic Services on ways to cut emissions from aircraft, including encouraging airlines to use a reduced number of engines to taxi to and from the runway, adopting smart airfield design to decrease taxiing distance and using plug-in power and PCA for aircraft at the gate.

DELIVERING A CARBON-NEUTRAL GROWTH ROADMAP

One of our key aspirations is to make sure that the expansion of Heathrow results in no net increase in carbon emissions. We published our Carbon Neutral Growth Roadmap in 2018, setting out how we will achieve this.

We already know that 95% percent of our post-expansion aircraft emissions will be offset through CORSIA, the UN aviation measure for offsetting growth in international aviation emissions after 2020.



RUNNING TERMINAL 2 SOLELY ON 100% RENEWABLE ENERGY

With 124 solar panels on its roof, as well as utilising a biomass boiler powered by waste wood chips from woodlands in southern England, at Terminal 2, everything from the check-in screens to last-minute, pre-flight phone battery top-ups is powered by 100% renewable energy.

WORKING TOWARDS A SUSTAINABLE FUTURE FOR AVIATION

ESTABLISHING A HUB FOR SUSTAINABLE INNOVATION

We have made Heathrow a hub for innovation on the journey to sustainable air travel.

To date, we have invested over £800,000 in sustainable innovation initiatives, including projects to produce low carbon concrete and use willow to help power Terminal 2.



SUPPORTING SUSTAINABLE FUEL PILOTS

We support pilot projects for new sustainable fuels, such as British Airways' work with Velocys on converting household waste into aviation fuel.



INTRODUCING THE WORLD'S FIRST AIRPORT ULTRA LOW EMISSION ZONE

We want to help our passengers get their journeys off to a green and positive start. That's why we will be introducing the world's first airport Ultra Low Emission Zone (ULEZ) by 2022, along with an airside ULEZ by 2025, meaning nearly all our airside vehicles will be electric or plug-in hybrid.

Over time, with the opening of the new runway from 2026 and improvements to public transport access to the airport, the Heathrow ULEZ will transition into a vehicle access charge (VAC) on all passenger cars, taxis and private hire vehicles coming to car parks or drop-off areas.

RESTORING ENGLISH PEATLAND TO OFFSET OUR CARBON EMISSIONS

Heathrow is restoring English peatlands - a type of natural habitat critical for biodiversity - to take carbon out of the air.

Heathrow's first project with Lancashire Wildlife Trust, covering 70 hectares, is expected to save more than 22,000 CO₂ tonnes over 30 years, equivalent to 64,000 passenger journeys from Heathrow to New York.

Our peatland projects help us compensate for the carbon emissions of our airport infrastructure, so we can be carbon neutral from 2020. But we won't stop there - our goal is zero emissions from airport operations by 2050.

INVESTING IN CARBON SINKS

Britain's agricultural soils offer massive potential as carbon sinks. An estimated 15 to 20 million tonnes of CO₂ could be locked up by fertilising the soil through the addition of 1% of organic matter to 1% of agricultural soil. Heathrow is supporting an innovative pilot in Scotland to explore how carbon farming could help incentivise these practices.



PARTNERING WITH ORIGINAL THINKERS

We are partnering with leading academics to solve some of the aviation industry's biggest challenges. For example, we are working with the University of Surrey to explore low carbon concrete technology and have teamed up with Cranfield University, the University of Reading and the University of Essex to learn how we can best support electric aircraft.

INDEPENDENT ASSURANCE STATEMENT TO HEATHROW AIRPORT LTD.

ERM Certification and Verification Services (ERM CVS) was engaged by Heathrow Airport Ltd. (HAL) to provide assurance in relation to the 'Heathrow Carbon Footprint 2018' (the Report) as published on the Heathrow Airport Ltd. website.

ENGAGEMENT SUMMARY	
Scope of our assurance engagement	Whether the selected 2018 GHG data listed below, as included in the Report, are fairly presented, in all material aspects, with the reporting criteria: <ul style="list-style-type: none"> • Total Scope 1 emissions (tonnes CO₂e) • Total Scope 2 emissions (tonnes CO₂e) • Total Scope 3 emissions (tonnes CO₂e) • Total of Scope 1, 2 and 3 emissions (tonnes CO₂e)
Reporting criteria	HAL's Carbon Footprint document, which includes the reporting boundary, set out at: https://www.heathrow.com/content/dam/heathrow/web/common/documents/company/heathrow-2-0-sustainability/further-reading/HAL-GHG-Reporting-Criteria-2018.pdf
Reporting period	Reporting period 1 January 2018 to 31 December 2018
Assurance Standard	ERM CVS' assurance methodology, based on the International Standard on Assurance Engagements (ISAE 3000 Revised).
Assurance level	Limited assurance.
Respective responsibilities	<p>Heathrow is responsible for: Selecting the Reporting Criteria, Measuring and reporting the selected information in accordance with the Reporting Criteria; and Preparing the Report and for the collection and presentation of the selected data within it.</p> <p>ERM CVS' responsibility is to provide a limited assurance conclusion on the agreed scope based on the assurance activities performed and exercising our professional judgement.</p>

OUR CONCLUSIONS

Based on our activities, as described below, nothing has come to our attention to indicate that the selected 2018 GHG data are not fairly presented, in all material respects, with the reporting criteria.

This conclusion is to be read in the context of the remainder of this report, in particular, the sections on inherent uncertainty and this report's intended use.

SUMMARY OF ASSURANCE ACTIVITIES

A multi-disciplinary team of GHG and assurance specialists performed a range of assurance procedures as follows:

- Enquiry with management representatives responsible for preparing modelled and calculated data, which was included in the GHG inventory.
- Enquiry with relevant colleagues to understand and evaluate the management systems and processes (including internal review processes) used for collecting and reporting the selected data.
- An analytical review of the 2018 carbon emission data.
- Inspection of the underlying calculations used to derive the GHG emission values.
- For the surface access GHG emissions:
 - o The basis of the calculation was confirmed as being data collected by the Civil Aviation Authority (CAA) a separate third party entity.
 - o The methodology used to extrapolate the third party/CAA collected data was reviewed.
 - o Modelled outputs were obtained and agreed to the data used to calculate passenger surface access GHG emissions. No direct testing of the models used to extrapolate the data used to calculate the GHG emissions was undertaken.
- Confirmation of the conversion factors and assumptions used.
- Reviewing the presentation of information relevant to the scope of our work in the Report to ensure consistency with our findings.
- Agreed a sample of electricity consumption back to supplier invoices.
- Inspection of the Renewable Energy Guarantees of Origin (REGO) certificate for the renewable energy supplied to HAL.
- We did not undertake source data verification at any operated facilities.

OUR OBSERVATIONS

We have provided Heathrow with a separate management report with our detailed (non-material) findings and recommendations. Without qualifying our conclusions as presented above, and recognising the improvements made in the carbon footprint for 2018, we have the following key observations:

- The passenger surface access distances travelled, used to calculate the corresponding GHG emissions is based on the Civil Aviation Authority (CAA) survey data which represents 0.1% of the total passengers travelling to and from Heathrow Airport.
- The 2018 Scope 3 GHG emission figures do not include emissions resulting from the transport of freight to and from Heathrow Airport. We recommend the collection of relevant data in order to be able to calculate and report on these emissions in future years.

- The distances used in calculating the 2018 GHG emissions from Passenger Surface Access to Heathrow is representative for the year 2017. These figures were then scaled up to represent the 2018 HAL passenger throughput data.
- The above items are not only important for improving the accuracy and completeness of the Scope 3 emissions relating to airport access but also to be able to compare emissions over time and monitor the effect of management measures aimed at reducing Heathrow's overall carbon footprint

ASSURANCE LEVEL

The work performed in a limited assurance engagement varies in nature and timing from, and it less in extent that for, a reasonable assurance engagement. Consequently, the level of assurance obtained in a limited assurance engagement is substantially lower than the assurance that would have been obtained had a reasonable assurance engagement been performed.

INHERENT UNCERTAINTY

The reliability of the assured information is subject to inherent uncertainties, given the scientific uncertainty about the measurement of GHGs and the Estimation uncertainty due available methods for determining, calculating or estimating the underlying data. It is important to understand our assurance conclusions in this context.

THIS REPORT'S INTENDED USE

This assurance report is made solely to HAL in accordance with the terms of the engagement contract between HAL and ERM CVS. To the fullest extent permitted by law, we accept no responsibility and deny any liability to any party other than HAL for our work, for this assurance report or for the conclusions we have reached.



Jennifer Larsen-Rogers
 Head of Corporate Assurance Services
 13th November 2019

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