Supported by:

Federal Ministry
for the Environment, Nature Conservation,
Nuclear Safety and Consumer Protection

based on a decision of
the German Bundestag

Glasgow Declaration
Climate Action in Tourism

United Nations
Framework Convention on
Climate Change

UNWTO
World Tourism Organization

CLIMATE ACTION IN THE TOURISM SECTOR

An overview of methodologies and tools to measure greenhouse gas emissions

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Climate Action in the Tourism Sector – An overview of methodologies and tools to measure greenhouse gas emissions
ISBN (printed version): 978-92-844-2391-0
ISBN (electronic version): 978-92-844-2392-7
DOI: 10.18111/9789284423927

Published by the World Tourism Organization (UNWTO), Madrid, Spain.
First published: 2023

Printed in Spain.

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Citation: World Tourism Organization (2023), *Climate Action in Tourism – An overview of methodologies and tools to measure greenhouse gas emissions,* UNWTO, Madrid, DOI: https://doi.org/10.18111/9789284423927.

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Acknowledgments

This report was developed by the World Tourism Organization (UNWTO) with support from the Federal Ministry for the Environment, Nature Conservation, Nuclear Safety and Consumer Protection of Germany (BMU) and is released in collaboration with UN Climate Change (UNFCCC).

Jeremy Smith led the research under the coordination of Virginia Fernandez-Trapa and the supervision of Dr. Dirk Glaesser, with the support of Roxana Ashtari. A participatory approach was followed involving the members of the Glasgow Declaration Working Group on Capacity Building. The research was implemented within the framework of the Sustainable Tourism Programme of the One Planet Network and in support of the Glasgow Declaration on Climate Action in Tourism.

Special thanks go to Megan Morikawa (Iberostar Group), Susanne Etti (Intrepid Travel), Claire Whitely (Sustainable Hospitality Alliance) and Nadine Pinto (The Travel Corporation) for their contribution in developing the detailed table on emission scopes. We also thank the following experts for their invaluable insights and advice during the development of this report:

Alison Burgh, *Acorn Tourism Consulting Ltd*
Saskia Griep, *Better Places*
Paul Peeters, *Breda University*
Ewald Biemans, *Bucuti & Tara Beach Resort*
Diana Körner, *Chumbe Island Coral Park*
Benedetta Cassinelli and Nick Walsh, *Considerate Group*
O'Shannon Burns, *Cornell University*
Gwendal Castellan, *Destination Vancouver*
Naut Kusters, *European Centre for Ecological and Agricultural Tourism (ECEAT)*
Charlie Cotton, *Ecollective*
Kresse Wesling, *Elvis and Kresse*
Stewart Horne, *Energy Savings Trust*
Tim Fairhurst, *European Tourism Association*
Juan Marambio, *Explora*
Guy Bigwood, *Global Destinations Sustainability Movement*
Sebnem Erzan, *Google*
Federico Vignati, *Green Initiative*
Angela Nagy, *GreenStep Solutions*
Andrea Nichols, *Green Tourism*
Eric Ricaurte and Olivia Ruggles-Brise, *Greenview*
Dr Emma Rachel Whittlesea, *Griffith University*
Sibylle Bloch, *Hotelplan Suisse*

Megan Morikawa, *Iberostar Group*
Ingunn Sornes, *Innovation Norway*
Susanne Etti, *Intrepid Travel*
Carla Danelutti, *IUCN Mediterranean (MEET Network)*
Davina Stanford, *Leeds Beckett University*
Lucette Demets and Fiona Plumpton, *London & Partners*
Matthias Beyer, *mascontour GmbH*
Siddiqua Mondol, *Ministry of Tourism, Culture and the Arts of Trinidad and Tobago*
Selina Donald, *Momentum*
Alex Narracott, *Much Better Adventures*
Ewout Versloot, *Netherlands Bureau for Tourism and Conferences*
Arica Sears & Patty Martin, *Oregon Coast Visitors Association*
Sarah Rose Dunn, *Oxfam*
Jonathon Day, *Purdue University*
Fiona Macklin, *Race to Zero*
Chloe King, *Solimar International*
Anna Spenceley, *Spenceley Tourism and Development (STAND) Ltd*
Carl Kish, *Sustainable Tourism & Outdoors Kit for Evaluation (STOKE)*
Claire Whitely, *Sustainable Hospitality Alliance*
Paloma Zapata, *Sustainable Travel International*
Kayli Anderson, *Synergy Enterprises*
Patrick Richards, *TerraVerde Sustainability Limited*
Delphine King & Anne-Kathrin Zscheinger, *The Long Run*
Gopinath Parayil, *The Blue Yonder*
Nadine Pinto, *The Travel Corporation*
Katie Worobec, *Thompson Okanagan Tourism Association (TOTA)*
Tim Loonen, *Travalyst*
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Janie Neumann, *Visit Scotland*
Devin Middlebrook, *Visit Tahoe*
Jaume Mata, *Visit Valencia*
Stefan Gossling, *Western Norway Research Institute*
Cecilie Smith-Christensen, *World Heritage Catalysis*

About this report

Measurement of greenhouse gas (GHG) emissions presents several challenges for the tourism sector. The tourism value chain is complex, diverse and overlapping. The process of measurement is marked by an unfamiliar lexicon and set of principles, such as the concept of Scopes *(see Annex 5 for a detailed explanation).* For a sector working to recover from the impacts of the pandemic, there is in general little technical capacity – and often limited enthusiasm – to undertake an endeavour that does not appear to offer immediate results in return. Thus, the measurement landscape is still marked by a range of fragmented approaches.

It appears essential therefore to produce a global overview of current existing approaches available to and used in the tourism sector, to assess the challenges effectively and to develop sector-wide consensus in key areas in order to facilitate, accelerate and track progress on climate action and emissions reduction in the coming years.

This report seeks to provide an overview of the global efforts of the tourism sector and assess the current situation regarding GHG emissions measurement in tourism. It provides an **overview of methodologies** establishing the approaches and frameworks guiding measurement **and the tools** currently available for practitioners to use to measure emissions. It assesses how the **development of such methodologies and tools** has progressed. And it outlines what more needs to be done to support the sector to measure its emissions. In doing so, it supports the implementation of the commitments launched in November 2021 through the **Glasgow Declaration on Climate Action in Tourism,** for which measurement is the first pathway that signatories are requested to adopt.

The aim is to provide support for tourism practitioners at the beginning of their climate action journey by facilitating them in choosing suitable ways to measure and further engage. In addition, it is hoped that policymakers and solution providers will benefit from the perspectives contained within the overview as they consider what gaps remain to be addressed.

Introduction

Summary:

The importance for the tourism sector to measure its GHG emissions; the current scale of tourism's emissions worldwide; some of the key issues to consider

Keywords:

Tourism, transport, emissions, measurement, vulnerability, Glasgow Declaration on Climate Action in Tourism

Key Messages:

- Tourism's complexity makes measurement challenging
- Transport is the most significant industry to decarbonize
- An equitable approach to accelerate measurement, which considers the needs of those most vulnerable to climate change, must be found

Why measurement of emissions matters

Across the world, the destructive impacts of climate change are occurring with ever greater frequency and intensity. 2022 saw wildfires, drought, flooding and temperatures reached unprecedented levels. The need for urgent, immediate and drastic GHG emissions reduction is clearer than it has ever been.

Although we can see and feel these impacts ever more clearly, emissions measurement has been alerting us to these risks for far longer. The first measurements of the heating effects of CO_2 on the atmosphere were conducted by Eunice Foote in 1856.[1] The weather station on Mauna Loa in Hawaii began measuring GHG intensities in 1958, when the concentration in the atmosphere of CO_2 was 316 parts per million. It is now at 420.[2]

1 Darby, M. (2016), 'Meet the woman who first identified the greenhouse effect', *Climate Home News,* published on 2 September 2016, online available at: https://www.climatechangenews.com [02-10-2022].

2 National Oceanic and Atmospheric Association (2021), 'Carbon dioxide peaks near 420 parts per million at Mauna Loa observatory', *NOAA Research News,* published on 7 June 2021, online available at: https://research.noaa.gov and https://research.noaa.gov/article/ArtMID/587/ArticleID/2764 [02-10-2022]

Because it has taken society so long to respond, the Intergovernmental Panel on Climate Change (IPCC) said in its latest 2022 report that global emissions need to halve by 2030,[3] and reach net zero as fast as possible before 2050 to stand the best chance of keeping global temperature rises beneath 1.5 °C above pre-industrial levels. The increase of temperature is currently around 1.2 °C.[4]

Yet, according to the International Energy Agency (IEA), global energy-related carbon-dioxide emissions in 2021 were the highest ever measured,[5] rising 6% above its 2020 level to 36.3 billion tonnes. As our emissions keep rising, the World Meteorological Organization (WMO) asserts that there is a 50:50 chance of average global temperature reaching 1.5 °C in the next five years,[6] and that the likelihood is increasing all the time.

While the urgency to act is increasingly clear, the ongoing shift in the world's economy in response to the climate emergency is also seeing opportunities opening up for companies and destinations that are able to position themselves to support the green transition. According to the *World Energy Investment 2022* report of the IEA, investment in clean energy has grown by 12% a year worldwide since 2020. Encouragingly, investment in solar, batteries and electric vehicles is increasing at a rate consistent with reaching the global net zero goal for emissions before 2050.[7]

The GHG emissions of tourism

Tourism is an extremely complex sector, operating across all countries, in every geography, at a vast range of scales and involving diverse stakeholders operating markedly different types of businesses and operations.

At a global level, 2008 research by the World Tourism Organization (UNWTO), the United Nations Environment Programme (UNEP) and the World Meteorological Organization (WMO) estimated the GHG emissions of the tourism sector at around 5% of global emissions and estimated that 75% of all tourism emissions are linked to transportation.[8] More recently, an academic research project estimated that the sector was responsible for 8% of global greenhouse gas emissions in 2013.[9]

3 Intergovernmental Panel on Climate Change (2022), 'The evidence is clear: the time for action is now. We can halve emissions by 2030', published on 4 April 2022, online available at: https://www.ipcc.ch [02-10-2022].

4 Roper. W (2021), 'Global Warming Chart – Here's How Temperatures Have Risen Since 1950', published on 25 January 2021, WEF, Geneva, online available at: https://www.weforum.org [02-10-2022]

5 International Energy Agency (2022), 'Global CO_2 emissions rebounded to their highest level in history in 2021', press release, published on 8 March 2022, online available at: https://www.iea.org [02-10-2022]

6 World Meteorological Organization (2022), 'WMO update: 50:50 chance of global temperature temporarily reaching 1.5°C threshold in next five years', press release 09052022, published on 9 May 2022, online available at: https://public.wmo.int/en/media/press-release/wmo-update-5050-chance-of-global-temperature-temporarily-reaching-15%C2%B0c-threshold [02-10-2022]

7 International Energy Agency (2022), 'Record clean energy spending is set to help global energy investment grow by 8% in 2022', press release, published on 22 June 2022, online available at: https://www.iea.org [02-10-2022]

8 World Tourism Organization and United Nations Environment Programme (2008), *Climate Change and Tourism – Responding to Global Challenges,* UNWTO, Madrid, DOI: 10.18111/9789284412341.

9 Lenzen, M.; Sun, Y.Y.; Faturay, F. et al. (2018), 'The carbon footprint of global tourism', *Nature Climate Change,* volume 8, pp. 522–528, DOI: https://doi.org/10.1038/s41558-018-0141-x

The ranges in these figures reflect the complexity in measuring the sector's emissions. What should be included? Where do the boundaries lie? Is tourism responsible for the emissions from food consumed in its hotels (or is that the responsibility of agriculture)? Is it responsible for the transport of this same food (or is that shipping)? Is it responsible for the emissions from the taxi a visitor takes from the airport to the hotel (or is that transport)? The challenges of establishing consensus on these questions lead to such divergent measurements of the sector's emissions. Moreover, to be truly comprehensive, measurement needs to factor in more GHGs than CO_2, since other greenhouse gasses and particles can have a bigger climate impact than just CO_2.

A 2019 report from UNWTO and the International Transport Forum (ITF), *Transport-related CO_2 Emissions of the Tourism Sector – Modelling Results,* estimated transport-related emissions from tourism as having grown at least 60% from 2005 to 2016, at which point transport-related CO_2 caused 5% of global emissions. According to the report, against the current decarbonization efforts, sector CO_2 emissions could rise at least by 25% by 2030, compared to 2016.[10]

Despite the lack of a standardized or universally accepted measurement for the overall emissions of tourism, it is clear the sector has a significant responsibility to decarbonize, and that the majority of those emission reductions need to come from transport.

Finally, despite the plunge in travel due to the COVID-19 pandemic in 2020-21, international tourist arrivals rebounded strongly in 2022, reaching 63% of 2019 levels in January–December according to the *UNWTO World Tourism Barometer.*[11] Based on UNWTO scenarios for 2023, international tourist arrivals could reach 80% to 95% of pre-pandemic levels this year. International air traffic came close to 60% of 2019 levels in the first nine months of 2022 according to the International Air Transport Association (IATA). Likewise, IATA predicts that, despite the increase in the price of oil, the aviation industry will see total passenger numbers (international and domestic) reach 83% of pre-pandemic levels in 2022.

A detailed understanding of emissions measurement is essential for the ongoing viability of tourism. As the case for urgent climate action becomes more widely demanded, industries seen to be laggards on sufficient progress may be exposed. Consider that the IPCC emphasises global emissions need to halve by 2030, yet the World Travel & Tourism Council (WTTC) *Net Zero Roadmap for Tourism,* published in November 2021, estimated that global tourism emissions will peak in the 2030s, and then rapidly descend as new technologies enable a rapid decarbonization of the transport fleet. Considering that protests, regulation and behavioural shifts are likely to become more commonplace in efforts to reduce emissions worldwide, tourism needs to increase its ambition and show it is making bold, measurable reductions in its emissions in order to ensure it protects its social licence in the years to come.

It is also vital to consider that many of the developing countries that are most dependent upon tourism – Small Island Developing States in particular – have marginal responsibility for overall climate emissions. Yet these islands are both most vulnerable to worsening climate impacts and most reliant on inbound tourism for their economies. Only through fair, transparent measurement

10 World Tourism Organization and International Transport Forum (2019), *Transport-related CO_2 Emissions of the Tourism Sector – Modelling Results,* UNWTO, Madrid, DOI: https://doi.org/10.18111/9789284416660.

11 World Tourism Organization (2023), *UNWTO World Tourism Barometer,* volume 21, issue January 2023, DOI: https://doi.org/10.18111/wtobarometereng.

can the economic and social costs to these countries be weighed against the environmental and health impacts – and equitable solutions be found.

In the coming years the role of emissions measurement (along with transparent reporting in order to demonstrate not just measurement, but progress on decarbonization) will become increasingly standard practice. Already, considerable progress is being made in the sector on committing to measure and decarbonize, and this will inevitably increase as the climate situation worsens and demand for action increases.

In November 2021, at the UN COP26 Climate Conference in Glasgow, United Kingdom, the Glasgow Declaration on Climate Action in Tourism was launched. By the end of 2022, around 800 businesses, destinations and associations across the global tourism sector have signed up to the declaration's commitments.[12]

At the heart of these commitments lie five pathways to guide climate action – measure, decarbonize, regenerate, collaborate and finance. The measure pathway is explained as follows: "[As signatories we commit to measure] and disclose all travel and tourism-related emissions. Ensure our methodologies and tools are aligned to UNFCCC-relevant guidelines on measurement, reporting and verification, and that they are transparent and accessible."[13]

The overview presented in this report seeks to support signatories and the sector at large in meeting these aims.

12 World Tourism Organization (n.d.), 'The Glasgow Declaration on Climate Action in Tourism', online available at: www.unwto.org [03-10-2022].

13 Ibid.

Chapter 1
Current status of tourism emissions measurement

Summary:

Background to this project, why it is necessary, what it seeks to achieve; the current status of tourism emission measurement, focussing on three categories - accommodation, tour operators and destinations

Keywords:

Measurement, accommodation, tour operators, destinations

Key Messages:

- Accommodation has largest number of methodologies and tools designed for its needs, followed by tour operators, then destinations
- There is little consensus over differing responsibilities and boundaries, or metrics used when organisations measure
- New tools are being released that may address some of challenges

Background to the research

The work that underpins this report builds on the first *Global Survey on Climate Action in Tourism,* conducted by the UNWTO between May – September 2021, representing the most extensive such survey to date, with submissions from 1139 respondents globally and from across the sector.[1]

The key findings, which guide this overview and predicate its need, can be summarized as follows:

- Few organizations are measuring (only 20.7% of respondents said they were).
- There is little standardization or consensus amongst those that report they are measuring.
- Existing methodologies and tools often do not cater for the needs of tourism organizations, especially small and medium sized enterprises (SMEs).
- Few of the tools detailed by respondents are freely accessible and designed for wide use:
  - Some respondents reported using offset companies' calculators to measure – many of which offer free measurement as their business model enables it, although the purpose is to sell offsetting.
  - Other respondents used consultants and certification companies, who offer no free tools, but deliver deeper support.

1 World Tourism Organization (2022), *Baseline Report on Climate Action in Tourism,* UNWTO, Madrid, DOI: https://doi.org/10.18111/9789284423965.

In line with the initial findings of the survey, it was decided to systematically review the methodologies and tools in use across the sector, both those reported as being used by survey respondents, and those either known to the project team or sourced through further desk research and interviews.

Over the course of the research, more than 50 methodologies and tools were identified and assessed. These were compiled from responses to the global survey, further insights gained from extensive interviews with experts in climate and tourism, and supplementary literature and desk research, in order to ensure that this report represents a representative overview.

As a first step to analysis, a set of criteria were agreed that would enable comparative analysis of the various methodologies and tools. Any methodologies and tools that did not sufficiently fulfil the criteria established for analysis were then removed from the review sample, as were any that would not provide benefits to much of the tourism sector – either through not being freely available, being designed for specific destinations, for specific companies' proprietary use, or no longer updated or in use. The remaining methodologies and tools were then assessed according to the agreed set of criteria. (See annex 1 for more details on the approach taken, including criteria for analysis; and annex 2 for a table profiling these methodologies and tools.)

Following this research, a phase of in-depth interviews, questionnaires and working group sessions with experts from across the sector was undertaken, in order to further refine the dataset, gain the breadth of the experts' insights into measurement, challenge any initial assumptions, and work to find consensus over the findings and recommendations for ways forward.

While developing this technical brief, additional work was also undertaken reviewing the public statements regarding climate targets and commitments made by a sample of 428 companies that are assessed as being potential frontrunners in committing to climate action in the sector.

The sample comprises the following:

1. Tourism companies with commitments listed in Science Based Targets Dashboard;

2. Companies who have published a Climate Action Plan through Tourism Declares a Climate Emergency or the Glasgow Declaration on Climate Action in Tourism;

3. Companies who participated in the Global Survey of Climate Action in Tourism and stated that they are measuring emissions; and

4. Companies whose climate action commitments were assessed as part of WTTC's Net Zero Roadmap for Tourism.

Having completed the review of these datasets in October 2022, analysis has provided supporting validation to the assessments and guidance delivered within this report, as follows:

- 34% report measuring, but few publicise what methodologies used;
- 23% of those reviewed reported having a baseline year from which measurement began, with a range of years from 1996–2021;
- 37% report having an interim target for Scopes 1 and 2, and 20% reported a Scope 3 target that was distinct from their Scopes 1 and 2; and
- 11.24% reported having a long-term Net Zero target.

These figures lend further credence to this report's assessment that without sector-wide guidance or consensus over how stakeholders should measure, engagement is, and will continue to be, slow and inconsistent.

Measurement of emissions is only starting

In 2019, UNWTO and UNEP published the *Baseline Report on the Integration of Sustainable Consumption and Production Patterns into Tourism Policies.*[2] The report looked into a wide range of sustainability issues, including climate and emissions reduction. The report observed that: "An emerging approach for better connecting national and subnational levels of government in terms of measurement is the establishment of tourism observatories at destination level". At time of publication of this report, however, very few national or subnational destinations are publicly reporting the emissions from tourism.

For larger companies and major players, measurement and reporting are increasingly becoming a legal requirement, impacting not only their operations but also those of their suppliers (who will often be SMEs). For those who are most involved, membership of organisations such as the Sustainable Hospitality Alliance and initiatives such as Hotel Carbon Measurement Initiative (HCMI), make it possible for them to offer support others who can build on their experiences as early adopters, nonetheless, at this time, and as confirmed by the analysis conducted for the review of commitments referred to on page 13, the majority are not reporting their emissions.

SMEs, which represent around 80% of the tourism enterprises, are mostly unengaged with emissions measurement. There are some exceptional SMEs, as shown by the number of signatories to the Glasgow Declaration on Climate Action in Tourism and Tourism Declares a Climate Emergency that are SMEs, who represent some of the most proactive frontrunners in sustainable tourism, being purpose-led companies that have undertaken the challenges of measurement, reporting and reduction without centralized support or guidance. Yet the results of the *Global Survey on Climate Action in Tourism* make clear that they remain the exception, and the vast majority of SMEs (as with the majority of larger companies and destinations) have not engaged at all with measurement.

2 World Tourism Organization and United Nations Environment Programme (2019), *Baseline Report on the Integration of Sustainable Consumption and Production Patterns into Tourism Policies,* UNWTO, Madrid, p. 63, DOI: https://doi.org/10.18111/9789284420605.

Which metrics does tourism use to measure?

Analysis of the answers given to the Global Survey on Climate Action in Tourism revealed a range of metrics used to measure emissions relating to tourism operations. The most frequent and widely accepted include:

- **CO_2e** emissions per customer
- **CO_2e** emissions per booking
- **GHG** emissions per guest/night
- **CO_2e** guest/night
- **CO_2** per passenger per night
- **Emissions** per meeting hour

Lack of consensus over responsibilities and boundaries

The focus for measurement is primarily on supporting decarbonization through the measurement of current emissions and emission reductions. Currently much more work has been done on accounting for operational emissions (e.g., in offices), or in industries such as accommodation that are responsible for a smaller overall percentage of tourism's emissions. However, considering the majority of emissions come from transport, and aviation in particular, there is concern amongst interviewees that the focus of decarbonization measurement should rather be on measuring those, and the impacts of decisions and interventions on reducing them.

It has also been observed that priorities for countries in different development stages are extremely different in focus – simplified as adaptation vs. decarbonization and resilience vs. reduction. The current focus of methodologies and tools on decarbonization is likely a result of them being designed by and for organizations in developed countries. However, there are multiple other factors and impacts of significance to consider, such as non-carbon benefits (for example through health benefits from cleaner air) which are even harder to measure than emissions.

A review of current published climate action plans of members of the Tourism Declares a Climate Emergency initiative, all of which were published between 2020 and 2022 and done so without any central guidance or consensus, shows that many organizations are not measuring emissions, but rather measuring the frequency of actions that may result in emissions reduction, such as tracking the increase in the amount of bicycle trips in their itineraries or the amount of vegetarian meals in the menu. While the actual carbon reduction of such interventions is unclear (and may well be unmeasurable), the progress of the action is measurable, reportable and communicable to guests and staff.

Measurement seen as a barrier rather than an enabler

Where larger companies report measurement, it is often either conducted using proprietary methodologies and tools (or using consultants), or in the case of certain accommodation providers, using the HCMI.

For SMEs, multiple interviews with those who have committed to deliver climate action plans reaffirm that they need measurement tools that cater to their needs and capacity. For many, especially in the context of trying to recover from the impacts of the long-lasting COVID-19 pandemic, right now the priority is not on reducing emissions but on increasing receipts.

This situation is exacerbated by the fact that many SMEs consider measurement inherently difficult. Either they are worried that they spend so much time on measurement and trying to do that effectively that they don't have time to spend on actual decarbonization projects in practice, or they avoid measuring altogether and focus on emissions reductions without an awareness of how much impact they have. As one respondent to the *Global Survey on Climate Action* wrote: "Accessible and cost-effective tools for measuring in a way that also allows us to make changes and reduce our impact, are the biggest hurdle for us, particularly in the current circumstances with limited travel and business impacts."

Where tools are designed to be sold at a cost, they are designed to cater for the needs of those that can afford them. As most SMEs have only very small budgets available for those tools, there is no incentive for the tool designers to make them useful for SMEs. Meanwhile, where tools/methodologies have been created without an ongoing funding mechanism, the providers may lack the finance to improve the user experience or update functionality. As a case in point, several tools recommended in earlier briefings reviewed in the course of researching this report no longer exist.

For every tool that has been previously recommended and then discontinued, there will be a cohort of former users that risk losing motivation and being unsure where to look for a replacement. As another respondent to the *Global Survey on Climate Action* wrote: "Carbon accounting/neutrality schemes are prohibitively expensive for small or micro businesses. So, it's hard to justify claims with authority. I'd like to work on methodologies that all small operators can use with confidence very cheaply."

New generation tools are emerging

There are, however, signs that the situation is changing. New tools and resources are being released that appear at first review to respond to many of the challenges confronting other older tools. Earlier tools are often complex to use, based on spreadsheets and needing understanding of multiple varying emissions sources in order to complete. Newer tools focus on easy to access and understand data sources such as energy bills or even offer direct connection to smart devices.

Moreover, unlike most earlier tools, progress now is towards integrating measurement with targeted guidance for relevant decarbonization interventions, and the seamless production of clear reports.

Likewise, whereas the methodologies that underpin many earlier tools are unclear or inaccessible, there is a growing move towards open sharing of methodologies, written in jargon-free language, which will be essential to accelerate rapid sector-wide progress. However, as these latest tools are either extremely new or even pre-launch at the time of release of this report, it is impossible at this moment to inform on how they have been used by the sector.

Lessons from other sectors

Outside of tourism, interviewees in the finance, fashion and events sectors reported similar challenges in their sectors, in particular around the difficulties posed by Scope 3 emissions[3] and apportioning responsibility across the value chain; and, as with tourism, there are signs of progress in terms of new tools. For example, the events industry has recently launched a user-friendly tool – TRACE– that enables event producers to account for all significant measures in events, including accommodation, transport, waste, etc. The tool provides measurement, connected to decarbonization guidance and a reporting platform. As a result, it provides both tailored and relevant support to users and gathers anonymized data to build a sector-wide picture of progress.

The events industry and tourism sector are inextricably linked since the Meetings Industry[4] is fully part of tourism – both operate in destinations, and both rely on the same travel and accommodation providers. Thus, the insights from such a tool offer great utility, and indeed it is already reported to be in use by destination managers looking to decarbonize their events industry.

3 Scope 3 emissions: emissions the organization is indirectly responsible for, up and down its value chain.

4 UNWTO defines business tourism (related to the meetings industry) as a type of tourism activity in which visitors travel for a specific professional and/or business purpose to a place outside their workplace and residence with the aim of attending a meeting, an activity, or an event. The key components of business tourism are meetings, incentives, conventions, and exhibitions. The term "meetings industry" within the context of business tourism recognizes the industrial nature of such activities. Business tourism can be combined with any other tourism type during the same trip.

Source: World Tourism Organization (2019), *UNWTO Tourism Definitions,* UNWTO, Madrid, DOI: https://doi.org/10.18111/9789284420858.

Chapter 2
Current status of methodologies and tools for accommodation providers

Summary:

An overview of the methodologies and tools being used by accommodation providers

Keywords:

Methodology, tool, emissions, measurement, hotel, accommodation

Key Messages:

- Accommodation industry is better positioned to measure its emissions than other parts of tourism
- HCMI is most widely used methodology and tool
- New tools are looking to simplify process for SMEs

The accommodation industry – specifically hotels – is by some margin the most well-serviced in terms of methodologies and tools. HCMI was launched in June 2012 by the Sustainable Hospitality Alliance (the alliance, previously International Tourism Partnership) and WTTC, in collaboration with 23 leading global hospitality companies. Initially reviewed by the World Resources Institute (WRI) – one of the GHG Protocol development partners – and updated in 2021 to further align with the GHG Protocol, it has since become established as the best-known and most widely used methodology and accompanying tool. Further updates are being considered for incorporation in 2023.

As well as being used by over 30,000 hotels around the world, it also provides the basis for the Hotel Footprinting Tool, the Cornell Hotel Sustainability Benchmark (CHSB) and the Net Zero Methodology for Hotels, developed by Greenview and launched at COP26, which is currently being tested.

However, with around 184,300 hotels worldwide currently,[1] HCMI is not the only tool or methodology in use. Numerous multinational companies use their own bespoke proprietary measurement systems, while others use enriched paid-for tools and services such as Con-serve, by Considerate Group.

Beyond these services, some membership organizations have designed tools and supporting services to enable their members to conduct measurement, from certification scheme Green Key

1 Lock, S. (2022), 'Global hotel count 2008 to 2018', published on 7 January 2o22, Statista, online available at: https://www.statista.com/statistics/1092502/number-of-hotels-worldwide/ [03-10-2022].

that hosts the HCMI tool on its site for its members, to the Long Run, which has designed a product applicable to its membership's needs, most of whom are ecolodges and remote properties.

The existence of these different methodologies and tools reflects the central challenge facing stakeholders in the accommodation industry (and other stakeholders across the other industries that make up the tourism sector).

How does one apportion responsibility for differing emissions sources when the ownership and operational models that govern the industry are themselves so diverse?

The *Net Zero Methodology for Hotels* captures the complexity of this challenge well: "For an independent hotel, the same entity may own and operate the hotel," explains the Methodology. "In rare cases, a major hotel chain may own, operate, and brand the hotel. In more cases, the hotel chain will operate the hotel but not own it. In even more cases, the operator will franchise the hotel to a different operator, and the building is owned by an entirely different entity. In the majority of cases for the global hotel chains, they franchise the hotel to a different operator, and that operator is an SME, which also owns the hotel."[2]

As well as assessing the challenge, the methodology is also the most up-to-date and exhaustive attempt to address it and provide the necessary guidance to the accommodation industry.

In 2022, two new tools have been launched that suggest a new direction that approaches to measurement may be heading. While deliberately avoiding the level of complexity or detail that earlier systems offer, tools such as Weeva (fee-based and available in beta version for free trial at time of publication) and the SME Climate Hub calculator (created by Normative and free with commitment) provide easy-to-use measurement and supporting guidance and reporting functionality that distinguishes them from other services. In so doing they look to provide increased usability to clients, in particular SMEs.

2 Greenview (2021), Net Zero Methodology for Hotels, Greenview, Singapore/Washington D.C., online available at: https://greenview.sg [31-10-2022].

Chapter 3
Current status of methodologies and tools for tour operators

Summary:

An overview of the methodologies and tools being used by tour operators

Keywords:

Methodology, tool, emissions, measurement, tour operator

Key Messages:

- Differing operational structures make measurement challenging for tour operators
- Many frontrunners are using consultants to address specifics of own operations
- No consensus over inclusion of aviation in tour operator calculation

One of the many significant challenges confronting tour operators – and those seeking to support them with measurement – is the different operating models inside the sector. At its simplest, these can be divided into *asset heavy* and *asset light.* Asset heavy tour operators own the vast majority of their infrastructure: the hotels where guests stay, the coaches on which they travel around, for example. At the extreme they might even own their own aeroplanes. Asset light tour operators own far less: they create itineraries that stay in hotels owned by other companies, travel on other companies' coaches, etc.

These ownership models radically alter the emission boundaries of a tour operator. For an asset heavy company, most of its emissions will fall in scopes 1 and 2.[1] For an asset light company, they will fall into Scope 3. This, in turn, sets further challenges. For example, the Science-Based Targets Initiative only requires SMEs to set targets for Scopes 1 and 2 (although it does require measurement of Scope 3). On the other hand, measuring Scopes 1 and 2 is considerably easier than measuring Scope 3, due to the level of control a company has over the emissions.[2]

1 **Scope 1** emissions: emissions that an organization causes directly through combustion of fuels or use of refrigerants in its owned properties and vehicles. **Scope 2** emissions: emissions an organization makes indirectly through the purchase of electricity or energy, for example, for heating and cooling buildings. **Scope 3** emissions: emissions the organization is indirectly responsible for, up and down its value chain. Scope 3 is further subdivided into 15 types of emission.

2 See annex 4 for further information on the scope classification.

There is a further complication when it comes to measurement for tour operators as regarding the inclusion (or not) of international flights from guests coming to and leaving the destination where the tour takes place. Many tour operators do not include these flights in their own measurements, considering that where guests come from and how they choose to travel is beyond their control (especially as a guest may come on a three-week holiday to Australia, but only takes a one-week tour with the tour operator, for example). However, this approach is not universally adopted, and other tour operators include the emissions from the flights, arguing that they should take responsibility for the emissions caused, as they are promoting holidays to people that necessitate them flying.

As such, there is no accepted consensus or widely accepted methodology for measuring tour operator emissions.

The provision of tools specifically targeting tour operators is therefore also extremely limited. In a review of frontrunning tour operators who are the founder signatories of Tourism Declares a Climate Emergency, all those who had measured had created their own solutions (with one exception). Some had worked with consultants to create platforms specific to their own needs, while one company had created an open source, spreadsheet-based solution and guidance which can be shared with anyone wishing to adopt its approach. These companies are all international tour operators with some capacity (e.g., they almost all have one or more paid employees solely focussed on sustainability). For SMEs with less capacity, employing consultants or developing their own approaches is highly challenging.

The only publicly available calculator specifically designed for tour operators that respondents to the Global Survey were using is the fee-based tool Carmacal, winner of the 2017 UNWTO Award for Innovation in Research and Technology and currently reported as being updated.

As with the accommodation sector, however, there are signs of progress. Launched in mid-2022, Path Net Zero appears to offer similar usability to that provided for the accommodation industry by Weeva and the SME Climate Hub Calculator. However, it is not free, and its business model is currently tied to users paying for carbon offsetting in order to process the measurements for specific trips.

As for now, the complex and composite nature of tourism operations does not allow any tool to measure the totality of the supply chain. Therefore, in the absence of full spectrum tools, composite solutions employing multiple calculators are often the only current approach available.

Where flights are included in measurements, dedicated aviation calculators (such as those offered by ICAO, Atmosfair or other offset providers), or the incorporation of emissions data (as with Google or Skyscanner flight search) offer an estimation. One calculator, launched by Sustainable Travel International in 2022, goes further and offers measurements of a wide range of transport options and travel activities such as commercial and charter flights, vehicles, cruises, liveaboards and yachts. However, the fact that many methodologies are employed by different flight calculators means that the same journey may be determined to account for very different volumes of CO_2 emissions depending upon which tool is used.

Meanwhile, accommodation-specific calculators can be used to measure this component of a trip. But using these tools offer at best approximations of the trip's total emissions, as they do not include all aspects. In addition, for resource-stretched companies, or those lacking technical expertise, coordinating such an approach is an onerous task, and one that does not support the wider sector in building shareable, consensus-driven approaches and data.

As one tour operator responding to the *Global Survey on Climate Action* replied: "Datasets for accommodation are not precise enough for small-scale tour operators to meaningfully measure the CO_2 emissions built into their trips. Travel agents and tour operators are the primary decision makers for travel they arrange, in the sense that they choose the suppliers they work with; but they generally have only imprecise data about emissions in their supply chain, which makes it difficult to prioritize low emissions as a criterion in developing a product."

Chapter 4
Current status of methodologies and tools for destinations

Summary:

An overview of the methodologies and tools being used by destinations

Keywords:

Methodology, tool, emissions, measurement, destination

Key Messages:

- Destinations have the least number of methodologies or tools designed for their use when seeking to measure emissions
- The majority of work on destination methodologies is currently taking place in academia
- Some frontrunner destinations developing own solutions, often designed to support private sector stakeholders inside destination

Destination organizations face the greatest challenges when it comes to engaging in measurement. Their organizational structures, spheres of influence and capacity for action vary greatly, as do the scales at which they operate. A subnational destination marketing organization (DMO) may contain smaller local DMOs within (or overlapping its borders), while the country it is part of will be represented by a national tourism organization (NTO) too. Allocating responsibility is even more complex than for the private sector.

Historically, most destination organizations focussed on marketing and had not considered issues such as emissions measurement to be within their remit. However, in recent years and driven in large part as a response to demands for ensuring implementation of policies beyond purely economic objectives, there has been a move towards these organizations looking to take greater responsibility for managing tourism inside the destinations they promote. With this shift in mandate has come increased calls to gain an insight into measurement of emissions and other environmental and societal impacts caused by inbound tourism.

However, as with tour operators, there is no consensus towards what to measure, or what their responsibilities should be as regards it. There are no methodologies publicly available to destinations looking into measuring their own emissions, nor any widely available tools designed specifically for their use.

Emissions measurement, when undertaken, has almost entirely been done in cooperation with academic institutions or as research projects, working directly with national or subnational DMOs to create an estimate of emissions in order to guide policy.

UNWTO, together with pioneering countries and in partnership with international organizations like UNDESA-UNSD and ILO, launched in 2016 the Measuring the Sustainability of Tourism[1] (MST) initiative aimed to provide a statistical framework to measure the impacts and dependencies of tourism on the economy, society and the environment, at both the national and sub-national levels.

Destination organizations face the greatest challenges when it comes to engaging in measurement

The Statistical Framework for MST will be a valuable guiding tool for countries to produce credible, comparable and integrated data to better guide decisions and policy with respect to sustainable tourism - including the Sustainable Development Goals. It aims to become the third international statistical standard on tourism after the *International Recommendations for Tourism Statistics* and the *Tourism Satellite Account: Recommended Methodological Framework*.

MST is based as much as possible on existing internationally agreed measurement frameworks, statistical infrastructures and data. One of the features of the Statistical Framework for MST is the link between the Tourism Satellite Account (TSA) and the System of Economic-Environmental accounting (SEEA). One of the main accounts in this sense relates to the generation of GHG emissions by the tourism industries. Various MST pilots have implemented the GHG emissions account by tourism industries, delivering, for example, the following findings.[2]

- In Germany, tourism as a whole is slightly more emission-intensive than the average for the German economy with a share of 4.5% of total emissions (provide year); this is largely due to transportation services
- In Italy, tourism consumption accounts for 5.2% of total economy output (as of 2015), it generates 5.9% of the economy's GHGs and requires 5.5% of total use of energy
- In Sweden, passenger transport services is the primary contributor to tourism's GHG emissions, representing over 60% of total GHG emissions of the sector (in 2018)

Researchers from the University of Queensland have also developed a model based on the TSAs.[3] Their input-output model is considered systematic, consistent with how tourism GDP and employment are measured, and has been tested in Australia, New Zealand, Norway and Scotland. The approach is considered to deliver coherence between economic and emissions measurement, as it combines TSAs (or other data where TSA is unavailable) with environmental data to quantify

1 World Tourism Organization (n.d.), 'Measuring the Sustainability of Tourism: MST', online available at: https://www.unwto.org/tourism-statistics/measuring-sustainability-tourism [28-11-2022].

2 World Tourism Organization (2019), *Experiences from Pilot Studies in Measuring the Sustainability of Tourism – A Synopsis for Policy Makers,* UNWTO, Madrid, online available at: https://webunwto.s3.eu-west-1.amazonaws.com/s3fs-public/2020-09/Experiences-from-pilot-studies-in-Measuring-the-Sustainability-of-Tourism.pdf [28-11-2022].

3 Sun, Ya-Yen; Lenzen, M. and Liu, Bi-Jen (2019), 'The national tourism carbon emission inventory: its importance, applications and allocation frameworks', *Journal of Sustainable Tourism,* 27:3, pp. 360–379, DOI: 10.1080/09669582.2019.1578364.

emissions from tourism compared to other sectors, and to track progress over time. It also offers a model to address the challenge of how to divide responsibility for aviation emissions fairly and avoid double counting, by attributing responsibility for aviation emissions to the country where the airline is registered.

This attribution of responsibility matches the approach adopted by the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) a market-based mechanism launched by the International Civil Aviation Organization (ICAO), with 116 nation states participating, which is designed to ensure that any growth in emissions from international flights after 2020 is compensated so as to be labelled "carbon neutral".[4]

Significant aspects of destination decarbonization measurement are undertaken by the relevant private sector stakeholders (aviation, transport and accommodation). Other in-destination measures such as infrastructure, energy generation, waste management, are the role of the municipal government or other industries. Therefore, beyond providing assessments of the totality of emissions at a destination level, increasingly national tourism organizations are looking to support their own private sector stakeholders through providing them with the tools and frameworks for measuring their emissions.

Examples of **national tourism organizations** providing tools and frameworks for measuring emission:

- **Visit Finland** has developed a tool to support members of the national sustainable tourism scheme – Sustainable Finland – measure their own emissions.
- **Visit Scotland** is preparing a carbon calculator for its own national sector (which will be free and open for all to use), along with supporting handbooks for nine different types of private sector stakeholder.
- The Co_2rism tool created by **Innovation Norway** offers a tool for NTOs looking to see how to make changes to their tourism policies to impact on emissions.

At a subnational and city level, DMOs continue to question what their role and responsibility for measurement should be. While no established methodology exists for measuring at a subnational level, researchers of the University of Queensland have considered the potential for selecting a relevant suite of indicators from TSAs to guide subnational measuring, and propose trialling such work in countries such as Spain and Australia that also have subnational TSAs.

4 International Civil Aviation Organization (n.d.), 'Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA)', ICAO, Montréal, online available at: https://www.icao.int/environmental-protection/CORSIA/Pages/default.aspx [03-10-2022]

For now, there are only very limited examples of **destination measurement** at this scale, such as:

- **Visit Valencia in Spain** has become the first city DMO to apply the ISO to a tourist destination scale, measuring Scopes 1 to 3, and with third-party certification. The carbon footprint of tourism in the city has been calculated by Global Omnium and verified by AENOR Internacional according to a public, international methodology: the ISO14064-1:2012 International Standard for GHG Emissions Inventories and Verification
- The website for the **Swedish city Goteborg's DMO** provides its own calculator primarily designed for consumers visiting the destination and enables emissions measurement of different transport and accommodation types. It also includes a business-facing Application Programming Interface (API) and is increasingly developing its usability for industry and destinations
- **The Canary Islands**' own tailor-made methodology called 'journey to decarbonization' is embodied in a free digital application that is soon to be launched and managed. The Spanish Island's tool consists of four modules: calculate, define, reduce and offset. Companies can measure their footprint and self-assess their level of maturity in decarbonization; measures and good practices for reduction are provided; initiatives and local offset projects are communicated; as well as complementary resources shared (regulations, templates, FAQS and a glossary)

Chapter 5
Recommendations for the way forward

Methodologies

Find consensus around boundaries and measurement responsibilities

Complex as the undertaking is, all stakeholders would benefit from agreement and guidance on the boundaries of their measurement responsibilities.

The boundaries will differ greatly between different types of organizations in the sector, e.g., for hotels/accommodation Scopes 1 and 2 will constitute a large part of their footprint, whereas for many travel agencies/tour operators/DMOs it is likely in Scope 3.

However, for establishing boundaries, Scopes or similar are not enough. Guidance will need to be delivered without jargon and provide tangible examples that make clear how different parts of the value chain play their role.[1]

Provide tailored guidance for different stakeholder groups

It is clear that destinations, while willing to engage in measurement, are seeking greater guidance on what their distinctive role and responsibility might be. The role of DMOs could be related to collecting the measurements of other stakeholders in the destination and supporting them through guidance, tools and network opportunities. Interviews with DMO stakeholders found a range of opinions as to the correct way forward.

There is wide support for DMOs encouraging their stakeholders to measure emissions – and desire for guidance as to how they should do this. There is wide belief that the role of the DMO should be to coordinate action and collate measurement – again, with the need for guidance, ideas and best practice sharing. And there is support for coordinating stakeholders in the destination and promoting best practice so as to use the DMO's position to support and drive change. As one DMO respondent to the Global Survey on Climate Action stated: "As a DMO, it is challenging to have three streams of climate action work: measuring and reducing carbon as an organization, helping our stakeholders to measure and continue reducing their carbon footprints, and advocating for

1 See Annex 4 for more detail on Scopes and Annex 5 for definitions of key terms relating to emissions measurement.

our stakeholders to measure and continue reducing their carbon footprints, and advocating for consumers to make lower-emission travel choices. Funding for climate action is also a constant struggle."

Further work also needs to be undertaken towards defining clear guidance and consensus with regards to the measurement of aviation emissions by non-aviation tourism stakeholders. In particular, defining their role as part of measurement at destination level would be necessary.

Where political situations allow, defining a position with regards to the role and potential of tourism in the transition to renewable energy could also be strategic, especially in the field of accommodation and hospitality, where there is control over power sources and where energy use is significant.

Prioritise usability over precision to scale up engagement

This complex undertaking necessarily involves all tourism stakeholders to ensure fairness, accountability and engagement. However, their roles and responsibilities are not universally the same. For example, if pressure to measure puts too much burden on SMEs without delivering tangible benefits to their business, it exacerbates problems and inhibits uptake. Hence, balance needs to be struck between the need to be able to accurately measure and apportion responsibility amongst stakeholders, and to ensure engagement, efficacy and progress.

The challenges of engaging with measurement reported across the sector, in particular by SMEs and Destinations, highlight the need for methodologies that are as simple and practical as possible. Consensus around the sector needs to be achieved as to what a simplified set of criteria might be that would enable stakeholders who are reluctant or struggling to measure. Ideally such a simplified approach would drive uptake and could then encourage people to progress in following years towards more detailed and complex measurement as capacity increases. If a move is made towards simplified criteria, it should also be clear that these are being promoted to drive engagement, and that greater, more complex work will be required in time, and is to be encouraged as soon as possible.

Measurement methodologies need to be simple and practical

Catalyse support for SMEs

Larger players in the sector who have legal requirements to measure, who have in-house (or outsourced) capacity and expertise and who generally include SMEs in their Scope 3 measurements, could be engaged to catalyse support for SMEs to advance in emissions measurement. The Sustainable Hospitality Alliance and its support for HCMI offers an example here of how large companies can work together to provide support to more resource constrained SMEs, and how governments can also support such work.

In addition, greater engagement with relevant academic institutions may offer one approach to address the capacity challenges facing SMEs, for example connecting SMEs with tourism schools looking to gain practical experience.

In the case of tour operators, there could be benefit if emissions calculation functionality was included in the itinerary builders many utilize.

Promote the benefits of measurement (financial, social and environmental)

Work should be undertaken to ensure that all stakeholders gain - and see how they gain - tangible benefits from measuring their emissions, for example through cost savings and access to promotional opportunities.

Advance climate risk valuations, measurement of mitigation potential of nature-based solutions, non-carbon benefits, etc

While the nature of net zero commitments and the focus of most measurement is on emission reduction, it would be useful to identify ways to quantify the impact climate-related disasters have on tourism, in particular in order to mobilize governments.

Likewise, it will be necessary to develop measurements for the various non-carbon benefits that accrue from decarbonization strategies if they are to be included into a holistic – and therefore accurate – picture of tourism's full role on ecosystems and society – positive and negative.

Tools

From the research into the latest development of tools to support tourism, it is clear that the situation on measurement is evolving and, in the months, and years to come could have significantly changed as new tools and services seek to address many of the key challenges confronting the sector right now.

Likewise, the number of now obsolete tools previously recommended in earlier publications makes clear that organizations should not invest time and resources in using tools that may not remain useful or even active, especially in the context of limited finances during the COVID-19 recovery.

Furthermore, insights into work proceedings outside the tourism sector make clear that visible benefits could be gained from engaging in collaboration and alignment with climate action initiatives that focus broader and beyond tourism. This can pay dividends for stakeholders in tourism, while also benefiting the wider momentum towards emissions measurement by bringing the impact by many tourism industries to the forefront.

As the tourism sector looks into developing new tools, or improving and updating those currently in use, analysis of the current situation some key factors to consider when assessing the long-term and sector-wide viability of products from different providers.

The following characteristics are key influences to consider when assessing the suitability of providers for creating and maintaining the necessary tools:[2]

1. **The sectoral understanding to ensure relevance**
   Does the provider have a tourism background or connected expertise and the ability to deliver useful tools?

2. **The scientific understanding to ensure rigour**
   Does the provider have access to expert knowledge to ensure the tool is scientifically robust?

3. **The design understanding to ensure usability**
   Does the provider have technical skills to ensure a smooth programming and the ability to deliver continuous advancements?

4. **The independence to ensure neutrality**
   Does the provider have a relationship to the tool which ensures neutral assessments?

5. **The openness to disclose methodological aspects**
   Does the provider encourage knowledge sharing, prioritising openness with essential information, such as the methodology and its components?

6. **The profile to engage and build a network of users**
   Does the provider have the capacity to enable the tool to reach a wide-enough network of users to ensure potential benchmarking and the exchange of user experiences?

7. **The resources/capacity to sustain free access to the tool**
   Does the provider have access to revenue streams that enable it to make the tool free, or at a price that is accessible to all users?

2 This analysis is based on: World Tourism Organization (2016), *Innovative Catalysts Boosting Sustainability in the Tourism Sector – Based on cases and initiatives from Germany,* UNWTO, Madrid, available online at: www.unwto.org [15-02-2023].

Conclusion

As more and more organizations make commitments through the Glasgow Declaration on Climate Action in Tourism and engage in measurement towards target setting and decarbonization, it will become increasingly important that the tourism sector reaches consensus over how it approaches measurement, and that the methodologies and tools are in place to facilitate the rapid and urgent acceleration of engagement. These tools will be needed to engage and mobilize the sector, but also to track its essential progress towards the commitments it has made for 2030 and beyond.

The measurement of progress is essential at multiple levels; and tourism needs to show it is playing its part. As a complex and multi-faceted sector, it needs to understand where the biggest challenges remain and where progress is being driven. At a destination and company level, it is essential to support and highlight the good work of those who are making the commitments, and to enable people to understand what is having the most impact so that investment and energy is not wasted on fruitless endeavours. As a counterpoint to this, it is only through transparent measurement and accounting that greenwash can be avoided.

Most importantly though, it is essential to ensure that the challenges around measurement cease being a barrier to climate action – measuring emissions is not, of itself, enough. It is only useful as a tool towards effective emission reduction. As a consequence, there is a risk that doubt as to *how* or *what* to measure impedes action on emission reduction; and the current situation regarding methodologies and tools for measurement should not impede commencing action on decarbonization. The sector knows the primary causes of the carbon footprint for tourism businesses, and the need for rapid energy and operational transitions.

Whether through the lived experiences in our destinations, or the ever more urgent news being brought from around the world, this has to be the decade not just of measurement, but of urgent climate action.

Annex 1
Approach used in researching this report

The analysis and guidance provided in this report have been developed systematically and progressively across the following three stages:

Stage 1 – Establish the dataset and criteria

Prior to the beginning of this research project, UNWTO led a research in collaboration with the Adventure Travel Trade Association (ATTA), Tourism Declares a Climate Emergency, California State, California State University, Monterey Bay, San Francisco State University, and Texas AM University, and conducted the first *Global Survey on Climate Action in Tourism* between May and September 2021 and received 1139 valid responses from a range of private and public tourism stakeholders. As the most extensive survey to date of the tourism sector on this issue, it provides a sound basis from which to commence the overview of tourism emissions measurement.

As part of this survey, respondents were asked a series of questions concerning their own approach to measuring emissions, such as:

- Is your business measuring (estimating/calculating) emissions from your tourism operations?
- How is your business measuring emissions from your tourism operations? Select the measurement frequency for each of the items.
- Which methodologies, tools or approaches does your business use in measuring emissions?
- Which metric does your business use when referring to emissions from tourism operations?
- What emission source(s) is your business measuring?
- Which scope of emissions is your business measuring?
- Is your business outsourcing measurement of emissions?

The answers to these questions, and detailed analysis of the complete survey, can be found in the *Baseline Report on Climate Action in Tourism* published by UNWTO and ATTA in December 2022.[1] The key findings, which guide this overview and predicate its need, are detailed on page 8 of the Baseline Report.

1 World Tourism Organization (2022), *Baseline Report on Climate Action in Tourism,* UNWTO, Madrid, DOI: https://doi.org/10.18111/9789284423965.

Having compiled the total list of methodologies and tools cited by survey respondents, any methodologies and tools that would not provide benefits to much of the sector were removed – either through being designed solely for specific destinations with no wider applicability, being for proprietary use of specific companies, being fee-based, or being no longer updated or in use. The remaining methodologies and tools were reviewed according to the initial set of criteria, as follows:

1. **Pertinence**

   Signatories to the Glasgow Declaration on Climate Action in Tourism (who all commit to measuring and reporting their GHG emissions) are divided into three categories: business, supporting organization, or destination.

   Which of these signatory types is the methodology/tool suitable for use by? Through this analysis, a greater understanding of which stakeholders are better served through measurement would be built.

2. **Focus**

   Does the methodology/tool enable a user to measure across all Scopes 1, 2 and 3, or is it limited in some way? Does the methodology/tool enable the measurement of all GHG or only CO_2? Is the methodology tool designed to support the work of the users towards net zero, carbon neutrality or some other approach?

3. **Practicality**

   For which of the following elements does the methodology/tool include practical guidance (at least two should appear to qualify for review):

   – Setting a baseline;
   – Setting the boundaries of emissions;
   – Suitable metrics; and/or
   – Setting targets and milestones.

4. **Replicability**

   How usable is the methodology or tool by various stakeholders across tourism?

   Is it up to date?

   How useful is it for SMEs or those with little or no technical expertise or capacity?

   Does the publisher have an established reputation for delivery of such tools/methodologies?

5. **Cost**

   Is the methodology/tool freely available or is it only available with a cost?

Stage 2 – Initial review of methodologies and tools

These answers provided an initial dataset for review which was later supplemented with additional methodologies and tools known to the review team or through further desk research.

It was also decided to augment the analysis with early findings from a complementary piece of research on climate commitments in tourism which reviews a representative sample of public commitments made by leading actors from the following datasets:

1. Companies who had published a Climate Action Plan by August 31, 2022, through Tourism Declares a Climate Emergency or the Glasgow Declaration on Climate Action in Tourism;

2. Companies who participated in the Global Survey of Climate Action in Tourism and stated that they are measuring emissions;

3. Companies whose climate action was assessed as part of WTTC's Net Zero Roadmap for Tourism;

4. Companies with a Science Based Target.

From this initial review, a set of assumptions were developed for stage 3, below.

Stage 3 – Develop assumptions into guidance

Having conducted the initial review of the methodologies and tools, an in-depth consultation process was undertaken to ensure the completeness of the dataset, and to learn from experts and practitioners what their experience was with various methodologies and tools, so to refine the project assumptions and criteria (see Annex 2 for methodologies and tools reviewed according to final criteria) into the guidance contained in this technical brief.

Following these interviews and supplementary research, and the development of more refined assumptions, a questionnaire was sent to the Glasgow Declaration Working Group on Capacity Building.[2] The group was asked what methodologies and tools they had knowledge or experience with, and to provide any insights into those already included in the review dataset.

The findings from these interviews enabled building a set of final assumptions around the current status of emissions measurement for tourism, and a possible approach to addressing the challenges revealed. The assumptions were presented to the Working Group for its insights and proposals which were integrated into the initial assumptions and collected into a set of agreed principles that form the basis of this report.

2 One Planet Network (n.d.), 'Glasgow Declaration – Working Group on Capacity Building: Members', online available at: https://www.oneplanetnetwork.org/programmes/sustainable-tourism/glasgow-declaration/working-group/capacity-building/members [03-10-2022].

Annex 2
Overview of methodologies and tools

The following methodologies and tools are all widely accessible and considered to provide some utility to non-climate specialists working in tourism who are looking to measure their GHG emissions. The free tools and resources listed are also included in the *Glasgow Declaration on Climate Action repository of tools and resources.*

	Title	Descritpion	Pertinence	Focus	Practicality	Replicability	Costs
Methodologies							
Accommodation methodologies							
1	**HCMI**	Developed to enable hotels to report in a consistent way, in particular to corporate customers	Business	Scopes 1,2 and 3 For Scope 3 - only emissions from outsourced laundry are included	Guidance provided towards setting a baseline Guidance provided towards setting emission boundaries Users can track progress so long as they measure on an annual basis Can be used to set measurable targets	Used by over 30,000 hotels globally, HCMI data can be used by hotels participating in the Cornell Hotel Sustainability Benchmark Index (CHSB) – the hotel industry's largest annual benchmarking of energy, water and carbon use It is also the methodology used by the Hotel Footprinting benchmarking tool	Free
URL: https://sustainablehospitalityalliance.org/resource/hotel-carbon-measurement-initiative/							
2	**Net Zero Methodology for Hotels**	Developed to support hotels and the wider hotel industry delivering on their net-zero commitments.	Business	Scopes 1,2 and 3 Provides detailed analysis of how Scope 3 responsibility should be apportioned for accommodation providers seeking to achieve Net Zero	Define boundaries and parameters Support disclosures for SBTi, Glasgow Declaration, Race to Zero. Establish performance and engagement targets.	Launched in 2021 with steering group of WTTC, PATA, SHA and Tourism Declares. 180+ page methodology best suited to those with expert capacity such as asset owners and chains	Free
URL: https://greenview.sg/wp-content/uploads/2021/11/Net-Zero-Methodology-for-Hotels-Practical-Guide-November-2021-FINAL.pdf							

	Title	Descritpion	Pertinence	Focus	Practicality	Replicability	Costs
Methodologies							
Tour operator/composite methodologies							
3	**Earthcheck**	Supports a range of different stakeholders to utilise the MyEarthcheck platform, enabling measurement and benchmarking across operations	Business & Destination	Scopes 1,2 and 3 Enables measurement of 3 most significant GHGs for tourism - CO_2, CH4 and N2O	Methodology designed to be used with proprietary platform, however clear, detailed explanations provide useful insights to anyone seeking to undertake emissions measurement	Earthcheck is a long established Australian certification scheme. It works the Griffith Institute for Tourism, Griffith University to deliver an annual review of the methodology to ensure it remains aligned with key global GHG accounting standards and practices	Free
URL: https://earthcheck.org/resources/							
4	**Much Better Adventures Methodology**	Open source methodology used by UK based travel company to measure emissions from its trips and create own carbon labelling scheme	Business	Scopes 1,2 and 3 Scope 1 and 2 include Electricity and gas from office and home working Scope 3 includes customer flights to/from destination, All transport in destination (land, sea and air), Accommodation, Food, Contingency for supply chain emissions and commodity purchases	Detailed step-by-step methodology for measuring emissions from a portfolio of trips Clearly explained, open sourced, jargon free, makes this very accessible to tour operators needing somewhere to start	Clearly explained methodology for measuring, from UK-based adventure travel company that is a co-founder of Tourism Declares	Free
URL: https://www.muchbetteradventures.com/magazine/hey-travel-industry-heres-how-to-measure-your-carbon-footprint/							
5	**Travel and Climate**	Open source methodology developed to support tool used by Swedish DMO Goteborg & Co	Business	Scopes 1, 2 and 3 Specific scopes depends upon ownership of assets by user when measuring CO_2 emissions	Although tool designed primarily for consumers, it is underpinned by an extremely clear and detailed methodology of use to industry stakeholders	Goteborg & Co is a signatory of the Glasgow Declaration and leading destination, who has built and is developing the Travel and Climate project in collaboration with academic and industry stakeholders in Sweden and internationally	Free
URL: https://travelandclimate.org/methodology							

	Title	Descritpion	Pertinence	Focus	Practicality	Replicability	Costs
6	**Wilderness Group methodology**	Open-source methodology developed for and used by the Wilderness Group (a tour operator based in the United Kingdom), showing how they calculate and share the carbon footprint of each of their customers	Business	Scopes 1,2 and 3 Enables measurement of GHG footprint per customer	Detailed and replicable or adaptable guidance for tour operators looking to measure their emissions relating to a range of issues including accommodation, activities, business travel, food, events and office, as well as transport, trips and tours	Clearly explained methodology for measuring from UK-based adventure travel company, designed by climate consultancy ecollective	Free
URL: https://www.wildernessscotland.com/wp-content/uploads/WG-Carbon-Emissions-Framework-Methodology.pdf							
Destination methodologies							
7	**Estimation of tourism carbon footprint and carbon capacity**	Study estimating the tourism carbon footprint in China's Heilongjiang Province from 2009 to 2018 by using tourism carbon footprint and tourism carbon capacity models	Destination	Scopes 1,2 and 3	Research study focussed on single Chinese province, but including concept of Tourism Carbon Capacity	Project was delivered by School of Tourism and Cuisine, Harbin University of Commerce	Free
URL: https://academic.oup.com/ijlct/article/16/3/1040/6248119							
8	**Measuring tourism emissions at destination level: Australia case**	Research in Australia based on a framework integrating the principles of TSA with the National Greenhouse Accounts	Destination	Scopes 1,2 and 3	Provide a way for national destination to measure and accountf for tourism emissions estimated across destinations, industries and visitor types	Although applied to destinations in Queensland, Australia, it could be tailored to contexts of other destinations	Free
URL: https://www.sciencedirect.com/science/article/pii/S2666957922000301							
9	**Nationally Appropriate Mitigation Action (NAMA) in the sector of Tourism in Morocco**	Extrapolation method - based on methodology validated by GHG Protocol, estimating carbon footprint of Morocco tourism based on carbon footprint of Marrakech tourism	Destination	Scopes 1,2 and 3 Measures GHG emissions, including transport to and from Marrakech, accommodation, activities, on site mobility, F&B, waste and construction of new hotels	Detailed report, with useful appendices including proposed indicators for progress, impact etc	Report delivered by UNEP and UNDP in 2019	Free
URL: https://www.oneplanetnetwork.org/sites/default/files/from-crm/mor_-_advancescp-iki_-_nama.pdf							

	Title	Descritpion	Pertinence	Focus	Practicality	Replicability	Costs
10	**Tourism Auckland Emissions Methodology**	Report on the measurement of New Zealand city of Auckland's tourism carbon footprint using both a top down and bottom up methodology	Destination	Scopes 1,2 and 3	This report provides a method for monitoring tourism's GHG emissions, and a baseline for pre-COVID-19 tourism. Designed for Auckland to inform future tourism planning and management, and marketing strategies towards low-carbon segments	Report goes into detail on process, and provides extensive information on the different methodologies and their applicability	Free
URL: https://www.knowledgeauckland.org.nz/media/2115/carbon-footprint-of-auckland-tourism-auckland-unlimited-becken-s-higham-j-may-2021.pdf							
Transport methodologies							
11	**Atmosfair**	Methodology for calculating CO_2 emissions created by business travel	Business	Scope 3	Seeks to provide the most complete and specific methodology for measuring business travel, by covering the entire span of business travel (flights, hotels, rental cars, rail and conferences)	Atmosfair, a German non-profit organization promoting, developing and financing renewable energies in over 15 countries worldwide, designed the methodology (last updated 2016) in cooperation with the German Business Travel Association (DRV)	Free
URL: https://www.atmosfair.de/en/standards/emissions_calculation/co2_reporting_for_companies/vdr_standard_methodology/							
12	**Co2rism**	Methodology behind Co2rism, a tool designed for destinations (and businesses) to calculate the relative CO_2 emissions caused by transport of different demographics of tourists to and in Norway.	Business & Destination	Scope 1 and 3 Specific Scopes depend who is using, as transport offers a different Scope depending upon user and whether they own vehicles involved in calculation	Methodology enables the comparison of travel impacts from different tourist source markets travelling to specific destinations in Norway, covering six transport modes: aviation, ferries, trains, car, bus and campers Although the actual tool is currently only available in Norwegian, the methodology is translated into English	Methodology created for Innovation Norway, a Norwegian governmental body focussed on development of Norwegian enterprises and industry	Free
URL: https://assets.simpleviewcms.com/simpleview/image/upload/v1/clients/norway/CO2RISM_method_NILU_8251f1fd-526b-4812-8f1f-0d60c60e7a1f.pdf							

	Title	Descritpion	Pertinence	Focus	Practicality	Replicability	Costs
13	**Ecopassenger**	Methodology designed to enable user to compare the energy consumption, CO_2 emissions and other environmental impacts for aviation, rail and cars for journeys across Europe	Business & Destination	Scope 1 and 3 Specific Scopes depend who is using, as transport offers a different Scope depending upon user and whether they own vehicles involved in calculation	Provides detailed technical information on how Ecopassenger measures and compares different transport modes across Europe with background on emission types and key sources for further research	Methodology written in 2016, developed in cooperation between UIC, the Sustainable Development Foundation, ifeu (the German Institute for Environment and Energy) and Hacon	Free
URL: https://ecopassenger.hafas.de/bin/help.exe/en?L=vs_uic&tpl=methodology							
14	**Travel impact Model**	Open-source methodology is based on methodologies and tools of Google and Skyscanner designed to enable a single model for reporting of emissions from aviation	Business	Scope 3 Enables CO_2 measurement by businesses wanting to measure aviation component of trips	Open source methodology is extremely detailed on the assumptions underpinning its framework and plans for future development	Methodology supports the Travalyst framework which aligns the leading consumer flight information platforms of Google and Skyscanner so as to provide clear, standardised information to consumers	Free
URL: https://github.com/google/travel-impact-model/							
Non-tourism methodologies							
15	**GHG Protocol Corporate Accounting and Reporting Standard**	Global standard for emission measurement, designed to help companies prepare a GHG inventory through the use of standardized approaches and principles	Business	Scopes 1,2 and 3	Although not a tourism specific methodology, various cross-sector and sector-specific calculation resources are freely available to support users facilitating involvement participation in voluntary and mandatory GHG programs	As the GHG Protocol is the international central standard that all methodologies and tools should align to, it provides a key reference point at any time	Free
URL: https://cdn.cdp.net/cdp-production/cms/guidance_docs/pdfs/000/002/852/original/SME-Climate-Framework.pdf?1637746697							
16	**SME Climate Reporting Framework**	The framework is designed to support SMEs looking to measure and report on their emissions	Business	Scope 1,2 and 3	This framework provides guidelines for SMEs looking to measure emissions, how to set reduction targets and how to report It supports the measurement tools and guidance provided in the SME Climate Hub	Launched in 2020, the framework was produced by CDP with the Exponential Roadmap Initiative, We Mean Business and Normative, and built on best practice from the leading global initiatives in emission measurement and reduction	Free
URL: https://cdn.cdp.net/cdp-production/cms/guidance_docs/pdfs/000/002/852/original/SME-Climate-Framework.pdf?1637746697							

	Title	Descritpion	Pertinence	Focus	Practicality	Replicability	Costs
Tools							
Accommodation tools							
17	**Con-Serve**	Dynamic data management platform for the hospitality industry that measures consumption of electricity, heat, water, waste and outsourced laundry	Business	Scopes 1,2, and 3	Subscription-based service with differing levels of support, providing users with data for use in benchmarking, monitoring and reporting	Designed and managed by UK-based firm offering sustainability tools and services to a wide range of international hotel clients	Multi-tiered subscriptions
URL: https://considerategroup.com/services/conserve/							
18	**HCMI**	Spreadsheet-based tool enabling hotels to calculate the carbon footprint of rooms and meeting spaces	Business	Scopes 1,2 and 3 For Scope 3 - only emissions from outsourced laundry are included	Designed to enable hotels to understand their carbon footprint and deliver activities including: Benchmark performance; Set and track progress towards measurable targets; and Prepare reports	Tool designed by leading provider Greenview for Sustainable Hospitality Alliance, a member organisation representing 30% of the global hotel industry	Free
URL: https://sustainablehospitalityalliance.org/resource/hotel-carbon-measurement-initiative/							
19	**Hotel Footprinting tool**	Global benchmarking tool using data from the Cornell Hotel Sustainability Benchmarking index enabling users to estimate relative carbon footprints of hotel stays worldwide	Business & Destination	Scopes 1,2 and 3 Enables CO_2 emissions measurement of hotel stays, which can be used to estimate for Scope 3 business travel, or for Scope 1 and 2 estimates if used by hotels to compare own emissions to regional averages	Supports users to compare carbon footprint of hotel stay in different destinations for Scope 3 reporting and for travel bookers to provide comparable information to clients	Tool designed by Greenview, leading provider of sustainability programs and data management for the hospitality and tourism sector	Free
URL: https://www.hotelfootprints.org/							

	Title	Descritpion	Pertinence	Focus	Practicality	Replicability	Costs
20	**Greenhouse Gas Abatement Cost Model (GACMO)**	Spreadsheet-based tool designed to help accommodation businesses estimate their GHG emissions relating to energy and food use	Business	Scopes 1, 2 and 3 Scope 3 measurement is limited to emissions relating to food	Tool is a free-to-download spreadsheet supported by manual and ideas for mitigation activities to help reduce emissions	Tool designed and managed by UNEP, and tested in various destinations where UNEP runs programmes. This hotel specific version is an adaptation of a model and tool designed for countries through more than 20 years of research at UNEP Copenhagen Climate Centre, and was used by several countries to prepare their INDCs	Free
URL: https://www.oneplanetnetwork.org/knowledge-centre/resources/hotel-ghg-mitigation-tool-gacmo							
21	**Greenview Portal**	Data management system designed for hotels and hotel companies by company who created Hotel Carbon Measurement Initiative	Business	Scopes 1,2, 3 As well as full GHG measurement supports measuring other issues ranging from water and waste to social impact.	Subscription-based service enabling users to manage, monitor and benchmark progress against a range of sustainability measures and to prepare for Global Sustainable Tourism Council (GSTC) certification	Designed by Greenview to enable users to deliver on HCMI and other measures, the platform is the first system to gain GSTC recognized status	At cost on enquiry
URL: https://greenview.sg/services/greenview-portal/							
22	**MyEarthcheck**	Paid platform enabling wide range of tourism stakeholders to measure and benchmark emissions (and other sustainability issues, eg water use)	Business & Destination	Scopes 1,2 and 3 Enables measurement of main GHG emissions across all scopes for a range of different stakeholders	Focus is on enabling users to track emissions and benchmark progress against similar stakeholders Additional services available to help clients set and meet targets	Requires user to be signed up to Earthcheck certification scheme (or to be member of an organisation that has signed up on its behalf)	Multi tiered subscriptions
URL: https://earthcheck.org/what-we-do/certification/							

	Title	Descritpion	Pertinence	Focus	Practicality	Replicability	Costs
23	**Weeva**	Paid platform (currently in beta and launching fully in 2023) enabling hoteliers to easily measure, track and report on emissions and a range of other sustainability and social metrics	Business	Scopes 1,2,3	Designed to be as easy to use as possible for individual or multiple properties, enabling measurement, target setting, and reporting, and supported by guidance proposing recommended activities to improve progress across 18 areas of sustainability including climate action	Built with support of leading sustainability initiative The Long Run and global certification organisation Preferred by Nature, Weeva will be fully available in 2023	Cost TBC when launched
URL: https://weeva.earth/							
Tour operator tools							
24	**Carmacal**	Database application designed to enable tour operators to measure total carbon footprint of tour packages	Business	Scopes 1,2 and 3	Users can measure emissions across multiple sources, including international and local transport, individual accommodations, and activities	Built in 2016 and managed by European not for profit promoting sustainable development in tourism, it is currently reported as being updated	Annual membership allows limited number of calculations, with additional fees for more
URL: https://www.cstt.nl/carmacal							
25	**Path Net Zero**	Emissions calculator platform designed specifically for tour operators, enabling the measurement of itineraries	Business	Scopes 1,2 and 3	Enables user to estimate total emissions from multiple components of trip including international and domestic flights, land transport and accommodation	Usability is currently limited by need to sign up to purchase offsets to access the full functionality of the calculator	Free to use simple calculator, with access to full functionality gained by paying for offsets related to emissions
URL: https://www.pathnetzero.com/							

	Title	Descritpion	Pertinence	Focus	Practicality	Replicability	Costs
Non-specific tourism tools							
26	**Ecopassenger**	Tool designed to enable user to compare the energy consumption, CO_2 emissions and other environmental impacts for aviation,rail and car trips across Europe	Business & Destination	Scope 1 and 3 Specific Scopes depend who is using, as transport offers a different Scope depending upon user and whether they own vehicles involved in calculation	Detailed comparison tool across multiple transport modalities - train, car, plane	Tool only works for journeys in Europe, providing greatest level of detail for comparing trips	Free
URL: https://www.ecopassenger.org/							
27	**STI Carbon Calculator**	Tool designed to support STI offset scheme by enabling measurement of emissions from a wide range of travel activities by land, sea and air	Business & Destination	Scope 1 and 3 Specific Scopes depend who is using, as transport offers a different Scope depending upon user and whether they own vehicles involved in calculation	The calculator utilises average CO_2 emission factors of air travel, passenger vehicles, and fuel consumption provided by the DEFRA statistical analysis database, enabling trip planners to undertake detailed comparison of relative emissions from trips using different vehicle types	Designed by Sustainable Travel International, an international NGO that works with communities, companies, governments and organizations worldwide, the tool aims to support the NGO's offset programme.	Free to measure, however tool is designed to facilitate sale of offsets
URL: https://sustainabletravel.org/our-work/carbon-offsets/calculate-footprint/							
28	**Travel and Climate**	Predominantly consumer-focussed calculator developed for use by visitors to Swedish city Gothenburg, but offering increasing considerable potential for usability by industry	Business & Destination	Scopes 1,2 and 3 As GHG emissions measurements are provided for transport, accommodation and some activities, all Scopes are covered to some degree depending upon who is measuring and what	Rapidly evolving product originally designed for consumers to measure transport, but now with additional accommodation (and developing attractions) functionality, enabling users to compare different types of accommodation and different types of transport API is available at cost to embed functionality into own site	Goteborg & Co is a signatory of the Glasgow Declaration and leading destination, who has built and is developing the Travel and Climate project in collaboration with academic and industry stakeholders in Sweden and internationally Tool is extremely easy to use, while API offers users potential to integrate emissions into travel agency apps & booking sites, create carbon receipts for travel related purchases etc	Free to use on main site, and available for use on own sites as paid as an API
URL: https://travelandclimate.org/							

	Title	Descritpion	Pertinence	Focus	Practicality	Replicability	Costs
Non-tourism tools							
29	**Greenhouse Gas Protocol – The GHG Emissions Calculation Tool**	Spreadsheet-based tool from Greenhouse Gas Protocol and WRI to help companies estimate their greenhouse gas (GHG) emissions based on the Greenhouse Gas Protocol	Business	Scopes 1,2 and 3	Tool offers step-by-step process to estimate company emissions supported by instructions and examples of use	Designed by the global organisations responsible for providing the framework that all else aligns to	Free
URL: https://ghgprotocol.org/ghg-emissions-calculation-tool							
30	**Normative emissions calculator**	Simple to use tool enabling quick estimations of emissions based on bills and expenses for companies that sign up to SME Climate Hub	Business	Scopes 1,2 and 3 Provides emissions measurement for a range of emissions sources including upstream emissions from purchased goods and services, capital goods, upstream transport and distribution, and business travel, calculated from expenses. In addition summarises emissions according to Scopes	Extremely easy to use as all measurement processed from bills and expenses and therefore involving no additional expertise However calculator is industry agnostic and does not include tourism specific measurements	Simple, user friendly way, supported by Google, to engage large numbers of early stage companies in climate action	Free
URL: https://smeclimatehub.org/start-measuring/							
31	**Scope 3 Evaluator**	Web-based tool from Greenhouse Gas Protocol is designed to enable companies to measure, report and reduce emissions throughout their value chain	Business	Scope 3	Designed for non-expert use and with minimal data collection required, the tool enables estimation for all 15 Scope 3 categories	Designed by the global organisations responsible for providing the framework that all else aligns to	Free
URL: https://ghgprotocol.org/scope-3-evaluator							

	Title	Descritpion	Pertinence	Focus	Practicality	Replicability	Costs
32	**SME Carbon Footprint Calculator**	Calculator designed to help UK-based SMEs measure their corporate emission footprint following Greenhouse Gas Protocol Guidance	Business	Scopes 1 and 2	Supports SMEs using easily accessible data sources such as fuel bills and service sheets to measure emissions	The calculator is developed by the Carbon Trust, a global organisation behind world's first carbon footprint label with more than 20 years experience. However is not tailored for tourism and is UK specific	Free
URL: https://www.carbontrust.com/resources/sme-carbon-footprint-calculator							
33	**TRACE**	Platform designed to enable events companies to measure, track, reduce and report emissions from live, hybrid and digital events.	Business & Destination	Scopes 1, 2 and 3	Designed for the event industry to provide them with an easy to use solution delivering measurement, guidance and reporting, the platform is also being used by destination organisations looking to reduce emissions from events	Trace has been developed collaboratively by isla, the industry body for sustainable events, working with many of the leading global players	Cost, reduced for members of isla
URL: https://traceyour.events/							
34	**Green Events Tool**	Platform developed by UNEP, UNFCCC and Gulf Organisation for Research & Development to enable users to evaluate the sustainability and environmental performance of events	Business & Destination	Scopes 1,2 and 3	Tool enables measurement of emissions associated with venue, international flight travel, local ground transportation, audio-visual systems, accommodation, exhibition and production, communications and catering activities	Designed by UNEP and UNFCCC, the tool is new to market in late 2022	Free
URL: https://greeneventstool.com/							

Annex 3
Emission scopes in detail

While measuring Scopes 1 and 2 is relatively straightforward for most businesses and organizations, measuring Scope 3 emissions is very complex and implies numerous overlaps across stakeholders. Nevertheless, for most businesses and organizations, Scope 3 emissions make up the largest share of their total emissions. In the table below, the three Scopes are explained and examples provided. The Scope 3 categories which are most commonly applicable to tourism operations are shaded in grey.

Type of emission sources		
Scope 1	This covers the GHG emissions that a company or organization creates directly from its facilities and vehicles. These emissions are related to combustion sources and fuels, as well as refrigerant. Examples: Fuels used for heating your facility (boilers, generators), fuel used for company-owned vehicles, refrigerant for AC and cold storage.	
Scope 2	These are the emissions that a company or organization creates indirectly in connection with its energy consumption. Examples: Electricity or energy purchased as a utility for heating and cooling buildings.	
Scope 3	In this category are all the emissions that a company or organization is indirectly responsible for, as a consequence of its activities, up and down its value chain. There are 15 categories of scope 3 emissions, detailed below. Example: Products bought from suppliers, business travel, employee commuting, food and beverage, outsourced services, waste, etc.	
	1. Purchased goods and services	Extraction, production, and transportation of goods and services purchased or acquired. Example: Office supplies, it expenses, telecommunications, brochures, consulting, water usage, paper, food, beverages, toiletries, cleaning products, linens, outsourced laundry, staff uniforms, marketing materials and guest gifting.
	2. Capital goods	Extraction, production, and transportation of capital goods purchased or acquired. Capital goods are products that have an extended life and are used by the company/organization to provide a service. Example: Construction and reformation, new boilers, larger equipment, vehicles – anything that you will not replace for a few years that's high in value.

Type of emission sources		
Scope 3	**3. Fuel and energy related activities (not already accounted in scope 1 or 2)**	Extraction, production, and transportation of fuels and energy purchased or acquired, not already accounted for in scope 1 or scope 2, including: a. Upstream emissions of purchased fuels b. Upstream emissions of purchased electricity c. Transmission and distribution losses d. Generation of purchased electricity that is sold to end users Example: Transmission of natural gas or other fuels to remote off-grid locations; companies selling excess power to the grid (e.g., net positive hotels)
	4. Upstream transportation and distribution	Distribution and transportation of products purchased between: a. Tier 1 suppliers and own operations (in vehicles and facilities not owned or controlled by the company or organization) b. Third-party transportation and distribution services purchased between a company and organization's own facilities (in vehicles and facilities not owned or controlled) Example: Shipping of brochures that a tour operator receives and then distributes to travel agents or local hotels; Transportation of guests arranged by the hotel within the destination or to/from the destination.
	5. Waste generated in operations	Disposal of waste (solid and wastewater) generated in operations and treatment in facilities not owned by the company or organization. Example: Waste to landfill amounts, recycling amounts, organic waste amounts.
	6. Business travel	Transportation of employees for business-related activities in vehicles not owned or operated by the reporting company. Example: Air travel for employees to attend a conference or FAM Trip; Emissions from business travellers overnight stays.
	7. Employee commuting	Transportation of employees between their homes and their worksites in vehicles not owned or operated by the reporting company. Example: Travel for employees to get to and from work; Emissions from teleworking.
	8. Upstream leased assets	Operation of assets leased by the company or organization (lessee) and not included in scope 1 and scope 2. Example: Rented assets such as vehicles or boilers.
	9. Downstream transportation and distribution	Transportation and distribution of products sold to the end consumer (if not paid for by the reporting company/organization), including retail and storage (in vehicles and facilities not owned or controlled by the reporting company). Note: Typically, does not apply to services.
	10. Processing of sold products	Processing of intermediate products sold in the reporting year by downstream companies (e.g., manufacturers). Note: Typically, does not apply to services.
	11. Use of sold products	End use of goods and services sold by the company or organization. Example: Any flights sold by the business, package travel (travel offered from pick-up to drop-off which typically includes transport, accommodation and meals); Excursions sold by a hotel.

Type of emission sources		
Scope 3	**12. End-of-life treatment of sold products**	Waste disposal and treatment of products sold at the end of their life. Note: Typically, does not apply to services
	13. Downstream leased assets	Operation of assets leased, owned by the company or organization (lessor) and not included in scope 1 and scope 2. Example: Hotel amenities such as restaurants, gift shops which are leased.
	14. Franchisess	Operation of franchises not included in scope 1 and scope 2 reported by franchisor. Example: Franchised hotels.
	15. Investments	Operation of investments (including equity and debt investments and project finance), not included in scope 1 or scope 2. Example: Cover emissions associated with investments

Annex 4
Key terms related to measuring GHG emissions

Baseline Year

The first year that one reports a measurement for and upon which any reductions are measured against. GHG accounting is conducted on an annual basis, where emissions are first measured (i.e., in order to establish the inventory base year) and then measured year on year going forward for comparison and progress tracking. The time period selected for the GHG inventory can be calendar year, financial year, or other set periods such as quarterly reporting.

Carbon Neutrality

Where an activity emits GHGs into the atmosphere, carbon neutral is achieved by compensating for the equivalent amount of emissions through either traditional offsets or carbon removals. Carbon Neutral: the status where the greenhouse gas emissions associated with an organization, company, product or service are estimated, plans are developed and implemented to reduce or avoid them, and finally any non-avoided emissions are compensated or "offset" with carbon credits.

CDP

CDP (formerly known as the Carbon Disclosure Project), runs one of the most prevalent global frameworks for carbon reporting, used by investors, companies, cities, states and regions to report their measured environmental impacts. It is not tourism specific.

CO_2e

Carbon Dioxide is the most abundant greenhouse gas caused by human activity and carbon is often used as a shorthand to refer to greenhouse gas emissions. However, there are several others, such as Nitrogen Oxide and Sulphur Oxide. For the sake of simplicity, much GHG emissions measurement and reporting is standardised to CO_2e, where 'e' is standard for equivalent.

Emission boundaries

The first step in GHG accounting is to define the boundary of the GHG inventory. These are imaginary lines encompassing the emissions to include in an organisation's GHG inventory. There are organisational boundaries which determine which company operations to include, and operational boundaries which determine which emissions sources to include and how to categorise them. Using the guidance as set out by the GHG Protocol's Corporate Accounting and Reporting Standard, there are three distinct consolidation approaches for setting the boundary.

These are the:

- Equity share approach
- Operational control approach
- Financial control approach

The most common consolidation approach is that of 'operational control', that is, the controlling corporation has the full ability to introduce and enforce operating policies and procedures at the facility, office or operations location. If a company has operational control, then it is responsible to account for 100 per cent of the GHG emissions from that facility, office or operations location.

Emissions factor

An emissions factor is a representative value that attempts to relate the quantity of a pollutant released to the atmosphere with an activity associated with the release of that pollutant.

Emission sources

Many of our daily and/or business activities result in emissions. For instance, using water in the kitchen, using electricity for appliances, our waste, air conditioning, business flights, printing brochures, transport, etc. These are called emission sources.

The segmentation of different emissions sources into Scope 1, 2 and 3 is a way of categorising the different kinds of carbon emissions a company creates in its own operations, and in its wider value chain. Having first appeared in the GHG Protocol of 2001, it is now the standard way of working out what emissions are the responsibility of different stakeholders, and what level of control (and therefore responsibility and opportunity to act) it has over them.[1]

- **Scope 1 emissions**— Emissions that an organisation causes directly through combustion of fuels or use of refrigerants in its owned properties and vehicles.

- **Scope 2 emissions** — Emissions an organisation makes indirectly through the purchase of electricity or energy – for example for heating and cooling buildings.

- **Scope 3 emissions** — Emissions the organisation is indirectly responsible for, up and down its value chain. Scope 3 is further subdivided into 15 types of emission.

GHG accounting

The first step of any carbon management strategy is for organisations to account for the GHG emissions generated by their activities, such as fuel or electricity use and business travel. Identifying and quantifying GHG emissions helps to identify excessive energy usage or other inefficiencies. Lowering GHG emissions goes hand in hand with increasing efficiency and cost effectiveness. In addition to cost savings, measuring and reducing GHG emissions helps enhance a brand. Customers, whether companies or individuals, care about who they do business with and look for products and services from environmentally responsible companies. Also, employees are also attracted to companies that are environmentally aware. On the investor side, there is increasing sustainability awareness and investors consider 'ESG' – environmental, social and governance – information when making investment decisions as well as assessing climate risk.

1 See Annex 4 for more detail on how accommodation providers and tour operators should approach additional details on *scopes*.

GHG accounting has the following objectives:

- help organisations prepare a true, fair account of emissions
- simplify and reduce the costs of compiling an inventory
- assist businesses and governments in managing and reducing emissions
- facilitate participation in GHG programs
- increase consistency and transparency in GHG accounting and reporting

Greenhouse gas (GHG)

The release of GHGs traps heat in the atmosphere, causing global warming. The seven GHGs included in emissions inventories are Carbon dioxide (CO_2), Methane (CH_4) and Nitrous oxide (N_2O); along with Hydrofluorocarbons (HFCs), Perfluorocarbons (PFCs), Sulfur hexafluoride (SF_6) and Nitrogen trifluoride (NF_3).

Greenhouse Gas Protocol

The Greenhouse Gas Protocol establishes comprehensive global and standardised frameworks to measure and manage GHG emissions from private and public sector operations, value chains and mitigation actions.

Net Zero

Net Zero is the target for all emissions reduction efforts. It involves reducing the production of GHG emissions to as near zero as possible, and then removing all remaining emissions from the atmosphere. The status where the greenhouse gas emissions associated to an organization, company, product or service are estimated, plans are developed and implemented to reduce or avoid them, and finally any non-avoided emissions are “neutralized” through carbon capture or removal technologies.

Nationally Determined Contribution (NDC)

Launched at Paris COP21, the NDC’s are designed to ensure fair and necessary emissions reductions, considering that some countries (mostly those most industrialised) are both historically and currently responsible for the majority of emissions. They factor in the consideration that countries have to balance emissions reductions with other critical demands like ending poverty. Furthermore, the biggest emitters need to make the largest and fastest cuts.”

Race to Zero

The Race to Zero is a a campaign led by the High-Level Champions, with support from United Nations Climate Change, that works with businesses, cities, regions, investors, and financial and educational institutions to commit to achieve net zero carbon emissions by 2050 at the latest.

Science-based targets

Science-based targets are goals developed by a business or organiation to provide it with a clear route to reduce greenhouse gas emissions. An emissions reduction target is defined as ‘science-based’ if it is developed in line with the scale of reductions required to keep global warming below 2C from pre-industrial levels. These targets can then be approved by the Science Based Targets initiative.

Annex 5
List of companies reviewed for systematic review of climate commitments

AAT Kings, Abercrombie & Kent, Accessible Travel Solutions, Accor, Adelman Travel, Adtrav Travel Management, Adventure Specialists B.V. - Shoestring, Koning Aap & Yourway2go, Adventure Tours UK, Adventure World Travel, Adventures By Disney, Adventurous Ewe, Aeroflot, Africa Diamond Tours, Africa Travel Inc, Agence Kanda Voyage, AHI Travel, Aida, Air Canada, Air China Ltd, Air France/KLM, Air India Limited, Air New Zealand, Airasia Berhad, Airbnb, Airtrade Holland, Alaska Airlines, Alikats Mountain Holidays, All Dreams Cambodia, All Nippon Airways Co. Ltd, Almounia Hotel & Spa, Amadeus River Cruises, Amaya Kuda Rah Maldives, American Airlines, American Cruise Lines, American Express Gbt, Americantours International, Amity Tours, Amtrav, Anantara Hoi An, Anwb, Apa Hotels & Resorts, Arjeplog Hotel Silverhatten AB, Ascott Limited, Atelier De Cuisine Chef Tarik, ATG Business Travel Management, Atlas Reizen, Atlas Travel & Technology, Avalon Waterways, Avoya Travel, Azamara, Azul Linhas Aereas Brasileiras, **B**alboa Travel, Banyan Tree Hotels & Resorts, Barefoot Holidays St. Lucia, BCD Travel, Beluga Adventures, Best Western Hotels, Better Places, Bhaya Cruises Co. Ltd, Blackstone Group, Blount Small Ship Adventures, Booking.com, Bouchard Finlayson, Brendan Vacations, British Airways, BTG Home Inn, Bush Oasis **C**aravan Park, Caesars, Cain Travel, Canadian Mountain Holidays, Caravan And Motorhome Club, Carnival, Casal Dei Fichi, Cathay Pacific Airways, Celebrity, Celes Beachfront & Samui Palm Beach Resort, Celestyal Cruises, Centara Hotels & Resorts, Cheapoair, Chile Nativo, China Eastern Airlines, China Southern Airlines, Chobe Holdings Limited, Choice Hotels International, Christopherson Business Travel, Cocha Travel, Coco Palm Dhuni Kolhu, Coco Collection, Sunland Hotels Pvt. Ltd, Collette Travel Services, Como Point Yamu, Compagnie Bourlingue Alias Freewheelin'tours, Conlin Travel, Contiki, Corporate Travel Management, Costa Cruises, Costa Rica Tour, Crossroads Maldives (Hard Rock Hotel And Saii Lagoon Maldives), Crystal, Crystal Creek, Cullinan, Journeys, Cunard, CWT, **D**alata Hotel Group, Daluyon Beach And Mountain Resort, Delta Air Lines, Der Touristik, Despegar, Destination America, Dialoog Hotel Banyuwangi, Diamond Resorts Europe, Diethelm Travel Group, Direct Travel, Discovery Nomads, Disney, Dnata Travel, Dolphin Bay Resort, Down Under Tours, Dream Cruises, DTX Hotel Nha Trang, Dune 7, Dusit International, **E**arthchangers, Eastgate Safaris, Easyjet UK Limited, Edreams Odigeo, Emirates, Emirates Holidays, Enchanting Travels, Epikurean Hospitality (Thailand) Co. Ltd., Eternal Landscapes Mongolia, Ethical Travel Portal, ETOA, Europamundo, Eurotur, Eurowings, Evan Evans Tours, Everest Pioneer Trek Nepal Pvt. Ltd, Executive Travel, Exo Travel, Exodus Travels, Expat Explore Travel, Expedia, Explora Caribe Tours, Explore, Extended Stay America, **F**air Voyage, Fairaway, Far And Wild, Fareportal, Fiyavalhu Maldives, Flight Centre Travel Group, Foge Comigo, Four Seasons Hotels And Resorts, Fred Olsen, **G** Adventures, Gant Travel, Go! Jamaica Travel, Gol, Grand Circle Cruise Line, Grand European

Tours, Grandis Hotels & Resorts SDN BND, Green Tourism, Greentree Inns, Grosvenor Tours, Grupo Julia, **H**aggis Adventures, Hainan Airlines, Hapag Lloyd, Headwater, Hebridean Island Cruises, Henritours, Here To Travel, Highland Explorer Tours, Hike And Sail Turkey, Hilton Worldwide, Holidaycheck, Holland America, Hostelworld, Hotel Awa, Hotel Kasbah Lamrani, Hotel Las Arenas Balneario Resort, Hotel Manaslu Pvt.Ltd., Hotel Marshyangdi P. Ltd, Hotel Uthgra Los Cocos, Hotel Uthgra Presidente Perón, Hotel Uthgra Sasso, Hotelplanner, Huazhu Hotels Group, Hurtigruten, Hyatt Hotels, Hylton Ross, IHG, **I**kapa Tours And Travel, Impactful Tourism, Independent Hostels, Inside Travel Group, Insight Vacations, Inspired Adventures, Inspiring Journeys, Interglobe Aviation Ltd. Dba Indigo, International Volunteer HQ, Internova Travel Group, Interstate Hotels, Intown Suites, Intrepid, Ivythwaite Lodge, **J**acks Alt Stays, Japan Airlines Co., Ltd., JB Travel GMBH, Jetblue Airways, Jinjiang International, Joro Experiences, Jseason Travels And Tours (P)Ltd., Jumeirah, **K**alapathar Lodge, Keep Flying Travel And Tourism, Kempinski, Khách Sạn La Casa Hà Nội, Khiri Travel, KHM Travel Group, Kindle Journeys, Kintetsu International Express, Korean Air Lines, Ksar Ljanoub, Kuoda Travel, Kuoni Travel, **L**a Residence Phou Vao, A Belmond Hotel, Langham Hospitality Group, Lastminute, Latam Airlines Group Sa, Le Caramelle Di Baratti, Legacy Vacation Resorts, Lindblad Expeditions, Lion Airlines, Lion World Travel, Little Gwendreath, Loews Hotels, Lotte Hotels & Resorts, Lufthansa, Luxury Gold, **M**acher, Magnuson Hotels, Makemytrip, Malahini Kuda Bandos, Manchebo Beach Resort And Spa, Mandarin Oriental Hotel Group, Marella Cruises, Marriott International, Mascontour, Meet&Greet Italy, Melia, Metropolitan Touring, MGM Resorts International, Millennium & Copthorne, Minor Hotels, Monvigliero Vineyard Villas, MSC Cruises, Much Better Adventures, Mường Thanh Holiday Hue Hotel, My Dream Boutique Resort & Spa, Mystic Cruises, **N**am Bộ Tourist., NECSTouR, NH Hotel Group, Nirvana Travel & Tourism, Nordic Leisure Travel Group, Norwegian, NTO Ukraine, Oceania Cruises, **O**ld Town, Olivers Travels, Omega World Travel, Omni Hotels & Resorts, On The Beach Group, Ovation Travel Group, Oyo, **P**&O Cruises, P&O Cruises Australia, Pa Sak Tong, Pan Pacific Hotels And Resorts, Panoramic Journeys, Paradise Cruise Line, Parkroyal Yangon, Paul Gauguin Cruises, Peak Incentives, Pearl Seas Cruises, Pegasus Hava Tasimaciligi A.S., Petra Fig Tree Villa, Phoenix Reisen, Pollman's Tours & Safaris, Polwaththa Eco Lodges, Ponant/Paul Gauguin Cruises, Ponte Travels, Princess, Professional Travel, Pung-Waan Resort & Spa, **Q**antas Airways Ltd., Qatar Airways, Quark Expeditions, **R**adisson, Rayane Tours Sarl, Rayavadee, Reclaim Your Self, Red Carnation Hotels, Red Lion Hotels Corporation, Red Roof Inn, Regent Seven Seas, Regional Air, Retrace Hospitality, Richedu International Consult, Riu Hotels & Resorts, Rosewood Hotel Group, Royal Caribbean, Ryanair, SA Avianca, **S**aga Cruises, Sakmut Hotel & Spa, Salt & Bush Eco Tours, Sardegna Grand Hotel Terme, Saudi Arabian Airlines Corporation, Sawadee Reizen, Scandic Hotels, Scandinavian Airlines System, Scenery Adventures Ltd, Scenic Luxury Cruises And Tours, Sea Going Green, Seabourn, Seadream Yacht Club, Seit Outback Australia, Seres Springs Resort & Spa Singakerta, Seychelles Travel, Shamrocker Adventures, Shandong Airlines, Shangri-La Hotels And Resorts, Shenzhen Airlines, Sichuan Airlines, Signature Travel Network, Sila Urban Living, Silk Path Hotels & Resorts, Silversea, Siva Travel Services, Six Senses, Skyscanner, Small World Vacations, SNP Natuurreizen, Soneva, South American Tours, Southwest Airlines, Spicejet, Spirit Airlines, Springbok Atlast Tours And Travel, Star Clippers, Star Cruises, Steppes Travel, Sunwing Travel Group, Sustainabile Tourism Foundation Pakistan, Swain Destinations, **T**auck Inc, Terraverde Sustainability, Thai Marano Travel, The Adventure Connection, The Dolphin Company, The Inside Trek, The Lapis Hotel, The Long Run, The Peninsula Bangkok, The Safari Collection, The Sarojin, The Shellsea Krabi, The Travel Corporation, Thompsons Africa, Tiger Mountain, Topdeck Tours, Tour Partner Group, Toyoko Inn, Tracoin, Traflagar, Trailfinders, Trails Of Indochina, Training Aid, Travel Corporation Asia, Travel Edge, Travel Matters, Travel Planners International, Travel Talk Tours, Travelling Whale, Travellink, Travelodge, Travelopia, Travelzoo, Trip.Com Group, Tripadvisor, Tripntap, Trivago,

Trufflepig, Tui Cruises, Tui Group, Turkish Airlines, **U**nited Airlines, Uniworld Boutique River Cruises, **V**erdmont Vacations, Vietnam Airlines, Vietravel, Viking Cruises, Virgin Atlantic & Holidays, Virgin Australia International, Virgin Voyages, Virtuoso, Visit Inverness Loch Ness, Vueling Airlines, **W**alt Disney Parks And Resorts, Warwick Hotels And Resorts, Webjet, West Sweden Toiurism Board, Westgate Resorts, Westjet, Whitbread, Windstar, Wizz Air, World Challenge, World Heritage Catalysis, Wyndham Hotels And Resorts, **X**iamen Airlines, Xigera Safari Lodge, **Y**ampu Tours, Yankee Leisure Group, Yellowwood Adventures.

List of acronyms and abbreviations

ATTA	Adventure Travel Trade Association
CDP	Carbon Disclosure Project
CHSB	Cornell Hotel Sustainability Benchmark Index (CHSB)
COP26	Conference of the Parties to the United Nations Framework Convention on Climate Change
CORSIA	Carbon Offsetting and Reduction Scheme for International Aviation
CO_2	carbon-dioxide
CO_2e	carbon-dioxide equivalent
DEFRA	UK Department for Environment, Food and Rural Affairs
DMO	destination marketing organization
DRV	Deutscher Reiseverband, the German Business Travel Association
GDP	gross domestic product
GHG	greenhouse gas
GSTC	Global Sustainable Tourism Council
HCMI	Hotel Carbon Measurement Initiative
IATA	International Air Transport Association
ICAO	International Civil Aviation Organization (ICAO)
IEA	International Energy Agency
IPCC	Intergovernmental Panel on Climate Change
ITF	International Transport Forum
MST	Measuring the Sustainability of Tourism
NDC	nationally determined contribution
NOAA	National Oceanic and Atmospheric Association
NTO	national tourism organization
SEEA	System of Environmental-Economic Accounting
SME	small and medium-sized enterprise
TSA	Tourism Satellite Account
UIC	Institut für Energie und Umweltforschung Heidelberg
UNEP	United Nations Environment Programme
UNSD	UN Statistics Division
UNWTO	World Tourism Organization
WMO	World Meteorological Organization
WRI	World Resources Institute
WTTC	World Travel & Tourism Council

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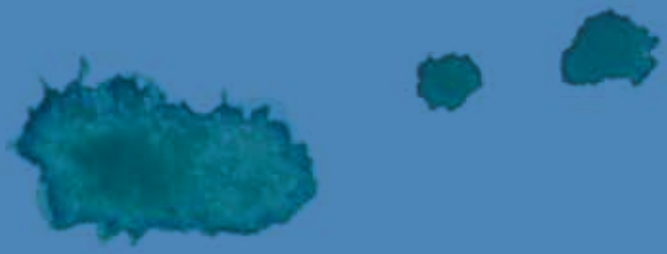

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