



A Manual to Measuring and Monitoring Resource

Efficiency and Greenhouse Gas Emissions in the Hotel and Conference Sector

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ABOUT THE PROJECT:

The project aims to reduce greenhouse gas emissions and increase resource efficiency in three tourism value chains: food and beverage, accommodation, and meetings, incentives, conferences and events (MICE). The project is implemented in four countries: Philippines, Dominican Republic, Mauritius and Saint Lucia.



To learn more about the project, visit <https://www.oneplanetnetwork.org/value-chains/transforming-tourism>

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1

Introduction

This guide will help you to measure and improve the performance of your tourism business in resource efficiency and GHG emissions. In particular, it looks at resource efficiency in the accommodation and conference sector in developing and emerging economies. Its developers, the International Climate Initiative Project “Transforming Tourism Value Chains in Developing Countries and Small Island Developing States to Accelerate More Resource-Efficient, Low-Carbon Development”, hosted by the United Nations Environment Programme, welcome feedback from you and stories of your successes and achievements [via our project platforms](#). While individual company approaches may be effective in some cases, sharing experiences helps develop a common approach that promotes sustainability through the wider tourism industry.

More than 80 different categories of accommodation, such as hotels, motels, pensions, bed and breakfasts, self-catering, bungalows, vacation homes, holiday villages, campsites, farms etc., have been identified internationally (UNWTO and UNEP, 2008). These guidelines can be applied to all of them, as long as resource use in various business activities can be separated out from the energy use for activities not related to business. They will help you calculate and reduce the greenhouse gas (GHG) emissions of your business.

The guide also provides benchmarks which build upon major benchmark studies carried out over the last ten years. The benchmarks suggested in the guide are not intended to be industry-wide benchmarks, but to provide guidance and examples on best-standard of performances and comparisons within the hotel and conference sector.¹

1.1 Overview

This guide will help you to understand how to develop a resource efficiency and greenhouse gas (GHG) baseline for your business, and how to measure and monitor changes against those baselines. It will:

- Introduce a business case for resource efficiency and GHG footprint management within hotels and conference centres.
- Discuss the benefits of measuring and monitoring.
- Provide advice on resource efficiency management (energy, water, waste, food).
- Outline data collection requirements to establish a baseline.
- Describe the tools available to help businesses plan for change.
- Help hotel staff understand key areas of sustainability.

1.2 Before using this guide

1. Download the Resource Efficiency and GHG Tool & the GACMO Tool² and speak to in-country partners who can support you in their use.
2. Have available bills or order information about food and drink purchases, and water, energy and waste costs.
3. Have available information on guest nights per month, or number of day delegates per month, whichever is relevant to your business.
4. Watch the webinars available to help you use the Resource Efficiency Tool.³

¹ Additional national and regional studies on benchmarks are planned to be integrated in further iteration of this guide, such as the foreseen Spanish version.

² See Annex 9 for further guidance on the GACMO tool. GACMO stands for Greenhouse Gas Abatement Cost Model.
<https://www.oneplanetnetwork.org/knowledge-centre/resources/hotel-ghg-mitigation-tool-gacmo>
<https://www.oneplanetnetwork.org/knowledge-centre/resources/resource-efficiency-data-and-performance-monitoring-tool-0>

³ Webinars- Resource Efficiency tool. Transforming Tourism project YouTube channel

1.3 A note on data collection

Data should be collected and entered into the Resource Efficiency and GHG Tool on a regular basis, either monthly or quarterly.

The first information you enter can be used as a baseline from which you can track progress. Screenshots of the tool can be found in Appendix 3.

Trainings and webinars are also available on [this playlist](#) to familiarize yourself with the tool and find answers for frequently asked questions.

The GACMO tool requires in-depth data collection to establish a baseline and then monitors the effects of mitigation activities rather than ongoing GHG emissions.

An aerial photograph of a sailboat with two masts sailing in a vibrant turquoise bay. The bay is surrounded by lush green islands and a coastal town with colorful buildings in the distance. The sky is clear blue with a few clouds. The water's color transitions from deep blue to bright turquoise near the shore, indicating shallow depths and clear water.

2

Business case for sustainability

2.1 Why is sustainability in the tourism sector important?

In many parts of the world, tourism is essential to the economy. **Prior to the Covid-19 pandemic, tourism accounted globally for over ten per cent of gross domestic product⁴; and provided one in every 10 jobs⁵ International tourist arrivals were predicted to rise from 1.1 billion in 2014 to 1.8 billion in 2030, according to the United Nations World Tourism Organization (UNWTO).**

However, Covid-19 brought the tourism sector to a near-complete standstill⁶. International tourist arrivals fell to levels not seen since 1990 and UNWTO estimates that the crisis has cost the world about \$4 trillion and placed 100-120 million direct tourism jobs at risk⁷ out of the estimated loss of 225 million jobs worldwide in 2020 (ILO). The hospitality, hotels and food service industries employed an additional 144 million workers in developed and developing countries⁸.

Failure to recover from Covid-19 could reduce global GDP by 1.5 to 2.8 per cent. In 2020, international arrivals dropped by 74 per cent given widespread travel restrictions and socio-economic challenges, representing an estimated loss of \$US 1.3 trillion in export revenues⁹.

While the tourism sector has not yet rebounded to pre-Covid levels, the second half of 2021 has shown improvements compared to 2020¹⁰.

For developing countries, in particular, tourism contributes to economic growth, employment, investment and technology dissemination. For some small island nations, tourism makes up to 25-60 per cent of national GDP.

In some Small Island Developing States, tourism accounts for 30 per cent of export revenues (UNWTO). Small businesses, responsible for 80 per cent of the industry, are particularly vulnerable, as well as women, who make up 54 per cent of the tourism workforce, according to studies by ILO and the UNWTO¹¹. But while tourism can have positive effects on the economy, its success can sometimes have negative impacts on the environment. Tourism can add to pollution and waste, increase GHG emissions, as well as water, land and energy use. **Left unchecked, unsustainable tourism can put at risk the very thing tourists flood to some countries and regions to see: the natural beauty of healthy ecosystems and flora and fauna habitats.**

In 2018, tourism contributes just eight per cent of global GHG emissions¹², but this, along with water and energy consumption, is expected to double by 2050¹³. The Sustainable Hospitality Alliance study indicates that the hotel industry will need to reduce emissions by 66 per cent by 2030 and 90 per cent by 2050 to stay within the 2°C threshold of global warming agreed in 2015 at the UN Climate Change Conference in Paris (known as COP21)¹⁴.

4 <https://wtcc.org/Research/Economic-Impact>

5 <https://www.unwto.org/tourism-and-covid-19-unprecedented-economic-impacts>

6 <https://unctad.org/news/we-urgently-need-kickstart-tourisms-recovery-covid-19-crisis-offers-opportunity-rethink-it>

7 https://unctad.org/system/files/official-document/ditcinf2021d3_en_0.pdf

8 ILO sectoral brief (2020), The impact of COVID-19 on the tourism sector

9 World Tourism Organization (2021), Recommendations for the Transition to a Green Travel and Tourism Economy, UNWTO, Madrid

10 https://unctad.org/system/files/official-document/ditcinf2021d3_en_0.pdf

11 https://www.ilo.org/wcmsp5/groups/public/---ed_dialogue/---sector/documents/briefingnote/wcms_741468.pdf

12 <https://unfccc.int/news/travel-tourism-must-transform-to-survive-thrive>

13 <https://www.greengrowthknowledge.org/research/tourism-green-economy-background-report>

14 <https://sustainablehospitalityalliance.org/resource/global-hotel-decarbonisation-report/>

Yet many countries and businesses do not include resource efficiency targets in their international pledges and plans. **Linking tourism to countries' commitments under the Paris Agreement has been slow. This is in large part because national data on the resource efficiency and carbon intensity of the sector's products and services is kept separately. This guide is designed to address this issue.**

The Covid-19 pandemic has had an unprecedented effect on tourism, with job losses and business closures exacerbating inequalities in and the vulnerability of local communities. Covid-19 has highlighted the importance of putting environmental resilience at the core of recovery. As the tourism sectors rebuilds worldwide, businesses will need to implement strategies that ensure the health and safety of customers and staff, while minimizing the environmental impacts of their operations and supporting local communities.

Switching to sustainable consumption and production in tourism offers vast opportunities to protect the environment while fostering social inclusion and sustainable economic development through decent jobs. But to truly transform tourism, such a shift needs to happen across the entire value chain, involving all stakeholders, and using a life-cycle approach to make products and services more sustainable.

2.2 Economic benefits of sustainable tourism practices

Often making good decisions for the local community and environment also means saving resources and money. Companies

reducing food waste (Champions 12.3)¹⁵ say that for every US\$1 invested in making changes for sustainability, the businesses could expect to save \$14.

Customers expect businesses to act responsibly. A recent consumer trends survey by the Association of British Tourist Associations (ABTA)¹⁶ in 2019 showed 38 per cent of customers expected their travel company to take a lead on sustainability and 20 per cent were prepared to pay more for holidays from companies with a better environmental and social record.

Customers expect travel companies to build sustainability in their product offer.

The majority of consumers (80 per cent) believe companies should be committed to preserving the natural environment and 55 per cent want fair working conditions¹⁷, while 75 per cent want a more responsible holiday and 66 per cent would like to easily identify a greener holiday¹⁸.

Nielsen's Global Citizenship Survey of more than 28,000 customers in 56 countries shows that 46 per cent were willing to pay extra for products and services from companies that have implemented programmes to give back to society¹⁹.

Environmental awareness has even increased during the pandemic. In October 2020, Booking.com released a global research report, The Future of Travelling, after surveying 20,000 travellers across 28 countries. The report found that 53 per cent of global travellers wanted "to travel more sustainably in the future as Covid-19 has opened their eyes to humans' impact on the environment."²⁰ Another 69 per cent of respondents

15 Champions 12.3 (2017) <https://champions123.org/the-business-case-for-reducing-food-loss-and-waste/?frame-nonce=aa2cf734de>

16 ABTA report <https://www.abta.com/news/abta-launches-travel-trends-report-2019>

17 TUI Travel 2010

18 Virgin Holidays and TUI UK and Ireland 2011

19 Nielsen's Global Corporate Citizenship Report April 2012

20 Booking.com Report

said they expect the travel industry to offer more sustainable travel options.

There is a developing trend for sustainable tourism to provide a differentiated holiday experience for customers. These products have been linked to earlier booking curves, higher customer satisfaction and retention rates, and superior margins²¹ for those willing to pay for a sustainable experience.

Although many customers remain more driven by price than sustainability, other holiday-makers value unique, authentic experiences in local communities. Customer data from Thomas Cook shows 93 per cent enjoy experiencing local culture and places of interest, while 83 per cent “like to find local restaurants to taste regional cuisine”. Responding to this desire improves the customer experience and boosts income in the local community²².

By embedding sustainability and related good practices within your business activities, you will also be reducing costs associated with hiring and retaining staff.

Research shows that staff feeling part of a bigger picture and understanding their contribution to making the local community sustainable are important drivers for staff satisfaction and retention. Staff satisfaction is, on average, 50 per cent higher in companies with a strong CSR culture²³.

In a survey of more than 900 companies by Red Balloon and Altus Q, employers with highly engaged staff could expect sales and profits up to six times higher than competitors with average employee engagement. The research also suggested that higher staff engagement resulted in improved customer satisfaction and loyalty²⁴.

Acting sustainably requires a business to consider financial, environmental and societal issues. By considering the impacts your business might have on these areas within your operations, as well as the local and wider community, you will be managing risks to your business and be better placed to meet emerging environmental regulations.

21 Travel Foundation Whitepaper, Survival of the fittest, Sustainable Tourism means business.

22 2012 Travel Foundation Survival of the Fittest. Sustainable Tourism means business.

23 Kenexa Worktrends Study 2010.

24 <http://www.redballoon.com.au/corporate/articles/engagement-capabilities-2012> Accessed 18 November 2021

A cyclist wearing a bright yellow jacket and a matching helmet is seen from behind, pointing towards a range of large, rugged mountains with patches of snow. The cyclist is standing on a paved road next to a wooden fence. The sky is clear and blue.

3

Resource Efficiency and GHG Management in Tourism

3.1 Why measure and monitor resource efficiency and GHG emissions in tourism?

There is clear evidence that tourism's global resource consumption is growing rapidly, despite efficiency gains and the introduction of new and more efficient technologies. It is estimated that tourism's global resource use, including energy, water, land and food, will at least double over the coming four decades. In many cases unsustainable tourism can endanger the very basis of its own success: healthy ecosystems and habitats. For instance, plastic pollution can also result in significant loss of income for tourism businesses. In December 2017 Bali had to temporarily close some of its most popular tourist beaches due to an influx of (mostly plastic) waste on its coastline. Tourist sites, hotels, tour companies and water-based sports companies all experience reduced incomes when plastic pollution deters visitors. This has a direct impact on workers at these companies, as well as other formal and informal workers who are connected to the tourism industry in the area.

Monitoring and measuring resource efficiency and GHG emissions will ensure that impacts associated with economic, social and environmental risks are understood and managed.

Understanding your resource use and GHG emissions footprint will help you develop your strategy for adaptation and resilience. This could be done by investing in renewable energy sources, reducing water use, cutting the GHG emissions footprint of your food and drink purchases, or preventing food waste.

Measurement of indicators of resource efficiency such as energy, water, food and drink and solid waste will give a better understanding of where opportunities for improvement lie.

Energy

In many facilities energy is the second-highest operational cost after payroll. This is often due to the use of energy-intensive technology to provide modern comforts and conveniences, such as air-conditioning, to large numbers of guests. Most hotels and conference centres meet their energy needs by purchasing energy produced through the burning of fossil fuels (coal, oil and natural gas), which contribute to local air pollution and global climate change. The extraction, refining and transport of fossil fuels can also cause environmental damage. Adopting appropriate renewable technologies, architecture and design that can lead to energy savings, e.g. passive energy standards, passive solar heating, passive cooling, smaller guest rooms or public areas, thermal insulation of facades²⁵, and other energy-saving actions, will also contribute to reducing the environmental impacts of your business.

Water

In many areas of the world, demand for water exceeds supply and is seriously straining available water resources. Some of the most water-stressed areas are also home to some of the largest international tourism destinations. Guest demand for water is usually far greater than that of local residents. In addition to the water required for hotel and conference management activities such as kitchens and laundry, features such as swimming pools, lawns, and golf courses can add significantly to total usage. Excessive water use can degrade or destroy local water resources, threatening availability for local needs. Problems may be made worse

25 Gössling, S. & Lund-Durlacher, D. (2021). Tourist accommodation, climate change and mitigation: An assessment for Austria, *Journal of Outdoor Recreation and Tourism*, <https://doi.org/10.1016/j.jort.2021.100367> - open access - contains international data

in areas where high tourist season corresponds with periods of low rainfall. Tourism is a thirsty business and managing your water footprint is one of the keys to success. Having a future plan to ensure water supply will help protect your business.

Waste

Hotels and conference centres produce large quantities of solid waste, ranging from packaging to food scraps, and cleaning and maintenance materials, some of which are toxic. Often this waste is collected in badly designed waste dumps, discarded directly into oceans or rivers, or simply dumped in areas out of sight of guests. Improper waste disposal visually degrades a destination and can lead to water and soil pollution through leaching of contaminants from waste piles. Poorly designed waste dumps can result in fires, odours, flies and ineffective containment of wastes. These threaten the environment and human health. Even where waste is disposed of legally, landfills have limited capacity, which is a particular problem on small islands. Waste costs directly impact the bottom line of your business.

In addition to waste management costs, there can be other hidden costs. In the case of food waste, the true cost should also include the cost of the ingredients, the time taken for staff to order goods, handling and storage costs, preparation costs and front of house costs associated with serving food that ends up as waste.

An often-overlooked area that can generate a lot of waste is when refurbishment or construction is taking place. Careful consideration of the materials and goods you buy for use within your business will allow you more options for recycling or re-use during these times.

Climate change

It is well acknowledged today that global warming is one of the most crucial challenges for humanity and that human activities are contributing significantly to it (IPCC).

At the United Nations Climate Change Conference (COP21) in Paris in December 2015, countries decided to adopt the Paris Agreement, a universal, legally binding climate accord that aims to strengthen the global response to the threat of climate change in the context of sustainable development.

In the context of the Paris Agreement, countries are required to undertake and report on their post-2020 climate efforts, known as Nationally Determined Contributions (NDCs), in order to achieve the objective of the agreement of limiting the global temperature increase to well below 2°C, while pursuing efforts to limit the increase to 1.5°C until 2100.

In 2018, the IPCC Special Report on Global Warming called to limit global warming to 1.5°C to avoid the worst effects of climate change, which implies that net zero CO₂ emissions need to be reached globally around 2050 and concurrent deep reductions in emissions of non-CO₂ forcers, particularly methane²⁶.

To reach this goal, UNEP, UNWTO and partners have launched in 2021 the Glasgow Declaration which aims to act as a catalyst for increased urgency about the need to accelerate climate action in tourism and to secure strong actions and commitment to cut tourism emissions at least in half over the next decade and reach Net Zero emissions as soon as possible before 2050 in the tourism sector²⁷.

²⁶ IPCC 2018 https://www.ipcc.ch/site/assets/uploads/sites/2/2019/06/SR15_Full_Report_High_Res.pdf

²⁷ <https://www.oneplanetnetwork.org/sustainable-tourism/glasgow-declaration-commitment-decade-tourism-climate-action>

The private sector will be an important player if countries are to meet their commitments. The tourism industry makes up a significant part of many countries' economies and therefore tourism businesses have a key role to play. Transitioning from the current development pathway to a low-emissions one will require significant investment and innovation. For example, adopting low-carbon technologies and changing behaviours should allow companies to optimize their resource use, reduce their operational costs, and increase their efficiency while improving their environmental performance and tackling climate change.

Accounting for the value chain impact

In addition to the resources used by your business directly (water and energy), resources are also spent in the production of many things that hotels buy, for example textiles, furniture, electrical and electronic equipment, and especially food. These so-called embedded resources and emissions are often higher than direct use of energy and resources. Understanding the water or GHG emissions footprint of the resources that are used can give you information on how to reduce impacts on resource use and increase efficiency.

3.2 Measurement and Monitoring

Indicators for Action

Key Environmental Indicators (KEI) for this project are proposed based on priority activities that are typically most impactful.

These indicators can be used to track progress towards becoming more resource efficient, reducing emissions, and embedding sustainable actions into businesses and the wider hospitality sector. All indicators will also be presented per guest night/delegate day. These indicators are as follows:

1. Total Energy Use (4.1 Energy Management)
2. Total Volume of Water Use (4.2 Water Management).
3. Total Procurement of Food and Beverages (4.3 Food and Drink Procurement).
4. Total Volume of Solid Waste Generated (4.4 Waste Management and Prevention).
5. Total Quantity of Relevant High-Intensity Food Consumed (purchases or sales as available).
6. Total Volume of Plastics Waste (4.5 Plastics Waste Reduction).

When these data are entered into the Resource Efficiency and GHG Emissions Tool, the user will be able to see monthly trend data for each indicator.

In addition, two further KEI are calculated by using the data collected for the indicators above into the Resource Efficiency and GHG Emissions Tool. This tool calculates a partial but wide-ranging businesses GHG emissions footprint and the water footprint of the food consumed by the business.

7. Greenhouse Gas Emissions Reduction Guidance
8. Water Footprint (ISO 14046).

Finally, there are additional valuable indicators to consider. The Resource Efficiency and GHG Emissions Tool makes provision for collecting data on these and they are touched on as part of the chapters already mentioned.

9. Food Waste Generated (4.4 Waste Management and Prevention).
10. Plastic Consumed (packaging of purchases or items e.g. soap bottles or straws etc.) (4.5 Plastics Waste Reduction).

Guest Data

In order to account for seasonal fluctuations in guest numbers or conference centre users over the year each month of data is compared to the number of guests

or day delegates using the facility that month. This will allow you to see trends in resource use more clearly.

Baseline data

After hotels and conference centres have collected data for one month, they will be able to understand the amount of resources they are using. This data should be entered into the Resource Efficiency and GHG Emissions Tool which will automatically calculate

resource use. The results can be used as a baseline or starting point. Any changes to the business that owners and managers make in order to improve resource efficiency can be tracked and compared to this baseline.

An overview of how KEI data can be collected is presented below in Table 1. More details on the rationale for collecting these data and examples of good practice can be found in the relevant theme chapter of this guide.

Table 1: Project Baseline Data Requirements

Data required	Unit	Evidence / Source	Indicator	Theme Chapter
Non-renewable energy Renewable energy Delivered fuel	Mega-joules MJ	<ul style="list-style-type: none"> Utility bills Meter readings Purchase ledger 	Total energy use	Energy management
Total unsorted waste (landfill) Total recycled waste Total composted waste	Kg or tonnes	<ul style="list-style-type: none"> Waste management contractor Weigh and estimate Estimate 	Total volume of solid waste generated	Waste management
Total red meat consumed (purchase or sold using data most available)	Kg	<ul style="list-style-type: none"> Purchase ledger OR Point of sale data 	Total quantity of red meat consumed	Food and drink
Total purchases food and drink (21 categories)	Kg	<ul style="list-style-type: none"> Purchase ledger Point of sale data 	Corporate carbon footprint Corporate water Footprint*	Food and drink
Total units of water (metered sources) Total units of water (non-metered sources) Total units of water (tankered sources)	Cubic metres m ³	<ul style="list-style-type: none"> Utility bills Meter readings Onsite meters Purchase orders Use estimates Purchase orders 	Total volume of water use	Water management
Water footprint (ISO14046*)	Cubic metres m ³	Calculated from water, food and drink information	Corporate water footprint*	Energy management, Water management, food and drink
GHG emissions footprint*	CO ₂ tonnes	Calculated from energy, food and drink, and waste information	Corporate GHG emissions footprint*	Waste management

*Calculated within the Resource Efficiency and GHG Emissions Tool

Resource Efficiency Tool

The Resource Efficiency Tool has been developed to collect baseline and monthly data, and also to provide businesses with an indication of their progress with regards to the KEIs.

The tool is based on a spreadsheet which contains user notes to help with data entry.

Resource Efficiency Measuring and Monitoring Guidance

In the next chapters of the guide, more detailed information on how to collect, measure and report data for the following areas will be provided:

- **Energy management.**
- **Water management.**
- **Food and drink procurement.**
- **Waste management and prevention (including plastics).**

Each chapter will contain advice on how to collect data if it is not readily available.

Getting started with measurement

Make a monitoring plan for each of the indicators that you need to measure. See Appendix 1 Monitoring Plan Template for a template that you can use or adapt.

- **Consult with the relevant staff** (this will depend on the data being requested) on how data should be collected.
- **Identify a member of staff for each task** that is needed within the monitoring plan.
- **Remember that some monitoring has to happen at specific times.** You might need to take a meter reading on the first day of the calendar month and last day of the calendar month, for example. Some data may be historic and so will not need gathering.

A hiker with a large green backpack is walking away on a mountain trail at sunset. The hiker is wearing a dark jacket and brown pants. The landscape is a vast, mountainous valley with a winding river in the distance. The sky is a mix of orange and blue, indicating the time is either dawn or dusk. The hiker is walking on a rocky path that leads up a hillside.

4

Resource Efficiency Management Guidance

4.1 Energy Management

The aim of energy management is to create an energy-efficient, comfortable internal environment for guests and staff by cutting wasted energy and not corners. This will help you retain your customer base while reducing your costs and your GHG emissions footprint.

Sustainable Development Goal target 12.2

By 2030, achieve the sustainable management and efficient use of natural resources.



Why is Energy Management important?

Energy costs for the hotel sector are significant and as demand for electricity increases security of supply becomes more of a risk. If non-renewable energy is used, it is also fueling climate change.

Benchmarks

Utility Consumption²⁸

Utility Consumption*	Excellent	Satisfactory	High
Electricity (kWh/guest/Yr)	< 2,555	2,555-2,920	> 2,290
Energy for hot water (kWh/guest/Yr)	< 1,580	1,580-2,000	> 2,000
Energy for heating (kWh/room/Yr)	< 600	600-650	> 650

*Temperate Climate

Electricity Consumption²⁹

Electricity Consumption	kW/m ²
Per guest night	65
Electricity Consumption ³⁰	kW/m ²
Small hotel	220
Big hotel	270

Electricity Consumption ³¹	kWh/guest night
0-2 Star	73.2
3 Star	52.5
4 Star	56.2
5 Star	120.6

Table 2: Project Baseline Data Requirements

Indicator	Data Source	Guidance
Total units of non-renewable electricity consumed.	<ul style="list-style-type: none"> Utility bills Meter readings 	<p>This indicator comprises the electricity that has been purchased from an electricity supplier when energy has been generated from coal, gas or nuclear sources. Utility bills should include the kilowatt hours (kWh) or Mega Joules (MJ) of electricity purchased over a given time period (usually monthly). Measurement Unit: (MJ) see conversion table, Appendix 3 Conversion Tables.</p> <p>Frequency: Data entry to the Data Spreadsheet should occur quarterly and be sent to your Country Support Partner. Data should be recorded in monthly intervals.</p>

28 <http://www.redballoon.com.au/corporate/articles/engagement-capabilities-2012> Accessed 18 November 2021

29 South Pacific Tourism Organisation; 2018 Resource Guide for Sustainability Management in South Pacific Island Hotels

30 South Pacific Tourism Organisation; 2018 Resource Guide for Sustainability Management in South Pacific Island Hotels

31 https://www.dehoga-bundesverband.de/fileadmin/Startseite/05_Themen/Energie/DEHOGA_Umweltbroschu_re_Oktober_2016.pdf

Indicator	Data Source	Guidance
Total units of non-renewable electricity consumed.	<ul style="list-style-type: none"> • Utility bills • Meter readings 	<p>This indicator tracks the electricity produced from solar panels, wind turbines, photovoltaic (PV) panels, biogas, tidal or hydro. It may also include the purchase of renewable energy credits from a utility provider. Utility bills or meter readings should include the kilowatt hours (kWh) or Mega Joules (MJ) of electricity purchased or used over a given time period (usually monthly).</p> <p>Measurement Unit: (MJ) see conversion table, Appendix 3 Conversion Tables.</p> <p>Frequency: Data entry to the Data Spreadsheet should occur quarterly and be sent to your Country Support Partner. Data should be recorded in monthly intervals.</p>
Total units of renewable electricity consumed.	<ul style="list-style-type: none"> • Utility bills • Meter readings 	<p>This indicator tracks the electricity produced from solar panels, wind turbines, photovoltaic (PV) panels, biogas, tidal or hydro. It may also include the purchase of renewable energy credits from a utility provider. Utility bills or meter readings should include the kilowatt hours (kWh) or Mega Joules (MJ) of electricity purchased or used over a given time period (usually monthly).</p> <p>Measurement Unit: (MJ) see conversion table, Appendix 3 Conversion Tables.</p> <p>Frequency: Data entry to the Data Spreadsheet should occur quarterly and be sent to your Country Support Partner. Data should be recorded in monthly intervals.</p>
Total units of fuel consumed for fleet vehicles and / or generators	<ul style="list-style-type: none"> • Purchase orders 	<p>This indicator comprises the amount of fuel that has been purchased for fleet or other vehicles as well as generators used on-site. Bills should include the amount of fuel in litres.</p> <p>Measurement Unit: (MJ) see conversion table, Appendix 3 Conversion Tables.</p> <p>Frequency: Data entry to the Data Spreadsheet should occur quarterly and be sent to your Country Support Partner. Data should be recorded in monthly intervals.</p>

Programme Indicators

In order to calculate the “Total Amount of Energy Use per Guest Night” by each hotel or conference centre annually, this target has been broken down into the following sub-indicators:

- Total Units of Non-Renewable Electricity Consumed (MJ).
- Total Units of Renewable Energy Consumed (MJ).
- Total Units of Fuel Consumed for Fleet Vehicles and / or Generators (MJ).

An explanation of what data is required, the frequency data collection, and how to find the information is shown in Table 2: Energy.

Making the Business Case

Hotel energy cost depend on a variety of factors, such as the climate zone, location, guest profiles, building energy standards, occupancy rates, service provisions (e.g. wellness areas) or need for air conditioning³². While there is no generic percentage, a hotel’s energy costs can be expected to account for around 6% per cent of operating costs³³ but they can be 25 per cent or more

³² <https://www.sciencedirect.com/science/article/pii/S2213078021000037?via%3Dihub#bib7>

³³ Examples:EnergyStar (n.d.) “Hotels: An Overview of Energy Use and Energy Efficiency Opportunities” <https://www.energystar.gov/sites/default/files/buildings/tools/SPP%20Sales%20Flyer%20for%20Hospitality%20and%20Hotels.pdf>

for hotels located in areas with high electricity costs, including cost for hot water and other electrical devices (washing machines, dryers, minibar, wellness-related services) which are major energy consumers³⁴, and where fuels such as liquid petroleum fuels (LPG) are used, e.g. Pacific Islands³⁵.

Research such as from the Australian Hotels Association (AHA) indicates that energy use and associated costs are generally split evenly across four main areas: use in kitchen, heating, cooling and lighting³⁶.

In a typical breakdown of use within a hotel more than 50 per cent of electricity use is accounted for by chillers, lighting, electric heating and electric ventilation, heating and laundry services. LPG use is about 30 per cent in space heating, 32 per cent in domestic and pool water heating, 22 per cent in laundry and 16 per cent in kitchen use³⁷.

Good Practice in Action **Hotels**

23 Hotels in Mauritius took part in the public-private partnership programme on energy efficiency (Programme National d'Efficacité Énergétique, PNEE)³⁸. Hotel's energy audits showed that the majority of energy consumption was linked to air conditioning and cooling (42 per cent) followed by kitchen-related energy consumption (19 per cent). The audit identified energy savings of 36 per cent in average for the hotels.

NH Hotels' in Leeuwenhorst in the Netherlands is the winner of the 2018 Green Hotelier Award for carbon. It reduced energy consumption per occupied room by 15 per cent³⁹. Besides ensuring energy was not wasted throughout the building, the hotel reduced energy through cogeneration and the use of natural solutions such as sunlight for lighting and heating. It used centralized systems to control room temperature and monitor energy use throughout the building. By offering electric car charging points and bicycle rentals the hotel supports its guests in reducing their own ecological footprint.

The Raddison Blu Marseille hotel in France won the Carlton Rezidor's Think Planet Initiative Award in 2016 for having reduced its energy use by 31 per cent in the past five years⁴⁰. Examples of smart energy habits implemented in Marseille, and at other hotels in the group, include: turning off unnecessary lighting, replacing light bulbs with LEDs, and regulating heating and air-conditioning temperatures. The hotel also installed a fully induction-powered kitchen and invested in new and efficient tunnel washers.

LUX* Resorts & Hotels is offsetting the carbon footprint of some guests' stays by funding a solar PV field in Mauritius (Sarako Solar Farm, Bambous) through its Tread Lightly programme, which enables hotel guests to voluntarily offset the carbon footprint of their holidays. The group has seen a year-on-year increase of two per cent in LUX* guests' participation in the offsetting programme (prior the pandemic)⁴¹.

34 Gössling et al (2021)

35 South Pacific Tourism Organisation; 2018 Resource Guide for Sustainability Management in South Pacific Island Hotels

36 Australian Hotels Association: Introduction to Energy Efficiency. Energy Efficiency Fact Sheet https://www.ahawa.asn.au/news_information/campaigns/energy_efficiency.phtml

37 Australian Hotels Association: Introduction to Energy Efficiency. Energy Efficiency Fact Sheet https://www.ahawa.asn.au/news_information/campaigns/energy_efficiency.phtml

38 PNEE. Project Feedback and Best Practices

39 <http://www.greenhotelier.org/our-themes/community-communication-engagement/worlds-greenest-hotels-inspired-by-the-global-goals/> Accessed 7 Aug 2018

40 <http://www.greenhotelier.org/our-themes/energy/radisson-blu-marseille-wins-annual-think-planet-award/> Accessed 7 Aug 2018

41 <http://www.greenhotelier.org/our-themes/energy/lux-offsetting-guest-stays-through-solar-power-project/> Accessed 7 Aug 2018

Hotel Rural Vale de Rio in Portugal has reduced heat and electrical consumption using an energy management system. It also invested in LED lighting throughout the premises.

Additionally controlling devices have been installed that automatically turn off the air-condi-

tioning inside a room when the balcony door is left open. The biggest reduction in energy use was achieved by the installation of wood chip boilers, which have saved €70,000 a year in electricity costs and €120,000 a year in heating costs⁴².

Tour Operator

Under its Better Holidays Better World 2015-2021 strategy, TUI Group aims to deliver 10 million 'greener and fairer' holidays annually by 2020. 'Greener and fairer' holidays are defined as holidays taken in hotels that have achieved a sustainability certification recognized by the Global Sustainable Tourism Council (GSTC). The TUI Group plays an active role on the Travelife Board, and in 2014 helped to develop new, stricter criteria for the Travelife certification scheme. Travelife type 1 criteria include sustainable procurement provisions such as:

- **When purchasing or replacing electrical equipment, the hotel demonstrates that low-energy equivalent technologies were considered.**
- **As a part of purchasing requirements, suppliers are informed of the accommodation's energy management policy and requested to regularly inform the hotel about initiatives to reduce their energy consumption.**
- **All equipment containing hazardous chemicals (refrigerants, coolants etc.) are identified in a register and assigned an "end-of-life plan" that commits to replacing the equipment with less harmful, more resource-efficient alternatives.**

In 2018, the number of customers staying in hotels certified by a Travelife standard increased by 11.9 per cent, reaching 9.2 million in 1,520 hotels. In 2018, 81 per cent of TUI hotels and resorts held a sustainability certification. In 2017, TUI conducted a data analysis of about 330 hotels to evaluate more thoroughly the environmental and social benefits of sustainability certifications for hotels. Compared to non-certified hotels, hotels with sustainability certifications achieved: 10 per cent lower CO2 emissions per guest night, 19 per cent less fresh water use per guest night, 24 per cent lower waste volume per guest night, 15 per cent less total water use per guest night, 23 per cent higher use of green energy, nine per cent higher employment rate of national employees and higher customer satisfaction scores for accommodation overall.

⁴² <http://www.greenhotelier.org/destinations/europe/hotel-rural-vale-do-rio-running-on-100-renewable-energy/> Accessed 7 Aug 2018

Multi-stakeholder Partnership

A group of key stakeholders in the textile value chain from the hospitality industry met to identify and implement an innovative sourcing solution to reduce negative lifecycle impacts and costs of linen and towels, while being mindful of guests' health and comfort. The group decided to focus on the procurement of bed linen (sheets, pillowcases and duvet covers) and bath linen (terry towels, bath sheets and bathmats). Bed and bath linen together add up to an average of 1.95 kg of linen washed per overnight stay (1.7 kg if bedcovers are used, 2.1kg if duvets are used).

In 2014, Betterfly Tourism measured the impacts of a pilot scheme in Nantes, France, where the Amiral Hotel (48 rooms) procured unbleached bed linen and microfibre towels. The hotel conducted a satisfaction survey with the guests and results showed a strong acceptance of the unbleached bedlinen from the guests: 81 per cent responded that they were very satisfied with the overall quality, with 19 per cent satisfied. Some 85 per cent of the respondents were very satisfied with the visual aspect of the linen.

Unbleached bed linen appears to an actionable solution to reduce negative impacts of linen in the hospitality sector. However, results on the microfibre towels indicate that – despite their potential positive impacts on the environment – more work needs to be done to offer products with a perception of higher quality.

As fibres are preserved when manufacturing unbleached linen, less cotton is required in production. So, according to Betterfly Tourism calculations:

- **Production of unbleached bed linen requires 37 per cent less non-renewable resources, in comparison with importing bleached linen.**
- **Unbleached bed linen enables a reduction in energy consumption of 42 per cent and water consumption of 28 per cent during its life cycle, including the manufacturing process (for example, irrigation water and transport of cotton).**
- **As the bleach step is removed, fewer chemicals are used during production. Unbleached linen fibres have a longer lifespan, reducing overall costs and the need to procure new items for hotels.**
- **When compared with cotton towels, microfibre towels allowed 43 per cent savings in energy consumption (microfibre towels require a shorter drying cycle), and 47 per cent in water consumption.**
- **Microfibre towels also last longer, with the potential for up to 200 machine washes.**

To ensure the well-being and comfort of guests, tour companies supply travellers with safe, cool and convenient drinking water. However, providing every guest with non-reusable water bottles results in a negative ecological impacts.

Buffalo Tours decided to offer guests the option of refilling reusable bottles from coolers instead, with the following objectives: reducing the amount of plastic waste sent to landfill; ensuring that water bottles were made from safe materials, reducing the risk of harmful plastics or chemicals; and raising awareness of customers on environmental protection using a branded reusable water bottle.

In 2017, more than 200,000 disposable water bottles were eliminated. The production of these bottles is equivalent to the emission of 17,800 Kg of CO₂.

Getting started with energy measurement
In addition to tracking your energy use in the Resource Efficiency Tool, we recommend undertaking an energy audit across your properties.

Links to useful tools, guidance and initiatives

- UK's Carbon Trust "Hospitality: Saving energy without compromising hospitality"⁴³
- Green Kitchen Standard – a joint initiative from the Soil Association UK and the Carbon Trust.⁴⁴

4.2 Water Management

Why is Water Management important?

UN Habitat's 2016 World Economic Forum Global Risk Report rates water crises as the third most impactful global risk. By 2030 the global demand for water is expected to grow by 50 per cent, and currently 40 per cent of the world's population suffers water

shortages for at least one month a year⁴⁵. While water management is a global issue and the challenges depend on the region you are located in, it is a resource that is best managed locally.

Water management contributes to Sustainable Development Goal target 6.4:

"By 2030, substantially increase water-use efficiency across all sectors and ensure sustainable withdrawals and supply of freshwater to address water scarcity and substantially reduce the number of people suffering from water scarcity."



43 <https://www.carbontrust.com/resources/hospitality-sector-energy-saving-guide>

44 <https://www.soilassociation.org/certification/catering/green-kitchen-standard/>

45 UN Habitat (2016) World Cities Report 2016: Urbanization and development.

Benchmarks

Average water use per guest

Climate	Litres / guest ⁴²
Temperate climate	620
Mediterranean climate	819
Tropical climate	820

Average water use per guest night

Geographic area	Litres / guest night ⁴³
Europe	200
Asia	900

Rating of utility consumption

Hotel size	Excellent	Satisfactory	High
	Litres/guest night ⁴⁴		
small and budget fully serviced hotels*	200	200-210	> 210
small and budget fully serviced hotels*	200	200-210	> 210
luxury fully serviced hotels*	<500	500-560	>560

*temperate climate

Programme Indicators

In order to calculate the “Total Volume of Water Use” per guest night used by each hotel or conference centre, this target has been broken down into the following sub-indicators that will be measured in this programme:

- **Total units of water from metered sources (m3).**
- **Total units of water used from non-metered sources (m3).**
- **Total units of Water delivered (if applicable) (m3).**

An explanation of what data is required, the frequency of when the data is collected, and how to find the information is shown below in Table 3: Water.

Table 3: Water: Total volume of water use (m3)

Indicator	Data Source	Guidance
Total units of water from metered sources	<ul style="list-style-type: none"> • Utility bills • Meter readings 	<p>Utility bills include the litres or cubic metres of water consumed or purchased over a given time period. Typical utility invoices occur monthly.</p> <p>Measurement Unit: m3 see conversion table, Appendix 3 Conversion Tables.</p> <p>Frequency: Data entry to the Data Spreadsheet should occur quarterly and be sent to your Country Support Partner. Data should be recorded in monthly intervals.</p>
Total units of water from non-metered sources	<ul style="list-style-type: none"> • Onsite meters • Purchase orders • Monthly estimates of usage 	<p>This indicator refers to water that is not provided by a utility service, for example water sourced from a well or from rainwater. Measurements can be an estimate of the amount of water consumed in cubic metres over time.</p> <p>Measurement Unit: m3 see conversion table, Appendix 3 Conversion Tables</p> <p>Frequency: Data entry to the Data Spreadsheet should occur quarterly and be sent to your Country Support Partner. Data should be recorded in monthly intervals.</p>

46 International Tourism Partnership (ITP) Environmental Management for Hotels, Industry Guide for Sustainable Hotels, Chapter 3 Water

47 Only European and Asian hotels were compared in the source: Becken, S. (2014) Water equity – Contrasting tourism water use with that of the local community. <https://www.sciencedirect.com/science/article/pii/S2212371714000341>

48 ITP (2005) “Sustainable Hotel Siting Design and Construction” <https://sustainablehospitalityalliance.org/wp-content/uploads/2020/06/Sustainable-Hotel-Siting-Design-and-Construction-Chapter-9.pdf>

Indicator	Data Source	Guidance
Total units of water from tankered sources	<ul style="list-style-type: none"> Purchase orders 	<p>This indicator will include deliveries of freshwater from outside sources. Use the purchase order information to record the volume. For example, if you have a 10,000-litre tank that is refilled three times a month, your consumption would be 30,000 litres or 30m³ per month.</p> <p>Measurement Unit: m³ see conversion table, Appendix 3 Conversion Tables 2.</p> <p>Frequency: Data entry to the Data Spreadsheet should occur quarterly and be sent to your Country Support Partner. Data should be recorded in monthly intervals.</p>

This chapter focuses on direct water consumption from the sources mentioned in Table 3 above. Material sources of indirect water consumption for hotels are in the production of food and energy. There is guidance for the resource efficiency of food and energy found in Chapters 4.3 and 4.1 respectively and this will also help a business to reduce its indirect water consumption.

Making the business case

In the hotel and conferencing sector, water costs can account for up to 10 per cent of utility costs, which may not seem significant at first. However, in most cases businesses are paying for water twice: first to get a water supply and second to treat the water before disposal.⁴⁹ In addition, they may also be paying for a significant amount of energy if the water has been heated. Because these costs are not included in water bills, water is often overlooked as an opportunity for cost savings.

Saving water reduces the amount of wastewater that needs to be treated, thereby lessening the risk of water pollution. In rural or remote areas, it also ensures that local residents are not deprived of their essential supply. Depending on how water-efficient they are to start with, hotels can reduce the

amount of water consumed per guest per night by up to 50 per cent and this does not have to compromise guest comfort or experience.⁵⁰

Freshwater used within hotels and conference centres can include guest use, room cleaning, laundry, kitchen activities and maintenance of grounds and swimming pools. Typically, more than one-third of the consumed water in hotels is used within guest rooms¹².

Water saving technologies are well established. **The easiest time to instal water-efficient fittings is during construction or renovation works. Research shows that retro-fitted water-efficient fittings have a payback period of between a few months to four years.**⁵¹

Good Practice in Action

The Paloma Perissia, a 352-room, five-star, all-inclusive beachfront hotel in Turkey, embarked on a year-long sustainability improvement project with the Travel Foundation that lowered its annual costs by €153,000, well over €400 a room. It also helped reduce water consumption by 24 per cent per guest night, a total of 37,000m³ a year, enough to meet the annual water needs of 145 households in Turkey. Energy consumption fell by 20 per cent per guest night.⁵²

49 Eurostat 2009

50 Thomas Cook 2015 Water Management Manual https://www.responseandability.com/images/projekte/ThomasCook_Futouris_Water_Management_Manual_Mai2015.pdf

51 European Commission Joint Research Centre, 2013

52 2012 Travel Foundation Survival of the Fittest.

The Mercure Convention Center Ancol Jakarta,⁵³ which is part of the AccorHotels group, is committed to sustainability and won the “Green Hotelier of the Year, 2018”. The AccorHotels corporate goals are aligned to wider sustainability goals. The centre started a refurbishment programme in 2015 based on a ‘Roadmap-2020’ they created in order to achieve its sustainability goals. It has seen water savings of 51 per cent in the past six years and sustained a 10 per cent reduction in water use during 2016 while revenues grew by seven per cent in the same time period.

The centre began by carrying out a water audit, and then made a water management plan that mixed simple changes with some significant investments. It has reduced its water needs to the point where it no longer uses a well. The Jakarta City Administration can now divert the well water to more than 7,300 people. The centre has reduced oils and greases by 30 per cent in the past two years, increased water recycling efficiency to greater than 70 per cent for the sewage treatment plant and achieved an overall reduction of costs by nearly 12 per cent from 2016 to 2017.

The Holiday Inn in Flinders, Australia, recouped a \$19,500 investment in low-flow shower technology, and after 18 months cut water usage by 50 per cent.⁵⁴

Jade Mountain Resort in Saint Lucia harvests 100 per cent of the resort’s water needs itself, totalling about 2.5 million litres annually. When Jade Mountain was built it discovered that the municipal water company would not be able to supply its water needs. This was because the company’s infrastructural challenges would restrict water access

for the local community when the resort was receiving a supply feed. The resort decided to reinstate a historical reservoir on its property as a catchment and receives water during high-flow times of the river through the valley. The water from the reservoir is pumped to a hilltop on property where it is treated and then, once potable, is distributed using no additional power (gravity flow) from the hilltop storage.

Cost savings have been significant – an aggregated cost for its water is \$3.60 per 1000 gallons versus \$13.70 per 1000 gallons from the water company.⁵⁵

Getting Started

The first step to water management is to understand how you use and dispose of water by carrying out a water audit across your properties. The Sustainable Hospitality Alliance created the Hotel Water Measurement Initiative (HWMI) in 2016 to provide a consistent way of measuring and reporting water use.⁵⁶

Links to useful tools, guidance and initiatives

- Earthcheck is a leading scientific benchmarking certification and advisory group for travel and tourism. Their White paper ‘From Challenges to Solutions – Providing the business case’ provides the sector with evidence-based data on water stress and scarcity⁵⁷
- Water Check Worksheet 6 steps to becoming a Water Steward for Hotels⁵⁸
- Use the Sustainable Hospitality Alliance’s Hotel Water Measurement Initiative (HWMI) to measure and report water use in hotels along with 18,000

53 <http://www.greenhotelier.org/our-themes/water/mercure-convention-center-ancol-jakarta-saving-water-for-efficiency-and-the-community/> accessed 04.07.2018

54 Green Hotelier 2013, (SPTO report)

55 <http://www.slhta.com/environmental-best-practices-handbook/>

56 <https://sustainablehospitalityalliance.org/resource/hotel-water-measurement-initiative/>

57 <https://earthcheck.org/research/tourism-and-water/>

58 https://www.oneplanetnetwork.org/sites/default/files/itp-water-stewardship-report-2018-final-3_1.pdf

properties worldwide already using the methodology⁵⁹

- Share water use data through the Cornell Hotel Sustainability Benchmarking (CHSB) to improve public knowledge on water use in the sector and get a bespoke report for your property⁶⁰
- WRAP water efficiency in food and drink industry⁶¹
- Water Management Manual developed by Futouris together with Thomas Cook⁶²

4.3 Food and Drink Procurement

Why is tracking Food and Drink important?

One of the biggest impacts on your GHG emissions and water footprints comes from the food and drink that is served.

The GHG emissions footprint of food and drink relates to the amount of greenhouse gas emissions that are produced by growing, rearing, farming, processing, transporting, storing, cooking and disposing of the food. Food contributes around 33 per cent of global GHG emissions⁶³, but is also responsible for other environmental problems, such as deforestation and fertilizer runoff and pollution. By carefully choosing the types of foods that are served in your facility (and therefore procured by you), you can greatly reduce the negative impacts on the environment both in your own country and internationally.

Food is even more important when it comes to water. According to our analysis, the large majority of water footprint of hotels is associated with food. Foods and drinks use differing amounts of water in their growth and production process. One way to reduce the amount of carbon and embedded water

is to reduce the amount of meat served and increase the amount of vegetarian and vegan (plant-based) food on offer.

Resource efficient and sustainable food and drink procurement contribute to SDG target 12.2:

Sustainable Development Goal target 12.2

“By 2030, achieve the sustainable management and efficient use of natural resources.”

Because food and drink have a large environmental footprint, reducing their wastage is critical. For more information on how to manage and prevent food waste see Chapter 4.4 Waste Management and Prevention.



Sustainable Development Goal target 12.3

By 2030, halve per capita global food waste at the retail and consumer levels and reduce food losses along production and supply chains, including post-harvest losses



59 <https://sustainablehospitalityalliance.org/resource/hotel-water-measurement-initiative/>

60 <https://www.greenview.sg/chsb-index/>

61 <http://www.wrap.org.uk/node/31479>

62 <http://www.futouris.org/projekte/wertvolles-wasser/>

63 <https://www.fao.org/news/story/en/item/1402118>; <https://iopscience.iop.org/article/10.1088/1748-9326/ac018e>

Benchmarks

Benchmark	Example target ambitions	
Local supply	80% of approved suppliers ⁵³	
Egg procurement	100% cage-free/free-range (depending on location). ⁵⁴	100% organic ⁵⁵
Fish/seafood procurement	More than 20% from responsible sources or certified sources e.g. Marine Stewardship Council (MSC) or Aquaculture Stewardship Council (ASC). ⁵⁶	No 'red list'/endangered species ⁵⁷
Meat	30% of burger 'meat' is from mushrooms ⁵⁸	
Dairy	100% organic	Plant drink alternatives available at all sites
Coffee	100% from certified sources ⁵⁹	
Customer engagement	Highlighting all 'healthy' and 'low carbon' items on menus ⁶⁰	

Programme Indicators

In order to calculate the carbon and water footprints of a hotel or conference centre, food and drink use information needs to be entered into the Resource Efficiency and GHG Emissions Tool. Data for purchases of the following items should be collected (as kg or tonnes):

- Red meat, beef
- Red meat, lamb
- Red meat, pork
- Meat - other
- Poultry, chicken or other
- Seafood, fish
- Dairy, butter and cream
- Dairy, cheese
- Dairy, milk and yoghurt
- Eggs
- Grains, bread and pasta

- Rice
- Fruit
- Vegetables
- Yams and cassava
- Tea
- Coffee
- Oils
- Alcoholic drinks, beer, wine and similar
- Alcoholic drinks, spirits
- Sugar
- Cakes, biscuits and desserts
- Non-alcoholic drinks, soft drinks and bottled water
- Non-alcoholic drinks, fruit juices

An explanation of what data is required, the frequency of when the data is collected and how to find the information is shown in Box 4: Food and Drink Purchases.

64 <https://www.nh-hotels.com/corporate/responsible-and-sustainable-company/ethics-and-responsible-value-chain/responsible-value-chain/>; There is no globally appropriate definition of local. Country and cultural context must be considered and common sense applied.

65 <https://about.hyatt.com/fr/hyatt-thrive.html>

66 <https://www.nordicchoicehotels.com/social-responsibility-in-nordic-choice-hotels/the-food-revolution/#>

67 https://www.oneplanetnetwork.org/sites/default/files/transforming_tourism_through_sustainable_procurement_2019.pdf

68 <https://www.nordicchoicehotels.com/social-responsibility-in-nordic-choice-hotels/the-food-revolution/#>

69 <https://www.wri.org/news/2019/06/release-hilton-pledges-serve-more-planet-saving-cool-food>

70 <https://www.nordicchoicehotels.com/social-responsibility-in-nordic-choice-hotels/the-food-revolution/#>

71 <https://group.accor.com/en/commitment/planet-21/food>

Box 4: Food and Drink Purchases: Total food and drink purchased (Kg)

Indicator	Data Source	Guidance
Total food and drink purchased	<ul style="list-style-type: none"> • Purchase ledger • Point of sales data 	<p>This indicator calculates the amount of food and drink that is purchased each month. Information on purchases can be taken from purchase ledger data or from point of sales data. If actual data is not available, estimates can be See Guidance in Appendix 6 – Food and Drink Procurement Guidance</p> <p>Measurement Unit: Kg, for conversions see Appendix 3 Conversion Tables.</p> <p>Frequency: Data entry to the Data Spreadsheet should occur quarterly and be sent to your Country Support Partner. Data should be recorded in monthly intervals.</p>

Making the business case

By purchasing locally produced food you can reduce costs compared to buying imported goods. By establishing and improving purchasing relationships with local farmers and producers you can support and benefit your local community. For example, some 81 per cent of hotels in the Asia-Pacific region have a local procurement policy.⁷² You could also support women and minorities by setting targets to ensure they are not excluded when choosing your local suppliers.

Key findings from the *Green Lodging Trends Report (2017)*⁷³ indicate that guests have a growing interest in local foods. This enhances their cultural experience, supports the local community, and reduces environmental impact (because of shorter distances to transport goods). Globally, 68 per cent of hotels said that at least half of their food and beverage spending went to locally sourced products. The practice of having a local procurement policy has also jumped to 82 per cent from 74 per cent in 2016.⁷⁴ Local procurement, and planning menus to reflect seasonal food crops, is one of the best ways for hotels to converge on something good for the planet, for the guest, and for the bottom line.

Reducing consumption of red meat is a quick way to reduce a hotel's emissions and water footprints, provide healthier options to guests, and cut costs. Some 85 per cent of hotels indicate that they have vegetarian menu options.

Foods with a high emissions footprint also tend to be more expensive, reflecting the amount of resources needed to grow them, for example beef, lamb, large fish, and some types of seafood including shrimp. By reducing the portion sizes of emissions-intensive food you can reduce climate change impacts, and at the same time keep in line with trends towards lower meat consumption and more plant-based eating. A good way to do this without diminishing customer satisfaction is to focus on seasonal flavours, local fruit, vegetables and pulses.

Sustainable purchasing can also be enhanced by choosing certified products where possible, such as tea and coffee. This can reduce pressure on the environment and improve customer satisfaction. You can likewise encourage suppliers to minimize packaging and favour reusable options (e.g. boxes without lids, reusable crates) and provide opportunities for local enterprises to supply alternative products to hotels and

72 Green Lodgings Survey 2016 <https://www.greenlodgingnews.com/green-lodging-trends-report-2016-a-growing-project-because-of-you/>

73 Green Lodging Trend report 2017 http://www.greenlodgingnews.com/wp-content/uploads/2017/09/Green-Lodging-Trends-Report-2017_Final.pdf

74 Green Lodging Trend report 2017 http://www.greenlodgingnews.com/wp-content/uploads/2017/09/Green-Lodging-Trends-Report-2017_Final.pdf

conference centres as part of sustainable purchasing (also known as sustainable procurement).

Good Practice in Action⁷⁵

Local community engagement through the procurement of local food supplies in the Philippines

Tourism has become a primary source of livelihood in the El Nido Resorts' area of the Philippines. The popularity of El Nido as a prime tourist destination led to an overall increase of the area's population. El Nido Resorts wanted to address an increasing food demand, while creating opportunities for local communities to generate income and engage throughout the food value chain. The resort decided to support local food industries by procuring from suppliers in the region.

In El Nido Resorts, 60 per cent of the vegetables purchased are locally and organically produced, while 90 per cent of livestock purchased are locally reared. Procuring local food enabled an overall reduction of food costs of 20 per cent in 2016.

Use of third-party certifications to procure sustainable seafood

Almost all global fish stocks are overfished or fished to their limit. Illegal, unregulated, and unreported sourcing and mislabelling of fish is common. Seafood purchasing for hotels is highly centralized with different procurement teams per business or hotel chain to serve destinations in different locations. Leveraging large volume contracts for more sustainable options is almost impossible. Sustainable sourcing is complicated because sustainability information varies across suppliers and eco-labels.

Sustainable seafood guides can help hotels in assessing the sustainability of their seafood items and find sustainable alternatives more easily. The most popular seafood guides available are Monterey Bay Aquarium's Seafood Watch, WWF's country-specific seafood guides⁷⁶, and Marine Conservation Society's Good Fish Guide⁷⁷. These guides aim to help end users easily identify sustainability of seafood products from different species and origins through the use of easy-to-understand recommendation categories.

Hyatt Hotels has been working with conservation group WWF since 2012 to increase the percentage of global seafood purchased from responsible sources. The Hyatt strategy includes the following approaches:

- Increasing purchases from sources that are certified by credible, third-party audited standards that provide an auditing trail back to the fishery or farm.
- Providing support to time-bound, science-driven fishery improvement projects and aquaculture and purchasing fish/seafood from them.
- Reducing the impact of procurement on the most vulnerable species so those populations have a chance to rebound.

By 2017, 21 per cent of Hyatt's global seafood purchase volumes came from responsible sources, with 12 per cent from certified sources. Awareness of sustainable seafood issues has increased among Hyatt staff, suppliers and guests.

Getting started

The Transforming tourism through sustainable procurement⁷⁸ report recommends the following for procurement:

⁷⁵ The following case studies are adapted from Transforming Tourism through Sustainable Procurement: https://www.oneplanetnetwork.org/sites/default/files/transforming_tourism_through_sustainable_procurement_2019.pdf

⁷⁶ <https://www.seafoodwatch.org/seafood-recommendations>

⁷⁷ <https://www.mcsuk.org/goodfishguide/>

⁷⁸ UNEP (2019) Transforming Tourism through Sustainable Procurement. Online: https://www.oneplanetnetwork.org/sites/default/files/transforming_tourism_through_sustainable_procurement_2019.pdf

- **Work together with all relevant stakeholders along the tourism value chain.**
- **Empower travellers to drive change.**
- **Hold capacity-building initiatives for corporate buyers and staff on sustainable procurement practices.**
- **Investigate certifications and consumer information tools as guides for better procurement (and customer consumption) choices.**
- **Measure and report on the economic, social and environmental benefits and impacts of sustainable procurement to understand how such practices can be best implemented to benefit businesses along the value chain.**
- Forum for the Future's Protein Challenge 2040 outlines how we can reduce the amount of protein in our global diet.⁸³
- Livewell is the healthy eating for a healthy planet campaign developed by the WWF Foundation.⁸⁴
- Futouris Sustainable Food Manual for tourism service providers to develop, implement and market a local and sustainable food offer.⁸⁵
- Futouris Sustainable Food Guest Communication Manual includes 14 communication instruments to enable hotels and restaurants to communicate their sustainable food offer to guest.⁸⁶

4.4 Waste Management and Prevention

Managing waste from hotels and conference centres can make a significant difference to operating costs while maintaining and protecting the local environment and communities.

Reviewing the occurrence of waste throughout the value chain and making a plan to tackle it can ensure that resources are used efficiently. This helps to identify unintendedly purchased waste, such as plastic packaging around laundry services. It can also ensure that waste is managed appropriately. Materials that are re-used or recycled will be diverted from costly landfill disposal, as well as from polluting the immediate environment around the hotel and its beaches.

Links to useful tools, guidance and initiatives

- Trifocal: A European project looking at combining food sustainability, food recycling and food waste prevention messaging to consumers.⁷⁹
- The Sustainable Restaurant Association supports caterers on how to embed sustainability in their menus.⁸⁰
- Peas Please is a consumer campaign to encourage eating more fruit and vegetables.⁸¹
- The World Resources Institute's Better Buying Lab provides research, partnership working and strategy development to secure food sustainability for all.⁸²

79 www.trifocal.eu.com

80 <https://thesra.org/about-us/>

81 <https://foodfoundation.org.uk/peasplease/>

82 <http://www.wri.org/our-work/topics/food>

83 <https://www.forumforthefuture.org/protein-challenge>

84 <https://www.wwf.org.uk/updates/livewell-healthy-eating-healthy-planet>

85 <https://www.futouris.org/en/tools/>

86 <https://www.futouris.org/en/tools/>

Why is Waste Management important?

Waste tracking is part of doing business for many large hotel chains. The Global Sustainable Tourism Dashboard 2016 stated that nearly 60 per cent of businesses are tracking waste and recyclables at least every quarter. More than 70 per cent of hotel businesses in the Asia-Pacific area surveyed have carried out a waste audit in the past four years.

The principles of waste management are well established within the waste management hierarchy, with the greatest areas for potential saving being in the areas of waste prevention.⁸⁷

Reduce: The best way to realize savings is through the elimination or prevention of waste.

Recover: Collect and sort materials that can be re-used or recycled.

Re-use: Consider where items can be re-used, or whether they can be sold or donated to organizations that can re-use them. This includes food.

Recycle: Waste items such as bottles, cans, cardboard and paper can be collected and sorted for re-use or recycling if the infrastructure exists. Other items to consider include used batteries, plastic bottles, wine corks, bathroom amenities and cooking oil. If infrastructure exists, food waste and associated biodegradable parts should be collected for composting or biogas production.

Food is one of the major waste streams that can be generated by hotels and conference centres. The Waste and Resources Action Programme (WRAP) reports that 18 per cent of all food purchased by the hospitality and

food service sector is thrown away, reducing this would save money and also reduce GHG emissions. Food makes up a significant proportion of the total waste stream: 37 per cent of accommodation waste and nearly 50 per cent of waste generated in restaurants.⁸⁸ Food waste occurs mostly in storage, production, presentation (buffet), and consumption (plate waste).⁸⁹

Sustainable Development Goal target 12.2

By 2030, achieve the sustainable management and efficient use of natural resources.

Sustainable Development Goal target 12.3

By 2030, halve per capita global food waste at the retail and consumer levels and reduce food losses along production and supply chains, including post-harvest losses.

Sustainable Development Goal target 12.5

By 2030, substantially reduce waste generation through prevention, reduction, recycling and re-use.

⁸⁷ ITP EMH Chapter 4 Waste <https://sustainablehospitalityalliance.org/resources/>

⁸⁸ WRAP 2011 <https://wrap.org.uk/resources>

⁸⁹ <https://www.sciencedirect.com/science/article/abs/pii/S2213078020300669?via%3Dihub> Lund-Durlacher et al (2020), p. 3

Benchmarks

Total waste production per guest and night

Reference	waste / guest night			
Global Sustainable Tourism Dashboard ⁷⁰	4 litres / 2 Kg			
ITP ⁷¹	1 Kg			
DEHOGA ⁷²	0-2 star	3 star	4 star	5 star
	9.1 litres	4 litres	3.4 litres	3.7 litres

Waste generation is highly sensitive to context including location, culture and individual circumstance of the reporting businesses among other factors.

Food waste can account for more than 50 per cent of all hospitality wastes.⁹³

Programme Indicators

In order to calculate the total solid waste in tonnes used by a hotel or conference centre, this target has been broken down into the following sub-indicators. These are:

- Total unsorted waste (kg or tonnes).
- Total waste recycled (kg or tonnes).
- Total waste composted (kg or tonnes).

An explanation of what data is required, the frequency of data collection, and how to find the information is shown in Box 5: Waste.

Box 5: Total volume of solid waste

Indicator	Data Source	Guidance
Total unsorted waste	<ul style="list-style-type: none"> • Bills • Waste audit • Estimates 	<p>This indicator comprises the waste that ends up in landfill or in incinerators (when energy is not recovered). The weight or volume of the waste collected might be recorded by the waste contractor. If not, measurements should be undertaken by the hotel itself. Sample measurements are taken throughout the month and from various departments to determine a monthly estimate. See Guidance in Appendix 5 Waste Management Monthly Data Collection: Estimated Weight Templates.</p> <p>Measurement Unit: Metric tonnes. For conversions see, Appendix 3 Conversion Tables.</p> <p>Frequency: Data entry to the Data Spreadsheet should occur quarterly and be sent to your Country Support Partner. Data should be recorded in monthly intervals.</p>

90 Global Sustainable Tourism Dashboard 2016 https://www.griffith.edu.au/_data/assets/pdf_file/0035/89288/GlobalTourismDashboard2016-Infographic.pdf

91 ITP EM for Hotels, Chapter 4 - <https://sustainablehospitalityalliance.org/resource/environmental-management-for-hotels/>

92 DEHOGA 2016 https://www.dehoga-bundesverband.de/fileadmin/Startseite/05_Themen/Energie/DEHOGA_Umweltbroschu_re_Oktober_2016.pdf

93 WRAP 2012 Composition of UK Hospitality Waste

Indicator	Data Source	Guidance
Total waste recycled	<ul style="list-style-type: none"> • Bills • Waste audit • Estimates 	<p>This indicator focuses on waste that is recycled or reused and hence does not go to landfill or incineration. This can include plastics, glass, paper products, some metals. The weight or volume of the waste collected might be recorded by the waste contractor, but if not measurements should be done by the hotel. Sample measurements are taken throughout the month and from various departments to determine a monthly estimate. See Guidance in Appendix 5 Waste Management Monthly Data Collection: Estimated Weight Templates.</p> <p>Measurement Unit: Metric tonnes. For conversions see Appendix 3 Conversion Tables.</p> <p>Frequency: Data entry to the Data Spreadsheet should occur quarterly and be sent to your Country Support Partner. Data should be recorded in monthly intervals.</p>
Total waste composted	<ul style="list-style-type: none"> • Bills • Waste audit • Estimates 	<p>Composting of food waste and green waste can be done on site or by a waste contractor. The weight or volume of the waste collected is often recorded by the waste contractor but if weight data is not available, measurements should be undertaken by the hotel itself. Sample measurements are taken throughout the month and from various departments to determine a monthly estimate. See Guidance in Appendix 5 Waste Management Monthly Data Collection: Estimated Weight Templates.</p> <p>Measurement Unit: Metric tonnes. For conversions see Appendix 3 Conversion Tables.</p> <p>Frequency: Data entry to the Data Spreadsheet should occur quarterly and be sent to your Country Support Partner. Data should be recorded in monthly intervals.</p>

If hotels and conference centres have further detail about types of recycled waste streams, the *Resource Efficiency Tool* provides assistance to track these, too.

Making the Business Case

Benefit of waste reduction is firstly savings by reducing purchasing costs, waste disposal costs, energy consumption and avoiding environmental pollution.⁹⁴ For example, replacing disposable heating fuel cartridges with electric resistance elements in a buffet line of 10 chafers (water vessels for heating food) avoids the purchase of EUR 11,400 per year of disposable cartridges⁹⁵.

In many cases, waste is not collected, but is discarded directly into oceans or rivers,

or simply dumped in areas out of sight of guests. In addition to visually degrading a destination, improper waste disposal can lead to water and soil pollution through leaching of contaminants from waste piles. Improper waste management can result in fires, odours, insects’ proliferation, and ineffective containment of wastes. Uncontrolled disposal of toxic items such as paint cans and batteries can severely contaminate water, air and soil resources, threatening the environment and human health, and ultimately destroying the main natural assets of tourism destinations. Even where waste is disposed of legally, landfills have limited capacity, which is a particular problem for small islands.

94 http://www.ijera.com/papers/Vol7_issue7/Part-10/H0707103437.pdf

95 <https://ec.europa.eu/environment/emas/takeagreenstep/pdf/BEMP-6-FINAL.pdf>

Food waste often accounts for a large share of the overall waste generated in the hospitality industry with estimates of 30 to 50 percent⁹⁶. In the US, for example, food waste accounts for more than 50 percent of waste in the hospitality industry⁹⁷. The rate of food waste in the Philippine is estimated at more than 40 per cent⁹⁸ and in the Dominican Republic at up to 35 per cent⁹⁹.

There are important benefits to be achieved from reducing the amount of food waste requiring disposal. In the UK the potential savings of £10,000 a year have been identified for a typical restaurant.

According to a report (Hanson and Mitchell 2017¹⁰⁰), there is a robust business case for reducing food loss and waste. Analysis of historical data has been carried out, including businesses from nearly 1,200 sites across 17 countries and more than 700 companies representing a range of sectors, including food manufacturing, retail, hospitality and service. Researchers found that the median benefit-cost ratio was 14:1. Thus, for every US\$1 invested in food loss and waste reduction, half of the surveyed company sites realized a \$14 or greater return.

Some specific suggestions for preventing food waste include:

- **Prioritizing smart menu planning and fresh seasonal produce, which typically lasts longer, is of better quality, and often cheaper. Reviewing stock management and delivery processes for food with a short shelf life.**
- **Ensuring stock is rotated as new deliveries come in (first in, first out).**

- **Storing stock correctly, at the right temperature, labelled, and with dates.**
- **Assessing food and drink supply chain to identify environmental hotspots.**
- **Allowing editing of menus to avoid damaging of ingredients (e.g. out of season fruit) and include sustainable protein choices.**

Good Practice in Action

The Genuig Inn in Scotland was 2018's Green Hotelier Award winner in the waste category. The hotel reduced its waste to landfill by 97.5 per cent in the past 10 years. Food waste became part of its energy solution, being dried then used to add calorific value to biofuel. The resulting ash is used in the garden. In addition, chefs are skilled in portion control to avoid food waste. By getting tough on packaging the hotel reduced its cardboard and plastic waste by 50 per cent, and it also encourages guests to separate waste for recycling.

Sandals Regency La Toc Golf Resort and Spa has developed a 4Rs waste management programme and is EarthCheck Platinum standard accredited. It was the first of three Sandals resorts introduced to Saint Lucia.

In March 2017, a composting programme began using green waste derived from garden clippings (nitrogen) and shredded paper (carbon). Up to 250 pounds of usable organic soil conditioner has been generated since the three-month process of decomposition started. This product is used in landscaping¹⁰¹.

96 <https://wrap.org.uk/>

97 <https://www.hotelmanagement.net/operate/how-hotels-are-becoming-smarter-about-waste>

98 UNEP (2019). Overview and Hotspots Analysis of the Tourism Value Chain in the Philippines https://www.oneplanetnetwork.org/sites/default/files/iki_country_report_philippines_final_1.pdf

99 UNEP (2019) Overview and Hotspots Analysis of the Tourism Value Chain in the Dominican Republic https://www.oneplanetnetwork.org/sites/default/files/iki_country_report_dominican_republic_final.pdf

100 Champions 12.3 report <https://champions123.org/the-business-case-for-reducing-food-loss-and-waste/?frame-nonce=aa2cf734de>

101 <https://earthcheck.org/news/2017/august/sandals-saint-lucia-resorts-earthcheck-platinum-certified/>

Orchard Hotel achieved a 67-per cent diversion rate and \$25,000 annual savings through practices such as restroom paper-towel composting and housekeepers conducting in-room and at disposal area sorting¹⁰².

Getting Started

If you haven't already carried out a waste audit or you haven't carried one out in the last year, then this is a good place to start.

ITP Environmental Management for Hotels (waste chapter) provides some useful templates and benchmark data to consider¹⁰³

Some desirable actions/outcomes:

- **Single-use disposable items are avoided where possible (e.g. plastic bin liners are avoided, toner/ink cartridges are refilled, and rechargeable batteries are selected).**
- **Filtered tap water and reusable glasses are provided for drinking, to avoid the use of non-recyclable plastic bottles, unnecessary water transport, and disposable drinks cups.**
- **All recyclable materials (including glass, paper, organic waste and plastics) are separated for collection by recycling services. Where these services are not provided by local authorities, the enterprise contracts appropriate service providers (in collaboration with neighbouring enterprises if required to generate a critical mass and realize collection efficiencies).**

Housekeeping is an important control point for waste management, particularly with respect to sorting and recycling.

Links to useful tools, guidance and initiatives

- Solid Waste Data for Project Baseline; WRAP Webinar (2018).
- Green Hotelier Know How Guide¹⁰⁴
- Green Hotelier Manual for Environmental Management of Waste.¹⁰⁵
- Your Business is Food; don't throw it away is a free-to-use set of tools for the hospitality sector that shows how to make a food waste action plan and provides food waste prevention ideas¹⁰⁶
- The Pacific Asia Travel Association (PATA) has developed a free toolkit to help hotels reduce their food waste and work together. The group has shared its toolkit via its BUFFET (Building and Understanding for Food Excess in Tourism) website.¹⁰⁷
- The initiative 'United Against Waste' is a cross-industry platform with partners from government, scientific bodies and NGOs that provides guidance and tools to achieve halving food waste in kitchen operations by 2030 (in German)¹⁰⁸
- Futouris Sustainable Food Manual – Waste chapter¹⁰⁹

102 <https://www.hotelmanagement.net/operate/how-hotels-are-becoming-smarter-about-waste>

103 Reducing and Managing Food Waste in Hotels <https://sustainablehospitalityalliance.org/wp-content/uploads/2020/05/Environmental-Management-for-Hotels-4-Waste.pdf>

104 <https://sustainablehospitalityalliance.org/wp-content/uploads/2020/05/Environmental-Management-for-Hotels-3-Water.pdf>

105 <https://sustainablehospitalityalliance.org/wp-content/uploads/2020/05/Environmental-Management-for-Hotels-4-Waste.pdf>

106 <https://partners.wrap.org.uk/campaigns/your-business-is-food/>

107 <http://www.pata.org/food-waste/>

108 <https://united-against-waste.at/>

109 <https://www.futouris.org/en/tools/>

4.5 Plastics Waste Reduction

Why is plastic waste management in the tourism sector important?

Plastics appear everywhere in our daily lives, and we use them in all sorts of positive ways. However, this has led to an increase in plastic waste, which harms our environment. Many plastic items end up in our oceans, ecosystems, and landfill sites, and it is estimated that 8 million tonnes of plastic waste enter the oceans each year¹¹⁰.

Accommodation and restaurants are major contributors to packaging waste, including plastics with high embodied energy that are responsible for significant resource depletion upon disposal.¹¹¹ Tourists may generate up to twice as much solid waste per head as local residents¹¹². As well, tourism waste often varies seasonally, and is generated in areas sensitive to littering, potentially putting pressure on waste management facilities during peak season and damaging high nature value resources¹¹³. Plastic waste in the oceans poses a threat to the marine environment and sea life.

Human health¹¹⁴

- **Use of plastic products leads to ingestion and / or inhalation of large amounts of both microplastic particles and hundreds of toxic substances with carcinogenic, developmental, or endocrine disrupting impacts.** In addition, risks to human health and well-being arise from the open burning of plastic waste, exposure to pathogenic bacteria transported on plastics, and leaching out of substances of concern to coastal waters.

- **Microplastics entering the human body through contact, ingestion, or inhalation can lead to an array of health impacts,** including inflammation, genotoxicity, oxidative stress, apoptosis, and necrosis, which are linked to an array of negative health outcomes including cancer, cardiovascular diseases, inflammatory bowel disease, diabetes, rheumatoid arthritis, chronic inflammation, autoimmune conditions, neurodegenerative diseases, and stroke.

Food Chain

- **Once plastic reaches the environment in the form of macro- or microplastics, it contaminates and accumulates in food chains through agricultural soils, terrestrial and aquatic food chains, and the water supply.** This environmental plastic can leach toxic additives or concentrate toxins already in the environment, making them bioavailable again for direct or indirect human exposure.

Ecosystem and Marine Environment

- **Plastic disperses readily throughout marine, freshwater, and terrestrial environments into air, soils, rivers, lakes, and the ocean.** Not only is it unsightly, but it also could have grave negative consequences for global ecosystems and human health. Plastic debris is ubiquitous, and it has even been found in the deepest parts of the ocean, the seven-mile-deep Mariana trench in the western Pacific.¹¹⁵
- **The problem is exacerbated by decades of poor waste management coupled with overproduction and consumption of plastic that is used fleetingly.**

110 UNEP, 2017. <http://web.unep.org/environmentassembly/marine>

111 Eurostat, 2010. Environmental statistics and accounts in Europe – 2010 edition, Eurostat, 2010, Luxembourg. ISBN 978-92-79-15701-1.

112 IFC, (2007) IFC, EHS guidelines for Tourism and Hospitality Development, International Finance Corporation, 2007

113 <https://susproc.jrc.ec.europa.eu/activities/emas/documents/TourismBEMP.pdf>

114 <https://www.unep.org/resources/pollution-solution-global-assessment-marine-litter-and-plastic-pollution> and https://docs.wixstatic.com/ugd/24e531_a351a71fc6e34196884341e743c98717.pdf

115 See Sanae Chilba et al., Human footprint in the abyss: 30 years records of deep-sea plastic debris, 96 Marine Policy 204, 204-12 (2018), <https://doi.org/10.1016/j.marpol.2018.03.022>

- **One study predicts that there may be around 5.25 trillion pieces of plastic debris weighing some 269,000 tons in the ocean¹¹⁶, though the figures are almost impossible to verify.¹¹⁷**

The tourism sector, which is so reliant on the natural beauty of destinations worldwide, is starting to recognize the responsibility it has to eliminate problematic or unnecessary single-use packaging items.

Plastics waste reduction contributes to SDGs UN Development Goals

Sustainable Development Goal 12.2:

“By 2030, achieve the sustainable management and efficient use of natural resources.”



Sustainable Development Goal 12.5:

“By 2030, substantially reduce waste generation through prevention, reduction, recycling and reuse.”



Sustainable Development Goal target 14.1:

“By 2025, prevent and significantly reduce marine pollution of all kinds, in particular from land-based activities, including marine debris and nutrient pollution”



Benchmarks

Benchmarks on plastic consumption and plastic waste are not as available as for other resources.

Publicly available data are limited and can be in different formats than weight per guest night. Plastic consumption varies for certain items, such as plastic bottles, depending on the location. There is a big difference between an all-inclusive resort where running water is not drinkable, and a large city hotel where tap water is drinkable. Best practice examples in this area are emerging. One would be the Robinson resorts in the Maldives that reduced their plastic bottle consumption by 800,000 a year by switching to refillable glass bottles and providing water from desalination plants.¹¹⁸

Complementary to benchmark analysis the following principles are advised:

- Consider the purpose of the plastic materials currently consumed and if it is unnecessary, remove it.
- Switch to non-plastic alternatives for necessary plastics where they are available.
- Prioritize multiple-use plastics over single-use.

¹¹⁶ See Marcus Eriksen et al., Plastic Pollution in the World’s Oceans: More than 5 Trillion Plastic Pieces Weighing over 250,000 Tons Afloat the Sea, 9(12) PLoS ONE (2014), <https://doi.org/10.1371/journal.pone.0111913>

¹¹⁷ See Marcus Eriksen et al., Plastic Pollution in the World’s Oceans: More than 5 Trillion Plastic Pieces Weighing over 250,000 Tons Afloat the Sea, 9(12) PLoS ONE (2014), <https://doi.org/10.1371/journal.pone.0111913>

¹¹⁸ TUI Group, 2019, https://www.tuigroup.com/damfiles/default/downloads/plastic_reduction_guide.pdf-2f4f4f0e2278382fcd-50d9a530985b84.pdf

Plastic Indicators

The *Resource Efficiency Tool* also considers the following indicators:

- Single-use plastic purchases (tonnes or kg)
- Multiple-use plastic purchases (tonnes or kg)

Making the environmental and business case

CREST and WWF-US worked in 2018, together to enable three resort properties in the Caribbean to adopt Hotel|Kitchen guidance.¹¹⁹ A joint survey on food waste management in the Caribbean showed that 81 per cent of hotels and resorts would be interested in implementing or strengthening a programme to reduce and manage food waste with assistance; 83 per cent already buy local foods to extend shelf life; 77 per cent use reusable bottles or bulk condiments instead of single-use plastic; and 76 per cent plan menus to limit portions and cross-utilize ingredients.¹²⁰

“With a greater public awareness not only of environmental issues, but also of human rights and working conditions, tour operators and hoteliers are supporting this move towards responsible tourism that looks after our environment and our people. In 2018, we can expect more initiatives such as social enterprise projects which give back to local communities, carbon-neutral group tours, and the banning of plastics from beaches”.¹²¹

Some 58 per cent of *Condé Nast Traveller* readers surveyed said they choose a hotel

based on whether it gives back to local people and the planet.¹²²

“Lifecycle impacts of packaging are heavily dependent on factors such as whether or not recycled material is used in production, different packaging weights associated with alternative materials, manufacturing location and methods, transport distance, energy sources, fate of used products, etc”¹²³.

Futouris developed a cost-benefit analysis for the reduction of single-use plastic. “Even though single-use plastic is a cheap material, there are still opportunities for cost saving. For instance, by completely eliminating unnecessary products such as straws and stirrers you can make immediate savings. Even though the savings will be small, many small actions can add up over time. Other alternatives can require larger initial investments which you will need to budget for, but many do provide a good return in the medium to longer term. The example of Serious Business in the guide shows the potential savings from using sustainable alternatives. For example, hotels can save up to 4,475 € a year and 1,497 kg CO₂ by using refillable bottles with filtered water from the tap instead of single-use plastic bottles¹²⁴”.

Good Practice in Action

The Ascots Beach Hotel in Paphos, Cyprus, invested €867 to purchase 3,000 reusable plastic cups to replace disposable plastic cups and stopped using plastic bin liners in guest rooms. In the first year of operation, the disposal of 100 000 plastic cups was avoided, saving almost €2,000, and 50 per

119 https://www.responsibletravel.org/docs/The_Case_for_Responsible_Travel_2018_FINAL_FOR_WEB.pdf

120 https://www.responsibletravel.org/docs/The_Case_for_Responsible_Travel_2018_FINAL_FOR_WEB.pdf

121 ABTA, 2018. “Travel Trends Report 2018.” https://www.abta.com/sites/default/files/media/document/uploads/ABTA_Travel_Trends_Report_2018_0.pdf

122 Virtuoso, November 2017. “White Paper Sustainable Tourism: From Trend to Transformative Movement” [pdf]. https://thebrando.com/wpcontent/uploads/2014/03/Virtuoso_Sustainability_WhitePaperNovember-2017.pdf

123 Öko-Institut, 2008) Öko-Institut, *Comparative Life Cycle Assessment of various Cup Systems for the Selling of Drinks at*

124 <https://www.futouris.org/en/tools/> - Guidance On The Reduction Of Single-Use Plastic Accessed 18 November 2021

cent fewer bin liners were disposed of, saving a further €300. Guest satisfaction was not affected.

Rafayel Hotel, a 65-room five-star hotel in London, UK, replaced bottled water with filtered tap water in reused glass bottles, avoiding the purchase and disposal of 500,000 200-ml plastic bottles and 200,000 one-litre plastic bottles, and 205 tonnes of glass bottles, every year.

TUI Sensimar Lagoon Mauritius recycles all of its plastic bottles in collaboration with a local recycling station. The bottles are processed and then exported to other countries to make anti-allergy products like mattresses and pillows.

Robinson Clubs on Maldives are avoiding plastic waste thanks to sustainable treatment of drinking water. The system uses osmosis to desalinate and purify seawater. By adding minerals and carbonic acid, the freshly generated drinking water is converted into soda water and decanted into one of 7,500 new glass bottles. The bottles are cleaned locally, eliminating the transport and disposal of around 800,000 plastic bottles annually.

The Dessoale Malia Beach hotel in Greece has reduced the amount of plastic straws it uses by 95 per cent and has introduced water coolers, cutting plastic water bottles by 75 per cent.¹²⁵

The Green House Hotel is a boutique hotel and former Green Hotelier Award winner on the UK's south coast. The hotel opened in 2010 after an 18-month environmentally considered refurbishment. It has adopted the following practices to reduce plastic:

- Replacing UHT milk containers in bedrooms with fresh milk in reusable flasks, which is both more environmentally friendly and more appealing to guests. Milk is delivered to the hotel in pawhich are picked up and refilled.
- Investing in fixed 300ml refillable bottles instead of the single-use disposables.
- Cutting back plastic by limiting the number of Tetra Paks of juice and milk used.
- Implementing an onsite water filtration system.¹²⁶

Travel Foundation, in a 2011 project delivered with Thomas Cook, helped 21 hotels introduce simple measures to reduce plastic consumption in Cyprus – cups, bottles and straws. In just five months the hotels reduced costs by 30 per cent. Besides the financial savings from not purchasing plastic, there were staff cost benefits, including less time ordering and handling deliveries and clearing used plastic items in restaurants and pool areas. Additionally, there was a decrease in space required for stock storage, which could be put to a more profitable use. And there was less plastic litter on the beaches and in the oceans, increasing the attractiveness of the resort.¹²⁷

Getting started

Step 1: Undertake a review to establish and quantify which plastics are present in your value chain.

Step 2: Agree and set targets across your organization to reduce single-use and unnecessary plastic items.

¹²⁵ <https://sustainablehospitalityalliance.org/>

¹²⁶ <http://www.greenhotelier.org/our-themes/new-builds-retro-fits/talking-point-quitting-straws-and-other-ways-to-reduce-single-use-plastics/>
Accessed 18 November 2021

¹²⁷ 2012 Travel Foundation. Survival of the fittest. P.9

Step 3: Communicate your targets and plastic waste reduction ambitions to key stakeholders and employees (including housekeeping, catering, leisure facilities, maintenance and the office).

Step 4: Establish and implement an impact measurement plan in order to monitor your progress and achievements.

Step 5: Review your progress periodically to identify areas of continuous improvement and communicate widely to share your progress with guests and staff.

Links to useful tools, guidance and initiatives

- UK Plastics Pact – WRAP, Ellen MacArthur Foundation¹²⁸
- UN Clean Seas Campaign¹²⁹
- Make Holidays Greener Campaign – ABT¹³⁰
- TUI Plastic Reduction Guide¹³¹
- Best Environmental Management Practice in the Tourism Sector –

European Commission Joint Research Centre.¹³²

- The Case for Responsible Travel (2018)¹³³
- ABTA Travel Trends Report (2018)¹³⁴
- European Commission: Strategy for Plastics in a Circular Economy¹³⁵
- UK Plastics Pact, Roadmap to 2025 – Wrap¹³⁶
- Supplier Sustainability Handboo¹³⁷
- Global Tourism Plastics Initiative (2020) - Recommendations for the tourism sector to continue taking action on plastic pollution during COVID-19 recovery
- UNEP and World Travel & Tourism Council (2021). Rethinking Single Use Plastic Products in Tourism, Impacts, Management Practices and Recommendations
- Futouris Guidance On The Reduction Of Single-Use Plastic - cost benefit analysis <https://www.futouris.org/en/tools/>

128 <http://www.wrap.org.uk/content/the-uk-plastics-pact>

129 <https://www.cleaneas.org/>

130 <https://www.abta.com/news/make-holidays-greener-2018-launches>

131 https://www.tuigroup.com/damfiles/default/downloads/plastic_reduction_guide.pdf-2f4f4f0e2278382fcd50d9a530985b84.pdf

132 <https://susproc.jrc.ec.europa.eu/activities/emas/documents/TourismBEMP.pdf>

133 https://www.responsibletravel.org/docs/The_Case_for_Responsible_Travel_2018_FINAL_FOR_WEB.pdf

134 https://www.abta.com/sites/default/files/media/document/uploads/ABTA_Travel_Trends_Report_2018_0.pdf

135 <https://ec.europa.eu/environment/circular-economy/pdf/plastics-strategy-brochure.pdf>

136 <http://www.wrap.org.uk/sites/files/wrap/The-UK-Plastics-Pact-Roadmap-v2.pdf>

137 http://www.travelife.org/tourism_business_new/documents/Supplier_Sustainability_Handbook_English.pdf



5

Greenhouse Gas Emissions Reduction Guidance

5.1 Why is GHG management important?

Goal 13: Take urgent action to combat climate change and its impacts

Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries

Integrate climate change measures into national policies, strategies and planning

Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning

Implement the commitment undertaken by developed-country parties to the United Nations Framework Convention on Climate Change to a goal of mobilizing jointly \$100 billion annually by 2020 from all sources to address the needs of developing countries in the context of meaningful mitigation actions and transparency on implementation and fully operationalize the Green Climate Fund through its capitalization as soon as possible

Promote mechanisms for raising capacity for effective climate change-related planning and management in least developed countries and small island developing States, including focusing on women, youth and local and marginalized communities

International context

It is well acknowledged today that global warming is one of the most crucial challenges for humanity and that human activities are contributing significantly to it.

At the Paris climate conference (COP-21) in December 2015, countries decided to adopt the Paris Agreement under the United Nations Framework Convention on Climate Change. This was the first time that 195 countries that were parties to the convention had agreed on a universal, legally binding climate instrument. The Paris Agreement aims to strengthen the global response to the threat of climate change in the context of sustainable development.

Under the Paris Agreement, countries are required to undertake and communicate to the UNFCCC Secretariat, their post-2020 climate efforts, in order to achieve the objective of the agreement of limiting the global temperature increase to well below 2°C, while pursuing efforts to limit the increase to 1.5°C until 2100.

Transitioning from the current development pathway to a low-carbon one will require significant investment and innovation from the private sector. Adopting low-carbon technologies and changing behaviours should allow companies to optimize their resource use, reduce operation costs, and increase efficiency while improving environmental performance and tackling climate change.

Objective and scope of GHG reduction guidance

General guidance for calculating the emissions in a business-as-usual scenario, the emissions in a mitigation scenario, and the corresponding emissions reductions, can be found in Appendix 2. There is also an overview of different tools available to calculate GHG emissions in the accommodation sector. Finally, there is step-by-step guidance for using the Greenhouse Gas Abatement Cost Model (GACMO); a hotel version of this tool is described in Appendix 9.

The guidance discussed in this document can be applied to all categories of accommodation as long as energy use in various business activities can be covered and separated out from the energy use for activities not related to business.

When the calculations are made before the implementation of the mitigation options, the scenarios are made as ex-ante (looking at the future). When the calculations are made after the implementation of the mitigation options, the scenarios are made as ex-post (looking at the past). The emissions or emissions reductions calculated as ex-ante are "theoretic" as they have not occurred yet. The emissions or reductions calculated as ex-post are emissions (or reductions) are those that have been produced or achieved.

5.2 Sources of GHG emissions in hotels

In order to establish its baseline and mitigation scenarios, a hotel should distinguish between the direct and indirect emissions. These are as follows:

1. **Direct emissions:** These are generated from use of energy such as electricity for lighting, heating and cooling provided by air-conditioners, space heaters, refrigerators, freezers, water coolers, boilers, geysers etc.; electricity, gas or other fuel used in the kitchen for cooking / heating in restaurants. Electricity use for cleaning services, laundry (if done by the hotel itself), and for other services provided by a hotel within its premises (vending machines, for example) are also included. Finally, direct emissions also those from vehicles owned and operated

by the hotel, such as cars and buses for guest pick up. Emissions from waste generated by the hotel, from food and other kitchen waste, toiletries etc. also fall into this category.

2. **Indirect emissions:** These are generated elsewhere by third parties to provide products and services to a hotel. These include emissions from services outsourced by hotels such as laundry, food production and transport related to procurement of goods used in kitchens and other places, operations of car fleets, business travel of staff, buses, vans and other outsourced transport.

The opportunity of low-carbon diet offers to reduce emissions and climate impacts (indirect emissions, scope 3)

Food production is a significant contributor to climate change, accounting for a quarter of global greenhouse gas emissions. Animal-based foods account mostly for significant higher GHG emissions while plant-based foods have in general lower environmental impacts¹⁰³. In the hotel and conference sector the agri-food value chain, including food consumption, is an important element in reducing the sector's overall GHG emissions. One option is the integration of low-carbon diet offers for guests.

In 2019, for example, Hilton has become the world's first hotel group to commit to serving more climate-friendly foods working with the World Resource Institute's housed Cool Food Pledge¹⁰⁴. This includes evaluating the climate impact of the food served and develop plans to sell dishes with smaller climate footprints. The aim is to collectively slash food-related greenhouse gas emissions from signatories by 25% by 2030.

138 <https://www.wri.org/news/release-hilton-pledges-serve-more-planet-saving-cool-food>

139 <https://www.wri.org/news/release-hilton-pledges-serve-more-planet-saving-cool-food>

Hiltons has for example lowered its climate impacts in their burgers (their most ordered item) by swapping 30% of a highly resource-intensive food, beef, for mushrooms.

This document covers only direct emissions.¹⁴⁰ The boundary thus includes energy use in guest rooms, restaurants, conference centres, shops, casinos, swimming pool and other sports facilities, garden, 'back of house' (food, housekeeping and engineering), and other amenities in hotel premises. Emissions from the energy used for private spaces in the hotel, onsite staff accommodation for example, should not be taken into account. Therefore, if the emissions from the energy used for private spaces are not metered separately, they should be deducted.

Benchmarks

Although there are no industry benchmarks for the GHG emissions related to the energy-activities of the accommodation sector, a business can have a good idea of its performance level using benchmarks related to its energy management activities.

The World Tourism Organization (UNWTO) is the United Nations agency responsible for the promotion of responsible, sustainable and universally accessible tourism. An analysis performed by UNWTO under the Hotel-Energy-Solution (HES) project (HES, 2011), suggests that kWh/m²/year is a more widely reported and useful comparative measure of energy use levels than kWh/guest-night. The HES project proposes the following benchmarks:

Level of performance	Measure (kWh/m ² /year)
Excellent	<195
Good	195 to 280
Average	280 to 355
Poor	355 to 450

5.3 Getting started - Overview of how to calculate GHG emissions in the accommodation sector

Emissions from accommodation are usually calculated at a global level for the whole sector, and are useful for taking global sectoral policies or measures. **At the global level, calculations are generally based on global average emission factors (expressed as CO₂e per guest night multiplied by number of tourist nights) for each accommodation category (see HCMI methodology at section 3.2[1]).** When downscaling to the country or business level, the challenge is that emission factors can vary widely across the categories and geographical regions, and it can be difficult to find country-specific or business-specific emission factors, in particular for the small and large hotels categories.

There are some approaches and tools to estimate emissions from accommodation at country or at business level. In Gamage (2014), for example, the authors selected hotels from various categories, collected data on energy consumption for the sample, and then extrapolated it to country level. In this case, the LEAP¹⁴¹ model is used to calculate the emissions and construct the baseline and future scenarios. Other similar simple spreadsheet-based tool such as GACMO can be used for such sectoral analysis and scenarios at country or business level. REAP

¹⁴⁰ While direct emissions are a focus here, by acting on the principles of resource efficiency covered in early chapters, businesses will reduce their indirect emissions also.

¹⁴¹ LEAP - Low Emissions Analysis Platform - is a software system for integrated energy planning and climate change mitigation assessment developed at Stockholm Environment Institute (SEI US).

Tourism, a destination footprint and scenario tool that calculates direct and indirect supply-chain emissions from accommodation, travel, food, shopping, services, attractions, activities and events, has been developed and applied to SouthWest England (Whittlesea, E., Owen, A. 2012).

In order to estimate an emission reduction related to the implementation of specific mitigation options, a hotel should compare the emissions that occur in a baseline scenario (without the mitigation options) with the emissions that occur in a mitigation scenario (including the mitigations options).

A full explanation of how to calculate these emissions manually can be found in Appendix 2.

5.4 Links to useful initiatives and calculation tools for estimating energy use and related emissions at the business level (hotel level)

There are plenty of tools available that automate GHG emissions calculations and establish baseline and mitigation scenarios.

It has to be noted, however, that most of these tools allow a hotel to calculate emissions from energy use at a fixed point based on past emissions. To project future emissions, it is necessary to choose a tool (for example, the GACMO) that can assess specific mitigation options and estimate the potential emissions reduction from each specific option.

There have been several initiatives for calculations of energy use and emissions at the business (hotel) level. An overview is given in Table 2 and a description of each tool following.

Table 1: Overview of the tools for estimating energy use and related emissions at the business level.

	Can be used for energy use calculation	Can be used for ex-post assessment of emissions	Can be used for ex-ante assessment of emissions	Additional
The Hotel Carbon Measurement Initiative	yes	yes - as carbon footprint	no	
Hotel Energy Solutions	yes	yes - as carbon footprint	no	
The Hotel Footprinting Tool	yes	yes - as carbon footprint	no	
Performance management system	yes	yes - as carbon footprint	no	evaluate and monitor the impact of offsetting options

	Can be used for energy use calculation	Can be used for ex-post assessment of emissions	Can be used for ex-ante assessment of emissions	Additional
Nearly Zero Energy Hotel	yes	yes - as carbon footprint	no	
Greenhouse gas Abatement Cost Model - hotel version	yes	yes	yes	assess the impact of specific mitigation actions on green-house gas emissions

1. The Hotel Carbon Measurement Initiative (HCMi)¹⁴²

One popular tool for calculating emissions from a hotel as carbon footprint is HCMi, developed by the Sustainable Hospitality Alliance and the World Travel & Tourism Council in partnership with KPMG and 23 global hotel companies. More than 24,000 hotels globally use HCMi. Besides total emissions, the tool also calculates the carbon footprint per occupied room based on past emissions on a daily basis, and per area of meeting space on an hourly basis. The methodology includes emissions from outsourced laundry operations, which is an essential part of the hotel services with significant emissions, but excludes emissions from private spaces, including on-site staff accommodation, space leased to third parties not related to the hotel etc. The methodology also excludes guest travel to the hotel, employees' business travel, emissions in production of materials purchased by a hotel, waste disposal and other outsourced activities. Reporting and calculating of emissions is done annually.

HCMi calculates carbon footprint on the basis of past emissions. The tool does not include a list of potential mitigation options and so does not allow users to create a mitigation scenario to estimate future emissions.

2. Hotel Energy Solutions (HES)¹⁴³

Developed under a UNWTO-initiated project in collaboration with UNEP and EU agencies in tourism and energy, HES is an online tool that helps businesses measure their energy use. The project targets small and medium (SMEs) accommodation providers. HES helps businesses understand their energy consumption, and provides technical information on energy efficiency and renewable energy opportunities to cut costs and GHG emissions. The project focused on European SMEs since 90 per cent of hotels in Europe fall into this category. The tool uses two units of measurement for analysing energy consumption: one is kWh per guest-night and energy cost, and the other is kWh per square meter per year.

HES allows hotels to assess their current energy use and recommends appropriate renewable energy and energy efficiency technologies. It provides information about savings from the technologies selected by the hotel. The tool allows hotels to estimate emissions based on past figures, but does not allow for future projections

¹⁴² <https://sustainablehospitalityalliance.org/resource/hotel-carbon-measurement-initiative/>

¹⁴³ www.hotelenergysolutions.net

3. The Hotel Footprinting Tool (HFT)⁹³

HFT is a simple online tool that comprises a carbon footprint database for guest rooms and meeting spaces developed using HCMI methodology for a few regions worldwide.

In each region, the average size is calculated based on a sample of a few hotels; 15 hotels, for example, are located in the south of Germany, ranging from economy to luxury. The tool gives a range of carbon footprint sizes for each category, though category-wise data is not available in all cases. In case of existing data, the online tool calculates emissions as carbon footprint using the benchmark data. The hotels can then compare their own carbon footprint using HCMI methodology with the benchmark for the region.

HFT allows hotels to estimate on the basis of past emissions but does not allow for future projections.

4. Myclimate's IT-based performance management system (PMS)¹⁴⁴

Developed by Myclimate hotel solutions, a consultancy company that helps its clients to calculate the carbon footprint of their hotels, PMS considers emissions from energy, heat, cold, water, laundry (external), mobility, catering (food and beverages), administration, waste and recycling. It also provides carbon-offsetting options for guests and gives hotels the opportunity to use the label Climate-Neutral Hotel if they offset all CO₂ emissions. PMS helps hotels evaluate and monitor the impact of offsetting options taken annually. Additionally, hotels can compare their performance to the sector benchmark.

¹⁴⁴ <https://www.myclimate.org/get-active/corporate-clients/tourism/hotel-and-tourism-industry/>

¹⁴⁵ <http://www.nezeh.eu/home/index.html>

¹⁴⁶ <http://www.nezeh.eu/assets/media/PDF/D1491.5%20neZEH%20result-oriented%20report.pdf>

¹⁴⁷ <http://www.nezeh.eu/etoolkit/index.html>

¹⁴⁸ <https://unepdtu.org/publications/the-greenhouse-gas-abatement-cost-model-gacmo/>

PMS allows hotels to estimate emissions on the basis of past figures and to calculate the impact of offsetting options. The tool does not include a list of potential mitigation options and so does not allow establishing future projections.

5. Nearly Zero Energy Hotel (neZEH)¹⁴⁵

An offshoot of HES, neZEH was developed under an EU-funded project that focused on implementation of Nearly Zero Energy Buildings through large-scale renovations of existing hotels. The e-tool has three main pillars¹⁴⁶: energy performance assessed using a questionnaire; identification of opportunities for energy efficiency improvement; and knowledge sharing by showcasing neZEH pilot hotels' results and experiences. The neZEH toolkit is a web platform that a user can log into¹⁴⁷ and use. Hotel owners can assess their energy consumption and identify appropriate solutions for improving energy efficiency using the tool.

neZEH allows hotels to estimate their energy performance and identify energy efficiency opportunities. The tool allows hotels to estimate emissions on past figures but does not allow future projections.

6. Greenhouse gas Abatement Cost Model (GACMO)¹⁴⁸

GACMO is an Excel-based tool developed by a UNEP DTU Partnership and is used to calculate baseline and mitigation scenarios at national or sectoral levels. It is based on

a country's energy consumption of fossil fuels data and electricity data. A version of the GACMO tool targeting accommodation businesses has been adapted for the calculation of GHG emissions related to energy activities in the framework of the project «Transforming Tourism Value Chains in developing countries and Small Island Developing States to accelerate more resilient, resource-efficient, low-carbon development». Based on the energy consumption data of a hotel, the tool allows estimating emissions related to baseline or mitigation scenarios and options. The tool also estimates savings or additional costs related to specific mitigation options.

GACMO allows hotels to their energy performance and emissions based on past figures and also allows for future projections. It includes a list of potential mitigation options that hotels can select to develop their own mitigation scenarios. In addition, the tool provides financial information (investment costs and annual costs) related to specific mitigation options.

5.5 Mitigation options

There are a number of options (technology- and non-technology-based) to mitigate GHG emissions from hotels. Those include reducing energy use, using renewable energy, improving energy efficiency, buying renewable power, and using a carbon offset programme.

Hotel-sector energy primarily comes from electricity, natural gas and fuel oils. Typical ratios for SME hotels in Europe are 40 per cent for electricity, and 60 per cent for fuel oil and natural gas. Three-quarters of this energy is used for space-heating, hot-water production, air-conditioning and ventilation, and lighting (HES 2011a). Renewable energy and

energy efficiency measures can contribute substantially to mitigate carbon emissions. Various mitigation options are briefly described below.

Reducing energy use

Energy use can be reduced with a variety of options, most requiring either little or no investment. In all cases, it is important to involve employees, and in many cases hotel guests. Broadly, these options can be put into two categories:

- **Good Housekeeping:** This refers to good practices that would prevent energy wastage, leakages, and reduce demand for energy by using natural sources etc. Examples are (HES 2011a; UNWTO and UNEP 2008):
 - Creating a maintenance schedule for all energy-intensive equipment such as heating, cooling and refrigeration equipment, for example regular checking and cleaning of fans, condensers and compressors, ensuring doors fit and close properly and their seals are in good condition, and defrosting freezers frequently as frost build-ups reduce efficiency.
 - Setting up standard operating procedures for equipment.
 - Optimizing landscaping to minimize the summer heat gain by buildings to reduce cooling needs.
 - Reducing the need for air-conditioning by keeping guestroom setting at reasonable levels- between 20-25° C.
 - Reducing loss from hot water by setting maximum water temperatures to a reasonable level (60° C) and installing low-flow shower heads.

- Making best use of daylight, including trimming trees if needed.
- Energy consumption monitoring and auditing.
- Motivating employees and customers through awareness-raising activities, training sessions, and incentives for energy-use reduction.
- **Influencing hotel guest behaviour.** This refers to good practices targeting hotel guests. Examples are:
 - Providing information to guests about energy use to increase awareness.
 - Incentivizing guests to use less energy through better communication and “nudges”.
- Installing sun shading devices to keep the building cool and reduce the energy demand for cooling.
- Installing a key card system to switch off electricity automatically when guest rooms are vacated.
- Using high-efficiency energy-saving bulbs and installing occupancy sensors in common areas and guest rooms so that redundant lighting is switched off.
- Using electric appliances with high energy-efficiency rating, especially when appliances are being replaced.
- Using energy-efficient motors for Heating, Ventilation and Air-Conditioning (HVAC) system.

Energy efficiency improvement

Energy efficiency improvement can be achieved through technology-based and non-technology-based options. To improve efficiency, an energy audit is usually carried out to identify energy consuming devices and their consumption. An analysis then determines appropriate technological and non-technological solutions. Examples for energy efficiency improvement are (HES 2011b; UNWTO and UNEP 2008):

- Installing thermal-insulated windows to reduce heating and cooling load.
- Improving the thermal insulation of the hotel building as a whole to reduce heating / cooling demand.
- Preventing air infiltration at doors and windows, including entrance, which otherwise leads to waste of energy (for cooling and heating).
- Using efficient space cooling and ventilation systems, and regulating space heating and cooling temperatures, including in different zones according to hotel needs as well as for guest rooms.
- Using high efficiency boilers.
- Examining feasibility of and installing a building energy management system.
- Examining feasibility of and installing combined heat and power (CHP) system.
- Replacing outdated technical equipment as more energy-efficient options become available.

Procuring sustainable cooling equipment in Sri Lanka¹¹⁴

Air-conditioning at Jetwing Blue was initially provided via a conventional electrical chiller. A diesel-fired boiler was also run to produce steam for the laundry and generate hot water. **In 2017, and in collaboration with the Green Cooling Initiative¹¹⁵, it was decided to replace these with a vapour absorption chiller (VAC) and a biomass boiler.** A VAC is a gas cooling system that runs via steam generated from a biomass boiler and so drastically reduces use of grid electricity. The refrigerant used is distilled water, which, at very low pressure (60 mmHg) absorbs heat from the water circulating through the fan coil units during evaporation and releases heat during condensation. Thanks to its environmentally friendly characteristics and the fact that it does not produce emissions during repairs or leakage, using water as a refrigerant is considered a sustainable option.

Impacts

Average electricity consumption reduced: 113,345 kWh/month

Average cost reduction resulting from reduced grid electricity use: 10 per cent

Average CO₂ emissions avoided: 770 MT/year

VACs contribute to the mitigation of GHG emissions in the environment, as de-ionized water is used in the absorption cycle as a refrigerant instead of climate-damaging refrigerants such as CFCs, HCFCs and HFCs.

Procurement of energy-efficient equipment to reduce carbon footprint in the Philippines¹¹⁶

In 2009, Daluyon Beach and Mountain Resort joined the EU-funded SWITCH-Asia Zero Carbon Resorts project¹¹⁷ (2009-2014), whose objective is to enable tourism SMEs to procure energy services in an efficient, cost-effective, and environmentally sound manner. The project accompanies hotels and resorts in their switch from fossil fuels to renewable energy sources to reduce emissions and secure the availability of energy services in urban, remote, environmentally sensitive areas. In this context, the resort developed alternatives to incorporate cost-effective, energy-efficient, and environmentally friendly technologies in its daily operations (i.e. efficient lighting and air-conditioning, environmentally friendly insulation materials etc).

The "3R" strategy features throughout the process: reduce energy consumption, replace inefficient appliances and equipment, and redesign buildings into more self-sufficient and carbon-neutral structures.

Impacts

Before 2009, the resort used a 110kVA Diesel Generator set for 16 rooms with restaurants and facilities, which was then downsized to 83kVA despite the expansion to 27 rooms thanks to the use of gas cooling and heating technology.

Initially, the resort had a single air-conditioning system of 2hp non-inverter type, demanding on average 1866 W. This system was replaced with two more efficient inverter units (which can modulate compressor speed according to the load): one of 1.5hp with an average power demand of 840 W and another 1hp with 640 W. These two units allowed savings of 55-65 per cent of monthly electric costs.

The installation of tubular lighting enabled a decrease in temperature in the kitchen, as fluorescent lights generate less heat during the daytime. It allowed monthly energy cost savings of \$US 24 per tubular light.

Installing louvre ventilation on the roofs of guest rooms and staff houses, as well as water sprinklers on the roof of the pavilion tent, helped reduce radiant heat and generated annual energy savings of \$US 4,200.

Using 100 per cent solar-powered LED lighting in the guest rooms and beach bar allowed annual savings of \$US 400 per lamp.

The transition to a gas absorption chiller and heater technology enabled between 46 per cent and 60 per cent savings in operating costs as opposed to a traditional electric air-conditioning system.

149 https://www.oneplanetnetwork.org/sites/default/files/procuring_sustainable_cooling_equipment_in_sri_lanka_1.pdf

150 The Green Cooling Initiative (GCI) is funded by the International Climate Initiative by the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) and implemented by GIZ Proklima. More details are available at <http://www.green-cooling-initiative.org/>

151 https://www.oneplanetnetwork.org/sites/default/files/procurement_of_energy_efficient_equipment_in_the_philippines_2.pdf

152 More information available at: <https://www.switch-asia.eu/project/zero-carbon-resorts-zcr/>

Use of renewable energy technologies

Most of the renewable energy technologies such as wind, photovoltaic, solar thermal, geothermal, biomass and energy regeneration from waste can be used by hotels. However, their implementation will depend on many factors including scale of operation of the hotel, availability of energy resources, space available, distance from resource etc. These factors determine the economic viability of the technology.

Wind and solar photovoltaic, for example, could be used in big resorts and hotels, whereas solar hot-water systems can be used in any type of accommodation that is exposed to solar radiation and has space to instal the systems. An additional option is to buy renewable power. Hotels that plan to expand have the opportunity to use renewable energy throughout the construction process.

Carbon offset through guests and others

Carbon offset programmes are offered by some hotels where guests pay to offset the emissions related to their stay in the hotel, typically indicated as emissions per guest night. Hotels usually buy these offsets from projects set up for this purpose by entrepreneurs. These projects often include ac-

tivities related to renewable energy, energy efficiency, afforestation or reforestation.

These offsets do not reduce the GHG emissions but help compensate for them through sinks or reduction elsewhere. However, when a hotel offsets its emissions through guests, it transfers its responsibility to reduce emissions to customers. In this process, the hotel itself remains inefficient, which means that technological and other changes needed to reduce emissions are being bypassed (UNWTO and UNEP, 2008). Therefore, carbon offsets should be used only to complement, but not replace, hotels' other efforts to reduce emissions. Carbon offsets should be used by hotels only when required carbon emission reductions cannot be done internally.

It should be noted that a variety of offset project offers exists. To ensure "good quality" and the desired results in the additional environmental benefits, due diligence is essential. Certification schemes, such as Gold Standard, are one option to choose offset projects as their aim is "to ensure projects that reduced carbon emissions featured the highest levels of environmental integrity and also contributed to sustainable development."¹⁵³

153 <https://www.goldstandard.org/about-us/vision-and-mission>



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