Consultation Document

Recommended Key Environmental Indicators for The Tourism Private Sector

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Table of Contents

Glossary

10Year Framework of Programmes	The 10-year framework of programmes on sustainable consumption and production patterns (10YFP) is a global framework of action to enhance international cooperation to accelerate the shift towards sustainable consumption and production (SCP) in both developed and developing countries. The framework supports capacity building, and facilitates access to technical and financial assistance for developing countries for this shift. The 10YFP aims at developing, replicating and scaling up SCP and resource efficiency initiatives, at national and regional levels, decoupling environmental degradation and resource use from economic growth, and thus increasing the net contribution of economic activities to poverty eradication and social development.
10YFP Sustainable Tourism Programme (STP)	The 10YFP "Sustainable Tourism Programme including eco-tourism" catalyzes changes in tourism operations by promoting transformation through efficiency, innovation and adaptability. The STP supports policy development and evidence-based decision-making, while also adopting a life cycle approach for continuous improvement. It emphasizes collaboration among stakeholders, use and implementation of tools, sustainable finance and investment and results-based project implementation and monitoring to achieve its sustainable tourism objectives.
Carbon footprint	Carbon footprint is the amount of carbon dioxide released into the atmosphere as measured from any particular source It is also described as the amount of greenhouse gases (see definition below) released into the atmosphere expressed in carbon dioxide equivalents, CO_{2eq}.
Destination	The following is extracted from UNWTO's definition: "…a physical space in which a visitor spends at least one overnight. It includes tourism products….It has physical and administrative boundaries defining its management, and images and perceptions defining its market competitiveness…"
Green House Gases (GHGs)	According to the UNFCCC, "greenhouse gases" refer to the atmospheric gases responsible for causing global warming and climate change. The major GHGs are carbon dioxide (CO_2), methane (CH_4) and nitrous oxide (N_2O). Less prevalent but very powerful greenhouse gases are hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF6).
Scope 1, 2 and 3 GHG emissions	The Greenhouse Gas Protocol defines these as follows: • Scope 1: direct impacts (e.g. carbon footprint) from sources that are owned or controlled by the reporting entity. • Scope 2: Indirect impacts (e.g. carbon footprint) are a consequence of the activities of the reporting entity, but occur at sources owned or controlled by another entity. • Scope 3: other indirect impacts (e.g. carbon footprint), e.g. from extraction and production of purchased materials and fuels, transport-related activities in vehicles not owned or controlled by the reporting entity, electricity-related activities (e.g. transmission and distribution losses) not covered in Scope 2, outsourced activities, waste disposal, etc.

Hotspots analysis	A methodological framework that allows for the rapid assimilation and analysis of a range of information sources, including life cycle based and market information, scientific research, expert opinion and stakeholder concerns
Indicator	The dictionary definition of an "indicator" is that which shows the condition or existence of something e.g. a trend or a fact. For the purposes of this document, this definition may be applied to environmental indicators, which are considered in three ways, as defined by the International Standards Organization's ISO 14031 guideline: • Environmental condition indicator (ECI): a specific expression that provides information about an organization's environmental performance • Management performance indicator (MPI): an environmental performance indicator that provides information about the management effort to influence an organization's environmental performance • Operational performance indicator (OPI): environmental performance indicator that provides information about the environmental performance of an organization's operations
Life cycle (LC)	According to ISO14040:2006, the life cycle refers to the "consecutive and interlinked stages of a product system from raw material acquisition or generation from natural resources to final disposal"
Life cycle assessment (LCA)	According to ISO14040:2006, LCA is a "compilation and evaluation of the inputs, outputs and the potential environmental impacts of a product system throughout its life cycle"
Life Cycle Thinking (LCT)	Life cycle approach is meant the whole life cycle activities of products or services are taken into account, which include the extraction of raw materials from natural resources in the ground and the energy generation. Materials and energy are then part of production, packaging, distribution, use, maintenance, and eventually recycling, reuse, recovery or final disposal.
SDGs	Sustainable Development Goals. On September 25th 2015, 193 UN member states adopted a set of goals to end poverty, protect the planet, and ensure prosperity for all as part of a new sustainable development agenda. Each goal has specific targets to be achieved over the next 15 years.
Value chain	The University of Cambridge[1] explains that the term 'value chain' builds on the 'supply chain' concept. The latter refers to the system and resources required to move a product or service from supplier to customer, while the 'value chain' refers to the manner in which value is added along the chain, both to the product/service and the actors involved. Tourism value chains include for example accommodation, food & beverage, Meetings/Incentives/Conferences/Events (MICE), ground transportation, tour operations, booking and online travel agencies.

[1] See: http://www.cisl.cam.ac.uk/graduate-study/postgraduate-certificate-in-sustainable-value-chains/definitions-publications.

Wastewater	UNSD defines wastewater[2] as that which is typically discharged into the sewage system. It contains matter (solids) or bacteria in solution or suspension. Wastewater treatment refers to a process to render wastewater fit to meet environmental standards or other quality norms. "Primary" treatment is a mechanical process designed to remove mainly solids suspended in wastewaters. "Secondary" treatment is a biological process designed to remove more of the solids from the primary process, but also microbes (i.e. bacteria) and organic matter. "Tertiary" treatment is regarded as an additional process to improve the secondary treatment process but which can remove 99% of all impurities from sewage.[3]

List of Abbreviations Used in the Text

10YFP	10-Year Framework of Programmes on Sustainable Consumption and Production Patterns
CI	Condition indicator
COP	Conference of Parties – supreme body of the UNFCCC
CMP	Conference of the Parties serving as the meeting of the Parties to the UNFCCC Kyoto Protocol and its main implementing body
DMO	Destination Management Organization
ESCI-UPF	School of International Studies/UNESCO Chair in Life Cycle and Climate Change
ETIS	European Tourism Indicators System of the European Commission
GHG	Greenhouse gas
GRI	Global Reporting Initiative
LC	Life cycle
LCA	Life cycle assessment
LCI	Life cycle initiative
LCT	Life cycle thinking
KEI	Key environmental indicator
MPI	Management performance indicator
OECD	Organization for Economic Co-operation and Development
OPI	Operational performance indicator
RUI	Resource use intensity
SDGs	Sustainable Development Goals
SETAC	Society of Environmental Toxicology and Chemistry
SMEs	Small and medium sized enterprises
STP	Sustainable Tourism Programme
TSA	Tourism satellite accounts
UNDESA	United Nations Department of Economic and Social Affairs
UN Environment	Formerly United Nations Environment Programme, UNEP
UNFCCC	United Nations Framework Convention on Climate Change

[2] UN Statistics Division (see Annex I: References).

[3] Source: World Bank: Introduction to Wastewater Treatment Processes.

UNSD	United Nations Statistics Division
UNWTO	World Tourism Organization
WBCSD	World Business Council on Sustainable Development
WTTC	World Travel and Tourism Council

1 Background

The year 2015 could be described as the culmination of global multi-stakeholder efforts in advocacy, cooperation and collaboration. Led by the United Nations system, the convening of 3 major global conferences in 2015 culminated in unprecedented levels of agreement and commitment by governments, the private sector and civil society on 3 main action agendas:

- The Addis Ababa Action Agenda (AAAA) of the 3rd International Conference on Financing for Development held in July 2015 and agreed to by 193 member states, with support from 600 civil society groups and 800 businesses. This Agenda provides the foundation for implementing the Sustainable Development Goals (SDGs) through its global framework for financing sustainable development. The agreement acknowledges the important role of corporate sustainability reporting to reach the global objective, and serves as a means for ensuring corporate transparency and accountability in support of a behavioural change towards sustainable consumption and production patterns that protect ecosystems.
- The 2030 Agenda for Sustainable Development of the UN Sustainable Development Summit in September 2015, adopted by 193 member states, with associated interest from a number of private sector coalitions. This Agenda defines 17 sustainable development goals (SDGs) for implementation in the next fifteen years, with universal application to all countries to end poverty, fight inequalities and tackle climate change, while ensuring that no one is left behind. Within this new agenda there are expectations that businesses, government and civil society actors will be equally responsible for progressing in a more sustainable path forward. Many assert that the private sector has particular strengths to bring to bear in delivering on the SDGs, including innovation, responsiveness, efficiency and provision of specific skills and resources.
- The Paris Agreement of the UN Conference on Climate Change (COP21/CMP11), signed by 197 countries to strengthen the global response to the threat of climate change by capping global temperature rise this century to well below 2 degrees Celsius above pre-industrial levels, and to pursue efforts to limit the temperature increase even further to 1.5 degrees Celsius. At the time of preparing this Consultation Document, 81 of 197 states parties had ratified the Agreement, resulting in its entry into force on 4 November 2016. It also sets the deadline for reaching an emissions peak before 2030, and for emissions to decline altogether soon after 2050. To finance the required implementation in developing countries, the agreement incorporates the climate-financing fund of $100 billion per year agreed on, in principle, in Addis Ababa and to be further developed in a detailed roadmap to be executed by 2030.

Although private sector participation is not unusual at such global events, the scale and visibility of their participation in the 2015 conferences were particularly evident. Businesses participated in climate action coalitions associated with the UNFCCC or, in the case of the 2030 SDGs, through platforms of the UN Global Compact, the Global Reporting Initiative (GRI) or the World Business Council for Sustainable Development (WBCSD), among others, which are collaborating with the UN Secretariat. These coalitions typically comprise large multinational and publicly listed companies with billions of dollars in annual revenues. A few large hotel chains were also involved, although participation by the global tourism sector was by no means extensive.

Since climate change represents a policy problem as well as an operational one for businesses, CoP21 has been a key event to highlight the major implications for private and public sector organizations. Taking the path of de-carbonisation requires much more than encouraging greater investments in renewable energies and in developing clean and low emissions technologies. As a start, it requires a rethink and redesign of the current and future products over their entire life cycles, in order to address long term environmental impact. It also requires engagement of the entire value chain of key economic sectors like tourism, and the creation of more inclusive and low impact business models.

The tourism sector is one of the fastest growing economic sectors in the world and, therefore, a key driver of socio-economic progress, particularly in developing and emerging economies. UNWTO reports (2016) that China is the fastest growing source market while tourism in the Americas region is the fastest growing. Consequently, an increasing number of destinations are investing in and adopting the sector as

a key driver of socio-economic progress linked to the creation of jobs and enterprises, export revenues, and infrastructure development. The global sector described by UNWTO (2016):

- International tourist arrivals in 2015 grew by 4.6 % (from 2014) to 1,186 million;
- By 2030, international tourist arrivals will reach 1.8 billion;
- In 2015, domestic arrivals were between 5 and 6 billion.
- Tourism generated US$ 1.5 trillion in export earnings, i.e. 7% of the world's exports or 30% of services exports;
- The direct, indirect and induced economic contribution of tourism, including international and domestic tourism, is 10% of global GDP;
- Tourism accounts for 1-in-11 jobs, globally.

This rapidly expanding growth is, however, not without its impacts and concerns, particularly in relation to resource consumption. UN Environment research has indicated that tourism's consumption of key resources - energy, water, land and materials (e.g. fossil fuels, minerals, metals, biomass) - is growing commensurately with its generation of solid waste, sewage and greenhouse gas emissions. In 2008, UNWTO estimated tourism's global share of CO_2 emissions as 5%, with transportation (air, car, rail) accounting for 75% of this figure, accommodations 20%, with the remaining balance from other destination-based activities (e.g. museums, theme parks, events and shopping).

A wider tourism resource perspective is given by Gössling & Peeters (2015). With respect to 2010, global food consumption will double by 2047, land-use by 2033, water consumption by 2048, and energy and CO_2 emissions by 2037. For CO_2 emissions, the share of tourism would potentially rise to 100% by 2070 in case all other sectors follow a Paris Agreed reduction pathway (Scott, Peeters, & Gössling, 2010). The externalities (environmental costs) of tourism transport alone amounts to between €20 and €55 billion for tourism within the EU alone, which is between €25 and €69 per trip (Peeters, Szimba, & Duijnisveld, 2007). This excludes long haul travel from and to the EU, which has a per trip externality that may amount to up to ten times these values (€250-€700 per trip).

The relative size of the global tourism sector, its scale of consumption and level of impacts on the environment adds to the risks of operating in a world grappling with climate risk. The year 2015 was also the hottest on record with temperatures increasing a further 0.1°C, which featured the strongest El Niño ever, areas ravaged by drought, devastating floods, typhoons and hurricanes, compounded by large migrations of people affected by environmental phenomena, sectarian and civil wars[4]. These events and disasters have cumulatively affected countries and regions and their populations, lifestyles, ecosystems and species, and in some cases have also affected tourism destinations.

The response of the global tourism sector must now be considered urgent and imperative. It must ensure managed, sustainable and/or resilient growth, and continuity of tourism-related business transactions as the engine of economic prosperity and in the face of increasing disruption. This response must be visible and coordinated globally, defined by effective climate mitigation and adaptation efforts, focused on decoupling economic growth from resource consumption, thereby contributing to the achievement of the global SDGs, in partnership with governments and civil society and using all available technology options.

The second session of the United Nations Environment Assembly (UNEA-2), which took place at UN Environment headquarters in Nairobi, Kenya, May 2016, under the overarching theme of "Delivering on the Environmental Dimension of the 2030 Agenda for Sustainable Development", culminated in resolutions and a global call by countries to address the critical environmental challenges facing the world today. The Assembly, which represents the world's highest-level decision-making body on the environment, requested UN Environment to engage the private sector through its convening power to enable multi-stakeholder dialogue on key issues, to connect the scientific community with policy-makers, and to build capacity. Particular emphasis was placed on implementing the 2030 SDGs and the Paris Agreement.

[4] J. Blunden et al., Amer. Met. Soc. 97 (8), 2015

Thematically, the Tourism & Environment Programme operating within the Consumption and production Unit (CPU) of UN Environment (Economy Division) promotes resource efficiency from a life cycle and value chain perspective – an approach recommended for the sustainable development of tourism. This means reducing the total environmental impact of the production and consumption of goods and services from raw material extraction to final use and disposal. In this way, adoption of responsible business behaviours and practices in the global tourism sector could spur innovation in product and service delivery, adoption of sustainable purchasing practices, actively reduce resource and chemicals use, whilst also building accountability and transparency in the disclosure of environmental performance by businesses.

2 Purpose

The Consultation Document was prepared to serve the following main objectives:

i) To foster discussion on recommended key environmental indicators for monitoring and reporting in the global tourism sector.

ii) To make the call for more coordinated national tourism sector responses to address the above objective in the context of the 2030 Agenda for Sustainable Development and the Paris Agreement through tourism public, private and civil society partnerships.

This Consultation Document aims at facilitating outreach to the tourism private sector in particular on the recommended key (or core) environmental indicators on which businesses should be routinely reporting. The Document may also be useful for other tourism stakeholders, e.g. destination management and civil society organizations, policy makers and other public sector bodies that design, develop, regulate or manage tourism destinations.

This document is an outcome from the findings of an international 2-day meeting among tourism and life cycle researchers, experts and practitioners convened by UN Environment in Paris, October 12th & 13th 2016. That meeting's objective was to apply life cycle thinking on the global tourism sector impacts in order to select the key (or core) monitoring indicators and targets that reflect the requirements of the 2030 Sustainable Development Agenda and the Paris Agreement. The meeting was part of UN Environment's work on the private sector to facilitate the application of science-based information in a business context, highlighting the use of multi-stakeholder dialogue and interventions in tourism value chains. This work also contributes to the 10YFP Sustainable Tourism Programme.

Indicators that were elaborated and selected during the meeting in Paris were presented to the representatives of the tourism industry during a Consultation meeting that took part in Marrakech, Morocco on 10th of November 2016 during the UNFCCC Conference of Parties (COP22). Based on the recommendations of this meeting, this document has been updated and will evolve through a public consultation process with industry and experts, into a guidance document incorporating all relevant and new information, priorities or best practices to support measuring and reporting environmental performance of the tourism private sector.

3 Indicators for sustainable tourism

3.1 Introduction

The development and use of indicators in tourism have a long history. Over the past two or more decades and coordinated by UNWTO, global work on tourism indicators addressed problems of inadequate planning and management of tourism development to ensure that destinations could retain their character and quality in the long term. Tourism development and operational impacts were causing rapid changes in physical and social environments related to, for example, pollution and degradation of terrestrial and marine areas, conflicts between communities and visitors, and disposal of wastes. It was also evident that destination managers were unable to sufficiently control tourism impacts, because of a lack of information, human and financial capacity, local equipment and infrastructure.

To address tourism "sustainability" issues, UNWTO published a comprehensive guidebook in 2004, "Indicators for the Sustainable Development of Tourism Destinations", that established a sustainable

development context for the recommended indicators i.e. reflecting social, environmental and economic changes. The UNWTO guidebook defined indicators as "measures of the existence or severity of current issues" or "signals" of impending situations or risks, articulated for regional, national and local levels and its applicability targeted destinations (regional-, national level and specific destinations), tourism companies and establishments. In that regard, the indicators were established to monitor:

- "changes in tourism's own structures and internal factors;
- changes in external factors affecting tourism;
- the impacts caused by tourism".

To this end, the tourism indicators were also considered part of an early warning system for destination managers and a key tool for measuring and monitoring change.

With the rapid expansion of tourism development globally in the following years, tourism indicators moved into the statistical mainstream mainly through the prism of economic and social impact, which measured and reported on, *inter alia*, tourist arrivals and related data on length of stay, hotel occupancy, seasonality and employment, among other factors by several agencies such as the OECD and UNWTO (global levels), regional destination management organisations (e.g. the Caribbean Tourism Organization, the Pacific Asia Travel Association) and national tourism authorities.

The "International Recommendations for Tourism Statistics 2008" published in 2010[5], builds upon statistical work and practice of earlier decades, establishes a common reference framework for countries to use in the compilation of tourism statistics, is linked to the national systems of accounts (e.g. TSAs) and used in econometric models promoted by the WTTC, among others. The main objectives of the 2008 "Recommendations" are to alleviate poverty, to promote sustainable tourism development, and to present a consistent system of definitions, concepts, classifications and indicators with related guidance on data sources and compilation methods. Work on sustainable tourism indicators continues to this day and has now been expanded to address the goals and targets of the 2030 Agenda for Sustainable Development and the Paris Agreement at global, regional and national levels.

3.2 Tourism Product Categories

The 2008 "International Recommendations" adds significant value for its extensive list of defined terms and functional units, which provide clarity and precedent when selecting and explaining tourism indicators and specifically sustainable tourism indicators. Particularly for the purpose of this Consultation Document, the definition of "tourism products" is helpful:

> 3.22. A "tourism product" represents a combination of different aspects (characteristics of the places visited, modes of transport, types of accommodation, specific activities at destination, etc.) around a specific centre of interest, such as nature tours, life on farms, visits to historical and cultural sites, visits to a particular city, the practice of specific sports, the beach, etc. This notion of "tourism product" is not related to the concept of "product" used in economic statistics, but rather to that used by professionals in the tourism business to market specific packages or destinations.
>
> Source: International Recommendations for Tourism Statistics, 2008 – see References in Annex I

This definition of the tourism product also clarifies the understanding and application of life cycle thinking for identifying environmental impact 'hotspots' over the long term. This, in turn, facilitates selection of appropriate indicators to measure these impacts. The tourism product classifications listed in Table 1 below, were considered in the prioritizing of KEIs. Listed for each product category are the related activities and examples of the types of organizations involved from the private and public sectors. The list of examples is not exhaustive.

[5] UN Department of Social and Economic Affairs (Statistics Division) and UNWTO (see Annex I – References)

Table 1: Tourism Product Categories

Tourism Product Categories	Description	Related Activities	Examples of Organizations
Passenger transport services	• Local transport and sightseeing • Passenger transportation services	– Urban and suburban land transport services[6] – Local water transport services – Cruises – Sightseeing transportation services	– Public passenger vehicles and carriers – Car rentals – Cable car operators – Small aircraft sightseeing providers
	• Origin-to-destination passenger transport services	– Inter-urban road/rail transport services – Origin-to-destination	– Outbound tour operators – Travel agencies – Air/water/space/land transporters
Accommodation	• Visitor accommodation services	– Room or unit accommodation services – Camp site services – Recreational and vacation camp services	– Hotels, resorts, guest houses – Park management concessions
Other destination-based services	• Museum and preservation services	– Museum and preservation services of historical sites and buildings – Botanical, zoological and nature reserve services	– Inbound tour operators – Destination management organizations
	• Performing arts and other live entertainment event presentation and promotion services	– Performing arts event promotion and organization services – Performing arts event production and presentation services – Other performing arts and live entertainment services	– Destination management organizations – Event management, promotions
	• Meetings, conferences, incentives and events services	– Convention and meeting services – Catering services – Trade shows	– Convention centres – Event management, promotions
	• Sports and recreational sports services	– Sports and recreational sports event promotion and organization services – Sports and recreational sports facility operation services – Other sports and recreational sports services	– Event management, promotions
	• Educational & training support services	– Other education and training services – Cultural education services – Sports and recreation – Education services	– Secondary, – Tertiary educational institutes, universities – Specialized centres e.g. research, training, skills development

[6] Note that the essential difference between local and origin-destination transport is that local describes the temporary place of stay to a visited place, while origin-destination describes the permanent place of residence as starting or end point.

Tourism Product Categories	Description	Related Activities	Examples of Organizations
	• Amusement and recreational services	– Amusement park and similar attraction service – Gambling and betting services – Coin-operated amusement machine services – Other recreation and amusement services	– Destination management organizations – Tourism promotions, marketing or product development organizations
	• Audio-visual and related services	– Motion picture projection services	– Tourism promotions, marketing or product development organizations
	• Beauty and physical well-being services	– Physical well-being services	– Hospitals (public, private) – Spas, wellness institutes
	• Food serving services	– Meal serving services with full restaurant services – Meal serving services with limited services	– Caterers – Restaurants – Bars
	• Beverage serving services	– Beverage serving services	– Beverage companies
	• Specialized store retail trade services	Specialized store retail trade services in: – Food, beverages and tobacco – Textiles, clothing and footwear – Miscellaneous consumer goods – Chemical and pharmaceutical products – Perfumery articles, cosmetic articles and toilet soaps	– Commercial enterprises – Beverage companies – Manufacturing companies – Retailers – Wholesalers
	• Social services without accommodation	– Child, day-care services	– Licensed or registered businesses
	• Services furnished by other membership organizations	– Religious services	– Non-profits – Chambers of commerce – Business associations

These tourism product categories are consistent with the 'demand side' classifications of the 2008 "International Recommendations", listed as:

i) Package travel, package holidays and package tours
ii) Accommodation
iii) Food and drink
iv) Local transport
v) International transport
vi) Recreation, culture and sporting activities
vii) Shopping
viii) Others

Understanding the scale of operations and spheres of influence for each product category also implies knowledge and understanding of the tourism supply chain. This has consequences for indicator measurements at the functional unit level (e.g. businesses, agencies, institutions), and at the destination

level, where aggregation of data across the tourism sector becomes important and hence issues related to database integrity and comparability.

3.3 Indicators Reporting in the International Development Agenda

Voluntary reporting frameworks and initiatives associated with the UNFCCC have become important market-driven motivators to the global private sector as evidenced by the significant growth in reporting by major corporations to the UN Global Compact, the Carbon Disclosure Project (CDP) and the Global Reporting Initiative (GRI). This has been observed even where no reporting requirement from governments had been introduced. While such reporting has built capacity and developed skills in reporting methodologies and for the development, use and application of indicators by companies, they still have not encouraged widespread monitoring and reporting by the tourism private sector in particular. Some also argue that these frameworks and initiatives are also inaccessible to SME's for barriers related costs and adaptability to their scale of operation.

In addition, the current global indicators work of the international community is already revealing a range of challenges associated with assembling quality cross-national time series of data related to the 2030 SDGs. Over the last 15 years of work on the Millennium Development Goals (MDGs), countries applied and reported on several goals and indicators related to social and economic development. Only one MDG was focused on sustainable development, which has been cited[7] as a reason for the limited expanse of environmental data records, along with other reasons related to complexity and cost of collation. Such experiences provide important lessons for addressing data gaps at national levels by involving larger numbers of tourism businesses.

It should be noted that consideration was also given to the on-going work of the Global Sustainable Tourism Council and its standard criteria of performance indicators for destinations, hotels and tour operators; the International Tourism Partnership and its "Hotel Footprinting Tool" and "Hotel Carbon Measurement Initiative", the European Tourism Indicators, among others. References are included in the Annex III on existing metrics, data sources and/or good practices used by these organizations. The intention was to avoid duplication and acknowledge on-going work. Their constituencies and important global work also form part of the fabric of tourism sector experts and practitioners that need to be better coordinated and oriented towards meeting the objectives of the 2030 SDGs and the Paris Agreement. This specific issue is not addressed in this Consultation Document but must also be considered a future objective.

Priority must now be given to measuring and monitoring environmental data by the global tourism private sector in partnership with destinations and for the purposes of establishing an enduring ethic of sound data collection and public reporting. A long term objective is to close existing data gaps at national levels. The scale recommended is at the level of the tourism value chain and not just hotels. The latter demonstrates, notwithstanding, important leadership from their decades of monitoring resource use. The main goal, however, is to ensure that the sector in its entirety contributes to national commitments made under the 2030 SDGs and the Paris Agreement, which requires a collective response from all productive sectors and stakeholders. Tourism value chain businesses, led perhaps by hotels, must now also be prepared to share data with national statistical offices and in accordance with acknowledged data collection and reporting protocols to ensure accuracy and for comparability purposes.

3.4 Life cycle thinking (LCT) and methods

'Life cycle' is a term typically associated with manufactured products and services as it implies consideration of the "consecutive and interlinked stages of a product or service system from raw material acquisition or generation from natural resources to final disposal"[8] – also described as 'cradle-to-grave'. The term has been adopted in the sustainable development agenda for its rigorous data inventorying and impact assessment methods. Life cycle methods systematically compile and analyze inputs and outputs of resource use (e.g. materials, energy, land) and emissions (to water, air and land) identifying multiple

[7] See "Environment is the weakest link in SDGs Indicators" by E. Zusman, T. Yoshida & S. Olsen in IGES Commentary, 14 October 2016, www.iges.or.jp.

[8] ISO14040:2006

associated potential environmental impacts (climate change, toxicity, acidification, etc.) that are directly attributable to the functioning of the product or service throughout its life cycle.

Looking at a specific sector, taking a LCT approach means going beyond the narrow, traditional focus on an enterprise's facility, and identifying impacts in overlooked areas. As stated by UN Environment/SETAC Life Cycle Initiative[9]: "If the green economy is to bring the necessary changes to guarantee a future for life on Earth, decision making on product sustainability, investment, and policy must be made using life cycle thinking and operationalized through life cycle management, approaches, and tools."

A life cycle approach to impact assessment enables product and services designers, service providers, companies, government agencies and individuals to make choices for the longer term, by considering impacts on all environmental media (i.e. air, water, land) in a systemic and holistic way. Life cycle approaches avoid the shifting of problems from one stage of product/service use to another, from one geographic area to another and from one environmental medium or one impact category (e.g. air or climate change) to another (e.g. water or eutrophication). The perspective and benefits of considering the value chain in life cycle analyses is explained in the following way by the University of Cambridge:

> From a sustainability perspective, 'value chain' has more appeal, since it explicitly references internal and external stakeholders in the value-creation process. It also encourages a full-lifecycle perspective and not just a focus on the (upstream) procurement of inputs.
>
> Source University of Cambridge, see: footnote #1 for reference

Life cycle assessment (LCA)

LCA is an analytical tool to assess the potential environmental impacts of products or services in quantitative terms by applying the life cycle perspective. It involves 4 main phases:

- Goal and scope definition, where the study is framed and the functional unit is defined.
- Life cycle Inventory analysis, a compilation of the inputs and outputs associated with the processes needed to fulfil the functional unit, i.e. those needed for developing and using products or services over their life cycles.
- Life cycle impact assessment, by assessing the potential environmental impacts of these inputs and outputs in quantitative terms, i.e. in the form of environmental performance indices.
- Life cycle Interpretation and improvement analysis, including sensitivity analyses, conclusions and improvement recommendations.

LCA may be used to assess the sustainability of:

- Tourism packages, products and services;
- Individual tourism value chains e.g. accommodation, food & beverage, transportation;
- The entire travel and tourism sector.

Used for these purposes, LCA requires long term analyses and decision-making at national, regional and global levels. To that end, indicators of progress and achievement are likely to be cumulative and aspirational. While LCAs could typically examine impacts along an entire tourism value chain, the costs of this exercise could potentially be quite large due to the substantial requirement for data, software and technical expertise. A full-scale LCA is needed for example, for collating precise impact data on all sectoral value chains operating in a country[10]. The results could be used for quantitative comparisons between sectors, national sectoral monitoring, assessment and reporting, or for developing the specifications of certification or labelling schemes.

[9] UNEP/SETAC (2012) Greening the Economy through Life Cycle Thinking – 10 Years of the UNEP/SETAC Life Cycle Initiative, 60p, Paris, France

[10] For instance, the Government of the Balearic Islands started an LCA study (Watson et al, 2009) to decide, based on environmental information, which type of tourist attract (beach and sun, cyclers, golfers, sailing, etc.).

While not extensively applied in the global tourism sector to date, a literature search revealed that it is very commonly used for food and beverage and that, LCA guidelines for tourism exist for holiday packages, some forms of tourism, and accommodation services. It is potentially being considered for application in tourism cities and regions.

An important criterion is the "functional unit" (FU), which specifies the measurable performance of the product or service. In the tourism sector, it is common to refer to per guest/night as a FU measure of efficiency of water/energy use or GHG emissions. FUs serve as the basis for quantitatively comparing product/service performance following the conduct of LCAs and supports decision-making on more sustainable alternatives.

Hotspots analyses

'Hotspots analysis' is a statistical technique that assimilates a variety of data. The analysis collects and identifies data over time and within a defined geographic area and typically reveals clusters of 'hotspots' that may indicate patterns or concentrations of impacts, activities, behaviours or other issues. Hotspots analyses have been applied in the assessment of e.g. ecosystems threatened by human activities; carbon-, water- or energy footprinting of grocery products; and in mapping concentrations of criminal activities for prevention by law enforcement.

The statistical rigour of hotspot analyses helps to focus attention on the main problem and to more efficiently target efforts and resources on the priority actions that yield the most positive benefits. Data inputs may be quantitative or qualitative e.g. market and scientific research, expert opinion or stakeholder concerns. Typically, the results derived from hotspot analyses include performance risks and opportunities, cost-benefit analyses or visual maps or graphs of these types of concentrated impacts, all of which may be used to support policy- and decision-making.

The results are used to identify and prioritize activities, sectors or products for action, based on their environmental impact. The prioritization may be based on different principles, such as distance to target (i.e. a need to deliver an outcome such as the Sustainable Development Goals), materiality (i.e. importance of a specific issue to stakeholders) or exploratory (i.e. a need to understand an emerging issue).

For the tourism sector, hotspots analysis may be applied in:

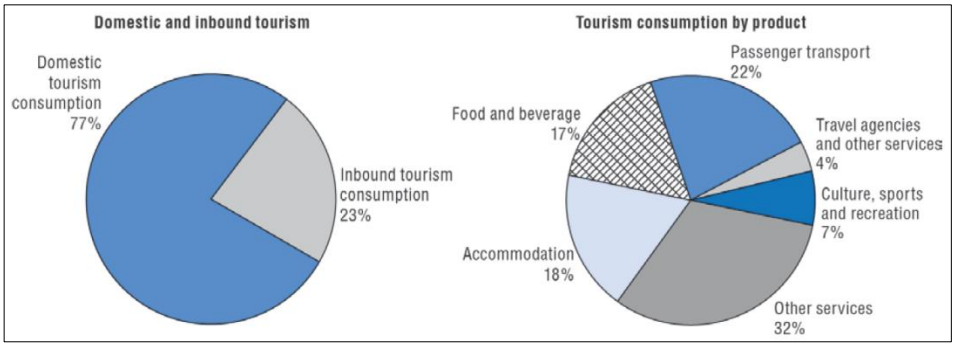
- The identification of high risk or potential environmental impacts;
- Prioritizing the thematic issues that mostly result from tourism value chain operations e.g. GHG emissions, food waste, water scarcity;
- Determining the most effective mitigation, management and/or improvement actions.

Given its highly technical nature, hotspots analyses require a multi-disciplinary team and may be both a precursor to a more detailed analysis such as LCA or a way of capitalizing on existing LCAs to reduce the need for detailed, costly analysis. The conduct of hotspots analyses is more manageable cost-wise than LCAs and can be quickly and accurately performed. It is therefore best to begin with a hotspots analysis of tourism business operations as a first diagnostic in order to identify more efficiently the main tourism-related impacts e.g. resource use or waste generation. The tourism products and services with the most significant impact or the most critical actors in the value chain may therefore be targeted for remedial actions.

3.5 Identifying the Main Tourism Impacts

Deliberating on range and scope of tourism impacts for which indicators should be recommended, the experts considered and focused on the tourism value chain categories specified in Table 1 above. The impact from travel and tourism transportation segment has however, proven to be a formidable challenge. Illustrating the relevance and importance of mitigating impact in travel segments, the OECD has calculated the share of tourism consumption by product category for domestic and inbound tourism, as in Figure 1 below.

Figure 1: OECD breakdown of tourism segments and consumption by product *(Source: OECD, 2016)*



Passenger transport listed at 22%, accounts for the biggest slice of tourism product consumption with projections of increasing shares to 2030. Although and on the basis of life cycle thinking, the environmental impact from GHG emissions of origin-to-destination transport is significant, concerns were expressed that, in reality, there was still low capacity in the short term for changing current forms of passenger transportation modes in countries. In that regard, destinations are faced with an arduously long pathway in providing alternative, low consumption tourist transport modes involving, for example, use of public transport, walking and cycling. It was acknowledged that achieving this requires significant investment and collaboration among the different tourism public and private sector actors involved in developing, regulating and operating tourist services (e.g. dedicated bike lanes, storage space for bikes, adapting public transport to accommodate bikes, etc.).

A study undertaken by UNWTO, UN Environment & WMO in 2008 on travel and tourism's contribution to global CO_2 emissions indicated that the sector contributes about 5% of total emissions, with tourist passenger transport (air, car, other) accounting for 75% of this total (Table 2). This figure indicates the heavy reliance by the global tourism sector on origin-destination transportation of tourists, which should not be ignored if the life cycle impacts of the global sector are to be fully accounted for. It is probably easier and more comparable to focus on measuring the CO_2 emissions of the entire sector rather than on all greenhouse gases emissions, as the latter is a problematic measure to calculate for the aviation sub-sector. From a longer term perspective, calculating CO_2 emissions provides the management information required to make and implement decisions across the global sector.

Table 2: Travel and Tourism contribution to CO_2 emissions

Tourism Sub-Sectors	CO_2 (Mt)	Percentage
Air transport*	522	**40%**
Car transport	418	**32%**
Other transport	39	**3%**
Accommodation	274	**21%**
Activities	52	**4%**
TOTAL	**1,307**	**100%**
Total World (IPCC 2007)	*26,400*	Table Source: UNWTO- UN Environment -WMO 2008
Tourism Contribution	*4.95%*	*Scott, D. et al, 2010 (see references)

While the research literature describes studies on the environmental impact of the hotel industry, most of this work focuses on one or two environmental impacts such as water and energy use. Gössling et al.

(2015)[11] describe that few studies are available on the environmental impact of hotels across multiple impact indicators and over the entire life cycle of tourism products and services, including upstream impacts i.e. those impacts that exist outside the boundaries of the typical hotel, such as those related to the production of the consumed food.

Two studies, however, directly illustrate the use and application of life cycle thinking for identifying the environmental impact in one tourism value chain – hotel operations. The first study was conducted by the ACCOR Group on its global environmental footprint[12] (Figure 2 below), and the second involved research conducted on over 60 hotels in France[13] (Table 3 below). Based on results from the latter study, a Hotel Environmental Footprint methodology has been developed in France by ADEME, the Ministry of Environment, hotel associations and experts in order to regulate communication and prevent green-washing by applying LCA principles.

Based on these studies the main environmental impacts identified for tourist accommodations relate to:

- Greenhouse gas
- Energy use
- Water use
- The sustainable sourcing and purchase of goods (e.g. cleaning products, paper, food supplies etc.)
- Waste
- Biodiversity.

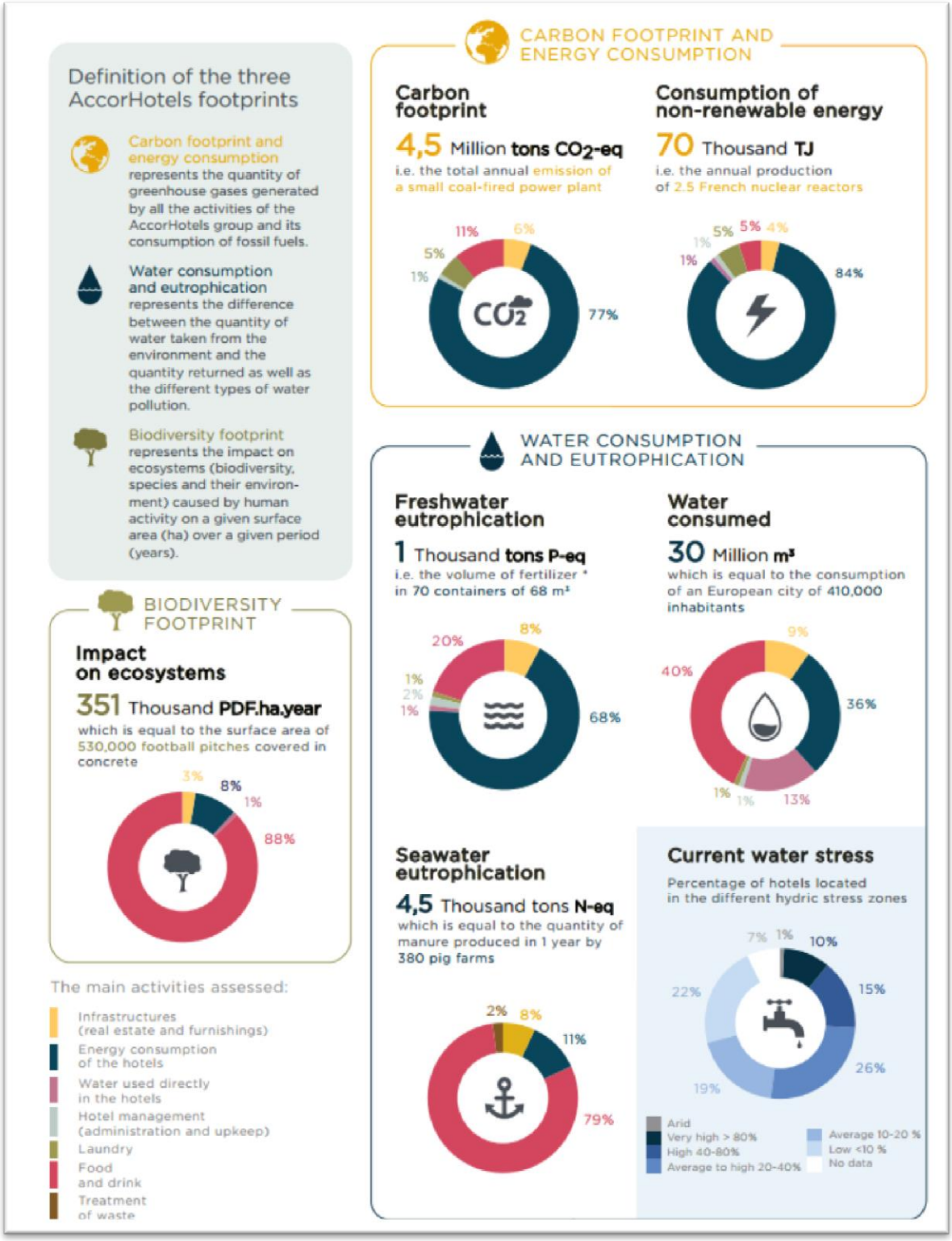
In the case of biodiversity, although the impact is considered relevant, the lack of information for this indicator that considers life cycle thinking requires further research.

[11] New performance indicators for water management in tourism, Gössling et al., 2015

[12] The environmental footprint of the ACCOR Group, December 2011

[13] ADEME, 2016, see Annex I: References.

Figure 2. Example of applying life cycle assessment to evaluate the environmental footprint of ACCOR's global hotel operations[14]



[14] Source: Accor Hotels, 2016: Accor Hotels' environmental footprint. http://www.accorhotels-group.com/fileadmin/user_upload/Contenus_Accor/Developpement_Durable/pdf/EN/accorhotels_environmental_foot_print_2016.pdf.

Table 3: Key impact areas in a French hotel study identified from life cycle approaches *(Source: ADEME, 2016)*

Key areas	Sources of impacts (in descending order of importance)
Climate change	Energy consumed on site (72%)[1] Food products including breakfast (14.7%)[1] Laundry production and laundry cleaning (1.4% for laundry cleaning according to the ACCOR study – approximately 12 to 15% according to Betterfly Tourism experiments, including laundry production and daily transport) Electrical equipment manufacturing (between 5 and 10%[15]) Cleaning products (1 to 4%)2, amenities (2%)[2] and refrigerant gases (2.2%)[1]
Energy consumption	Energy consumed on site (80%)[1] Energy consumed by laundry services (6.9%)[1] Catering including breakfast (6.5%)[1] Construction, renovation and deconstruction (4.7%)[1] Office furniture (2.0%)[1]
Water consumption	Water consumption on site (80% to 86% excluding breakfast food, excluding cotton production, approximately 20 to 30% otherwise[1 and 2] Consumption related to laundry services (15%[2] excluding cotton production and food / 12%[16] including cotton production and breakfast food) Water consumption for food products (0% if excluded, approximately 70% if included)[17]
Waste	Construction waste Waste related to energy production (for countries that use primarily coal) Waste related to activities (food, packaging for consumables) Laundry
Product purchase	Breakfast, cleaning products, amenities, textile products, garden upkeep products, pool cleaning products)
Biodiversity	Weight of the various contributors is not well known for the following items: Garden upkeep, water waste, electrical equipment, breakfast products, etc.

There is consistency between the studies and the research literature of the relevance and importance of the above-described impact areas in hotel operations and in tourism generally. The assumption has been made therefore that GHG emissions, water and energy use, waste generation and biodiversity are the impact areas and issues that should be prioritized for measuring and monitoring.

The next section presents the recommended key environmental indicators for monitoring.

[15] Data from experiments on environmental communication led by EVEA Tourisme (Betterfly Tourism)

[16] Eco-innovation project for linen rental services, 2014, EVEA Tourisme (Betterfly Tourism)

[17] Study conducted by EVEA (Tourisme Betterfly Tourism) on analysis of breakfasts 2011 – 2012.

4 Key Environmental Indicators (KEIs) for the tourism sector

4.1 Rationale

Addressing the main impact areas identified before, environmental indicators may be used to report on business performance and return on investments or, when aggregated across regions or destinations, can indicate the quality of the natural environment and the progress towards achieving the 2030 SDGs and targets. Perhaps most importantly, measuring and monitoring tourism development is a practice that is sorely lacking in the global sector. If countries are to accomplish their sustainable development goals and keep global temperatures to within specified limits, the tourism sector must play its part and contribute transparently and visibly to these common objectives. To this end, the Consultation Document may also be regarded as a call to action for the global tourism sector.

At the October 2016 Expert meeting, there was general agreement for the above-listed key impact areas (i.e. the "environmental hotspots") to be prioritized for measuring and monitoring environmental performance and/or impacts in the global tourism sector. These impacts may be grouped as:

- Resource use: energy, water, land, materials
- Climate change: greenhouse gas emissions

The focus must now be beyond the conventional property boundaries of hotels, to include their value chains, and include businesses providing other tourism products and services (see Table 1 above). Each must address all possible direct and indirect impacts. Indicators were prioritized and described according to the following criteria:

- Direct relevance to the 2030 SDGs and/or the Paris Agreement;
- Applicable to tourism product life cycles;
- Scalable and specific, measurable, assignable, realistic and time-bound (S.M.A.R.T.);
- Have metrics that are already available or in use by the sector;
- Application can already be demonstrated by existing best practices, case studies or linked to existing industry guidelines.

Regarding these factors, it is also important to note the work of the UN Statistics Division (UNSD) in collaboration with national statistical offices that evolved over 3 decades resulting in a "Basic Set of Environmental Indicators" (2016 revision) under its Framework for the Development of Environmental Statistics (FDES). This work also took into consideration important lessons learned from the application of environmental statistics in countries. These statistics reference the framework of core environmental indicators under which national statistical agencies are already collating data and are important to consider so as to avoid overlap and duplication. The established UNSD environmental statistics are included in the recommended indicator tables that follow this section.

The key environmental indicators are specifically described for application by the tourism functional units (see Table 1). Additional information resources specific to each indicator table is included at Annex II and additional explanation on indicators' metrics is provided in Annex III.

1. RESOURCE USE

ENERGY		
Expert recommended indicators	**Total energy used** • By functional unit • By primary energy source (e.g. fossil fuels, renewables etc.) **Ratio (%) of use of renewable energy sources vs primary energy source, per year.** • Efficiency ratio (%) per economic unit (e.g. per guest-night, per distance travelled, per area)	
UNSD specific indicator "Sub-component 2.2: Energy Resources"	▪ **Production from renewable sources** ▪ **Final energy use**	– Measurement: energy unit, mass, volume – Measurement: energy unit, mass, volume
Requirement of the 2030 SDG indicators and targets	#7.2.1 Renewable energy share in the total final energy consumption #7.3.1 Energy intensity measured in terms of primary energy and GDP #7.b.1 Investments in energy efficiency as a percentage of GDP	
Relevance to the Paris Agreement	• Increasing energy efficiency in the industry, buildings and transport sectors • Increasing investment in renewable energy technologies	
Life cycle perspective	The indicator that considers primary energy use addresses to a degree the life cycle perspective by including the efficiency of conversion of energy from the original source.	
Metrics already in use	• In all sectors: Energy measure expressed in mega joules, MJ or kWh • In the accommodation sector: Energy Usage per Occupied Room and Energy Usage per square meter/foot are ratio commonly used. See Annex III.A for enhanced metrics	

WATER		
Expert recommended indicators	**Total volume of water use** • By water source • By functional unit **Water footprint** (ISO 14046). **Ratio,** % of volume of water obtained from sustainable sources Volume of treated wastewater Potential eco-toxicity for aquatic fresh water per functional unit (Rosenbaum et al., 2008)	
UNSD specific indicator "Sub-component 2.6: Water	▪ **Water abstracted for own use** ▪ **Desalinated water**	– Measurement: volume

WATER		
Resources"	▪ **Reused water** ▪ **Water use**	
"Sub-Component 3.2: Generation and Management of Wastewater"	▪ **Volume of wastewater generated**	– Measurement: volume
	▪ **Pollutant content of wastewater**	– Measurement: mass (e.g., biochemical oxygen demand (BOD), chemical oxygen demand (COD), nitrogen, phosphorous, total suspended solids (TSS)
	▪ **Volume of wastewater treated**	– Measurement: volume (by treatment type (e.g., primary, secondary, tertiary)
	▪ **Total volume of wastewater discharged to the environment after treatment**	– Measurement: volume (by treatment type (e.g., primary, secondary, tertiary) By recipient (e.g., surface water, groundwater, wetland, sea, land)
	▪ **Total volume of wastewater discharged to the environment without treatment**	▪ Measurement: volume (by treatment type (e.g., primary, secondary, tertiary) By recipient (e.g., surface water, groundwater, wetland, sea, land)
Requirement of the 2030 SDGs indicators and targets	6.3. By 2030, improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally 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 12.2. By 2030, achieve the sustainable management and efficient use of natural resources 12.4. By 2020, achieve the environmentally sound management of chemicals and all wastes throughout their life cycle, in accordance with agreed international frameworks, and significantly reduce their release to air, water and soil in order to minimize their adverse impacts on human health and the environment	
Relevance to the Paris Agreement	Water resources and security are among the top priorities of national adaptation plans for the majority of countries as reported by their	

WATER	
	INDCs (UNFCCC, 2016)
Life cycle perspective	The water footprint indicator considers both the impacts of water use from various sources across the life cycle (e.g. sourcing, production and use phases) and the wastewater (end-of-life).
Metrics already in use	In all sectors: • Total water use (by volume) • Water scarcity footprint: water consumption (inventory) x 1/(availability-demand) • Water requirement: blue water (m^3) + green water (m^3) • Water use efficiency: blue water (m^3) + green water (m^3) • Fresh water pollution: kg P equivalent; Marine water pollution: kg N equivalent • CTUe (Comparative Toxic Unit for ecosystems) In the accommodation sector: Water use per guest/night (index) is a ratio commonly used. See Annex III.B for enhanced metrics

BIODIVERSITY/LAND		
Expert recommended indicators	% of coastal and marine areas that are protected[18] % of recognized organic or certified sustainable goods sourced for in-scope tourism business operations e.g. food, amenities, chemicals % of animal based meat (i.e. beef, pork, chicken, fish) sourced from sustainable stocks / sources	
UNSD Specific indicator "Sub-Component 2.3: Land" "Sub-Component 2.5 Biological resources"	▪ **Area under land use categories** ▪ **Imports of fish and fishery products**	– Measurement: Area (by type of land use e.g. use of built-up and related areas; land used for maintenance and restoration of environmental functions etc.) – Measurement: currency, mass, volume
Requirement of the 2030 SDGs indicators and targets	#12.2 By 2030, achieve the sustainable management and efficient use of natural resources #14.5: Conserve at least 10% of coastal and marine areas by 2020 consistent with national and international law and based on best available scientific information #15.1: By 2020, ensure the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services, in particular forests, wetlands, mountains and drylands, in line with obligations under international agreements #15.4: By 2030, ensure the conservation of mountain ecosystems, including	

[18] A clearly defined geographical space, recognised, dedicated and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values" (Dudley, N. (Ed.) Guidelines for Applying Protected Area Management Categories. (IUCN, 2008))

BIODIVERSITY/LAND	
	their biodiversity, in order to enhance their capacity to provide benefits that are essential for sustainable development #15.5: Take urgent and significant action to reduce the degradation of natural habitats, halt the loss of biodiversity and, by 2020, protect and prevent the extinction of threatened species
Relevance to the Paris Agreement	• Nationally determined contributions (NDCs) of relevant country • Article 2 relating to resilience, low carbon development
Life cycle perspective	From the recognition that food production (agriculture, fisheries) as well as other sectors with significant land use (such as forestry-derived products) are significant contributors to biodiversity loss, the indicators have taken into account the impact from sourcing and production of food (and other products), by stipulating that sustainable sourcing criteria be prioritized.
Metrics already in use	Total or ratio of land area – hectares, area See Annex III.C for enhanced metrics

MATERIALS (resources and waste)		
Expert recommended indicators	Total volume of solid wastes generated • By waste types (e.g. food, plastic, metals, cardboard etc.) • By treatment type (prevention, reuse, recycle, landfill disposal, incineration, etc.). **Ratio** of use of sustainable, resilient and resource-efficient tourism infrastructure buildings utilizing local materials: • By commercial value Material footprint per functional unit (measured in terms of direct material (e.g. product weight) or Raw Material Equivalent (e.g. allowing for conversion from raw material from mining to smelting) Ratio, % of purchased goods and services from sustainable sources that are certified to voluntary sustainability standards or through eco-labels (% economic value)	
UNSD specific indicator "Sub-Component 3.3 Generation and Management of Wastes"	▪ **Amount of waste generated by source** ▪ **Amount of waste generated by category** ▪ **Amount of hazardous waste generated**	– Measurement: mass – Measurement: mass (e.g., chemical waste, municipal waste, food waste, combustion waste) – Measurement: Mass
Requirement of 2030 SDGs indicators and targets	#12.3 By 2030, 50% per capita global food waste reduction at the retail and consumer level #12.4 By 2020, achieve environmental sound management of chemicals and all wastes #12.5 By 2030, substantial reduction in waste generation through prevention, reduction, recycling and reuse	

MATERIALS (resources and waste)	
	#14.1 By 2025, prevent and significantly reduce marine pollution #14.6 By 2020, protection of oceans by avoiding overcapacity and overfishing
Relevance to the Paris Agreement	Business organizations, in collaboration with their value chain and complex systems of stakeholders, are asked to fundamentally change current business operational models, **deep rethinking** of existing practices, **value chain engagement**, transformed managerial **mind-set and organization culture.**
Life cycle perspective	The indicators have taken into account the impact of waste management (end-of-life phase), as well as the resource impacts through all life cycle stages (through the consideration of Material Footprint).
Metrics already in use	• Mass • Per capita See Annex III.D for enhanced metrics

2. Climate Change

CLIMATE CHANGE (GREEN HOUSE GASES EMISSIONS, GHG)		
Expert recommended indicators	Corporate carbon footprint (Scope 1, Scope 3) • By tourism product/service • Annually Total CO_2eq (for aggregation and improvement) Total carbon footprint of a value chain/destination (Scope 3) • Annual basis **T**otal absolute CO_2 (related to targets set by 2020, 2025 and 2030). Existence of a climate change adaptation plan by 2020. Existence of a climate change mitigation plan by 2020.	
UNSD specific indicator "Sub-Component 3.1: Emissions to Air"	• **Carbon dioxide CO_2**	– Measurement: mass
Requirement of 2030 SDGs indicators and targets	#13 Take urgent action to combat climate change and its impacts #13.b 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 #13.1 Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries	
Relevance to the Paris Agreement	The Paris Agreement requires all Parties to put forward their best efforts through "**nationally determined contributions**" (NDCs) and to strengthen these efforts in the years ahead. This includes requirements that all Parties **report regularly on their emissions and on their implementation efforts.**	

CLIMATE CHANGE (GREEN HOUSE GASES EMISSIONS, GHG)	
	2 ° C agreed meaning 2015-2100 budget of 1000 Gton CO_2. Unmitigated tourism could take around 25% of this budget. The 1.5 ° C ambition would show tourism to take 50% of the CO_2 budget left. This calls for tourism companies to aim at reducing their absolute GHG emissions rather than focusing on efficiency targets. Decision 133 references Decision 126 - adaptation Decision 134. Invites the non-Party stakeholders referred to in paragraph 133 above to scale up their efforts and support actions to reduce emissions… By 2060 the unmitigated share of tourism annual emissions will be larger than the global agreed emissions. For aviation this will happen in 2070).
Life cycle perspective	The LC perspective is fully taken into account if Scope 3 indirect emissions are considered. The calculation should include at least all upstream categories.
Metrics already in use	• kg CO_2 • kg CO_2eq • CO2eq /km (for air travel) See Annex III.E for enhanced metrics

Annex I: References

ADEME, 2016, "General principles for environmental communication on mass market products", Part 27: Methodological guide for the environmental assessment of tourist accommodations; March 2016, Agence de l'Environnement et de la Maîtrise de l'Energie (ADEME) manual, and selection criteria for LCA (Annex B).

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UNEP, 2015: "Tourism's Global Resource Use", UNEP Briefing Paper, S. Gössling; 9pp.

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UNWTO, 2014: Improving evidence-based decision making in the tourism sector

UNWTO, 2016: "UNWTO Tourism Highlights", 16pp.

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UNEP, 2015, "Raising the Bar - Advancing Environmental Disclosure in Sustainability Reporting"

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Annex II: Additional Indicator Best Practice Resources Reported by Experts in the Paris Meeting

Energy Use

Links to existing guidelines	• European Tourism Indicator System • GRI for hospitality sector • GRI4 Reporting Guidelines • ITP Environmental Management for Hotels Manual reference link: http://www.greenhotelier.org/category/our-manuals/environmental-management-for-hotels/ • LEED Buildings: Operations and Maintenance • ISO standards on tourism activities
Existing data sources	Hotel Footprinting Tool of the International Tourism Partnership (ITP) tool. The data is collected by Cornell University through an annual surveyCornell University through an annual survey of 5000+ hotel properties. See also: http://www.greenhotelier.org/category/our-themes/energy/ Metrics used (Unit: kWh)
Good practice sources	• UNWTO's Hotel Energy Solutions • Near Zero Energy Hotels (NeZeh) • ACCOR Group Sustainable Development – implementation of Planet 21 and 2020 commitments • Costa Navarino Resort, Messinia, Greece • Saunders Hotel Group – MA, USA • TUI Group Sustainability • TravelLife certification scheme for tour operators and agents, hotels and accommodation • "General principles for environmental communication on mass market products", Part 27: Methodological guide for the environmental assessment of tourist accommodations; March 2016, Agence de l'Environnementl'Environnementl'Environnementl'Environnementl'Environnementet de la Maîtrise de l'Energie (ADEME) manual, and selection criteria for LCA (Annex B).

Water Use

Link to existing guidelines	• ISO 14046:2014; • UN Environment SETAC Guidelines Pellston Workshop in Valencia • Water Footprint Network Manual • ILCD Handbook • HWMI: http://tourismpartnership.org/water-stewardship/ • Life Cycle Initiative guidance: http://www.lifecycleinitiative.org • GRI – GR-EN8-10Water scarcity footprint – AWARE method, representing the relative available water remaining per area in a watershed, after the demand for humans and aquatic ecosystems has been met
Existing data sources	Characterization factors available at watershed and country level (see WULCA project) Volumetric approach focusing on inventory data only Characterization factors available from the European Commission's Product Environmental Footprint initiative Cornell Hotel Sustainability Benchmarking Index 2016

Good practices	http://www.greenhotelier.org/know-how-guides/water-management-and-responsibility-in-hotels/ http://www.costanavarino.com/enviromental-practices/water-management: A state-of-the-art sustainable water management plan based on a water resources assessment for the whole region (developed and financed by the hotels' owner company)

Biodiversity/Land

Link to existing guidelines	Convention on Biological Diversity (CBD): biodiversity guidelines, tools & resources UN Environment World Conservation Monitoring Centre: biodiversity resources IUCN: Red List of Threatened Species, Protected Area Categories IUCN (2012). Siting and Design of Hotels and Resorts: Principles and Case Studies for Biodiversity Conservation. GRI G4-EN11-14
Existing data sources	ISEAL Alliance Living Planet Index UNWTO Indicators of the Sustainable Development of Tourism, 2004; International Tourism Partnership's (ITP): Hotel Footprinting Tool v 1.0 UNFAO 2016 State of World Fisheries and Aquaculture (the data is collected by Cornell University through an annual survey of 5000+ hotel properties)
Good practices	• Large resort development e.g.Villages Nature, France; • Responsible sourcing at Hilton Worldwide • City Hotel Derry & RiverRidge Recycling in the U.K.: http://www.wrap.org.uk/sites/files/wrap/WRAP_Case_Study_City_RR.pdf • Andras House hotels http://www.wrap.org.uk/sites/files/wrap/Food%20waste%20prevention%20at%20Andras%20Hotels%20Case%20Study%20March%202015_0.pdf • ITP articles: http://www.greenhotelier.org/our-themes/supply-chain/itp-presents-sustainable-seafood-in-hotels/ http://www.greenhotelier.org/our-themes/supply-chain/starwood-launches-pocket-seafood-guide-to-help-protect-oceans/ http://www.greenhotelier.org/our-themes/supply-chain/green-hotelier-talking-point-supply-chain-deforestation-risk/ http://www.greenhotelier.org/know-how-guides/sourcing-sustainable-food-in-hotels/

Materials (resources and waste)

Link to existing guidelines	Global Reporting Initiative: total amount of waste generated per type, and disposal method GRI G4-EN22-26 International Tourism Partnership (ITP's) resources: • Product specifications for hotel owners/buyers • Environmental Management for Hotels Manual: http://www.greenhotelier.org/category/our-manuals/environmental-management-for-hotels/ • Know how guide to reducing and managing food waste in hotels UN Environment: Food Purchasing Guideline – available from www.scpclearinghouse.com
Existing data sources	OECD's Best practices for sustainable procurement Eurostat Estimates for Raw Material Consumption (RMC) and Raw Material Equivalents (RME) conversion factors
Good practices	ITP resources: http://www.greenhotelier.org/our-themes/waste-management/

Climate change (GHG emissions)

Link to existing guidelines	GHC protocol including Scope 3 Indirect emissions **ISO 14064** **GRI-EN15-21** **http://tourismpartnership.org/carbon-emissions/** ITP Environmental Management for Hotels Manual: http://www.greenhotelier.org/category/our-manuals/environmental-management-for-hotels/ http://sciencebasedtargets.org/
Existing data sources	LC databases: ELCD, Ecoinvent, GaBi (Listed in JRC and GHG Protocol) National lists of emission factors such as the Climate Registry (US) – (good aggregation of emission factors) Carmacal – the carbon management tool for tour operators and destinations – assesses all the direct CO_2 emissions of transport (>20 transport modes included and distances at Google maps road level accuracy, flights all airline-aircraft combinations in scheduled flights detailed up to the 12 million individual flight segment level) and 8008008008oo,ooo estimated footprints of accommodations) plus 25 high carbon footprint tourist activities (like heli-skiing). ITP's Hotel Footprinting Tool v 1.0 (the data is collected by Cornell University through an annual survey Cornell University through an annual survey of 5ooo+ hotel properties. This is based on real data calculated with HCMIs and reported by hotels).
Good practices	• ADEME: Bilan Carbone • Moroccan carbon footprint • ACCOR Hotels Group: Sustainable Development – Planet 21 and 2020 commitments • For a number of measures to reduce emissions at ports of call for cruise: http://www.portsofstockholm.com/about-us/environmental-work/environmental-measures/

Annex III: Additional Indicator METRICS

A. Energy Use

Energy consumption has a direct effect on operational costs and can increase exposure to fluctuations in energy supply and prices. The environmental footprint of an organization is shaped in part by its choice of energy sources. Changes in the balance of these sources can indicate the organization's efforts to minimize its environmental impacts.

Unit of measurement: kWh or MJ.

Type of measurement:

a. Report total fuel consumption from non-renewable sources including fuel types used.
b. Report total fuel consumption from renewable fuel sources including fuel types used.
c. Report the total:
   - Electricity consumption (kWh or MJ)
   - Heating consumption (kWh or MJ)
   - Cooling consumption (kWh or MJ)
   - Steam consumption (kWh or MJ)
d. Report the total:
   - Electricity sold (kWh or MJ)
   - Heating sold (kWh or MJ)
   - Cooling sold (kWh or MJ)
   - Steam sold (kWh or MJ)
e. Report total energy consumption differentiating the certified green energy purchasing and/or generation (kWh or MJ).
f. Report the amount of reductions in energy consumption achieved as a direct result of conservation and efficiency initiatives (kWh or MJ).
   - Include the types of energy included in the reductions: fuel, electricity, heating, cooling, and steam (kWh or MJ).
   - Include the basis for calculating reductions in energy consumption such as base year or baseline, and the rationale for choosing it.

Period of measurement and reporting: For seasonal activities and organizations that only operate for a specific period of the year, a yearly reporting can distort the results (monthly measurements would be preferred in this case). Thus, the period of measurement shall be chosen accordingly to the period of activity. Providing both, seasonal and yearly data would be optimal.

Intensity Metrics: Each measurement unit can be divided by the appropriate Functional Unit. The functional unit is that which refers to the main activity of the organizations. (i.e. for accommodation organizations a division of the unit of measurement per "guest·night" is widely used but, depending on the activity it can be modified). Providing both, the absolute values and the intensity ratio would be optimal.

B. Water Use

Reporting the total volume of water withdrawn by source contributes to an understanding of the overall scale of potential impacts and risks associated with the organization's water use. The total volume withdrawn provides an indication of the organization's relative size and importance as a user of water, and provides a baseline figure for other calculations relating to efficiency and use.

Unit of measurement: m³

Type of measurement:

Report the total volume of water withdrawn from the following sources:

a. Surface water, including water from wetlands, rivers, lakes, and oceans[19] (m³)
b. Ground water[17] (m³)
c. Rainwater collected directly and stored by the organization[20] (m³)
d. Waste water from another organization (m³)
e. Municipal water supplies or other water utilities (m³)

Provide data on:

a. Water quality (using EU WFD for the treated sewage and WHO standards for drinking water)
b. Water treated-recycled (m³)
c. Recycled grey water (m³)
d. Water imported to the region (m³)
e. Percent/amount of water reused % or m³ of water reduction achieved (due to a specific action or technology) and cost saved (m³ , € or $)
f. Total water discharge by quality and destination (m³)

Report the total volume of planned and unplanned water discharges by:

a. Destination (m³)
b. Quality of the water including treatment method[21]
c. Whether it was reused by another organization
d. Report standards, methodologies, and assumptions used.

Period of measurement and reporting: For seasonal activities and organizations that only operate for a specific period of the year, a yearly reporting can distort the results. Thus, the period of measurement shall be chosen accordingly to the period of activity (monthly measurements would be preferred in this case). Specific attention shall be placed in reporting the indicator also for the consumption in the dry seasons. Providing both, seasonal and yearly data would be optimal.

Intensity Metrics: Each measurement unit can be divided by the appropriate Functional Unit. The functional unit is that which refers to the main activity of the organizations. (i.e. for accommodation organizations a division of the unit of measurement per "guest·night" is widely used but, depending on the activity it can be modified). Providing both, the absolute values and the intensity ratio would be optimal.

[19] Blue Water: Fresh surface and groundwater, in other words, the water in freshwater lakes, rivers and aquifers.

[20] Green Water: the precipitation on land that does not run off or recharge the groundwater but is stored in the soil or temporarily stays on top of the soil or vegetation. Eventually, this part of precipitation evaporates or transpires through plants. Green water can be made productive for crop growth (although not all green water can be taken up by crops, because there will always be evaporation from the soil and because not all periods of the year or areas are suitable for crop growth).

Source: http://waterfootprint.org/en/water-footprint/glossary/#BW

[21] http://www.who.int/water_sanitation_health/resourcesquality/watpolcontrol.pdf

C. Biodiversity/Land

Unit of measurement: km^2, number of species, kg, m^3, currency (€ or $).

Type of measurement:

Provide information on the significant direct and indirect impacts of the organization on biodiversity in protected areas and areas of high biodiversity value outside protected areas. Measuring biodiversity also provides the background for understanding (and developing) an organizational strategy to mitigate these impacts. Through the presentation of structured and qualitative information, the Indicator enables comparison of the relative size, scale, and nature of impacts over time and across organizations

Ensuring the integrity of natural habitats can enhance the reputation of the organization, the stability of its surrounding natural environment and resources, and its acceptance by surrounding communities. A biodiversity strategy contains a combination of elements related to the prevention, management, and remediation of damage to natural habitats resulting from the organization's activities. This Indicator measures the implementation of a specific strategy for preventing or redressing negative impacts associated with activities.

Identify where its activities pose a threat to endangered plant and animal species. By identifying these threats, the organization can initiate appropriate steps to avoid harm and to prevent the extinction of species. The IUCN Red List of Threatened Species and national conservation list species serve as authorities on the sensitivity of habitat in areas affected by operations, and on the relative importance of these habitats from a management perspective.

Operational sites owned, leased, managed in, or adjacent to, protected areas and areas of high biodiversity value outside protected areas

a. Report the following information for each operational site owned, leased, managed in, or adjacent to, protected areas and areas of high biodiversity value outside protected areas:
   - Geographic location
   - Subsurface and underground land that may be owned, leased, or managed by the organization (km^2)
   - Position in relation to the protected area (in the area, adjacent to, or containing portions of the protected area) or the high biodiversity value area outside protected areas.
   - Type of operation (office, manufacturing or production, extractive…)
   - Size of operational site in km^2
   - Biodiversity value characterized by:
     - The attribute of the protected area or high biodiversity value area outside the protected area (terrestrial, freshwater, or maritime ecosystem)
     - Listing of protected status (such as IUCN Protected Area Management Categories, Ramsar Convention, national legislation)

b. Report the nature of significant direct and indirect impacts on biodiversity with reference to one or more of the following:
   - Construction or use of manufacturing plants, mines, and transport infrastructure
   - Pollution (introduction of substances that do not naturally occur in the habitat from point and non-point sources) (Report the type and amount)
   - Introduction of invasive species, pests, and pathogens
   - Reduction of species
   - Habitat conversion
   - Changes in ecological processes outside the natural range of variation (such as salinity or changes in groundwater level)

c. Report significant direct and indirect positive and negative impacts with reference to the following:
   - Species affected
   - Extent of areas impacted (km^2)
   - Duration of impacts (temporal (years) or Permanent)
   - Reversibility or irreversibility of the impacts

d. Report the size and location of all habitat protected areas or restored areas, and whether the success of the restoration measure was or is approved by independent external professionals.
e. Report whether partnerships exist with third parties to protect or restore habitat areas distinct from where the organization has overseen and implemented restoration or protection measures.
f. Report on the status of each area based on its condition at the close of the reporting period.
g. Report standards, methodologies, and assumptions used.
h. Report the total number of IUCN Red List species and national conservation list species with habitats in areas affected by the operations of the organization, by level of extinction risk:
   - Critically endangered
   - Endangered
   - Vulnerable
   - Near threatened
   - Least concern

Period of measurement and reporting: For seasonal activities and organizations that only operate for a specific period of the year, a yearly reporting can distort the results (monthly measurements would be preferred in this case). Thus, the period of measurement shall be chosen accordingly to the period of activity. Providing both, seasonal and yearly data would be optimal.

Intensity Metrics: Each measurement unit can be divided by the appropriate Functional Unit. The functional unit is that which refers to the main activity of the organizations. (i.e. for accommodation organizations a division of the unit of measurement per "guest·night" is widely used but, depending on the activity it can be modified). Providing both, the absolute values and the intensity ratio would be optimal.

D. Materials (resources and waste)

This Indicator describes the organization's contribution to the conservation of the global resource base and its efforts to reduce the material intensity and increase the efficiency of the economy. These are expressed goals of the Organisation for Economic Co-operation and Development (OECD) Council and various national sustainability strategies. For internal managers and others interested in the financial state of the organization, material consumption relates directly to overall costs of operation. Tracking this consumption internally, either by product or product category facilitates the monitoring of material efficiency and cost of material flows.

In addition, this Indicator seeks to identify the organization's ability to use recycled input materials. Using these materials helps to reduce the demand for virgin material and contribute to the conservation of the global resource base. For internal managers and others interested in the financial performance of the organization, substituting recycled materials can contribute to lowering the overall costs of operation. The trends revealed by this Indicator indicate management's progress in reducing the organization's dependence on natural resources.

Unit of measurement: Kg.

Type of measurement:

Have in place an Environmentally Preferable Purchasing (EPP) policy that includes, at a minimum, product purchasing policies for the building and site. Sustainable purchases are those that meet one or more of the following criteria:

a. Purchases contain at least 10% postconsumer[22] and/or 20% post-industrial[23] material (€ or $ and %)
b. Purchases contain at least 50% rapidly renewable materials (€ or $ and %)
c. Purchases contain at least 50% materials harvested and processed or extracted and processed within 200 km of the project (€ or $ and %).
d. Purchases are certified with a third party eco-label (€ or $ and %).

Report the total weight or volume of materials that are used to produce and package the organization's primary products and services during the reporting period, by:

a. Non-renewable materials used (kg and € or $)
b. Renewable materials used (kg and € or $)

Report the percentage of recycled input materials used to manufacture the organization's primary products and services.

Total weight of waste by type and disposal method reporting the total weight of hazardous and non-hazardous waste, by the following disposal methods:

a. Reuse (kg and € or $)
b. Recycling (kg and € or $)
c. Composting (kg and € or $)
d. Recovery, including energy recovery
e. Incineration (mass burn) (kg and € or $)
f. Deep well injection (kg or m³)
g. Landfill (kg)
h. On-site storage (kg or m³)
i. Other (to be specified by the organization) (kg or m³)

[22] Waste materials generated by households or by commercial, industrial and institutional facilities in their role as end-users of a product, which can no longer be used for its initial purpose.

[23] Manufacturing waste

j. Report how the waste disposal method has been determined:
k. Disposed of directly by the organization or otherwise directly confirmed (kg)
l. Information provided by the waste disposal contractor (kg)
m. Organizational defaults of the waste disposal contractor (kg)

Total number and volume of significant spills

a. Report the total number and total volume of recorded significant spills.
b. For spills that were reported in the organization's financial statements, report the additional following information for each such spill:
    - Location of spill
    - Volume of spill (l or m³)
    - Material of spill, categorized by:
    - Oil spills (soil or water surfaces) (l or m³)
    - Fuel spills (soil or water surfaces) (l or m³)
    - Spills of wastes (soil or water surfaces)
    - Spills of chemicals (mostly soil or water surfaces) (l or m³)
    - Other (to be specified by the organization)
c. Report the impacts of significant spills.

Weight of transported, imported, exported, or treated waste deemed hazardous (under the terms of the Basel Convention Annex I, II, III, and VIII; and ADR[24]) and percentage of transported waste shipped internationally:

a. Report the total weight for each of the following:
    - Hazardous waste transported (kg)
    - Hazardous waste imported (kg)
    - Hazardous waste exported (kg)
    - Hazardous waste treated (kg)
b. Report the percentage of hazardous waste shipped internationally.

Period of measurement and reporting: For seasonal activities and organizations that only operate for a specific period of the year, a yearly reporting can distort the results (monthly measurements would be preferred in this case). Thus, the period of measurement shall be chosen accordingly to the period of activity. Providing both, seasonal and yearly data would be optimal.

Intensity Metrics: Each measurement unit can be divided by the appropriate Functional Unit. The functional unit is that which refers to the main activity of the organizations (i.e. for accommodation organizations a division of the unit of measurement per "guest·night" is widely used but, depending on the activity it can be modified). Providing both, the absolute values and the intensity ratio would be optimal.

[24] https://www.unece.org/trans/danger/publi/adr/adr_e.html

E. Climate change (GHG emissions)

The Indicator covers the disclosure of the direct (Scope 1) GHG emissions, in CO_2 equivalents, of the GHGs covered by the UN 'Kyoto Protocol' and the WRI and WBCSD 'GHG Protocol Corporate Accounting and Reporting Standard':

1. Carbon dioxide (CO2)
2. Methane (CH_4)
3. Nitrous oxide (N2O)
4. Hydrofluorocarbons (HFCs)
5. Perfluorocarbons (PFCs)
6. Sulphur hexafluoride (SF6)
7. Nitrogen trifluoride (NF_3)

GHG emissions are a major contributor to climate change and are governed by the UN 'United Nations Framework Convention on Climate Change' and the subsequent UN 'Kyoto Protocol'. Some GHGs, including methane (CH_4), are also air pollutants that have significant adverse impacts on ecosystems, air quality, agriculture, and human and animal health. As a result, different national and international regulations and incentive systems (such as tradable emission permits) aim to control the volume, and reward the reduction of GHG emissions.

Reporting of GHG emissions is based on the reporting requirements of the WRI and WBCSD 'GHG Protocol Corporate Accounting and Reporting Standard' (GHG Protocol). The GHG Protocol includes a classification of GHG emissions called 'Scope' – Scope 1, Scope 2 and Scope 3. Scope is a classification of the operational boundaries where GHG emissions occur. Scope classifies whether GHG emissions are created by the organization itself, or are created by other related organizations, for example, electricity suppliers or haulage companies, as follows:

- Direct (Scope 1) emissions from operations that are owned or controlled by the organization
- Energy Indirect (Scope 2) emissions result from the generation of purchased or acquired electricity, heating, cooling, and steam consumed within the organization
- Other Indirect (Scope 3) emissions are all indirect emissions (not included in Scope 2) that occur outside of the organization, including both upstream and downstream emissions

Scopes 1, 2, and 3 of the GHG Protocol align with ISO 14064 definitions and GRI indicators.

The GHG Protocol prescribes reporting direct (Scope 1) emissions and energy indirect (Scope 2) emissions. Reporting other indirect (Scope 3) emissions is optional. The WRI and WBCSD 'GHG Protocol Corporate Value Chain (Scope 3) Accounting and Reporting Standard' prescribe reporting other indirect (Scope 3) emissions.

Unit of measurement: kg CO_2eq ; kg CO_2

Type of measurement:

a. Report gross direct (Scope 1) GHG emissions in metric tons of CO_2 equivalent, independent of any GHG trades, such as purchases, sales, or transfers of offsets or allowances (kg CO_2eq).
b. Report gases included in the calculation (whether CO_2, CH_4, N_2O, HFCs, PFCs, SF_6, NF_3, or all).
c. Report biogenic CO_2 emissions in metric tons of CO_2 equivalent separately from the gross direct (Scope 1) GHG emissions (kg CO_2eq).
d. Report the chosen base year, the rationale for choosing the base year, emissions in the base year, and the context for any significant changes in emissions that triggered recalculations of base year emissions .
e. Report standards, methodologies, and assumptions used.

f. Report the source of the emission factors used and the global warming potential (GWP) rates used or a reference to the GWP source.

Period of measurement and reporting: For seasonal activities and organizations that only operate for a specific period of the year, a yearly reporting can distort the results (monthly measurements would be preferred in this case). Thus, the period of measurement shall be chosen accordingly to the period of activity. Providing both, seasonal and yearly data would be optimal.

Intensity Metrics: Each measurement unit can be divided by the appropriate Functional Unit. The functional unit is that which refers to the main activity of the organizations (i.e. for accommodation organizations a division of the unit of measurement per "guest·night" is widely used but, depending on the activity it can be modified). Providing both, the absolute values and the intensity ratio would be optimal.