# Technical Brief on Measuring Tourism Greenhouse Gas Emissions:

# An overview of the state of current measurement tools and methodologies and recommendations for ways forward

Draft from 14 October 2022

# Contents

# 1 About this Technical Brief

2 Measurement of Greenhouse Gas (GHG) emissions presents several challenges
3 for the tourism sector. The tourism value chain is complex, diverse and
4 overlapping. The process of measurement is marked by an unfamiliar lexicon and
5 set of principles, such as the concept of 'scopes'. For a sector working to recover
6 from the impacts of the pandemic, there is little capacity - and often little
7 enthusiasm - to undertake an endeavour that does not appear to offer much in
8 return.  Thus, measurement which is taking place is marked by a range of
9 fragmented approaches.
10
11 It appears essential therefore to produce a global overview of current approaches
12 in order to address the challenges effectively and develop sector-wide consensus
13 in key areas in order to facilitate, accelerate and track progress on climate action
14 and emissions reduction in the coming years.
15
16 This technical brief seeks to provide an overview of the global efforts of the
17 tourism sector and assess the current situation regarding GHG emissions
18 measurement in tourism. It provides an overview of tools and methodologies
19 currently available for use; assesses how the development of such tools and
20 methodologies has progressed; and suggests what more needs to be done to
21 support the sector to measure its emissions. In so doing it supports the
22 implementation of the commitments launched in November 2021 through the
23 Glasgow Declaration on Climate Action in Tourism, for which Measurement is the
24 first pathway that signatories are requested to adopt.
25
26 The aim is to provide support for tourism practitioners at the beginning of their
27 climate action journey, facilitating them in choosing suitable ways to measure
28 and further engage. In addition, it is hoped that policy makers and solution
29 providers will benefit from the perspective contained within the overview as they
30 consider what gaps remain to be addressed.
31

1 # Introduction

2 ## Why emissions measurement matters

3 Across the world, the destructive impacts of climate chaos are occurring with ever

4 greater frequency and intensity. 2022 has seen wildfires, drought, flooding and

5 temperatures reach unprecedented levels. The need for urgent, immediate and

6 drastic GHG emissions reduction is clearer than it has ever been.

7

8 Although we can see and feel these impacts ever more clearly, emissions

9 measurement has been alerting us to these risks for far longer. The first

10 measurements of the heating effects of $CO_2$ on the atmosphere were conducted

11 by Eunice Foote in 1856[1].  The weather station on Mauna Loa in Hawaii began

12 measuring GHG intensities in 1958, when the concentration in the atmosphere of

13 $CO_2$ was 316 parts per million. It is now at 420[2].

14

15 Because it has taken society so long to respond, the Intergovernmental Panel on

16 Climate Change (IPCC) said in its latest 2022 report that global emissions need to

17 halve by 2030[3], and reach Net Zero as fast as possible before 2050 to stand the

18 best chance of keeping global temperature rises beneath 1.5 degree celsius

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[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/2016/09/02/the-woman-who-identified-the-greenhouse-effect-years-before-tyndall/ [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 7 June 2021, online available at https://research.noaa.gov/article/ArtMID/587/ArticleID/2764/Coronavirus-response-barely-slows-rising-carbon-dioxide [02-10-22]

[3] IPCC (2022) "The evidence is clear: the time for action is now. We can halve emissions by 2030.", published online 04 April 2022, online available at https://www.ipcc.ch/2022/04/04/ipcc-ar6-wgiii-pressrelease/ [02-10-2022]

1 above pre-industrial levels. The increase of temperature is currently around 1.2

2 degrees[4].

3

4 Yet, according to an International Energy Agency (IEA) report from April 2022,

5 global energy-related carbon dioxide emissions in 2021 were the highest ever

6 measured[5], rising 6% above its 2020 level to 36.3 billion tonnes. As our emissions

7 keep rising, a May 2022 report from the UN's World Meteorological Organisation

8 (WMO) asserts that there is a 50:50 chance of average global temperature

9 reaching 1.5 degrees celsius in the next five years[6], and that the likelihood is

10 increasing all the time.

11

12 The ongoing shift in the world's economy in response to the climate emergency is

13 also seeing opportunities opening up for companies and destinations that are

14 able to position themselves to support the green transition.  According to the IEA's

15 *World Energy Investment 2022* report, investment in clean energy has grown by

16 12% a year worldwide since 2020. Encouragingly, says the IEA, investment in solar,

17 batteries and electric vehicles is increasing at a rate consistent with reaching the

18 global Net Zero goal for emissions before 2050[7].

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[4] Roper. W (2021), 'Global Warming Chart - Here's How Temperatures Have Risen Since 1950', published online 25 January 2021, available online at https://www.weforum.org/agenda/2021/01/global-warming-chart-average-temperatures-rising [02-10-22]

[5] WEF (2022), 'Global $CO_2$ emissions rebounded to their highest level in history in 2021', published online 08 March 2022, available online at https://www.iea.org/news/global-co2-emissions-rebounded-to-their-highest-level-in-history-in-2021 [02-10-2022]

[6] WMO(2022), 'WMO update: 50:50 chance of global temperature temporarily reaching 1.5°C threshold in next five years', published online 09 May 2022, available online 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] IEA (2022), 'Record clean energy spending is set to help global energy investment grow by 8% in 2022', published online 22 June 2022, available online at https://www.iea.org/news/record-clean-energy-spending-is-set-to-help-global-energy-investment-grow-by-8-in-2022 [02-10-2022]

# 1    What percentage of emissions does tourism cause?

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

5

6    At a global level, 2008 research by the United Nations World Tourism Organisation
7    (UNWTO),  United Nations Environment Programme and the WMO estimated the
8    sector's GHG emissions at around 5% of global emissions and estimated that 75%
9    of all tourism emissions are linked to transportation[8]. More recently, research
10   found that the sector was responsible for 8% of global greenhouse gas emissions
11   in 2013[9].

12

13   The ranges in these figures reflect the complexity in measuring the sector's
14   emissions. What should be included? Where do the boundaries lie? Is tourism
15   responsible for the emissions from food consumed in its hotels (or is that the
16   responsibility of agriculture?). Is it responsible for the transport of this same food
17   (or is that shipping)? Is it responsible for the emissions from the taxi a visitor takes
18   from the airport to the hotel (or is that transport?). The challenges of establishing
19   consensus on these questions leads to such divergent measurements of the
20   sector's emissions.

21

22   A 2019 report from the UNWTO and the International Transport Forum (ITF)
23   estimated transport-related emissions from tourism as having grown at least 60%
24   from 2005 to 2016, at which point transport-related $CO_2$ caused 5% of global
25   emissions. According to the report, without significant decarbonisation efforts,
26   sector $CO_2$ emissions could rise at least by 25% by 2030, compared to 2016.

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[8] UNWTO (2008), 'Climate Change and Tourism - Responding to Global Challenges',
available online at:
https://webunwto.s3-eu-west-
1.amazonaws.com/imported_images/30875/climate2008.pdf (02-10-2022)

[9] Lenzen, M., Sun, YY., Faturay, F. et al.(2018), 'The carbon footprint of global tourism', *Nature
Climate Change*, published 20 March 2018, available online at
https://doi.org/10.1038/s41558-018-0141-x [03-10-2022]

1

2   Despite the lack of a standardised or universally accepted measurement for

3   tourism's overall emissions, it is clear the sector has a significant responsibility to

4   decarbonise, and that the majority of those emission reductions need to come

5   from transport.

6

7   Finally, despite the global shutdown of tourism in 2020 due to the COVID

8   pandemic, signs are that its subsequent reopening has seen numbers rapidly

9   return almost to where they were. According to the May 2022 issue of the UNWTO

10  World Tourism Barometer, aviation arrivals had exceeded 50% of 2019 levels by

11  May 2022, and were expected to reach 55% to 70% of 2019 levels in 2022[10]. Likewise

12  the International Air Transport Association (IATA) predicts that, despite a 40%

13  increase in the world oil price, the aviation industry will see "passenger numbers

14  reach 83% of pre-pandemic levels in 2022."[11]

15

16  A detailed understanding of emissions measurement is essential for the ongoing

17  viability of tourism. As the case for urgent climate action becomes more widely

18  demanded, industries seen to be laggards on sufficient progress, may be

19  exposed. Consider that the IPCC emphasises global emissions need to halve by

20  2030, yet the WTTC Net Zero Roadmap for tourism, published in November 2021,

21  estimated that global tourism emissions will peak in the 2030s[12], and then rapidly

22  descend as new technologies enable a rapid decarbonisation of the transport

23  fleet. Protests, regulation, and behavioural shifts are likely to become more

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[10] UNWTO World Tourism Barometer and Statistical Annex, May 2022 (2022), available online at https://www.e-unwto.org/doi/abs/10.18111/wtobarometereng.2022.20.1.3 [03-10-2022]

[11] IATA (2022), 'Travel Recovery Rebuilding Airline Profitability - Resilient Industry Cuts Losses to $9.7 billion', published 20 June 2022, available online at https://www.iata.org/en/pressroom/2022-releases/2022-06-20-02/#:~:text=Flights%20operated%20in%202022%20are,%24239%20billion%20generated%20in%202021.[03-10-2022]

[12] WTTC (n.d.), *A Net Zero Roadmap for Travel & Tourism - proposing a new Target Framework for the Travel 7 Tourism Sector*, available online at https://wttc.org/Portals/0/Documents/Reports/2021/WTTC_Net_Zero_Roadmap.pdf [03-10-2022]

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 how many of the countries in the global south that are most dependent upon tourism - islands in the Caribbean and Pacific 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 detailed, fair, transparent measurement 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 show not just measurement, but progress on decarbonisation) will become increasingly commonplace. Already, considerable progress is being made in the sector on committing to measure and decarbonise, and this will inevitably increase as the situation worsens and demand for action increases.

In November 2021, at the UN COP26 Climate Conference in Glasgow, the Glasgow Declaration for Climate Action in Tourism[13] was launched. As of September 2022, nearly 700 businesses, destinations and associations across the global tourism sector have signed up to the declaration commitments.

At the heart of these commitments lie five pathways to guide climate action - Measure, Decarbonise, Regenerate, Collaborate, 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."

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[13] One Planet Network (n.d.), available online at https://www.oneplanetnetwork.org/programmes/sustainable-tourism/glasgow-declaration [03-10-2022]

1

2 The overview conducted in this technical brief seeks to support signatories and

3 the sector at large in meeting these aims.

4

# Current status of tourism emissions measurement

## Background to the research

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

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

- Few organisations are measuring (less than 10% of respondents).
- There is little standardisation or consensus amongst those that are measuring.
- Respondents appear to be frustrated at the lack of (or inapplicability to their situation) tools and methodologies.
- SMEs are particularly challenged as few of the tools detailed by respondents are free and designed for their 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 offer deeper support.

Subsequent to this survey, it was decided to review the tools and methodologies 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 nearly 50 tools and methodologies were 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 it 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 tools and methodologies 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 sector - either through not being freely available, being designed for specific regions, for specific companies' proprietary use, or  no longer updated or in use. The remaining methodologies and tools were then reviewed according to the agreed set of criteria. (see annex 1 for more detail on the approach taken, including criteria for analysis; and annex 2 for a table profiling 10 free methodologies and seven tools that met sufficient criteria).

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 their insights into measurement, challenge any initial assumptions and work to find consensus over the findings and recommendations for ways forward. (The full list of experts consulted can be found in annex 5.)

While developing this technical brief, additional work is also being undertaken reviewing the public statements regarding climate targets and commitments made by a representative sample of 500 companies[14] that are assessed as being

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[14] The sample comprises the following datasets: 1: Companies with a Science Based Target; 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; Companies whose climate action was assessed as part of WTTC's Net Zero Roadmap for Tourism

potential frontrunners in committing to climate action in the sector. This work is ongoing (around 60% have been reviewed) at the time of the release of this technical brief for public consultation, and already provides useful context, reinforcing the selection of tools and methodologies and providing further validation to the assessments and guidance delivered.

## Which stakeholders are measuring?

In 2019, the UNWTO published the *Baseline Report on the Integration of Sustainable Consumption and Production Patterns into Tourism Policies*. 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, however, very few national or regional destinations are publicly reporting the emissions from tourism.

For larger companies and major players, measurement and reporting is increasingly becoming a legal requirement, impacting not only their operations but also those of their suppliers (who will often be SMEs). Regardless, at this time only a very few are currently reporting their emissions.

SMEs, which represent around 80% of the tourism value chain, are diverse in their situation as regards measurement. On the one hand, as shown by the breakdown of signatories to the Glasgow Declaration and Tourism Declares a Climate Emergency, some of the most proactive frontunners in sustainable tourism are SMEs, purpose-led companies that have undertaken the challenges of measurement, reporting and reduction without centralised 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.

# What is being measured?

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

It has been observed that priorities for Global South and Global North are extremely different in focus - simplified as adaptation for South vs decarbonisation for North, resilience for South vs reduction for North. The current focus of tools and methodologies on decarbonisation is likely a result of them being designed by and for organisations in the Global North. However there are multiple other factors and impacts of significance, 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 organisations 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 food 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.

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## 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
- $CO_2e$ guest/night
- GHG Emissions per guest/night
- $CO_2$ per passenger per night
- emissions per meeting hour

1

## How are stakeholders measuring?

Where larger companies report measurement, it is almost always either conducted using proprietary tools and methodologies (or using consultants), or in the case of certain accommodation providers, using the Hotel Carbon Measurement Initiative (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 COVID pandemic, the priority right now is not reducing emissions but 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 decarbonisation 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

1     wrote: "Accessible and cost effective tools for measuring in a way that also allows

2     us to make changes and reduce our impact are the biggest hurdle for us,

3     particularly in the current circumstances with limited travel and business

4     impacts."

5

6     Where tools are designed to be sold at a cost, they are designed to cater for the

7     needs of those that can afford them. As SMEs cannot afford them, there is no

8     incentive for the tool designers to make them useful for SMEs. Meanwhile, where

9     tools / methodologies have been created without an ongoing funding

10     mechanism, the providers may lack the finance to improve the user experience or

11     update functionality. As a case in point, several tools recommended in earlier

12     briefings reviewed in the course of researching this technical brief no longer exist.

13

14     For every tool that has been previously recommended and then discontinued,

15     there will be a cohort of former users that risk losing motivation and being unsure

16     where to look for a replacement.  As another respondent to the Global Survey on

17     Climate Action wrote: "Carbon accounting/neutrality schemes are prohibitively

18     expensive for small or micro businesses. So it's hard to justify claims with

19     authority. I'd like to work on methodologies that all small operators can use with

20     confidence very cheaply."

21

## 22     Are solutions imminent?

23     There are, however, signs that the situation is changing. New tools and resources

24     are being brought to market that appear at first review to respond to many of the

25     challenges confronting other older tools. Earlier tools are often complex to use,

26     based on spreadsheets and needing understanding of multiple varying emissions

27     sources in order to complete. Newer tools focus on easy to access and

28     understand data sources such as energy bills or even offer direct connection to

29     smart devices.

30

31     Moreover, unlike most earlier tools, progress now is towards integrating

32     measurement with targeted guidance for relevant decarbonisation interventions,

1    and the seamless production of clear reports. Likewise, whereas the

2    methodologies that underpin many earlier tools are unclear or inaccessible, there

3    is a growing move towards open sharing of methodologies, which will be essential

4    to accelerate rapid sector wide progress. However, as these latest tools are either

5    extremely new or even pre-launch at the time of this technical brief's publication,

6    it is impossible at this moment to report on how they have been used by the

7    sector.

8

9    Outside of tourism, interviewees reported similar challenges in their sectors, in

10    particular around the difficulties posed by Scope 3 emissions and apportioning

11    responsibility across the value chain. And as with tourism, there are signs of

12    progress in terms of new tools. For example, the events sector has recently

13    launched a user-friendly tool - TRACE[15] - that enables event producers to account

14    for all significant measures in events, including accommodation, transport, waste

15    etc. The tool provides measurement, connected to decarbonisation guidance and

16    a reporting platform. As a result it provides both tailored and relevant support to

17    users and gathers anonymised data to build a sector-wide picture of progress.

18

19    While not directly designed for tourism stakeholders, the overlapping nature of the

20    events and tourism sectors - both operate in destinations, and both rely on the

21    same travel and accommodation providers - means that insights into such a tool

22    offer great utility, and indeed it is already reported to be in use by destination

23    managers looking to decarbonise their events industry.

24

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[15] ISLA (n.d.) available online at https://traceyour.events/ [03-10-2022]

# Current status of tools and methodologies for accommodation providers

The accommodation sector - specifically hotels - is by some margin the most well serviced in terms of tools and methodologies.

HCMI was launched in June 2012 by the Sustainable Hospitality Alliance (previously International Tourism Partnership (ITP)) and the World Travel & Tourism Council (WTTC), in collaboration with 23 leading global hospitality companies.  Reviewed by the World Resources Institute (WRI) – one of the GHG Protocol development partners, and updated in 2020-2021, it has since become established as the best known and most widely used methodology and accompanying tool. It is currently being updated to fully align with the GHG Protocol and further updates are being considered for incorporation in 2023.

As well as being used by over 25,000 hotels around the world, it also provides the basis for the Hotel Footprinting Tool and the Net Zero Methodology for Hotels, written by Greenview and launched at COP26, which is currently being tested.

However, with around 185,000 hotels worldwide[16], HCMI is not the only tool or methodology in use. Numerous multinationals 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 organisations have designed tools and supporting services to enable their members to conduct measurement, from certification scheme Greenkey that has adapted HCMI, to the Long Run, which has designed a product applicable to its membership's needs, most of whom are ecolodges and remote properties.

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[16] Lock, S. (2022), 'Total number of hotels worldwide from 2008 to 2018', available online at https://www.statista.com/statistics/1092502/number-of-hotels-worldwide/ [03-10-2022]

1 The existence of these different methodologies and tools reflects the central
2 challenge facing stakeholders in the accommodation industry (and other
3 stakeholders across the other industries that make up the tourism sector). How
4 does one apportion responsibility for differing emissions sources when the
5 ownership and operational models that govern the industry are themselves so
6 diverse?

7

8 The *Net Zero Methodology for Hotels*, by far the most up to date and exhaustive
9 attempt to address this challenge and provide guidance to the accommodation
10 industry, captures the complexity of the challenge well. "For an independent hotel,
11 the same entity may own and operate the hotel," explains the Methodology. "In
12 rare cases, a major hotel chain may own, operate, and brand the hotel. In more
13 cases, the hotel chain will operate the hotel but not own it. In even more cases, the
14 operator will franchise the hotel to a different operator, and the building is owned
15 by an entirely different entity. In the majority of cases for the global hotel chains,
16 they franchise the hotel to a different operator, and that operator is an SME, which
17 also owns the hotel." [17]

18

19 In 2022, two new tools have been launched that suggest a new direction that
20 approaches to measurement may be heading (only one was live at time of
21 publication). While deliberately eschewing the level of detail that earlier systems
22 provide in order to provide increased usability to clients, Weeva (fee-based and
23 not yet live) and the SME Climate Hub calculator (created by Normative and free
24 with commitment) provide easy to use measurement and supporting guidance
25 and reporting functionality that distinguishes them from other services.

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[17] SHA (n.d.), Net Zero Methodology for Hotels, available online at
https://sustainablehospitalityalliance.org/resource/net-zero-methodology-for-hotels/
[03-10-2022]

# Current status of tools and methodologies for tour operators

One of the 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. 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. 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.

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 place 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 take a 1 week tour with the tour operator). However, this approach is not universally adopted, and other tour operators include the emissions from the flights, arguing that as they are promoting holidays to people that necessitate them flying, they should take responsibility for the emissions caused.

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 - with one exception - had created their own solutions. Some had worked with consultants to create platforms specific to their own needs, while one company, Much Better Adventures, had created an open source, spreadsheet-based solution and guidance which it 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 focused 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 reported using is Carmacal, winner of the 2017 UNWTO Award for Innovation in Research and Technology, a fee based tool that is reported to be 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 Weeva and the SME Climate Hub Calculator. It is not free, and its business model is tied to users paying for carbon offsetting in order to process the measurements for specific trips.

As it stands, however, the complex and composite nature of tourism operations means that no tools measure the totality of the supply chain. Therefore, in the absence of full spectrum tools, composite approaches are often the current approach. Where flights are included in measurements, dedicated aviation calculators such as those offered by Atmosfair or the International Civil Aviation Organisation (ICAO), or the incorporation of emissions data in Google's flight search -  although mostly targeted at consumers - 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.

1

2  Meanwhile accommodation calculators can be used to measure this component

3  of a trip. But all of these tools offer at best approximations, and do not include all

4  aspects. And for resource-stretched companies, or those lacking technical

5  expertise, coordinating such an approach is an onerous task, and one that does

6  not support the wider sector in building shareable, consensus-driven approaches

7  and data.

8

9  As one tour operator responding to the Global Survey on Climate Action replied:

10  "Datasets for accommodation are not precise enough for small-scale tour

11  operators to meaningfully measure the $CO_2$ emissions built into their trips. Travel

12  agents and Tour Operators are the primary decision makers for travel they

13  arrange, in the sense that they choose the suppliers they work with; but they

14  generally have only imprecise data about emissions in their supply chain, which

15  makes it difficult to prioritise low emissions as a criterion in developing product."

16

# Current status of tools and methodologies for destinations

Destinations Organisations face the greatest challenges knowing what their role is when it comes to engaging in measurement. Their organisational structures, spheres of influence and capacity for action vary greatly as do the scales at which they operate. A regional Destination Marketing Organisation (DMO) may contain smaller local DMOs within, while the country it too is part of will be represented by a National Tourism Organisation. Allocating responsibility is even more complex than for the private sector.

Historically, most Destination Organisations 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 organisations 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 as to what to measure, or what their responsibilities should be as regards it. There are no methodologies publicly available to Destinations looking to measure their emissions, nor any widely available tools designed specifically for their use.

Where emissions measurement has been done has been undertaken, it has almost entirely been delivered through academic institutions or as research projects, working directly with national or regional DMOs to create an estimate of emissions in order to guide policy.

1    In 2015, the UNWTO, in partnership with the UN Statistics Division (UNSD), launched
2    the Measuring Sustainable Tourism (MST) initiative[18]. The purpose of the initiative
3    is to develop a statistical framework that connects the established accounting
4    framework for tourism, Tourism Satellite Accounts (TSA) and accounts from the
5    System of Environmental-Economic Accounting (SEEA) framework. Although the
6    scope of this work is broader than GHG Emissions, they play a significant role, and
7    several pilot projects have already investigated them across various countries.
8    Various studies have used the TSA-SEEA and input-output analysis approach,
9    delivering the following findings:
10
11   ● In Germany, tourism as a whole is slightly more emission-intensive than the
12       average for the German economy with a share of 4.5% of total emissions.
13
14   ● In Italy, tourism consumption accounts for 5.2 per cent of total economy
15       output in Italy (as of 2015), generates 5.9 per cent of GHGs and requires 5.5
16       per cent of total use of energy products.
17
18   ● In Sweden, travel is the primary contributor to tourism's greenhouse gas
19       emissions, representing over 60 per cent of total GHG emissions of the
20       sector.
21
22   Researchers from the University of Queensland (who worked on the 2018 paper
23   estimating global tourism emissions at 8%), have also developed a model based
24   on the TSAs. Their Input-Output model is considered systematic, consistent with
25   how tourism GDP and employment are measured, and has been tested in
26   Australia, New Zealand, Norway, Scotland and Taiwan. It expects to have
27   estimates of the emissions of 100 countries by early next year. The approach is
28   considered to deliver coherence between economic and emissions
29   measurement, because it combines TSAs (or other data where unavailable) with

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[18] UNWTO (n.d.), available online at https://www.unwto.org/standards/measuring-
sustainability-
tourism#:~:text=The%20Statistical%20Framework%20for%20Measuring,social%20dimensio
ns%20of%20sustainable%20tourism.[03-10-2022]

environmental data to quantify 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 is also the approach adopted by the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) a market-based mechanism being developed by ICAO designed to ensure that any growth in emissions from international flights after 2020 is compensated so as to be "carbon neutral".[19]

Many destinations consider that the significant parts of destination decarbonisation measurement is being undertaken by the relevant private sector stakeholders - aviation, transport and accommodation - and that other in-destination measures such as infrastructure, energy generation, waste management, are the role of the municipal government or other sectors.

Therefore, beyond providing assessments of the totality of emissions at a destination level, increasingly national tourism organisations are looking to support their own private sector stakeholders by providing them with the tools and frameworks with which to measure their emissions.

- Visit Finland has developed a tool to support members of the national sustainable tourism scheme - Sustainable Finland - measure their own emissions.

- VIsit Scotland is due to launch a carbon calculator for its own national sector (although it will be free and open for all to use), along with supporting handbooks for nine different types of private sector stakeholder, before COP27.

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

- In France, Ademe - the government agency responsible for the energy transition towards 2030 - provides a wealth of support, data, tools, access to funding and guidance  for all sectors of society, including tourism. For example, they offer open-source calculators that enable the coordinated measurement of emissions related to food, transport and lodging.

- The Co2rism tool created by Innovation Norway offers a tool for NTOs looking to see how to make changes to their policies to impact on emissions.

- In Germany the German Tourist Board's "Feel Good" sustainable travel page now includes a consumer facing carbon calculator for flights and car travel.

At a regional 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 regional level, the University of Queensland researchers have considered the potential for selecting a relevant suite of indicators from TSAs to guide regional measuring, and trialling such work in regions such as Spain and Australia that have regional TSAs. For now there are only very limited examples of destination measurement at this scale, such as:

- Valencia has become the first city DMO to measure and report the climate impact of tourism at a city level, working with the consultancy Global Omnium, however there is no publicly available methodology.

- The website for Gothenburg's DMO provides its own calculator, which although designed for consumers, now includes a business facing API.

# Recommendations for the way forward

## Methodologies

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 organisations in the sector, e.g. for hotels/accommodation scopes 1 & 2 will constitute a large part of their footprint, whereas for many travel agencies/tour operators/DMOs it's very much in scope 3.  However, establishing the boundaries, scopes etc is 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. *(See annex 1 for more on this, and annex 3 for initial checklists for accommodation providers and tour operators.)*

This complex undertaking necessarily involves all stakeholders so as to ensure fairness, accountability and engagement. However their roles and responsibilities are not universally the same. Where, for example, pressure to measure puts too much burden on SMEs without delivering benefits to their business, it exacerbates problems and inhibits uptake.

A 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, and 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

1   then encourage people to progress in following years towards more detailed and
2   complex measurement as capacity increases. If a move is made towards
3   simplified criteria, it should also be clear that these are being promoted in order
4   to drive engagement, and that greater, more complex work will be required in
5   time, and is encouraged as soon as possible.
6
7   As a starting point, all signatories to the Glasgow Declaration on Climate Action in
8   Tourism (who have not yet started measuring) should prioritise measuring
9   Scopes 1 and 2 in 2023. In order to encourage ambition, all signatories should also
10  seek to measure certain key elements of Scope 3 in 2023, as an introduction to
11  supply chain emissions measurement. Ideally these should be the most
12  significant categories of Scope 3, e.g. business travel, which is relatively easy to
13  measure.
14
15  Further work also needs to be undertaken towards defining clear guidance and
16  consensus with regards to the measurement of aviation emissions by non-
17  aviation tourism stakeholders. In particular, defining their role as part of
18  measurement at destination level would be necessary.
19
20  Where political situations allow, defining a position with regards to the
21  role/potential of tourism in the transition to renewable energy could also be
22  strategic, especially as regards the accommodation industry, where there is
23  control over power sources, and energy use is significant.
24
25  It is hoped that larger players in the sector who have legal requirements to
26  measure, who have in house (or outsourced) capacity and expertise, and who
27  generally include SMEs in their Scope 3 measurements could be engaged to
28  catalyse support for SMEs to advance in their measurements.
29
30  Meanwhile, it is clear that Destinations, while willing to engage in measurement,
31  are seeking greater guidance on what their distinctive role and responsibility
32  might be. The role of DMOs in measurement could be related to bringing together
33  the measurements of other stakeholders in the destination and supporting them
34  through guidance, tools and network opportunities.

Interviews with DMO stakeholders conducted during the course of research 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 destination and promoting best practice so as to use their 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 organisation, helping 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."

Measurement requirements could therefore be progressively built as implementation of the Glasgow Declaration advances year on year, collaboratively building on best practice across the sector, growing consensus around methodologies and criteria, and the advent of newer tools.

In order to facilitate this process, a set of checklists and supporting guidance for tour operators and accommodation providers is to be found in Annex 2. Due to the current status of destination measurement, and the complexities detailed above, a destination focused checklist is not provided at this moment.

Further work needs to be undertaken to identify and promote the benefits that stem from measuring emissions to ensure that all stakeholders across the tourism value chain are able to see a clear business case for engaging in the process.

In some situations, in particular for SMEs or those without legal obligations or resources to prioritise measurement, developing 'real world' measurements might make more sense than abstractions. A business can clearly see the benefit to its balance sheet of a measurement that shows an increase in average length of

stay. If this increase also means a reduction in the number of international flights required to gain the same yield from tourism, then it also brings a reduction in emissions.  If measurement can be shown to have benefits, people will be more likely to adopt it. It will therefore be essential to ensure measurement has catalytic benefits for sustainable tourism and does not reinforce existing problems.

In addition, while the nature of Net Zero commitments and the focus of most measurement is on emissions reductions,  It would be useful to identify ways to quantify the impact climate related disasters have on tourism, in particular in order to mobilise governments.

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

# 1   **Tools**

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

6

7 Likewise, the number of tools previously recommended in earlier publications that
8 no longer exist makes clear that (and especially in the context of limited finances
9 during the COVID recovery) organisations should not invest time and resources in
10 using tools that may not remain useful or even active.

11

12 Furthermore, insights into work proceeding outside tourism make clear that there
13 is benefit to be had from engaging in collaboration and alignment with climate
14 action initiatives with a focus broader than/beyond tourism. This can pay
15 dividends for stakeholders in tourism, while also benefiting the wider momentum
16 towards emissions measurement through bringing the context of tourism to bear
17 in the many sectors where our sector has an impact.

18

19 As the sector looks to develop new tools, or to improve and update those currently
20 in use, analysis of the current situation brings some key factors to consider when
21 assessing the long term and sector wide viability of products from different
22 providers. The following creator characteristics are key influences to consider:

23

24 **The sectoral understanding to ensure relevance**
25 *Does the provider have the frame of reference, focus on core themes, and expert*
26 *knowledge to deliver useful tools?*

27

28 **The scientific understanding to ensure rigour**
29 *Does the provider have access to the expert knowledge to ensure the tool is*
30 *scientifically robust?*

31

32 **The technical/design understanding to ensure usability**

*Does the provider have the expert knowledge, understanding of communication, ability to deliver continuous advancements and prioritise of new ideas so as to ensure the replicability/stickiness of core message?*

**The independence to ensure neutrality**

*Does the provider's company value structure and relationship to the product or its clients enable them to remain neutral rather than building something to suit their own interests?*

**The openness to make transparent**

*Does their company value structure encourage a participatory approach to knowledge sharing, prioritising openness with essential information, such as the methodology and its components?*

**The profile to engage and build network of users**

*Do those responsible for promoting the tool such as the company's lead actors and their network, enable the tool to reach a wide enough network of users to ensure it can be used to deliver benchmarking, learn from diverse user experiences, and build capacity and collaborative potential across the sector?*

**The resources/capacity to make free**

*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, especially SMEs? Or does the cost mechanism predetermine what sort of users the tool is applicable to?*

# Conclusion

As more and more organisations make commitments through the Glasgow Declaration and engage in measurement towards target setting and decarbonisation, it will become increasingly important that the sector reaches consensus over how it approaches measurement, and that the tools and methodologies are in place to facilitate the rapid and urgent acceleration of engagement.

These tools will be needed to engage and mobilise the sector, but also to track its essential progress towards the commitments it has made - and needs to keep - for 2030 and beyond.

This measurement of progress is essential at multiple levels. 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. And 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 reduction. There is a risk that doubt as to how or what to measure impedes action on reduction.

The current situation re tools and methodologies for measurement shouldn't impede commencing action on decarbonisation. The sector knows the primary causes of the carbon footprint for tourism businesses, and the need for rapid energy and operational transitions.

1   Whether through the lived experiences in our destinations, or the ever more

2   urgent news being brought to use from around the world, this has to be the

3   decade not just of measurement, but of urgent climate action.

4

5

# Annex 1 - Approach used in researching this report

The analysis and guidance provided in this technical brief 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, in collaboration with the Adventure Travel Trade Association (ATTA), Tourism Declares a Climate Emergency, San Francisco State University, and Texas AM University conducted the first Global Survey on Climate Action in Tourism between May – September 2021 and received 1139 valid responses from a range of private and public 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. These questions were:

- 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 survey's final report, published by UNWTO and ATTA in 2022 here [INSERT LINK].

The key findings, which guide this overview and predicate its need, are as follows:

- Few organisations are measuring (less than 10% of respondents).
- There is little standardisation or consensus amongst those that are.
- Respondents appear to be frustrated at the lack of (or inapplicability to their situation) of tools and methodologies.
- SMES are particularly challenged as few of the tools detailed by respondents are free and designed for their 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 offer deeper support.

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

**Pertinence**
Signatories to the Glasgow Declaration on Climate Action in Tourism (who all commit to measuring and reporting their greenhouse gas emissions) are divided into three categories - business, supporting organisation, 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.

**Scope**

Does the methodology/tool enable a user to measure across all scopes 1,2 and 3, or is it limited in some way? As tourism faces considerable challenges in allocating responsibility across many overlapping stakeholders, are measurement tools supporting its efforts to address this?

**Emission types**

Does the methodology/tool enable the measurement of all Greenhouse Gases, or only $CO_2$?

**Rationale**

Is the methodology tool designed to support users' work towards net zero, carbon neutrality, or some other approach?

**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
- Setting targets and milestones

**Replicability**

How usable is the methodology or tool by various stakeholders across tourism? Is it up to date? How useful 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?

**Accessibility**

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

# STAGE 2 – Initial review of methodologies and tools

1 These answers provided an initial dataset for review. This dataset was then
2 supplemented with additional tools and methodologies known to the review team
3 or through further desk research.
4
5 It was also decided to augment the analysis with early findings from a
6 complementary piece of research that the project team is also undertaking into
7 climate commitments in tourism. This work is reviewing a representative sample
8 of public commitments made by leading actors from the following datasets:
9
10      1. Companies with a Science Based Target
11      2. Companies who have published a Climate Action Plan through
12         Tourism Declares a Climate Emergency or the Glasgow Declaration
13         on Climate Action in Tourism
14      3. Companies who participated in the Global Survey of Climate Action
15         in Tourism and stated that they are measuring emissions
16      4. Companies whose climate action was assessed as part of WTTC's
17         Net Zero Roadmap for Tourism
18
19 From this initial review, a set of assumptions were developed in preparation for
20 Stage 3, below.
21

# STAGE 3 - Develop Assumptions into Guidance

Having conducted the initial review of the tools and methodologies, 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 tools and methodologies, in order to refine the project team's assumptions into the guidance contained in this technical brief. (The full list of experts consulted can be found in annex 3.)

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[20]. The group was asked what tools and methodologies 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 the project team to build a set of final assumptions around the current status of emissions measurement for tourism, and a possible approach to addressing the challenges revealed.

The team presented these assumptions to the Working Group. Following this session, the Working Group's insights and proposals were integrated into the initial assumptions, and collected into a set of agreed principles that form the basis of this report's guidanc

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[20] One Planet Network (n.d.), available online 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. These tools and resources are available in the Glasgow Declaration on Climate Action Repository.

## METHODOLOGIES

### ACCOMMODATION METHODOLOGIES

| NAME | DESCRIPTION | USES |
|------|-------------|------|
| Net Zero Methodology for Hotels | Methodology developed to support hotels and the wider hotel industry delivering on net-zero commitments, the 180 page methodology was launched in 2021 | Define boundaries and parameters<br><br>Support disclosures for SBTi, Glasgow Declaration, Race to Zero<br><br>Establish performance and engagement targets |
| Hotel Carbon Measurement Initiative | Methodology developed to enable hotels to report in a consistent way, in particular to corporate customers. Currently used by over 25,000 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. | Guidance provided towards setting a baseline<br><br>Guidance provided towards setting emission boundaries<br><br>Users can track progress so long as they measure on an annual basis.<br><br>Can be used to set measurable targets |

1

## 2  TOUR OPERATOR METHODOLOGIES (includes aviation methodologies)

| NAME | DESCRIPTION | USES |
|---|---|---|
| Atmosfair | In cooperation with the German Business Travel Association (DRV), atmosfair developed a standard for the CO₂ calculation of corporate travel based upon the existing approaches of ICAO, DEFRA and IPCC among others. | The methodology covers the entire span of business travel (flights, hotels, rental cars, rail and conferences).<br><br>Designed to support atmosfair's offset programme, it also offers use for benchmarking and reporting. |
| Much Better Adventures Trip emissions methodology | Open source measurement methodology used by UK based travel company to measure emissions from its trips and create own carbon labelling scheme for its trips | Transparent and detailed sharing of methodology used by UK tour company for measuring emissions from its portfolio of trips<br><br>Clearly explained, open sourced, jargon free, makes this very accessible to tour operators needing somewhere to start |
| Travalyst Travel Impact Model | Open source methodology based on methodologies and tools of Google and Skyscanner designed to enable a single model for reporting of emissions from aviation | Working with major platforms, the methodology aims to underpin standardised and accurate and data to industry |

| | | |
|---|---|---|
| Wilderness Group Carbon Emissions Framework Methodology | Open source framework developed for and used by UK-based tour operator the Wilderness Group, showing how they calculate and share the carbon footprint of each of their customers. | Detailed and replicable or adaptable guidance for tour operators looking to measure their emissions relating to a range of issues including:<br><br>Accommodation, Activities, Business Travel, Food, Events, Office Transport, Trips and tours |

1

2 **DESTINATION METHODOLOGIES**

| NAME | DESCRIPTION | USES |
|---|---|---|
| CO2rism methodology | 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. | The tool is currently only available in Norwegian, however the methodology behind it is available in English. The calculator enables comparison of impact of travel from different tourist source markets travelling to specific regions in Norway, covering six transport modes - aviation, ferries, trains, car, bus and campers. |
| Estimation of tourism carbon footprint and carbon capacity | Academic study by School of Tourism and Cuisine, Harbin University of Commerce that estimates the tourism carbon footprint in Chinese province of Heilongjiang from 2009 to 2018 | Research study in single Chinese province including concept of Tourism Carbon Capacity |
| Measuring tourism emissions at destination level: Australia case | Research presenting a framework integrating the principles of TSA with the National Greenhouse Accounts. | Tourism emissions estimated across destinations, industries and visitor types.<br><br>Although applied to destinations in Queensland, Australia, proposals could be tailored to contexts of other destinations. |

| | | |
|---|---|---|
| [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 | Detailed report, with useful appendices including proposed indicators for progress, impact etc |
| [Tourism Auckland Emissions Methodology](#) | Report into the measurement of NZ city tourism carbon footprint using both a Top Down and Bottom Up Methodology, and providing extensive information on the different methodologies and their applicability | Report provides a method for monitoring tourism's GHG emissions, and a baseline for pre-COVID-19 tourism.<br><br>Designed for Auckland to inform future tourism planning and management, and marketing strategies towards low-carbon segments. |

1
2

1 **NON-TOURISM SPECIFIC METHODOLOGIES**

| NAME | DESCRIPTION | USES |
|------|-------------|------|
| SME Climate Reporting Framework | The framework, specifically tailored to support small and medium sized businesses who sign up to the commitments of the SME Climate Hub , lays out key climate points which SMEs should report on and use to inform their disclosures.<br><br>The Hub is an initiative of the We Mean Business Coalition, the Exponential Roadmap Initiative and the United Nations Race to Zero campaign in collaboration with Normative and the Net Zero team at Oxford University | This framework provides guidelines for SMEs looking to measure emissions, set reduction targets, act and report.<br><br>It supports the measurement tools and guidance provides in the SME Climate Hub |
| GHG Protocol Corporate Accounting and Reporting Standard | Designed to be program or policy neutral, It is the central standard underpinning  rigorous and aligned methodologies and tools | The standard and guidance are designed to help companies prepare a GHG inventory, facilitate participation in GHG programs, and boost consistency and transparency in GHG accounting and reporting. |

2

3

1 # TOOLS

2 ## ACCOMMODATION TOOLS

3

| NAME | DESCRIPTION | USES |
|---|---|---|
| Con-Serve | Data management platform designed for hospitality businesses and enabling measurement and reporting of a range of data points including electricity, heat, water, waste and outsourced laundry | Subscription service with differing levels of support, providing users with data for use in benchmarking, monitoring and reporting |
| Hotel GHG Mitigation Tool (GACMO) | Spreadsheet-based tool designed to help accommodation businesses estimate GHG emissions relating to energy and food use | Free to download spreadsheet supported by manual and ideas for mitigation activities to help reduce emissions |
| Hotel Carbon Measurement Initiative Tool | Spreadsheet based tool based on the methodology of same name designed to enable any hotel property to calculate the carbon footprint per occupied room on a daily basis, or the carbon footprint per area of meeting space on an hourly basis. It is supported with a one-page summary, and introductory webinar, and a detailed methodology | The tool is designed to enable hotels to understand their carbon footprint and support the following activities<br><br>Benchmark performance<br><br>Set and track progress towards measurable targets<br><br>Prepare transparent reports |
| Hotel Footprinting Tool | Tool estimates the carbon footprint of a single or for multiple hotel rooms nights and meeting spaces across the world.<br><br>Information can be used to calculate a company's business travel hotel stay carbon footprint for Scope 3 reporting and offsetting or provide information for clients on whose behalf you are booking or offsetting travel. | |

| | | |
|---|---|---|
| | Data is aggregated to show the median carbon footprint in particular geographical locations, with the choice of hotel class by number of stars<br><br>Tool calculates the carbon footprint using the Hotel Carbon Measurement Initiative (HCMI) methodology; useful for corporate reporting and calculating the amount that is required for carbon offsetting. | |
| SME Climate Hub Emissions Calculator | User-friendly tool enabling Hotel SMEs to get a useful snapshot of their overall operational emissions with readily available datapoints. | Emissions estimate is based on information provided around expenses and on site activities, however it is not tailored to any tourism specifics.<br><br>Tool is not designed to provide detailed figures, but rather to provide an actionable estimate supported by guidance and tips to support focussed action |

1
2

1 **TOUR OPERATOR TOOLS**

2

| NAME | DESCRIPTION | USES |
|------|-------------|------|
| Carmacal | Database based application designed to enable tour operators to measure total carbon footprint of tour packages | Subscription-based programme offers potential for users to measure across extensive portfolio of products |
| Ecopassenger | Developed in a collaboration between UIC, the Sustainable Development Foundation, ifeu (the German Institute for Environment and Energy) and Hacon (software), Ecopassenger is a tool designed to enable uses to compare the energy consumption, emissions and other environmental impacts for aviation, cars and trains | European-focussed comparison tool enabling users to compare multiple transport modes |
| Sustainable Travel International Carbon Footprint Calculator | Tool designed to support STI offset scheme by enabling measurement of emissions from high emissions travel activities such as commercial and charter flights, vehicles, cruises, liveaboards, and yachts. | Calculator utilises average CO2 emissions factors of air travel, passenger vehicles, and fuel consumption provided by the DEFRA statistical analysis database.<br><br>Enables detailed refinement of vehicle types when measuring emissions |

3

4

1 **NON-TOURISM SPECIFIC TOOLS**

2 Where companies and organisations find that the above tools do not meet their

3 specific needs, the following non-tourism specific tools may provide useful

4 insights into how to measure emissions across their value chain

5

| NAME | DESCRIPTION |
|------|-------------|
| 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 GHG Protocol. |
| Scope 3 Evaluator | Web-based tool from Greenhouse Gas Protocol designed to enable companies to measure, report, and reduce emissions throughout their value chain. |
| SME Carbon Footprint Calculator | Carbon Footprint Calculator designed to help UK based SMEs measure their corporate emission footprint following GHG Protocol Guidance |

6

7

1 # Annex 3 - Checklists

2 ● Checklists are to be included here in the final technical brief

3

# Annex 4 - Key terms

**Baseline**

The first year that one reports a measurement for and upon which any reductions are measured against.

**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 DIsclosure Project (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.

**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 Scopes**

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 GreenHouse

Gas 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.  (see Annex 1 for more detail on how accommodation providers and tour operators should approach Scopes)

**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.

**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.

**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 understanding that countries have to balance emissions reductions with other critical demands like ending poverty. Further, the biggest emitters need to make the most dramatic and rapid cuts.is a climate action plan to cut emissions and adapt to climate impacts."

**Race to Zero**

The Race to Zero is a United Nations-led campaign 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 organisation 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 Institute.

# Annex 5 - Experts Consulted

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