

IN COLLABORATION
WITH



United Nations Climate Change
Global Climate Action



INTERNATIONAL
OLYMPIC
COMMITTEE

SUSTAINABILITY ESSENTIALS

A SERIES OF PRACTICAL GUIDES
FOR THE OLYMPIC MOVEMENT

SPORTS FOR CLIMATE ACTION



SUSTAINABILITY ESSENTIALS

Sustainability is one of the most pressing challenges of our time across a wide spectrum of social, environmental and economic matters. Major issues such as climate change, economic inequality and social injustice are affecting people throughout the world. These are also pressing concerns for the sports community, both for managing its day-to-day affairs and for its responsibilities towards young people and future generations. We also recognise that sport has an unrivalled capacity to motivate and inspire large numbers of people. This is why we believe that the Olympic Movement has both a duty and an opportunity to contribute actively to global sustainability in line with our vision: “Building a better world through sport”.

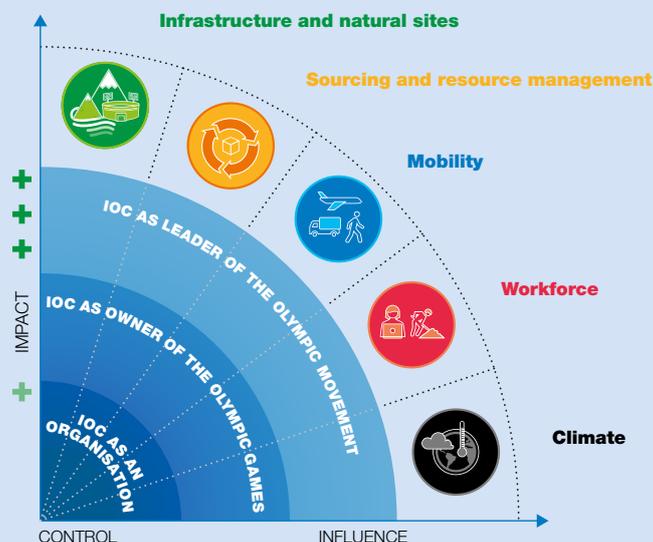
It is therefore logical that sustainability forms one of the key elements of Olympic Agenda 2020, the Olympic Movement’s strategic roadmap adopted in December 2014. In particular, this defined our approach to

sustainability across the IOC’s three spheres of responsibility:

- **The IOC as an organisation:** To embrace sustainability principles and to include sustainability in its day-to-day operations.
- **The IOC as owner of the Olympic Games:** To take a proactive and leadership role on sustainability and ensure that it is included in all aspects of the planning and staging of the Olympic Games.
- **The IOC as leader of the Olympic Movement:** To engage and assist Olympic Movement stakeholders in integrating sustainability within their own organisations and operations.

Following on from Olympic Agenda 2020, we issued the IOC Sustainability Strategy in January 2017. The Strategy is based on our three spheres of responsibility and five focus areas, as illustrated below.

The IOC Sustainability Strategy framework is illustrated below:



The Strategy sets out a number of actions in our capacity as leader of the Olympic Movement. Among these is a commitment to develop common guidelines, methodologies and tools for National Olympic Committees (NOCs) and International Federations (IFs). Further information can be found at <https://www.olympic.org/sustainability>.

The “Sustainability Essentials” series of guides is the first concrete outcome of this commitment. These guides aim to provide simple, practical and essential information on key aspects of sustainability for NOCs and IFs to be better able to navigate the complexities of this subject and develop effective sustainability programmes. Whether your organisation is just starting out, or is already actively engaged in sustainability, we hope these guides will provide a valuable overview and reference point for this important topic.

FEEDBACK

We hope that our “Sustainability Essentials” guides will provide a valuable basis for understanding sustainability. We also know that sustainability is a constantly evolving discipline, with new issues, challenges and opportunities always needing to be addressed. We therefore welcome feedback, comments and suggestions so that we can continually improve our guidance and ensure our material is as fresh, relevant and accurate as possible. If you have any comments, please contact us in any language at: sustainability@olympic.org

PRINTING

This document is available only as a downloadable pdf file from the IOC website. If you need to print a copy, please set your printer to double-sided copying on recycled paper. Ideally, please also avoid colour printing and copying.



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ESSENTIALS IN BRIEF

Climate change is already having a huge influence on sport across the world. The impact of higher temperatures, more frequent floods, extended droughts and rising sea levels are increasingly determining where sport can be played, when it can be played and how it can be played. Playing surfaces are being lost, playing seasons are changing and the timing and management of sports events are being affected. Extreme weather affects sporting performance and the ability to enjoy sport, as a player or as a spectator. The disruption and costs involved pose one of the greatest threats to the world of sport as we know it.

These impacts are being seen worldwide: unplayable surfaces for cricket, golf and football; heat stress among tennis players; lack of snow closing winter resorts; biological pathogens spreading to new areas and damaging turfgrass; increased energy bills for sports venues; water use restrictions and many more.

Sport is not just a victim of climate change; it is also a net contributor through greenhouse gas (GHG) emissions linked to travel, energy use and other forms of consumption.

This means that sports organisations have a responsibility to limit their climate impacts, as well as take measures to adapt to the impacts of climate change.

It is therefore only right that the sport community plays an active part in the global movement to take action on climate change. This is not just symbolic; sport is uniquely placed to use its significant powers of inspiration and influence to demonstrate leadership and undertake systematic efforts to promote greater environmental responsibility.

In this guide we set out how the world of sport can reduce its overall climate impact; how it can promote more sustainable and responsible consumption and advocate for climate action through education and communication.

This guide has been created in collaboration with UN Climate Change (UNFCCC) as a means to support the Sports for Climate Action Framework.

The individual positive actions of NOCs, IFs and numerous sports clubs and facilities around the world can make a real difference.

SPORT IS NOT JUST A VICTIM OF
CLIMATE CHANGE; IT IS ALSO
A NET CONTRIBUTOR THROUGH
GREENHOUSE GAS (GHG) EMISSIONS
LINKED TO TRAVEL, ENERGY USE AND
OTHER FORMS OF CONSUMPTION

SPORTS FOR CLIMATE ACTION ESSENTIALS IN BRIEF: SUMMARY OF KEY STEPS



1. MEASURE AND UNDERSTAND: KNOW WHERE YOU STAND

Establish a reference (baseline) carbon footprint to identify your organisation’s current levels of greenhouse gas (GHG) emissions and understand how you can take effective action.



2. TAKE ACTION



Avoid: *choose not to do something*

Prioritise opportunities to avoid carbon emissions.



Reduce: *choose to do less*

Optimise resource-efficiency in energy use, transport, materials and work practices in order to reduce your carbon footprint.



Substitute: *do the same but with “cleaner” processes/equipment*

Introduce renewable energy and lower-carbon technologies in place of older more carbon-intensive energy sources and equipment.



Compensate: *do good elsewhere to balance your unavoidable GHG emissions*

Implement measures to deal with residual or unavoidable emissions and promote behaviour change.



Report: *account for your GHG emissions and show progress towards carbon neutrality*

Publish results of your actions and share lessons learned.



3. EDUCATE AND INSPIRE

Inform your stakeholders about your climate action initiatives and encourage them to take action themselves.

INTRODUCTION

1

INTRODUCTION

INTRODUCTION

This guide to Climate Action is part of our “Sustainability Essentials” series. Our aim here is to provide a general understanding of the issues related to climate change and managing your carbon (or greenhouse gas/GHG) emissions. We examine what this means, why it is important, how it relates to sport and what your organisation can do to address climate change. In addition, we look at climate adaptation measures that organisations increasingly need to adopt in order to continue their day-to-day activities in the face of more extreme and variable weather patterns.

We have compiled this general overview of climate change and carbon management, as we believe it is essential for all sports organisations to have a basic understanding of how these issues are relevant to sport and how to ensure carbon management is an integral part of your sustainability programme.

Please note that this is a complex, technical subject and it is not possible in a simple guide to provide a comprehensive account of all the issues and practical measures applicable at the different levels from small organisations and grassroots facilities to major clubs, venues and events. What we hope is that this guide will provide you with sufficient understanding of the subject, ideas for getting started in addressing climate impacts, and where you will need to bring in expert support.

The structure of our approach derives from the IOC Sustainability Strategy, in which “climate” is a specific theme. The practical guidance given in Appendix 1 looks at specific ways in which carbon management relates to each of the focus areas highlighted in the Strategy.

“Imagine harnessing the passion, the striving for excellence and all the noble principles of healthy fair play and competition into the challenge of climate change. I applaud the International Olympic Committee for taking steps to do just that, with this publication on ‘Sports for Climate Action’, part of the ‘Sustainability Essentials’ series of guidebooks for National Olympic Committees and International Federations.

UN Climate Change is so pleased to have contributed to the preparation of this publication. By measuring their greenhouse gas (GHG) emissions, reducing them as much as possible and then looking for ways to compensate for unavoidable emissions, by funding green projects, sports bodies can make a real contribution to the sustainability of our planet. They can do even more, much more, if they engage athletes and sports fans in this effort.

Sport has such a strong, positive influence on our societies. Imagine all athletes, players and their inspired supporters demanding a healthy planet, with wellbeing a possibility for all. That is our dream, and I again applaud the IOC for taking practical steps to make that dream a reality. What’s more, I offer continuing support from UN Climate Change to mobilise sport around the world to take action for a sustainable future.”

Niclas Svenningsen

Manager Global Climate Action, UN Climate Change



IOC SUSTAINABILITY STRATEGY FOCUS AREA ON CLIMATE

The IOC's Sustainability Strategy, issued in January 2017, highlights Climate as one of five focus areas. This refers to the management of direct and indirect greenhouse gas (GHG) emissions associated with the Olympic Movement's activities, and adaptation to the consequences of climate change. Within this focus area, the Strategy sets out two strategic intents for 2030:

- Effective carbon reduction strategies are in place for operations and events, and are aligned with the objectives of the Paris Agreement on climate change.
- Adaptation to the consequences of climate change is taken into account in the planning of sports facilities and events.

This guide has been created as a means to support the Sports for Climate Action Framework, as seen in Appendix 1.

SPORTS FOR CLIMATE ACTION

The United Nations is a strong advocate for the role of sport in sustainable development. More specifically, UN Climate Change (UNFCCC) has created a framework, "Sports for Climate Action", to inspire and encourage all sports organisations to play a winning role in achieving global climate action goals.

- Principle 1: Undertake systematic efforts to promote greater environmental responsibility.
- Principle 2: Reduce overall climate impact.
- Principle 3: Educate for climate action.
- Principle 4: Promote sustainable and responsible consumption.
- Principle 5: Advocate for climate action through communication.

The aim is for sports organisations and their stakeholders to work together to achieve the net-zero emission economy of 2050 that global leaders agreed at COP 21 in Paris in December 2015. Sports for Climate Action sets out a cooperative framework to enhance existing commitments and drive new initiatives. The framework is based around five main principles:

Sports organisations are invited to sign up to the Sports for Climate Action principles, regardless of the current stage in their sustainability endeavours, and to work collaboratively to identify and highlight climate solutions.

This IOC guide on "Sports for Climate Action" explains how to understand and reduce your overall climate impacts, and help you work towards the Sports for Climate Action principles.

https://unfccc.int/sites/default/files/resource/Sports_for_Climate_Action_Declaration_and_Framework.pdf

KEY TERMINOLOGY EXPLAINED

There is a wealth of technical terminology associated with climate science and carbon management. In this guide we have used terms such as “carbon footprint”, “carbon management/mitigation” and “carbon offset”, as these are the most commonly used and known terms.

However, technically it would be more accurate to say GHG instead of carbon.

The following table provides simple explanations for some of the most common and relevant terms in use. They are presented in alphabetical order.

Key terminology explained

Carbon budget	A carbon budget is the cumulative amount of carbon dioxide emissions permitted over a period of time to keep within a certain temperature threshold. At a global level, the carbon budget is the estimated amount of carbon dioxide that can be emitted while still having a chance of limiting global temperatures rises to within 2°C above pre-industrial levels. At national, regional, city and corporate levels, investors and policymakers are increasingly turning to carbon budgets as a core component for analysing the potential implications of their choices in a carbon-constrained future.
Carbon emissions	<p>The burning of fossil fuels such as gas, coal or oil, causes carbon dioxide (CO₂) to be released (emitted) into the atmosphere. Carbon dioxide is a greenhouse gas (GHG), (see p13) as it traps heat in the atmosphere.</p> <p>Typical sources of such carbon emissions come from energy production to provide power, heating and cooling; using fuel in vehicles and machinery, and in the process of creating food, products and services for our consumption.</p>
Carbon Dioxide equivalent (CO ₂ eq)	Different greenhouse gases (GHGs) have specific heat trapping properties. For example, methane (CH ₄) has 20 times higher level impact of heating the atmosphere (known as global warming potential) than carbon dioxide, so that the emission of one tonne of methane has the same impact as the emission of 20 tonnes of carbon dioxide. Other GHGs (see p13) have even higher warming potentials. To avoid having to use different units for different GHGs, the term carbon dioxide equivalents (CO ₂ eq) is used as a common unit to describe the climate impact of any GHG. For example, 20 CO ₂ eq is used to describe the emissions of 20 tonnes of carbon dioxide but can also be used to describe the emission of 1 tonne of methane.
Carbon footprint	<p>This is a quantitative measure of the amount of carbon emissions attributable to a given organisation, activity (e.g. a sport event) or product. Carbon footprints can be measured at widely different scales, such as for an individual (e.g. one’s personal annual carbon footprint lies typically in the range 1-20 tonnes CO₂eq) all the way to a whole city, region or country, which typically range in the millions of tonnes of CO₂eq.</p> <p>The term carbon footprint is common currency but strictly speaking it is a measure of a basket of GHG emissions expressed in tonnes of carbon dioxide equivalent (tCO₂eq). Therefore, a more accurate (but less widely understood) term would be “GHG inventory”. Carbon footprint is in this report also synonymous with the term “climate footprint”.</p>



Key terminology explained

Carbon sink	<p>Processes that add extra carbon to the atmosphere are known as sources, and processes that take CO₂ from the atmosphere and store it are known as carbon sinks. The main natural carbon sinks are plants, the ocean and soil. Plants remove carbon dioxide from the atmosphere through photosynthesis and store it as glucose. Some of this carbon is transferred to soil as plants die and decompose. It is the role of the whole forest ecosystem that acts as a carbon sink. The oceans are also a major carbon storage system for carbon dioxide.</p> <p>Deforestation and degradation of forest and other natural ecosystems through human activities is turning some carbon sinks into net carbon sources.</p>
Climate footprint	See carbon footprint, previous page.
Direct emissions	Emissions resulting from fuel combustion in owned machines, devices and vehicles (Referred to as 'Scope 1' in the GHG Protocol).
Embodied carbon	<p>Embodied carbon is the amount of carbon emissions (expressed as CO₂e or CO₂eq) emitted through the processes of extraction, refining, production, transporting and fabrication of a material or product. The concept is particularly used in the construction industry. Typically, embodied carbon makes up a significant proportion of the overall carbon emissions associated with a sports building, even when lifetime operational carbon emissions are included.</p> <p>Thus, while in normal residential and office buildings the operational emissions can be more than 80 per cent of the total GHG emissions, in sports stadiums this may not be the case as embodied carbon can exceed the operational footprint due to the limited use the facilities get over their lifetime. Hence energy efficiency is less effective in stadiums than, for example, measure that extend their useful life or that ensure the capacity is not oversized.</p>
Emission factor	<p>The use of emission (or conversion) factors allows organisations and individuals to calculate carbon emissions from a range of activities, including energy use, water consumption, and transport activities. For instance, a conversion factor can be used to calculate the amount of carbon emitted as a result of burning a particular quantity of oil in a heating boiler.</p> <p>Emission factors can be found in various national databases and bespoke databases developed by technical specialists. A list of databases is available on the GHG Protocol website: http://www.ghgprotocol.org/life-cycle-databases.</p>

Key terminology explained

Greenhouse gases (GHGs)	<p>Gases that trap heat in the atmosphere are called greenhouse gases (GHGs). They play a vital role in maintaining global temperatures within a range suitable for life. However, naturally occurring GHG concentrations are being supplemented by additional gas emissions from human activities, causing global warming. The main GHGs and their manmade origins are:</p> <ul style="list-style-type: none"> • Carbon dioxide (CO₂) – Carbon dioxide enters the atmosphere through burning fossil fuels (coal, natural gas, and oil), solid waste, trees and wood products, and also as a result of certain chemical reactions (e.g., manufacture of cement). • Methane (CH₄) – Methane is emitted during the production of coal, natural gas, and oil. Methane emissions also result from livestock raising and other agricultural practices and by the decay of organic waste in municipal solid waste landfills. • Nitrous oxide (N₂O) – Nitrous oxide is emitted during agricultural and industrial activities, as well as during combustion of fossil fuels and solid waste. • Fluorinated gases – Fluorinated gases are used inside of products like refrigerators, air-conditioners, foams and aerosol cans. Emissions from these products are caused by gas leakage during the manufacturing process as well as throughout the product's life. <p>Hydrofluorocarbons, perfluorocarbons, sulphur hexafluoride, and nitrogen trifluoride are synthetic, powerful GHGs that are emitted from a variety of industrial processes. These gases are typically emitted in smaller quantities, but because they are potent GHGs, they are sometimes referred to as High Global Warming Potential (GWP) gases.</p> <p>Although there are a number of GHGs, it is common practice to shorthand these into carbon emissions. Carbon footprints are usually expressed as tonnes of carbon dioxide equivalent (tCO₂eq) to reflect the contribution of different GHGs.</p>
Greenhouse Gas Inventory	See carbon footprint (p11)
Greenhouse Gas (GHG) Protocol	<p>The GHG Protocol provides accounting and reporting standards, sector guidance, calculation tools, and training for business and government. It establishes a comprehensive, global, standardised framework for measuring and managing emissions from private and public sector operations, value chains, products, cities, and policies.</p> <p>Good practice in measuring one's carbon footprint is to follow GHG Protocol guidance. For more information see: http://www.ghgprotocol.org</p>
Indirect emissions	<p>Emissions resulting from purchasing energy, in particular electricity, steam, heat or cooling (Referred to as 'Scope 2' in the GHG Protocol).</p> <p>Indirect emissions also come from activities such as travel and from the provision of goods and services that your organisation has procured (Referred to as 'Scope 3' in the GHG Protocol).</p>
Science-based targets	Carbon reduction targets aligned with global decarbonisation goals aimed at keeping global average temperature increases below 2°C above pre-industrial levels.
The Paris Agreement	The Paris Agreement is a global agreement adopted in Paris in 2015, whereby all 197 Parties to the United Nations Framework Convention on Climate Change (UNFCCC), committed to undertake action to keep the global average temperatures well below 2.0 degrees Celsius above pre-industrial levels. This is to say that the world needs to become climate neutral (zero net emissions) by 2050 (see box on page 17 for further details).

2

UNDERSTANDING CLIMATE CHANGE

UNDERSTANDING CLIMATE CHANGE

There is no more pressing issue in the world today than climate change. The Earth's physical and biological systems are under unprecedented stress.

Even before the landmark Paris Agreement of 2015 has come into force (its implementation period is from 2020), experts are now urging global leaders to be more aggressive on timelines and emission reduction targets. The original 2°C limit on global temperature rise is already recognised to be insufficient, and the consensus is toward the more challenging target of 1.5°C.

This urgency for stronger climate action was highlighted in October 2018 by the Intergovernmental Panel on Climate Change (IPCC), the world's foremost collection of climate scientists, in its "Special Report on Global Warming of 1.5°C" approved by governments. The report states that the planet will reach the crucial threshold of 1.5 degrees Celsius above pre-industrial levels by as early

as 2030, precipitating the risk of extreme drought, wildfires, floods and food shortages for hundreds of millions of people.

Many low-lying countries and small island states face existential threats from rising sea levels and major flooding. In contrast, other countries are suffering from increasing desertification and prolonged droughts, leading to acute shortages of food and water for crop irrigation and drinking. In turn these impacts exacerbate poverty, hunger and inequalities among peoples, which can lead to displacement, migration of refugees and even conflicts.

Nature does not discriminate but the impacts of climate change are most severely felt by poorer countries and communities. For many, reducing climate change impacts is a critical matter of survival. However, it is a global phenomenon and even in the prosperous developed world, there are significant impacts due to climate change that are affecting people's homes, businesses and livelihoods.

THE ORIGINAL 2°C LIMIT ON GLOBAL
TEMPERATURE RISE IS ALREADY
RECOGNISED TO BE INSUFFICIENT, AND
THE CONSENSUS IS TOWARD THE MORE
CHALLENGING TARGET OF 1.5°C



WHAT IS CLIMATE CHANGE?

Climate change is a large-scale, long-term shift in the planet's weather patterns and average temperatures. Throughout geological history there have been tropical periods and ice ages, so climate change has been a continual, but usually gradual feature for all of time on earth.

Since the last ice age, which ended about 11,000 years ago, Earth's climate has been relatively stable at about 14°C. However, with the start of the Industrial Revolution, the global average temperature has been steadily increasing. Compared with climate change patterns throughout Earth's history, the rate of temperature rise since the Industrial Revolution is extremely high.

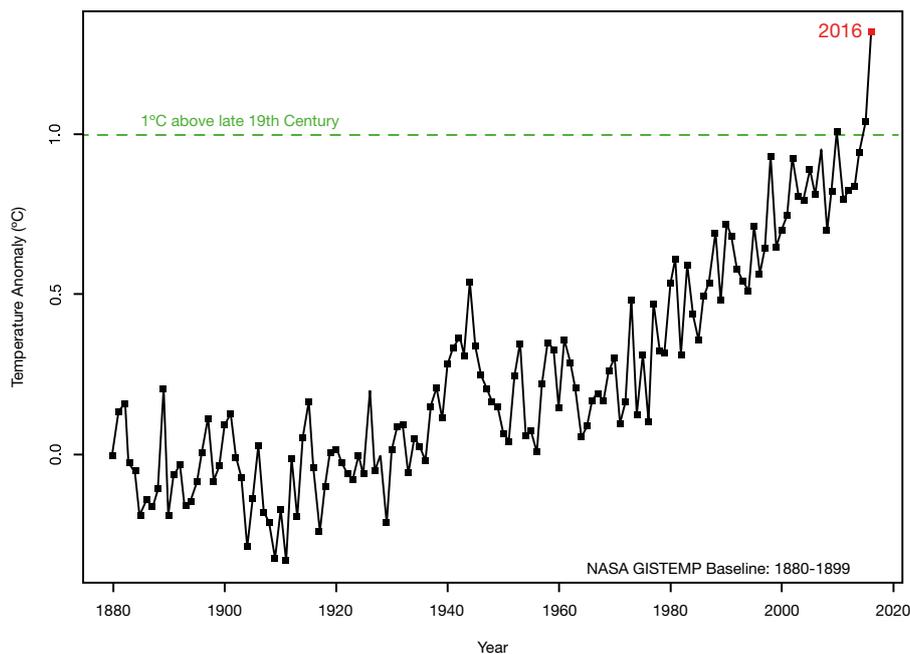
There is global scientific consensus that these modern temperature rises derive in large part (if not entirely) from human activities, notably the burning of fossil fuels (coal, oil and gas), which emit greenhouse gases (carbon dioxide,

methane and nitrous oxide in particular) that accumulate in the atmosphere, where they trap heat, thereby creating the warming effect. This is exacerbated by the destruction of rain forests and other vegetation that naturally serve as carbon reservoirs, or "sinks".

Climate change is not simply a matter of warmer average temperatures. The atmospheric pollution caused by greenhouse gas (GHG) emissions is disrupting global weather patterns. In fact a better term would be "climate chaos", as this would reflect the increasingly unpredictable and extreme nature of weather events being experienced in recent times – floods, storms, droughts, heatwaves, extended winter freezes etc.

International protocols (see box on Paris Agreement, p17) aim to curb GHG emissions in order to limit the average global temperature rise. This is why there is so much emphasis from governments, cities and corporations on cutting carbon emissions and developing clean technologies.

Global Mean Surface Temperature (January-June)



Source: [NASA](#)



PARIS CLIMATE AGREEMENT

Concluded in December 2015 at the COP 21 Summit¹, the Paris Climate Agreement is the world's first comprehensive climate agreement. It came into force on 4 November 2016. It deals with measures to limit greenhouse gas (GHG) emissions, mitigate and adapt to the impacts of climate change and establish new financing mechanisms, starting in 2020.

The central aim of the Paris Agreement is to hold the increase in global average temperature to well below 2°C above pre-industrial levels and to pursue efforts to limit the temperature increase to 1.5°C, as this would significantly reduce the risks and impacts of climate change.

Recognising, however, that impacts of climate change are already occurring and cannot be reversed instantly, the Paris Agreement also prioritises increasing the ability to adapt to the adverse impacts of climate change and foster climate resilience, as well as reduce GHG emissions. Emphasis is given to the need to increase adaptation support to parties most vulnerable to the impacts of climate change, including Least Developed Countries and Small Island Developing States.

As of November 2018, 180 out of the 197 parties to the UN Framework Convention on Climate Change (UNFCCC) have ratified the Agreement. Collectively, these parties account for over 90 per cent of global GHG emissions.

A UN Environment Report concludes that the Nationally Determined Contributions² that form the foundation of the Paris Agreement cover only approximately one third of the emissions reductions needed to be on a pathway for the goal of staying well below 2°C. The “gap” between the reductions of GHG emissions that the world needs and the pledges made by governments in Paris is alarmingly high. If the emissions gap is not closed by 2030, it will become unlikely that the goal of holding global warming to well below 2°C can still be reached³.

This is why urgent action by everyone, including state and non-state actors to enhance climate action is critical. To achieve climate neutrality, we must all do our part to reduce emissions caused as a result of our operations as much as possible, and then take the additional step to offset the remaining emissions, which cannot be reduced.

¹ COP 21: This was the 21st United Nations Climate Change Conference, literally the “Convention of Parties” to the UNFCCC. The IOC participated at COP 21 and in particular at the Climate Summit for Local Leaders, one of a number of complementary events taking place in parallel as part of the COP 21. At this event the IOC President, Thomas Bach, addressed an audience of over 1,000 city mayors on the theme of how the Olympic Games can be a catalyst for sustainable development of cities.

² Nationally Determined Contribution's (NDCs) are pledges made by countries to describe how are they going to implement the goals of the Paris Agreement, namely transition to a zero-carbon economy by 2050.

³ UN Environment Emissions Gap Report 2018. <https://unenvironment.org/resources/emissions-gap-report-2018>



CLIMATE CHANGE AND SPORT

Sport is being affected by climate-related changes in weather patterns across the world. The types of impacts include the following:

- damage to playing surfaces due to extreme temperatures, extended periods of drought, flooding, and/or pest species extending their natural range;
- damage to buildings and other infrastructure due to violent storms;
- coastal erosion and sea level rise directly affecting sport properties in seaside areas;
- warmer winters and lack of natural snow threatening ski resorts at lower altitudes;
- unseasonal rainfall forcing cancellation or abandonment of sport matches;
- heat waves forcing changes to timing of sport events;
- increased injuries to players from heat exhaustion and impact injuries from harder playing surfaces;
- more potentially harmful algal blooms limiting direct contact outdoor water sports;
- sub-standard fan experience where high temperatures create potential health risks and detract from the enjoyment of the event; and
- climate adaption measures being required in the design of new or refurbished sport venues.

All these impacts have potentially significant financial repercussions in addition to their physical and logistical impacts. These are not projections; they are all real impacts that have happened and continue to happen across sports and throughout the world.

The financial impacts relate to increased maintenance costs of sports grounds (such as through increased cost of alternative water supplies and more frequent monitoring and reporting requirements), revenue losses through lost playing time and associated sales of food and beverage and merchandise, increases to insurance premiums and additional materials and equipment to ensure suitable levels of comfort and wellbeing for players, the workforce and spectators.

With more extreme heat, changes in rainfall and more intense storms, there are questions about just how far to push players in elite and local sport, and whether the way some sports are played, or watched, is safe or sustainable. Elite venues are improving resilience but many local clubs and facilities, the lifeblood of sport, are struggling. In areas where days over 35°C multiply, having effective heat policies could ultimately be a matter of life or death. Industrial relations disputes over working conditions are also likely to increase as a consequence. The sport sector may need to learn from policies evolving in other outdoor industries. Summer daytime events will increasingly have to be rescheduled to the evening. There will be more funding demands for sports field lighting and air conditioned indoor facilities and greater financial stress on poorer clubs due to the cost of night-time events.

This means that climate change issues are not simply technical problems to be dealt with by practical management measures, but that they are central to future sport policy. Decisions on awarding events and even the sport calendar will have to consider climate impacts and these will have knock-on effects on broadcasting schedules, overlapping of major events, athlete training and preparation seasons and how people watch and participate in sport.

It is not the place of this guide to discuss or recommend policy formulation, but it is clear from the above and the accompanying examples, that the sport sector needs to take climate change issues extremely seriously and to be an active player in this field. Given its popularity and high profile, the sport sector has a huge opportunity to showcase practical measures to address climate impacts and to be a leading voice in efforts to support the UN Sustainable Development Goal number 13 (combatting climate change) and the implementation of the Paris Climate Agreement.

The individual positive actions of NOCs, IFs and numerous sports clubs and facilities around the world will be both a real contribution

to combatting climate change, and evidence to support the global campaign. The multiple effect of numerous local, small-scale actions can add up to a significant effort, and this is where we hope this guide will be of use.

Examples of climate impacts on sport

Even in mild temperate regions impacts associated with climate change are having significant impacts on sport. In the United Kingdom (UK) this has been observed across three long-standing, traditional sports: golf, football and cricket. While the British weather is notoriously changeable, it has always been within limits that have enabled these sports to originate and develop their particular character. The effect of climate change is in stretching these limits and introducing greater variability and wider extremes of temperature and rainfall.

These impacts are particularly affecting the viability of grassroots sport, through lost revenue and higher maintenance costs, but are also affecting professional clubs and events. The following examples are drawn from a 2018 report published by the Climate Coalition: “Game Changer: how climate change is impacting sports in the UK”.

GIVEN ITS POPULARITY AND HIGH PROFILE,
THE SPORT SECTOR HAS A HUGE OPPORTUNITY
TO SHOWCASE PRACTICAL MEASURES
TO ADDRESS CLIMATE IMPACTS



Golf

Sea-level rise poses the greatest long-term threat to golf in the UK. More than one in six of Scotland's 600 golf courses are located on the coast and many of these are being impacted by coastal erosion.

Inland, the effects of climate change are resulting in unexpected periods of course closures, even during summer, with disruption seen to some professional tournaments. Other signs are increasing prevalence and different timings of outbreaks of turfgrass diseases and pests, which add cost to course maintenance and affect playability.

The disruption caused by increased rainfall and extreme weather has seen more courses closed more often and for longer periods of time: for example, the years 2016/17 saw as much as 20 per cent less playing time at courses across the Greater Glasgow area than a decade previously.

Football

The most recent comprehensive survey of grassroots football found that, on average, clubs lose five weeks every season due to bad weather – with more than a third losing between two and three months. Extreme weather events caused the cancellation of 25 Football League fixtures during the 2015-16 season.

In response to major floods in 2015-16, the Football Association (FA), the Premier League and Sport England made £750,000 (USD 1.13m) available to support affected clubs. Longer term, the FA plans to invest £48m (USD 63m) in hundreds of new all-weather and specially adapted turf pitches across the country, including new dedicated facilities in 30 cities, in addition to upgrading more than 200 existing pitches nationwide.

Cricket

Of all the major pitch sports, cricket will be hardest hit by climate change. Traditionally, cricket is defined almost entirely by climatic conditions. If they change, so does the essence of the game.

Climate change will amplify these changes. Anticipated impacts will include changes to soil-moisture levels, while higher temperatures will bring drier air, then drier pitches and a drier outfield, changing all features of the game.

The rate of rain-affected matches has more than doubled since 2011; 5 per cent of matches during that time have been abandoned completely. Wet weather has caused a significant loss of fixtures every year in the last five at recreational level and significant flooding in six of the last 10 years.

Supporting clubs to get back on their feet and restore their facilities cost the English Cricket Board (ECB) £1m (USD 1.35m) in emergency grants during 2016 and £1.6m (USD 2.1m) in 2017. This trend has forced the governing body to set aside £2.5m (USD 3.25m) a year for small grants to help recreational clubs keep the game on. The ECB is also conducting research to identify flood risk, and producing guidance for clubs on climate-related risks.

Ski and Snowboard

In Scotland, continuous decreases in snow cover have been observed over the last 40 years and this is having significant impact on the ski industry there. Already the major resorts are heavily dependent on artificial snowmaking, while meteorological predictions indicate that the entire Scottish ski industry could be lost due to climate change within 50 years.

In continental Europe there are concerns particularly for ski resorts below 1,000 metres altitude. As temperature increase the snowline elevation will rise: an increase of 1°C will lift the snowline by 150m. As a result, less snow will accumulate at low elevations and the ski season may start up to a month later and finish up to three months earlier. On current trends, nearly half of all ski resorts in Switzerland, and even more in Germany, Austria and the Pyrenees, will face difficulties in attracting tourists and winter sport enthusiasts in the future.

This is not a linear trend and some years may still produce “good snow” at the “right time”. However, the overall trend is towards warmer winter temperatures and less snow, making the situation unreliable for tourism business.

More and more winter resorts have turned to using artificial snow. However, this will increase the climate impact because of additional energy consumption.

Tourism of any kind is extremely weather-sensitive, and weather variability will have a significant impact on the ski tourism industry: while warmer weather and less snow can be expected across the whole season, the loss of guaranteed good snow at particular times of year is just as significant. A further 2°C increase in temperature could severely impact the Alpine tourism industry, with predicted losses of up to 10.1 million overnight stays across the winter season, due to variable weather conditions and a lack of certainty around good skiing conditions.

A FURTHER 2°C INCREASE IN TEMPERATURE
COULD SEVERELY IMPACT THE ALPINE TOURISM
INDUSTRY, WITH PREDICTED LOSSES OF UP
TO 10.1 MILLION OVERNIGHT STAYS
ACROSS THE WINTER SEASON



Climate change: the challenges for sport

SKI AND SNOWBOARD

Challenges

 Temperature increases

 Decreased snow cover

 Weather variability

Impacts

- Decrease in snow cover means Scottish ski industry could be lost within 50 years
- In continental Europe, ski resorts below 1,000-metre altitude at risk; increase of 1°C will lift snowline by 150m.
- Less snow on low elevations will delay and shorten ski seasons
- 2°C increase could severely impact Alpine tourism industry; predicted losses of up to 10.1 million overnight stays due to uncertain weather conditions

FOOTBALL

Challenges

 Extreme weather events

 Bad weather

 Floods

Impacts

- Grassroots football clubs in UK lose 5 weeks every season due to bad weather
- Over 1/3 of clubs lose between 2-3 months
- 25 Football league fixtures cancelled during 2015-16 season due to extreme weather events

Climate change: the challenges for sport

GOLF

Challenges



Extreme weather events



Increased rainfall



Rising sea levels



Coastal erosion

Impacts

- 1/6 (100) of Scotland's golf courses are threatened by coastal erosion
- Instances of pests and disease outbreaks lead to inland course closures
- 20% less playing time at courses across Greater Glasgow due to excessive rainfall
- Additional maintenance costs
- Course closures for more frequent and longer periods of time

CRICKET

Challenges



Higher temperatures



Rainfall



Flooding

Impacts

- Pitch sport that is hardest hit by climate change
- Rain-affected matches in UK have doubled since 2011, with 5% abandoned completely
- Significant flooding in 6 out of the last 10 years
- Changes to soil moisture levels and dryness of air, pitches and outfield will alter all features of game



Cricket: Indian Premier League (IPL)

In 2016 the High Court in Mumbai ordered several IPL matches to be moved due to drought conditions and restrictions on water use in the state of Maharashtra. Parts of Maharashtra were enduring one of the worst droughts in the region for over 100 years and there was growing public concern over the lack of water in many parts of the state following two successive years of drought and crop failures. The court dismissed arguments that treated sewage could be used to prepare pitches. The decision meant 13 matches scheduled to be held in the cities of Mumbai, Pune and Nagpur had to be moved. Although the IPL attracts some of the world's top players and is one of the richest cricket leagues in the world, this case shows that despite its wealth and popularity, even top-level professional sport can be at the mercy of changing weather patterns due to climate change.

Source:

<http://sport360.com/article/cricket/ipl/174819/court-orders-ipl-to-move-matches-due-to-maharashtra-drought>
<http://www.bbc.co.uk/news/world-asia-india-36038026>

Sport in Australia

A report by the Australia-based Climate Institute (now disbanded) in 2015, highlighted how change and extreme weather events threaten the viability of much of Australian sport as it is currently played, either in the back yard, at local grounds, or in professional tournaments. Football, cricket, tennis and other sports were noted to be struggling to adapt to, or prepare for, the impacts of climate change.

- During the 2014 Australian Tennis Open, athletes, ball kids and spectators collapsed. Over 1,000 fans had to be treated for heat exhaustion.
- In 2007, more than half of rural Victoria's community sporting leagues delayed or shortened their season due to drought.
- Nearly two-thirds of surf lifesaving clubs are located on unstable shorelines.

Source:

<http://www.climateinstitute.org.au/sport-and-climate.html>

Sport in South Africa

In 2018, Cape Province in South Africa was experiencing its third consecutive year of drought. Despite several advanced water conservation strategies, the water supplies to Cape Town were reaching critical levels and this had significant impacts on the sport sector. Thirteen of the city's soccer venues were forced to close in an effort to conserve water. Cricket was also affected, with many local matches cancelled. The Western Province Rugby Union made the unprecedented decision to delay the start of its season, which normally takes place in April, until at least June. Various fields around the Cape Peninsula and beyond were in extremely poor condition and this was badly affecting many underprivileged community clubs on the Cape Flats.

The Two Oceans Marathon, which attracts 30,000 runners, had to introduce emergency water-saving measures, including for the first time ever, not providing any shower facilities at the finish line.

Source: <https://www.greenbiz.com/article/cape-town-sports-are-hit-hard-its-water-crisis>

Impacts of climate change on sporting events around the world

Maharashtra, India



100

years since droughts of equivalent magnitude (2016)



2

successive years of drought and crop failure (2016)



13

scheduled cricket matches moved from Mumbai, Pune and Nagpur (2016)

Victoria, Australia



1,000

fans treated for heat exhaustion during 2014 Australian Tennis Open



50%+

of rural leagues delayed or shortened their season in 2017



2/3

of surf lifesaving clubs are located on unstable shorelines

Cape Province, South Africa



3rd

consecutive year of drought (2018)



3

football venues closed in 2018 to conserve water



30,000

runners without shower facilities

3

KEY STEPS FOR CLIMATE ACTION

KEY STEPS FOR CLIMATE ACTION

OVERVIEW

No matter what size organisation or sporting event, there is a series of key steps that represent best practice in taking action to minimise and eventually neutralise your climate impacts.

1. Measure and understand

The starting point should be to gather information on your current activities to enable you to calculate a baseline carbon footprint. This provides a robust, quantitative measure of your organisation's (or event's) greenhouse gas (GHG) emissions.

This measurement is necessary to evaluate the overall climate impacts of the organisation or project, and to understand which activities contribute most to these impacts, which activities contribute less, and which parameters influence the impacts of these different activities.

Understanding the most significant impacts is essential for guiding decision-makers to take actions that will reduce your GHG emissions.

The top priority should be to focus on activities that have the highest contribution to the carbon footprint. The potential effectiveness of reduction measures can also be assessed through the same methods used to calculate your baseline carbon footprint. This will help you to select the most cost-effective actions with the highest reduction potential.

2. Take Action

Actions to mitigate your climate impacts should follow a hierarchical approach:

- Avoid – actions designed to eliminate GHG emissions occurring in the first place. This means not doing something: for example not printing hard copies of a document.
- Reduce – actions designed to lower the impact of your current activities. This is generally achieved by doing less of something and by using fewer resources.
- Substitute/replace – actions designed to improve efficiency. This may be achieved by switching to more efficient and “cleaner” equipment, fuels, materials or processes.

WHILE ALL EFFORTS TO MITIGATE CARBON EMISSIONS ARE GOOD, IT IS BEST TO TAKE A MORE STRATEGIC AND HIERARCHICAL APPROACH IN ORDER TO ACHIEVE THE GREATEST POSITIVE IMPACT



- Compensate – actions designed to compensate for some or all of your remaining, unavoidable impacts; this may include conventional “offsetting” schemes, but can also involve other initiatives that achieve net carbon benefits and even behavioural change campaigns.
- Report – provide a credible account of your carbon footprint and the climate actions you have undertaken in order to share knowledge and lessons learned. A carbon footprint can be used for communicating a sustainability plan based on solid metrics. Further, it can be used to assess and communicate the success of an action plan or to report the evolution of your GHG emissions over time.

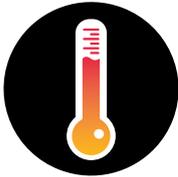
3. Educate and inspire

By communicating your efforts, both internally and externally, you will contribute to overall efforts to raise awareness about sustainability.

Many organisations and events already implement actions to reduce their GHG emissions and to compensate some or all of the emissions due to specific activities. Usually, however, these initiatives are ad hoc and not based on a full understanding of which climate actions are the most effective to undertake. While all efforts to mitigate carbon emissions are good, it is best to take a more strategic and hierarchical approach as outlined above in order to achieve the greatest positive impact in the most efficient and cost-effective manner.

BY COMMUNICATING YOUR EFFORTS,
BOTH INTERNALLY AND EXTERNALLY,
YOU WILL CONTRIBUTE TO
OVERALL EFFORTS TO RAISE
AWARENESS ABOUT SUSTAINABILITY

Sports for Climate Action Essentials in brief – summary of key steps



1. MEASURE AND UNDERSTAND: KNOW WHERE YOU STAND

Establish a reference (baseline) carbon footprint to identify your organisation's current levels of greenhouse gas (GHG) emissions and understand how you can take effective action.



2. TAKE ACTION



Avoid: *choose not to do something*

Prioritise opportunities to avoid carbon emissions.



Reduce: *choose to do less*

Optimise resource efficiency in energy use, transport, materials and work practices in order to reduce your carbon footprint.



Substitute: *do the same but with "cleaner" processes/equipment*

Introduce renewable energy and lower-carbon technologies in place of older more carbon-intensive energy sources and equipment.



Compensate: *do good elsewhere to balance your unavoidable GHG emissions*

Implement measures to deal with residual or unavoidable emissions and promote behaviour change.



Report: *account for your GHG emissions and show progress towards carbon neutrality*

Publish results of your actions and share lessons learned.



3. EDUCATE AND INSPIRE

Inform your stakeholders about your climate action initiatives and encourage them to take action themselves.

MEASURING CARBON EMISSIONS

4

MEASURING CARBON EMISSIONS

MEASURING CARBON EMISSIONS

The starting point should be to calculate your organisation's carbon footprint. This is useful for providing a baseline of your current situation and will help you to identify in a more precise way priority areas on which to focus efforts to reduce your climate impact.

GREENHOUSE GASES

The term “carbon footprint” can be misleading, as a proper carbon footprint includes gases other than carbon dioxide, including some gases that do not contain any carbon atoms. These are greenhouse gases (GHGs), so-called because of their role in absorbing and emitting thermal radiation in the atmosphere. A more correct term is “GHG inventory”, or “climate footprint”. The list of GHGs is provided by the IPCC Fifth assessment report.

Most GHGs are naturally present in the atmosphere but their concentrations have increased since the Industrial Revolution through man-made processes, to levels threatening the stability of climate patterns, hence the common terms “global warming” and “climate change”. The main source of emissions is the combustion of fossil fuels (oil, coal and natural gas) and use of refrigerants. Agriculture and deforestation are also important sources.

Each GHG is characterised by its global warming potential (GWP), which is determined by the greenhouse effect and its lifetime in the atmosphere.

Since carbon dioxide (CO₂) is by far the main contributor to global warming – about 75 per cent – the global warming potential of GHGs are measured relative to the mass of CO₂, and are thus expressed as CO₂ equivalent (CO₂eq).

The most common anthropogenic GHGs are:

- Carbon dioxide, CO₂
- Methane, CH₄
- Nitrous oxide, N₂O
- Sulphur hexafluoride, SF₆
- Other artificial gas, CHCs, PFCs, HCFC, (typically used for cooling systems)

A carbon footprint should be calculated, when possible, based on all GHGs listed by the IPCC. However, for the sake of pragmatism and as carbon footprint tools and software do not include all GHGs listed by the IPCC, one should aim to include at least the three most common GHGs, carbon dioxide (CO₂), methane (CH₄) and nitrous oxide (N₂O).

The results should be expressed in kg CO₂eq or t CO₂eq (tonnes CO₂ equivalent).



RATIONALE FOR CARBON FOOTPRINTING

The measurement of your global GHG emissions provides a basis for setting science-based targets and joining the global efforts to reduce GHG emissions around the world and to align with the 1.5°C global warming scenario, as targeted in the Paris Agreement on Climate Change and more recently reinforced by the special report of the IPCC (October 2018).

Carbon footprints are normally used to map the GHG emissions of an organisation, a service or a product, applying the life cycle approach (LCA)¹. Sports events have elements of each of these and should be treated as specific projects within a defined timescale, which present specific characteristics as detailed below.

Throughout each life cycle stage there is a potential to reduce impacts and improve performance, whether applied to organisations, services or products (or entire projects). Carbon footprinting identifies opportunities to achieve this. The results can be used to support decision-making, but also enhance the credibility of marketing and communication efforts on sustainability, as they will be backed by factual information.

Carbon accounting is a technical discipline and it can be easy to become lost in minute details. It is therefore always important to remember the real purpose of this exercise. It is about minimising the GHG emissions caused by your organisation and/or event. The carbon footprint is intended as a tool to facilitate decision-making for this purpose. Given resource and time constraints, there needs to be a pragmatic balance between achieving technical accuracy and the practical ability to avoid and minimise GHG emissions.

KEY PRINCIPLES FOR CARBON FOOTPRINTING

Measuring and reporting GHG emissions is a similar exercise to financial accounting and reporting that many organisations are already familiar with. To ensure that this exercise is a fair representation of the actual situation, a few principles for a successful climate strategy are indicated over the page. Of great importance is the consideration that this exercise should be seen as one that will continuously improve.

The GHG Protocol defines the following standardised principles for GHG accounting and reporting for businesses, which can be used in sports as well (see over page).

¹ The LCA approach is used to evaluate the impacts associated with products, organisations and services over their life cycles, from the extraction of raw materials, through transportation, production, distribution, use and end-of-life treatment. These different steps are called 'life cycle stages'.

- **Relevance:** ensure that scope, data, assumptions and methodologies compiling the GHG inventory reflect the organisation and can serve the needs of the internal and external users of the inventory.
- **Completeness:** account for and report all GHG emissions and removals within the chosen scope. Specific exclusions should be disclosed and justified.
- **Consistency:** use consistent methodologies to allow meaningful comparisons in the GHG-related information including the trends of emissions over time. Any changes to the boundaries, information, data, assumptions and methodologies over time should be documented.
- **Accuracy:** ensure that any bias and uncertainties in quantifying GHG emissions are minimised as far as possible.
- **Transparency:** disclose sufficient and appropriate information, including assumptions and references, to allow the users of your report to arrive at conclusions / decisions with reasonable confidence.

APPROACHES TO CARBON FOOTPRINTING

Carbon footprinting is an internationally recognised practice and various standards exist for estimation of the footprint of products or organisations. These include the GHG Protocol, ISO 14064 and the European Commission's Organisation Environmental Footprint (OEF) (see Table 1 over page). However, as these standards were not developed with sports events in mind, they are not necessarily well adapted for this purpose and a certain amount of flexibility and adaptation is required. This is where specialist help will be particularly valuable.

In the context of sport, there are two main approaches to carbon footprinting depending on whether you are considering a permanent entity (an organisation, a venue or a regular, recurring event), or a planned one-off sports event.

In the case of permanent and regular situations, it is reasonable to do annual measurements and track progress over fixed periods of time. Thus you can identify achievements year on year and opportunities for further improvement in subsequent years. This approach is akin to conventional corporate sustainability reporting. The advantage here is in having real data based on actual performance measurements to give you an accurate picture.

THERE NEEDS TO BE A PRAGMATIC
BALANCE BETWEEN ACHIEVING TECHNICAL
ACCURACY AND THE PRACTICAL ABILITY TO
AVOID AND MINIMISE GHG EMISSIONS



For events, and especially the larger scale tournaments and championships due to be held some years in the future, the focus has to be on estimating potential carbon emissions and developing plans to limit them in advance. If you wait until the event takes place to calculate your carbon footprint, you have no opportunity to implement any reduction measures. The approach here needs to be one akin to environmental impact assessments, whereby decisions are made on the basis of assumed impacts, rather than actual ones.

The challenge for event situations like this is the reliability of the assumptions. You can draw from experience of other events and similar projects but there will always be an element of uncertainty. Nevertheless, by following standard principles and methodologies, you should achieve a reasonable picture of the likely impacts, sufficient to formulate credible reduction and mitigation plans. When the event finally takes place, you can capture actual data and compare these with the original estimates. Knowledge gained from this will help for future events and for perfecting methodologies.

International standard	Description
GHG Protocol Corporate Accounting and Reporting Standard	“Requirements and guidance for companies and other organisations, such as NGOs, government agencies and universities that are preparing a corporate-level GHG emissions inventory”. Free to download at: https://ghgprotocol.org/corporate-standard
ISO 14064-1:2006	“Greenhouse gases – Part 1: Specification with guidance at the organisation level for quantification and reporting of greenhouse gas emissions and removals”. It includes requirements for the design, development, management, reporting and verification of an organisation’s GHG inventory. Available to purchase at: https://www.iso.org/standard/38381.html
ISO 14064-2:2006	“Greenhouse gases – Part 2: Specification with guidance at the project level for quantification, monitoring and reporting of greenhouse gas emissions or removal enhancements”. It includes requirements for planning a GHG project, identifying and selecting GHG sources, sinks and reservoirs relevant to the project and baseline scenario, monitoring, quantifying, documenting and reporting GHG project performance and managing data quality. Available to purchase at: https://www.iso.org/standard/38382.html
ISO 14064-3:2006	“Greenhouse gases – Part 3: Specification with guidance for the validation and verification of greenhouse gas assertions”. It can be applied to organisational or GHG project quantification, including GHG quantification, monitoring and reporting carried out in accordance with ISO 14064-1 or ISO 14064-2. Available to purchase at: https://www.iso.org/standard/38700.html
European Commission’s Organisation Environmental Footprint (OEF)	The OEF is a multi-criteria measure of the environmental performance of a goods/services-providing Organisation from a life cycle perspective. Free to download at: http://ec.europa.eu/environment/eussd/pdf/footprint/OEF%20Guide_final_July%202012_clean%20version.pdf

Table 1: Recognised international standards for measuring and reporting carbon footprints (GHG inventories)

DEFINING YOUR SCOPE AND ALLOCATING RESPONSIBILITIES

The scope of your carbon footprint should comprise the GHG emissions caused by your organisation's activities over a given period (e.g. a single year), or related to a specific project, such as a sports event. GHG emissions are considered either direct or indirect, as explained in the box below.

DIRECT AND INDIRECT EMISSIONS

The definition of the system boundaries includes all direct and indirect emissions related to your activities, corresponding to the GHG Protocol terminology, Scope 1, 2 and 3.

- Scope 1: direct emissions from fuel combustion in owned machines, devices and vehicles.
- Scope 2: indirect emissions from purchasing energy, in particular electricity, steam, heat or cooling.
- Scope 3: indirect emissions from upstream and downstream activities, such as travel, purchased goods and services.

Direct emissions are under the full control of the organisation, while indirect emissions are not. However, as indirect emissions can sometimes be several times higher than direct emissions and your organisation may be able to exert some influence in these areas, a comprehensive carbon footprint must include these emissions in the scope of the study.



As can be seen here, there is both an activity basis for defining the scope of the carbon footprint, and also an element of responsibility, or “ownership”. Put simply it is a question of what you control and what you can influence.

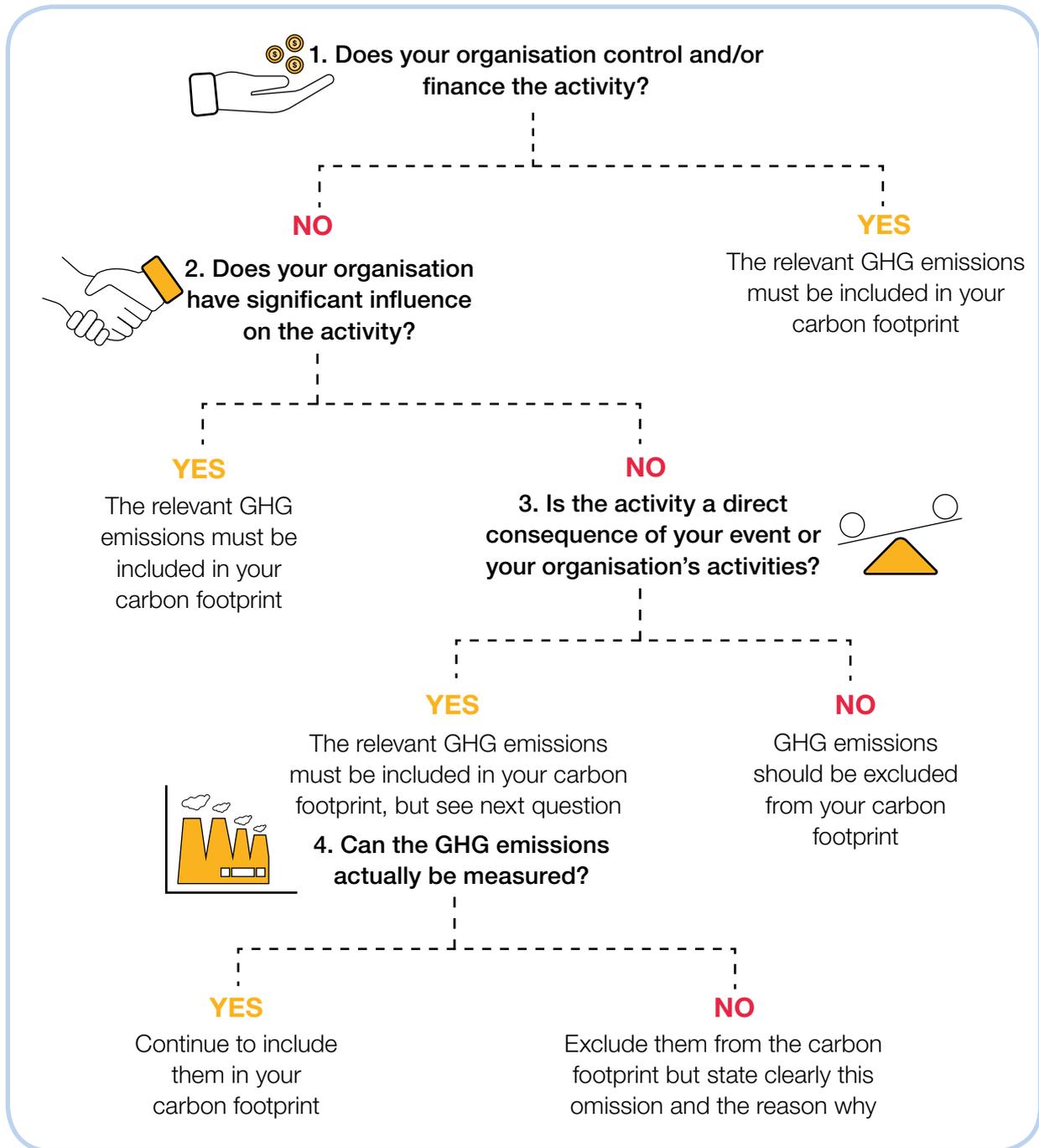
Control is where you make the decisions, such as procuring goods and services, choice of venues, size of event etc. If you choose to pay for something, you are the controlling mind. Influence is where there are related activities outside your direct control (i.e. you are not paying for them), but you may be able to exert varying levels of influence to help reduce GHG emissions. For example, you might encourage partner organisations to use certain materials or suppliers that conform with your sustainability policies, even though you cannot oblige them.

A relevant example is the NOC houses at the Olympic Games. These are not the responsibility of the Organising Committee of the Olympic Games (OCOG), or the host city, so they are not a direct part of the Games carbon footprint. However, they are clearly only operating because the Games are happening, so there is an association with the Games and it is reasonable to expect the OCOG to exert some influence on the NOCs to make these facilities as sustainable as possible.

From the NOC standpoint, these national houses are definitely their responsibility, so in carbon accounting terms, the respective NOCs should be “owning” and reporting GHG emissions related to the installation and operation of the facilities. The same principles would apply for example at a national event, where the NOC might take an influencing role over other third parties involved in the event.

ENCOURAGE PARTNER ORGANISATIONS
TO USE CERTAIN MATERIALS OR
SUPPLIERS THAT CONFORM WITH YOUR
SUSTAINABILITY POLICIES

The following decision tree can be used to determine which emission sources should be included in your carbon footprint:



Note – Shared activities: different organisations sometimes club together and share costs for an activity (e.g. multiple NOCs occupying a single “continental house” at the Olympic Games, or IFs sharing an office building). In these situations, the responsibility should be allocated in proportion to the relative contribution of each party. Thus if you pay 30 per cent, the GHG emissions related to that amount must be included in your direct, “owned” carbon footprint. The remaining 70 per cent will be part of your indirect, or “associated” carbon footprint and you have to decide whether this fits in step 2, 3 or 4 in the illustration above.



DATA COLLECTION

Wherever possible, the use of primary data should be favoured. Primary data derive from activities that can be directly measured or collected. Project documents and raw data from internal functions/departments, project teams and main partners and suppliers are the principal sources of information. By definition, primary data have a high level of quality and are the most accurate and the most representative within the specific context of your organisation or event.

Only when primary data are not available should secondary data sources be used. These include estimations, statistics, data from other similar organisations or previous events, or published data sets. When neither primary nor secondary data are available, default data using standard emission factors may be used.

Within most organisations, the starting point for data collection is likely to be with Finance and/or Procurement departments to identify expenditure categories. You are also likely to need data from the Human Resources department and those managing travel and accommodation activities.

Obvious priority categories for which data will need to be collected include:

- materials for event staging (e.g. timber, plastic banners, barriers, carpet, fabric);
- furniture, fittings and equipment (desks, chairs, lighting, IT equipment, vehicles, sports equipment etc.);
- food and beverage (catering operations provided);
- energy consumption (either measured on site, or from invoices);
- waste disposal (quantities of waste sent for reuse, recycling or other forms of disposal); and
- travel (number of journeys, mode of transport, class of travel and distance).

It is important to be consistent and clear regarding units of measurement, whether weights, volume, length, time, price or simply the number of standardised items. Collecting the data does not demand specialist skill other than a good attention to detail and a methodological approach. Depending on the size of your organisation, this may be done by nominated people in the respective departments, or by an individual assigned to collect data from across the organisation.

IT IS IMPORTANT TO BE CONSISTENT
AND CLEAR REGARDING UNITS OF
MEASUREMENT, WHETHER WEIGHTS,
VOLUME, LENGTH, TIME, PRICE OR SIMPLY
THE NUMBER OF STANDARDISED ITEMS

Where specialist knowledge will be required is in the interpretation of the data and calculating the carbon footprint. There are some online easy-to-use calculators (see next section), but they have a limited application and would not allow you to calculate a full carbon footprint for a complex situation like a sports organisation or event.

Nevertheless, if you are able to measure and collect your own data, this will save considerable time and cost, instead of asking external providers to do the whole task. If you are going to hire specialists to do the calculations, you should first agree with them on exactly which data and in which form they should be presented, as well as precisely the scope and timeframe of the footprint to be calculated.

CALCULATING YOUR EMISSIONS

To calculate the GHG emissions associated with each activity, you will need to convert the data you have collected using emission factors². The carbon footprint is the summation of these GHG emissions expressed in kg CO₂eq or tonne CO₂eq.

For larger organisations and/or events, there are specialised organisations that can help you complete the calculations³. Smaller organisations and/or events can use an online calculator that will be helpful in calculating the GHG emissions from the information input into the online tool. These tools are useful when you are new to reporting and the data you wish to convert into GHG emissions is simple. If feasible, in these cases it is recommended that you add an additional 15 per cent of emissions to your final calculations to ensure that you are on the conservative side.

Some examples of such calculators can be found at the following links:

<https://offset.climateneutralnow.org/footprintcalc>

<http://www3.epa.gov/carbon-footprint-calculator/>

<http://www.carbonfootprint.com/calculator.aspx>

² An **emissions factor** is a representative value that attempts to relate the quantity of a pollutant released to the atmosphere with an activity associated with the release of that pollutant. GHG emissions are expressed in kg CO₂e per unit of input. These factors are usually available in published databases.

³ ICROA: International Carbon Reduction and Offset Alliance



For travel-related GHG emissions, the International Civil Aviation Organisation's (ICAO⁴) carbon emissions calculator is recommended. It is simple to use and requires only a limited amount of information from the user.

Whether for an organisation or an event, calculating and assessing a carbon footprint should be seen as an iterative process that can be done several times. A first version should result in a simplified (screening) evaluation based on assumptions and/or rough estimations for missing data. This is useful for identifying the main contributors to the total carbon footprint, and in turn selecting the top priority data to refine. This first stage is also important for understanding where you may have data gaps or where data quality is poor.

Data quality can be very variable. Ideally the footprint should be compiled from real measurements, but typically one may have to make assumptions, estimates and use proxy indicators in the absence of direct values. For events in particular, there may be serious gaps in information about venue designs, levels of services, numbers of people involved etc.

Successive iterations will lead to a refinement of the calculated footprint and more detailed data are collected for the most significant activities. These iterations are necessary to improve the accuracy and quality of the results.

As more and more sports organisation and events publish carbon footprint information, we will have a much better sense of the main areas of impact and the likely magnitude of emissions. In turn this will help flag up any rogue data that might otherwise skew the results.

INTERPRETING YOUR CARBON FOOTPRINT

The results will identify which activities contribute most to the total carbon footprint. These data should be checked carefully to confirm accuracy and ensure any necessary refinement and improvement of the assessment. Once confirmed, these will be the priority areas for actions to reduce your GHG emissions.

DATA QUALITY CAN BE VERY VARIABLE. IDEALLY THE FOOTPRINT SHOULD BE COMPILED FROM REAL MEASUREMENTS, BUT TYPICALLY ONE MAY HAVE TO MAKE ASSUMPTIONS, ESTIMATES AND USE PROXY INDICATORS

⁴ ICAO is a UN specialized agency, established by States in 1944 to manage the administration and governance of the Convention on International Civil Aviation

The results can also be used to improve the credibility of communication and reporting about your sustainability programme. The scientifically based figures will support what might otherwise be just anecdotal or qualitative examples of your work.

Carbon footprinting is typically based on annual measurements and organisations report year-on-year changes. In the case of sports organisations this annualised approach may not always be appropriate. If your activities are governed by changing locations for particular meetings and events, and each year you are involved in different numbers of events of different scales, the chances are you will have a carbon footprint that oscillates from year to year. In such situations it will be hard to track meaningful progress.

For example in the case of the IOC, our carbon footprint is largest in years with Olympic Summer Games. It is lower in years with Olympic Winter Games and lower still in non-Games years. Being based in Switzerland, we can expect to have a lower carbon footprint if the Games are held in Europe, simply because there would be less long-haul travel for our staff and members.

This means in our case we would really need a full Olympiad cycle of four years in which to gain a meaningful baseline and a second four-year period in which to measure the effectiveness of our actions. Even then, geographical differences in locations where the Games are held would affect the comparisons.

Clearly it would be unacceptable to wait eight years or more to get a clear picture and we therefore have to find other ways to interpret our data in a smarter and meaningfully comparable way. If you breakdown the overall carbon footprint into its component elements, there are likely to be some items that are similar from year to year irrespective of how many events and where they are located.

One way to do this is to analyse your procurement categories and see where you have consistent historical expenditure from year to year. These relatively stable categories could be useful markers to align with your carbon footprint data. Then, as you introduce emission saving measures relevant to these areas, you should be able to monitor progress to see if you have achieved real reductions. You might then be able to extrapolate to other categories and calibrate accordingly.

FURTHER GUIDANCE

The IOC has developed a detailed methodology for measuring the carbon footprint of the Olympic Games. This provides a consistent approach for Games organising committees (OCOGs) to follow and aims to shorten the learning curve for new OCOG Sustainability teams, thereby helping them concentrate on

developing and implementing carbon management strategies. Although pitched for the Games, these guidelines set out many key principles and practical approaches that could be applied to other major events and individual organisations.

TAKING ACTION

5

TAKING ACTION

TAKING ACTION

AVOIDING AND REDUCING GREENHOUSE GAS (GHG) EMISSIONS

Your carbon footprint calculations will provide clear information on which aspects of your activities have the greatest climate impact, either directly or indirectly. The next step is to decide which measures can be implemented to avoid or reduce these impacts.

It is important always to bear in mind when applying these guidelines that recommended

solutions in one situation may not be appropriate in another. It is important to evaluate carefully if any proposed reduction or substitution measures negatively impact other sustainability indicators. For example, switching to a seemingly more sustainable product that is easy to recycle, but which in fact has a high water use in production and is manufactured in a water-stressed region, could on balance be less sustainable than another alternative.

SCIENCE-BASED TARGETS

Science-based targets provide companies and other organisations with a clearly defined pathway specifying how much and how quickly they need to reduce their greenhouse gas emissions. Specifically, these targets are based on staying in line with the level of decarbonisation required to keep global temperature increase below 1.5 degrees Celsius compared to pre-industrial temperatures.

Such targets are inevitably challenging but basing one's efforts in alignment with the projections calculated by the Intergovernmental Panel on Climate Change (IPCC) and which form the basis of the 2015 Paris Climate Agreement, you have a clear sense of what is needed to be done and by when. This is a more credible approach than simply announcing a percentage reduction target without any underlying scientific rationale.

For more information see: <http://sciencebasedtargets.org>



Although each organisation and sports event has its own particular situation, experience tells us that the principal GHG emissions are likely to fall within a limited number of categories. The principal ones are detailed below, along with some typical actions that can be done to avoid or reduce emissions. More detailed practical guidance is given in Appendix 1.

Travel and transport

Sport involves a large amount of movement of people, equipment and materials, particularly in relation to competitive events, such as flights taken by teams and officials, ground transportation including official cars and buses and the shipping of freight.

While this will vary according to the sport and the level at which competitions are held, people's travel and transportation of freight make up the greatest single source of carbon emissions linked to sport.

Recommended actions include:

- Implement a sustainable travel policy (e.g. car pooling, cycle to work schemes, incentivising rail travel instead of flying or driving).
- Utilise virtual meeting technologies and reduce travel to physical meetings.
- Assess alternative means of moving goods and equipment to lower the carbon impact of freight (e.g. shipping in advance, rather than airfreighting).

Direct energy use

The consumption of energy for power, heating and cooling at sport venues and at the offices of sports organisations is the next greatest source of carbon emissions. For large-scale events we need also to consider additional energy requirements for broadcasting, catering and living accommodation.

Recommended actions include:

- Ensure existing venues and offices have an up-to-date energy saving plan.
- Use energy-efficient appliances, lighting and IT equipment.
- Specify energy efficiency requirements for event venues.
- Install on-site renewable energy generation and/or switch to "green" energy supplies.

Venue design and construction

There is considerable energy used in construction work but one of the biggest impacts here relates to the embodied carbon in construction materials such as steel and concrete. This means taking account of the carbon emissions associated with the extraction, processing, manufacture and freighting of the materials concerned. Of course these are one-off items compared with the day-to-day operation of venues, but it can take several years of operation to reach the same level of impacts as the initial construction.

Recommended actions include:

- Ensure venue utilisation and occupancy rate are optimised. Multi-purpose venues that are in constant use represent a more efficient use of resources than stadiums that lie empty for long-periods.
- Venue designs and fit-out specification should stipulate “low-carbon” materials, such as using aggregate and concrete with recycled content and reused timber and other materials.

Equipment and materials

Most sport events need specialist sports equipment and a wide range of materials for preparing and presenting the venues to make them event-ready. This may include the installation of structures – usually temporary – such as spectator stands, broadcast compounds, catering facilities, toilets and other services. Very often these are rented, but where individual, made-to-order items (e.g. timber, carpet, fabrics, plastic and cabling), are purchased, used and disposed of afterwards, these items will add considerably to your carbon footprint.

Specialist sports equipment may need to be procured and most events provide uniforms for workforce and officials, all of which also add to your carbon footprint, especially if they are for single-use – e.g. event-specific branded clothing.

Recommended actions include:

- Rent rather than buy equipment and materials, especially if only required for a short time.
- Give preference to products that have been certified according to sustainable production criteria (e.g. timber products, paper and energy-efficient appliances).
- Avoid single-use items, which are wasteful, and maximise opportunities for storing and reusing materials.

Food and beverage

The production of certain foods has a high carbon footprint, most notably meat and meat products as well as greenhouse-grown crops and those demanding large quantities of water. Transportation and packaging also add to the “embodied” impacts.

WHERE INDIVIDUAL, MADE-TO-ORDER
ITEMS SUCH AS TIMBER, CARPET, FABRICS,
PLASTIC AND CABLING ARE PURCHASED,
USED AND DISPOSED OF AFTERWARDS,
THESE ITEMS WILL ADD CONSIDERABLY TO
YOUR CARBON FOOTPRINT



Recommended actions include:

- Introduce menus for staff and/or event catering that have a higher proportion of non-meat dishes.
- Source food labelled from environmentally responsible agriculture.
- Minimise food waste through more accurate gauging of quantities required
- Work with charities to redistribute surplus food.

Waste

Sports events in particular can produce large quantities of waste, which if disposed of in landfills causes additional GHG emissions.

Recommended actions include:

- Adopt a waste hierarchy that limits the amount of material that is considered as waste in the first place, then prioritise efforts to reuse and recycle (including composting), followed by waste to energy and biogas production.
- Work with suppliers to limit amount of packaging and to use more sustainable types of packaging.

The plan for emission avoidance and reduction may focus on a specific area (e.g. travel or facility management), event staging, or the entire organisation. In most cases emission reductions are achieved through a combination of one-time interventions (e.g. upgrading a heating system), and on-going processes (e.g. managing the heating system). It therefore makes sense to establish emission reduction strategies that are set up as integrated parts of the daily management of the organisation or event.

While it might be tempting to launch into some of the actions recommended in this guide, the best approach is to develop an action plan that allows you to prioritise actions based on the anticipated climate benefits, and to measure the effectiveness of what you have done or plan to do. In this way you will gain a better understanding of cost-benefits and be able to keep track of progress over time.

Remember, however, that some small actions may have relatively little impact in terms of actual emission savings, but they can be symbolically powerful and therefore good for raising awareness and motivating people. For example only provide locally sourced food and soft copies of documents for meetings and conferences, and make sure you explain to delegates why you are doing this.

SOME SMALL ACTIONS MAY HAVE
RELATIVELY LITTLE IMPACT IN TERMS
OF ACTUAL EMISSION SAVINGS,
BUT THEY CAN BE SYMBOLICALLY
POWERFUL AND THEREFORE GOOD
FOR RAISING AWARENESS

SUBSTITUTING: REPLACING OLD WITH NEW

This is a form of emissions reduction but achieved through being more efficient, rather than through doing less.

It can be a difficult balance between continuing with existing equipment that may be energy inefficient, and replacing with a new “greener” model. Do the operational savings outweigh the capital cost and the impact of disposal of the old equipment and the manufacture and transport of the new goods? The best course of action is likely to vary with circumstances.

It is a clearer decision when dealing with planned upgrades, where existing equipment has run its useful life. This is where energy efficient appliances, lighting, heating, ventilation and air-conditioning systems (HVAC) and vehicles can be introduced. Of course, assumed end of useful life can be well before actual redundancy and it is important not to be premature in rushing to upgrade items that are still serviceable.

In a similar vein, it is good to consider switching to renewable energy supplies, or even seeking opportunities for installing on-site renewable energy generation, such as solar panels.

More specific guidance is given in the following chapter under “infrastructure and natural sites” (see Appendix 2).

COMPENSATING FOR UNAVOIDABLE GHG EMISSIONS

Despite best efforts to reduce your GHG emissions, you will still have a residual balance of unavoidable emissions. If air travel is part of your activities, you can be sure you will have a sizeable residual footprint.

Many organisations seek to compensate for such unavoidable impacts by supporting other activities that create climate benefits. These might include using your sporting connections to inspire others to reduce their carbon footprints, possibly by making pledges, or you might directly support energy efficiency or renewable energy schemes, or replanting projects in your local area. These are all positive things to do and they mean that you would be more involved in the projects, which can bring wider benefits in terms of community engagement and goodwill. However, it can be difficult to calculate the amount of compensating benefits realised through such initiatives, unless they are part of some official programme.



The common alternative is to buy carbon credits through offsetting schemes. These vary in cost per unit of carbon offset, usually because of different levels of rigour in verifying the validity of the schemes and ensuring they are providing genuinely additional carbon benefits (see p49). There are many options to choose from, both on the voluntary market and through official schemes.

The advantages of using carbon offsets is that they are an easy way of mitigating the impacts that cannot be avoided and you receive some form of certification to confirm the amount of carbon you have offset. Furthermore, many offset projects also strongly contribute to other sustainable development benefits including poverty reduction, energy access for the poor, health improvements, and improved access to services⁵.

The disadvantage comes in the sense that you are typically paying for projects happening somewhere else, unconnected with your activities, and this means there is less incentive for you to reduce your actual impacts. The harshest critics of offsetting liken it to “conscience money”.

The distinction is that offsetting is not an alternative to reducing your GHG emissions, but must be used as a complementary mechanism that only makes sense after measuring and reducing emissions, and taking your climate action to another level. In this way, you are reducing at home and also helping GHG emission reductions elsewhere.

There are several choices to make. If you decide to offset do you offset your entire carbon footprint or a proportion of it, and through which scheme? Part of the decision will be based on how effectively you have been able to minimise your footprint through reduction efforts, and also on whether you need to invest in climate adaptation measures, as set out later in this document.

If you decide not to offset, do you have a sufficiently credible sustainability programme on other matters to enable you to withstand any criticisms on your stance against offsetting? It is not currently obligatory to be “carbon neutral” or to offset your emissions, but you need to be confident in your overall sustainability programme.

⁵UNFCCC Voluntary Cancellation Platform

The marketing power of sport and its potential to raise awareness and inspire positive actions are huge assets. Campaigns through sport to encourage people to adopt more climate-friendly behaviours can make a significant difference. Of course these have to be underpinned by credible and meaningful emission reduction actions, but the scale of climate benefit that could be realised through sport promotional activities represents a huge compensatory measure.

Challenges of proving additionality

If something was going to happen in any case, it is not valid to claim credit for helping it to happen. That is the essence of the argument on “additionality”. For example, if your organisation invests in an offsetting scheme that supports the building of a wind farm in a developing country, the assumption is that the credits you have purchased were necessary in order for the wind farm to be built. Often, however, studies are showing that many such projects would have happened anyway, so in carbon emissions trading terminology, these would not be “additional”.

Proving genuine additionality is extremely hard and requires sophisticated checks and controls that lead to greater costs per offset unit or credit. Cheaper schemes will be vulnerable to accusations of lack of rigour, which in turn can reflect badly on the purchasing organisations.

A further concern is that renewable energy installations may not necessarily be replacing older, dirty power generation, but simply adding capacity to allow more development. Saying, “it could have been worse”, is hardly a clarion call to a more sustainable future.

Carbon offsets in the age of the Paris Climate Agreement

With the adoption of the Paris Agreement, it is widely expected that international offsets (emission reductions achieved in other countries) will align to follow a common standard defined under the UNFCCC. This is to ensure that the offsets used are real, verifiable and not double counted, which today is a risk with some voluntary offset types. Today, and most likely also in the future, there are a variety of offset types, offering different benefits at different costs.

WITH THE ADOPTION OF THE PARIS AGREEMENT, IT IS WIDELY EXPECTED THAT INTERNATIONAL OFFSETS (EMISSION REDUCTIONS ACHIEVED IN OTHER COUNTRIES) WILL ALIGN TO FOLLOW A COMMON STANDARD DEFINED UNDER THE UNFCCC



Currently, UNFCCC-certified offsets from the Clean Development Mechanism (CDM) are considered “Grade A” offsets, as they are the only ones that are internationally tracked and verified by the United Nations, according to rules and procedures agreed at international level. Other international offset types, as well as domestic offsets, may also offer high-integrity alternatives.

Under the previous international agreement, the Kyoto Protocol, onus was on countries in the developed world to reduce their climate impacts. Under this regime, the carbon offset market largely involved mechanisms enabling businesses and other organisations to buy carbon credits via international markets, which usually funded projects in developing world countries.

Changes brought about through the Paris Agreement mean that developing world countries will want to keep the credits for their own use, thereby making them less available for overseas buyers. In turn this means more emphasis on businesses and organisations to do more to reduce their own impacts, rather than turn to convenient offsetting solutions. There will also be more focus – out of necessity – on domestic projects.

There will doubtless continue to be voluntary offsetting schemes, but as national and city governments and international institutions such as the European Union, develop policies that no longer envisage using international credits after 2020, the effect on the carbon offset market will be considerable.

Please see Appendix 5 for examples of UN-backed offset schemes and other leading initiatives in the voluntary sector that can be applied to sport.

PROVING GENUINE ADDITIONALITY IS EXTREMELY
HARD AND REQUIRES SOPHISTICATED CHECKS
AND CONTROLS THAT LEAD TO GREATER COSTS
PER OFFSET UNIT OR CREDIT

GERMAN SPORTS CLIMATE FUND

As a result of winning the right to host the Euro 2024 Football Tournament, the German Football Association has launched a fund to improve the environmental performance of its 25,000 member clubs as a way of mitigating the impact of the event. The fund is being positioned as an alternative to investing in carbon offset projects.

Through this initiative amateur clubs will be able, for example, to apply for support to replace old boilers, invest in e-mobility facilities, or buy energy-efficient electrical appliances. Normally such projects would be out of reach for grassroots sports facilities. This approach is based on the premise that the overall climate impact of the sport is much more related to the day-to-day operations of thousands of small clubs, than the one-off impact of a mega event.

Source: <https://sportsustainabilityjournal.com/news-analysis/sports-climate-fund-makes-environmental-transformation-possible-for-thousands-of-amateur-german-football-clubs/>

The DOW climate solutions framework

As the Official Chemistry Partner of the IOC, Dow has partnered with the Organising Committees of the Olympic Winter Games Sochi 2014 and Olympic Games Rio 2016, and the IOC itself, to develop tailor-made carbon mitigation programmes that address the technology needs of the regions in which they are implemented. The programmes have involved working with a wide range of stakeholders to introduce innovative low-carbon technologies in the sectors of Buildings & Infrastructure, Food & Packaging, and Manufacturing & Energy. These mitigation projects create high-quality, verified emission reductions to help balance the carbon footprint of the OCOGs mentioned above and the IOC, while at the same time accelerating the adoption of more sustainable technologies across different sectors.

The carbon mitigation programmes follow the principles outlined in Dow's Climate Solutions Framework. This allows event owners and organisations, in collaboration with partners, to implement a structured yet flexible approach to quantify and mitigate carbon emissions while also leaving a positive social and economic legacy.

Through these carbon mitigation projects, which commenced in Sochi in 2012, Dow has already delivered 4.3 million tonnes of carbon dioxide equivalent (CO₂eq), as of August 2018. By 2026, the reductions are projected to exceed 6 million tonnes of CO₂eq.

For further information, including full details of the Climate Solutions Framework and progress reports please see: <http://client.dow.com/Sustainability-in-Sport-Request>



REPORTING YOUR EMISSIONS

Although most sports bodies are not normally required to report their GHG emissions, it is worth considering disclosing this information in your advertising material, on your website and in any corporate sustainability reporting that you plan to do.

By communicating the results of efforts made to reduce the carbon footprint you can help increase staff motivation and more broadly improve awareness and understanding of your sustainability programme among partners, suppliers and other stakeholders.

The golden rules for communicating about your carbon footprint and climate actions are transparency and honesty, in order to avoid any risks of greenwashing or overstatement. The best way of achieving this is through third-party verification, although that may involve additional cost.

The information should be presented clearly and you need to distinguish the main categories of activity and who is responsible for each of these (e.g. your organisation or a partner or other party associated with your activities). A clear explanation must be given for any excluded categories or subcategories.

Your climate action footprint report should be written in a clear and accessible style that can be understood by non-specialists. It should include a chapter summarising your methodological approach, referencing relevant guidance for full details of the methodology used.

The contents of your climate action report should include the following sections:

General

- date the carbon footprint was calculated;
- contact information of parties involved in the calculation;
- changes since previous inventory and explanation for such changes;
- review statement by external panel of experts (optional); and
- main limitations of the study.

Scope

- description of the approach: main principles, timeframe and calculation methodology;
- clear description of the organisation/project being assessed in the carbon footprint;
- clear and comprehensive description of the categories and subcategories included in the scope; and
- comprehensive list of the activities excluded from the scope and the reason or justification for exclusion.

YOUR CLIMATE ACTION FOOTPRINT REPORT
SHOULD BE WRITTEN IN A CLEAR
AND ACCESSIBLE STYLE THAT CAN BE
UNDERSTOOD BY NON-SPECIALISTS

Data and assumptions

- databases used, name and version number;
- software used and version number (where relevant);
- comprehensive tables of data used for the calculations and corresponding sources, assumptions and limitations (in particular data missing); and
- data quality assessment (e.g. high, medium, low).

Results

- carbon footprint results, displayed per category and per subcategory; and
- analysis of potential reduction measures, with:
 - List of proposed reduction measures
 - Description of the approach for selecting the measures
 - Data used for the calculation of reduction potential of each measure and corresponding sources and assumptions
 - Potential GHG emissions reduction for each measure.

Public reporting will also provide you with opportunities to participate in voluntary initiatives and platforms such as UN Climate Change (UNFCCC)'s Climate Neutral Now Initiative, Momentum for Change Awards and Non-State Actor Zone for Climate Action. These will bring additional visibility to your organisation and showcase your progress and commitment.

The reporting should ideally include all parts of your organisation and activities, which you own or control, and all the emissions you measure, reduce and/or offset. It should also be organised in a way that data can be compared over time to show progress.

CLIMATE NEUTRAL NOW



The sports community can contribute to climate action, not only by addressing their own climate footprints, but also by spreading the word by including a strong climate action message in regular reporting and outreach to fans and partners. One way of making a statement is to join UN Climate Change (UNFCCC)'s Climate Neutral Now initiative by formally committing to move towards climate neutrality by measuring, reducing and offsetting your carbon footprint with UNFCCC-certified emission reductions.

At its core, Climate Neutral Now helps much-needed projects in developing countries to be implemented. This means that emissions are reduced as swiftly as possible, thereby enabling the world to head towards climate neutrality and, in so doing, meet its Paris Agreement obligations.

If you have taken steps to measure, reduce and offset your GHG emissions, you are invited to join the Climate Neutral Now initiative, whereby your commitment and actions are highlighted by UNFCCC and you have the opportunity to collaborate with UNFCCC and other sport organisations to support climate action in sports. For further information please see:

<https://unfccc.int/climate-action/climate-neutral-now>

6

ADAPTING TO CLIMATE IMPACTS

ADAPTING TO CLIMATE IMPACTS

The UNFCCC defines climate adaptation as actions taken to help communities and ecosystems cope with changing climate condition. This is recognition that climate change will impact on your activities, and therefore you need adaptation strategies to manage these impacts and lower the risks posed by the consequences of climate change.

Climate-related impacts may already be affecting your organisation and require immediate responses, while other impacts are projected for the future and require forward-looking strategies. These could be applied to sport events, venues, or your offices, and may encompass design criteria, operational management policies and emergency protocols.

ADAPTATION MEASURES FOR SPORT EVENTS

Event organisers need to consider potential effects of extreme weather on playability, athlete health and the welfare of workforce and spectators.

Throughout their existence some sports have had to contend with events being disrupted, cancelled or abandoned due to weather, but in recent years the trend for this is increasing. More problematic is the situation of extreme

heat, where the sport is still technically possible but potentially risks the health and wellbeing of athletes, and impacts on performance standards. In many places, such situations are becoming more predictable, and therefore organisers should be planning contingency measures, such as alterations to schedules, or even alterations to the rules of the sport, in order to avoid the most serious risks.

For workforce and spectators potential actions can include ensuring there is adequate provision of drinking water, sun cream and shade at events where hot conditions are likely, putting in place more medical support, and providing basic information for people about avoiding heat stress. These are normal precautions in hot conditions, but the issue is that extreme heat is becoming more common, including at times and places where it might not have been anticipated.

For the workforce, more frequent rest breaks and adjustment to shift patterns and/or working hours may also be necessary (see also section on “workforce” in Appendix 3).

Some large events have used misting sprays to cool spectators. Although refreshing, this does mean using potable water, which carries a cost and might not be the best use of scarce water resources.

EVENT ORGANISERS NEED TO CONSIDER
POTENTIAL EFFECTS OF EXTREME WEATHER
ON PLAYABILITY, ATHLETE HEALTH AND THE
WELFARE OF WORKFORCE AND SPECTATORS



There is of course a greater cost impact from all these measures, ranging from one-off costs for infrastructure improvements, to greater energy bills and expenditure on consumables and health and safety measures. Ironically, such additional safeguards may in themselves add further GHG emissions.

ADAPTATION MEASURES FOR SPORT VENUES AND BUILDINGS

The management of outdoor sport surfaces needs to anticipate a range of potential impacts from changes in rainfall patterns, requiring modifications to drainage or irrigation systems, and impacts from new pests and diseases infecting turfgrass, to increasing reliance on artificial snowmaking in mountain resorts (see box over page).

Design of new venues, or refurbishing old sites, should always factor in climate adaptation measures, including ventilation, orientation of buildings, choice of materials and natural landscaping – vegetation has an important cooling effect, as well as aesthetic and ecological benefits. Location of new venues should also assess potential risks from flooding, forest fires, landslips and coastal erosion (see also p77 for section on “infrastructure and natural sites”).

Existing venues may benefit from new or modified heating, ventilation or air-conditioning (HVAC) systems and changes to management practices in order to save water resources. Water storage, rainwater harvesting and sustainable drainage systems are other important considerations. Additional structures to provide shade, or establishing areas of natural vegetation may also be sensible.

In some extreme situations the cost of protecting against flooding or coastal erosion may be too great, and a policy of “managed retreat”, or even total relocation has to be considered.

DESIGN OF NEW VENUES, OR REFURBISHING OLD SITES, SHOULD ALWAYS FACTOR IN CLIMATE ADAPTATION MEASURES, INCLUDING VENTILATION, ORIENTATION OF BUILDINGS, CHOICE OF MATERIALS AND NATURAL LANDSCAPING



ARTIFICIAL SNOW

Snowmaking is simultaneously a climate adaptation measure and a generator of carbon emissions. In terms of adaptation, snowmaking is essential for maintaining viable ski seasons, pretty well everywhere. It overcomes natural variability, enabling resorts to provide consistent conditions for longer. This predictability is vital for the economic health of a multi-billion dollar industry. However, there are fears that snowmaking technology may not indefinitely be able to overcome warming trends due to climate change.

Fundamentally, snowmaking requires cold air, water and power. In drought-stressed regions, water scarcity is likely to be the critical limiting factor. Elsewhere, resort managers fear conditions will just not be cold enough to make sufficient artificial snow, even with the various additives that enable snowmaking in warmer temperatures. On the economic side, precision snowmaking is energy intensive, despite considerable efficiencies over the years – what once took a week to produce, can now be done in a day. However, aside from the investment in snowmaking machinery and water storage infrastructure, at some resorts the power cost for snowmaking can represent over half the annual energy budget.

Source: <https://www.mnn.com/money/sustainable-business-practices/stories/snowmakers-are-saving-ski-resorts-for-now>

EDUCATE AND INSPIRE

7

EDUCATE
AND INSPIRE

EDUCATE AND INSPIRE

We have explained in this guide about the urgency of addressing the increase in global temperatures, and about the severe impacts these are already having on many sports. The direction of travel is clear: climate change impacts are going to affect sport more and more in the coming years and it is vital for the sport community worldwide to take action to reduce emissions and to put in place climate adaptation measures.

Fortunately, the sport sector is uniquely placed to make a major contribution to tackling climate change. This is not through the quantum of potential greenhouse gas (GHG) emission savings to be achieved, but through the multiplier effect of sport being able to communicate, inform and inspire millions of people.

Other industries – for example aviation, agriculture and power generation – have much more massive global footprints and therefore a greater responsibility in quantitative terms to take action on reducing GHG emissions.

But the power of sport as a vehicle to raise awareness and motivate action worldwide is compelling. This global awareness should lead to numerous actions small, medium and large, all of which would add up to a truly significant total of GHG emissions savings.

EDUCATION

Usually when considering education, the focus is on young people; in sport especially, we are frequently talking about youth and future generations. However, in the context of climate change it is important to appreciate that sport is not simply a vehicle for educating others. Climate change is happening now and the policies and actions to address its impacts need to be put in place immediately. Therefore the priority must be for internal education within the sport sector for decision makers and managers to understand their roles and responsibilities in this field.

THE SPORT SECTOR IS UNIQUELY PLACED
TO MAKE A MAJOR CONTRIBUTION TO
TACKLING CLIMATE CHANGE THROUGH THE
MULTIPLIER EFFECT OF SPORT BEING ABLE
TO COMMUNICATE, INFORM AND INSPIRE
MILLIONS OF PEOPLE



This matters so that the sport sector as a whole can make a meaningful contribution to lowering global GHG emissions. By doing this, your organisation will increase its own resilience in the face of climate change – which is impacting sport now – and you will also gain credibility for when you come to promote messages on climate action to your stakeholders and wider public. It is a case of leading by example.

Through our partnership with UN Climate Change (UNFCCC), we intend for the IOC to be a source of information and guidance on this vital issue. We will be able to access relevant training materials and publications, as well as continue to develop bespoke educational materials.

At a local level we recommend sports organisations partner with NGOs, universities and other specialists (individuals and institutions) to draw upon existing and locally relevant materials, and to develop specific educational modules, workshops and training courses for your people. Ideally these should be relevant to all people in your organisation and those closely associated with your activities, such as suppliers, partners, venue owners etc. Most importantly, however, you need to ensure that your leadership team and senior managers participate in your climate awareness education programme.

The scope and content of this guide can serve as a framework for educational courses for professional people working in the sport sector. Ideally it should be used alongside the first guide in the “Sustainability Essentials” series: [“Introduction to Sustainability”](#).

INSPIRATION

Sport has the power to inspire, to motivate, to excite and to attract a following. In particular, in a world increasingly facing challenges, sport can be a vehicle of hope and aspiration. And it is fun.

These are the attributes that are so important to mobilise in the mission to raise awareness about climate change and to inspire millions of people to take positive action. The resources available through sport are immense:

- Broadcasting channels
- Social media
- Athletes as role models and climate ambassadors
- Showcasing sustainable actions at events and at club grounds
- Association/federation networks
- Sport clubs memberships and team fans
- Sponsors and partners
- Iconic venues

The challenge is for sports organisations to mobilise these assets to support action on climate change. Some current examples of sports bodies/people taking positive climate action are summarised over the page.

Reducing energy costs for grassroots sports clubs

The Dutch Football Association (KNVB) has pledged to help the nation's 3,000 grassroots sports clubs significantly lower their energy costs and environmental impact by brokering renewable energy deals and facilitating finance opportunities for energy-saving equipment. As part of De Groene Club (The Green Club) project, the KNVB has partnered with a utilities company to offer amateur clubs energy advice, as well as favourable prices for the installation of solar panels, new boilers and insulation.

The KNVB and its partners KNLTB (Dutch Tennis Association) and KNHB (Dutch Hockey Association) plan to go through the same five-step process (energy advice, drafting plan of approach, best-value common measures, financial advice, and realisation) with 300 grassroots clubs per year, starting with football, hockey and tennis.

Interested clubs are expected to make an initial investment of between €30,000-€50,000 to purchase equipment, such as solar panels and boilers, with a return on investment expected after around five or six years. They can use their own money or apply for financial assistance through the Stichting Waarborgfonds Sport (SWS), a social investment fund, which has been facilitated by the KNVB.

Source: <https://sportsustainabilityjournal.com/news-analysis/dutch-fa-making-the-economic-case-for-environmental-sustainability-in-grassroots-sport/>

SPORT HAS THE POWER TO INSPIRE,
TO MOTIVATE, TO EXCITE AND TO
ATTRACT A FOLLOWING. IN PARTICULAR,
IN A WORLD INCREASINGLY FACING
CHALLENGES, SPORT CAN BE
A VEHICLE OF HOPE AND ASPIRATION



“The most sustainable football club in the world”

Forest Green Rovers Football Club is a professional club in League Two, the fourth tier of English football. The club has attracted much media and public attention for their ambitious and overt stance on sustainability and is an inspiring example for others to emulate in any sport. Below is an extract from the club’s website:

“We’re bringing together football and environmental consciousness in a way no other football club in the world is doing right now. And it’s working. We see a great opportunity to create a truly sustainable football club – somewhere we can demonstrate sustainable thinking and technology to a new and passionate audience.”

Underpinning this inspiring call to action are some impressive achievements:

- **Green energy** – the entire club is powered by 100 per cent green energy supply, including some directly generated on-site from solar panels on the stadium roof.

- **Organic pitch** – no pesticides or herbicides are used on the turfgrass.
- **Water conservation** – rainwater is captured for pitch irrigation instead of mains water.
- **Electric mower** – the grass is cut with a GPS-directed electric lawnmower powered by solar energy.
- **Sustainable transport** – fans are encouraged to travel to all games (home and away) by sustainable means and at the ground the club has installed electric vehicle charging points.
- **Sustainable food** – Forest Green Rovers is 100 per cent vegan: it offers freshly made vegan food to all players, staff and fans, which is a significant way of reducing the club’s carbon footprint.

The club has also created an eco-trail so that visitors to their home ground can explore all the initiatives being done to make the club a champion of sustainability.

Source: <https://www.fgr.co.uk/our-ethos>

ONOC Ambassador for climate change

David Katoatau the champion weightlifter from Kiribati, 2014 Commonwealth Games Gold Medallist, and three times Olympic Games representative, has been named as an Oceania National Olympic Committees (ONOC) ambassador for climate change as he seeks to raise awareness of the issue.

David has a strong personal connection with the issue of climate change, having lost his family home to a severe tropical storm and recognising the plight of his country, a low-lying small island state that is suffering from sea level rise and severe coastal erosion. Therefore, he is able to use his profile and popularity as a leading sports personality to convey a powerful message that resonates because of his personal story.

Many athletes from across the spectrum of sports and nations could similarly be impressive advocates for climate action and it is important for sports organisations to seek candidates and nurture opportunities for them to have a voice.

Athletes for the Earth

Athletes for the Earth™ is a campaign by Earth Day Network⁶ to profile Olympic and professional athletes as spokespeople for Earth Day and to increase environmental awareness and activism, with a focus on climate action. The initiative was launched at the 2010 Olympic Winter Games in Vancouver with the following aims:

- harness voices of athletes to address climate change;
- illustrate the interaction of athletes with their environment;
- connect popular athletic activities with environmental stewardship;
- promote role models for young people;
- express athletes' unique dependence on healthy climate conditions that allow them to compete; and
- promote environmental stewardship through PSAs and public appearances.

Olympic TOP Partner Toyota is the exclusive corporate partner of Athletes for the Earth in 2018 and aims to continue this role through to the 2020 Olympic Games in Tokyo.

Source: <https://www.earthday.org/campaigns/campaign-for-communities/athletes-for-the-earth/>

⁶ Growing out of the first Earth Day in 1970, Earth Day Network is the world's largest recruiter to the environmental movement, working with more than 50,000 partners in nearly 192 countries to build environmental democracy.

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FINAL THOUGHTS AND FUTURE ISSUES TO CONSIDER



FINAL THOUGHTS AND FUTURE ISSUES TO CONSIDER

All scientific projections are pointing to greater variability and extremes in weather patterns. Although long-term forecasting is fraught with difficulty, analysis of trends does show increasingly the likelihood of climate change having an impact on the traditional timing of several outdoor sports. Not only might this affect timing of events (e.g. to hold them earlier or later in the day when temperatures are cooler), but ultimately we could also be faced with seasonal shifts and having to reconsider calendar slots for particular sport seasons and events.

Aside from the physical consequences of unplayable conditions, climate impacts will have significant consequences for athlete training regimes, public attendance, sponsorship and broadcasting schedules.

Given that the largest climate impact of sport can be attributed to greenhouse gas (GHG) emissions from travel, will this lead to rethinking how we are able to afford big global events? Will we need to recalibrate how events are staged, so that spectators from further afield are encouraged to watch from home rather than travelling to a live event?

WILL WE NEED TO RECALIBRATE HOW
EVENTS ARE STAGED, SO THAT SPECTATORS
FROM FURTHER AFIELD ARE ENCOURAGED
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Each of these considerations would have major contractual and financial implications. There are no simple solutions here, as rights packages for sponsors and broadcasters are often based on multi-year agreements and take account of schedules for many different events across a calendar period. Nevertheless, the potential impacts of climate change are such that NOCs, IFs and other sport governing bodies collectively need to examine the risks posed to their sports alongside the health and wellbeing issues for all the people involved.

This of course assumes that sport bodies have full control over such decisions. Increasingly, however, we may see tighter legislative controls on working practices and health and safety such that public authorities and trade unions will be significant determinants on future planning for sports activities.

Therefore sports bodies need to anticipate such eventualities and become more actively engaged with the relevant authorities and other stakeholders, to ensure that sport has an effective voice in the matter.

As with all such issues, credibility comes from being seen to take the matter seriously and taking demonstrable steps to implement relevant measures. While the sport sector alone cannot turn back the tide of climate change, it is a hugely important player in this issue, with the capability of showcasing practical solutions to a vast audience, including business leaders and decision makers, as well as the general public.

Therefore, the actions taken by all sport bodies, large and small, will collectively make a positive difference that will resonate across the whole sector and beyond.

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“THE ONLY CERTAINTY ASSOCIATED WITH CLIMATE CHANGE IS THAT THERE WILL BE GREATER UNCERTAINTY.

Climate change will be accompanied by a complex range of direct and indirect impacts with many unknown variables necessitating a range of socio-cultural/community responses. The best model for strategic management in the face of complexity and uncertainty will be an industry framework for climate change. The [sport] industry must work in partnership to ensure these strategies work together and do not compete.

It is vital that urban green spaces are recognised as underpinning the very fabric of our sport, leisure and recreational industries and that water used to maintain them is considered to be necessary. Green spaces also mitigate the impacts of climate change.

... It is essential that we demonstrate maximum water-use efficiency across all sectors and develop and maintain a culture of excellence and continuous improvement...”

Source: <http://www.dsr.wa.gov.au/about/plan-for-the-future/climate-change>

WHILE THE SPORT SECTOR ALONE CANNOT
TURN BACK THE TIDE OF CLIMATE CHANGE, IT IS
A HUGELY IMPORTANT PLAYER IN THIS ISSUE

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APPENDICES

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APPENDIX 2: Practical measures for climate action

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APPENDIX 1: SPORTS FOR CLIMATE ACTION FRAMEWORK

1. BACKGROUND

1. Global warming is placing our planet and future generations at risk. Meeting the scale of the challenge requires action by all sectors, including the sport sector to achieve the goals of the Paris Climate Change Agreement. Around the world, governments, cities and businesses are taking bold climate action, leading the way towards a healthier and more sustainable future. By employing solutions to global warming each of us will be improving and contributing to public health, promoting social justice, preserving natural resources, creating reliable sources of energy and contributing to the society and economy as a whole.
 2. Businesses are now looking to respond to the challenges of climate action in tangible ways. Companies are committing to renewable energy and energy productivity, are setting concrete targets in line with the climate science and cross-sectoral business initiatives are recognizing and addressing the climate impacts of supply chains and resource use on agriculture, land use, transport and water. Collectively climate action by non-state actors can provide building blocks for 21st century businesses models and for delivering the scale needed to transform economies. Yet, there is a universal recognition that more ambitious and effective climate action from all levels of government, the private sector and civil society is needed now to limit the global temperature rise to 1.5 degrees Celsius, and avoid the worst effects of climate change.
 3. Sports organisations can display climate leadership by engaging actively and collectively in the climate neutrality journey, in turn helping to differentiate from competitors, build brand reputation and engage their sports personnel, employees and members on environmental issues.
 4. This can be achieved by taking responsibility for their climate footprint, helping global ambition step-up and incentivising action beyond sports to take meaningful and transformative climate action.
- #### 1.1 Implications of the Paris Agreement for the sport sector
5. In 2015 the governments of the world came together to determine a new direction for global growth and development. In September 2015, the Sustainable Development Goals, or SDGs, were agreed. Then, in December of the same year, the Paris Climate Change Agreement was adopted, rapidly entering into force in November 2016. The Paris Agreement and Sustainable Development Goals are two visionary agreements which hold great potential to stabilize our climate, proliferate peace and prosperity, and open opportunity for billions of people.
 6. The Paris Agreement seeks to accelerate and intensify the actions and investment needed for a sustainable low-carbon future. Its central aim is keeping a global temperature rise this century to to 1.5 degrees Celsius above pre-industrial levels and to pursue efforts to limit the temperature increase even further to 1.5 degrees Celsius. The Paris Agreement also aims to strengthen the ability of countries to deal with climate change impacts.



Countries have put forward “nationally determined contributions” (NDCs), with a commitment to strengthen these efforts in the years ahead. However, success cannot be achieved by governments alone. All sections of society, from individuals to corporations, must contribute at increasing levels of scale and acceleration.

7. Sport’s impact on our climate is complex and can be difficult to measure depending on the size of the organization and/or event. However, most sports organisations and fans would now acknowledge that sport’s contribution to climate change – through associated travel, energy use, construction, catering, and so on – is considerable. Moreover, sports’ global interest for billions of fans, and the media coverage generated in response, provide a strong platform for the sport sector to play an exemplary role in meeting the challenge of climate change, and inspire and engage large audiences to do the same.
 8. Impacts of climate change will vary greatly from region to region and from sport to sport. However, some general implications for the sector can be inferred:
 9. Climate change is also impacting on sport. We see this happening in various ways:
 - (a) Damage to playing surfaces due to extreme temperatures, extended periods of drought, flooding, and/or pest species extending their natural range
 - (b) Damage to buildings and other infrastructure due to violent storms
 - (c) Coastal erosion and sea level rise directly affecting sport properties in seaside areas
 - (d) Warmer winters and lack of natural snow threatening ski resorts at lower altitudes
 - (e) Unseasonal rainfall forcing cancellation or abandonment of sport matches
 - (f) Heat waves forcing changes to timing of sport events
 - (g) Increased injuries to players from heat exhaustion and impact injuries from harder playing surfaces
 - (h) More potentially harmful algal blooms limiting direct contact outdoor water sports
 - (i) Sub-standard fan experience where high temperatures create potential health risks and detract from the enjoyment of the event
 - (j) Climate adaption measures being required in the design of new or refurbished sport venues
 10. All these impacts have potentially significant financial repercussions in addition to their physical and logistical impacts. These are not projections; they are all real impacts that have happened and continue to happen across sports and throughout the world.
- ## 1.2 Opportunity for sports sector to become a climate leader
11. UN Climate Change invites sports organizations and their stakeholders to join a new climate action for sport movement that will set the trajectory and provide the support for sport to play a winning role in achieving global climate change goals.
 12. Uniting behind a set of principles, this movement of sports organisations and their communities will work together to get on track for the net zero emission economy of 2050 that global leaders agreed in Paris.
 13. In particular, UN Climate Change welcomes the leadership of the International Olympic Committee to contribute to key areas of action under this movement, and invites other governing bodies, sport federations, leagues and clubs, to join the journey to jointly develop climate action agenda in sports, by leading and supporting specific working groups and by bringing their expertise, tools and best practices, into this framework.



14. The activities under Sports for Climate Action have two overarching objectives:

- (a) Achieving a clear trajectory for the global sports community to combat climate change, through commitments and partnerships in congress with verified standards, including measuring, reducing, and reporting greenhouse gas emissions in line with the 1.5–2-degree scenario as set out in the Paris Agreement;
- (b) Using sports as a unifying tool to drive climate awareness and action among global citizens.

15. Sports for Climate Action sets out a cooperative framework to both catalyse new and enhance existing environmental commitments. It needs to be open and inclusive initiative seeking to build on other related initiatives and commitments made by participating organisations.

2. SPORTS FOR CLIMATE ACTION PRINCIPLES

16. The Sports for Climate Action Initiative aims to provide sports organizations with a forum where organizations can pursue climate action in a consistent and mutually supportive fashion by learning from each other, disseminating good practices, lessons learned, developing new tools, and collaborating on areas of mutual interest.

17. The Principles of Sports for Climate Action Initiative will serve to mainstream climate action and will outline actions that, at a minimum, meet fundamental responsibilities in the areas of environmental sustainability and combatting climate change. By incorporating the five principles into strategies, policies and procedures, and by vocalising them to the sports community, organisations are upholding their basic responsibilities to people and planet, but also setting the stage for wider diffusion of the

message and long-term success beyond the context of sport.

18. The participants in the Sports for Climate Action Initiative will commit to adhere to the following five principles:

- (a) **Principle 1: Undertake systematic efforts to promote greater environmental responsibility;**
- (b) **Principle 2: Reduce overall climate impact;**
- (c) **Principle 3: Educate for climate action;**
- (d) **Principle 4: Promote sustainable and responsible consumption;**
- (e) **Principle 5: Advocate for climate action through communication.**

19. Sports organizations are invited to sign up to the Sports for Climate Action principles, regardless of their current stage in their environmental endeavours and work collaboratively to identify and spotlight climate solutions. There is a requirement to demonstrate ongoing progress, over time, after commitment to these principles is established.

Principle 1: Undertake systematic efforts to promote greater environmental responsibility

20. The objective of this principle is to move beyond ad-hoc environmental practices to a comprehensive incorporation of climate change and its impacts into business strategy for operations, events, procurement, infrastructure and communications.

21. As a minimum, sport organisations should bring themselves up to the standards of good practice by; establishing responsibility for sustainability at the board level by defining sustainability strategies and implementing robust approaches to reducing their climate impact, and by considering internal and external issues that influence the climate impact of the organization now and in the future.



Principle 2: Reduce overall climate impact

22. The objective of this principle is to encourage sports organizations to prepare a strategy for achieving climate neutrality for their organizations and their events. No matter what size of organisation or sporting event, everyone has a climate impact and everyone can take action to reduce it. The following series of key steps represent best practice in taking action to minimise and eventually neutralise your climate impacts. They offer a practical approach to achieve the greatest positive impact in the most efficient and cost effective manner.

2.1 Measure and understand

23. The starting point should be to gather information on your current activities to enable you to calculate a baseline climate footprint. This provides a robust, quantitative measure of your organisation's (or event's) GHG emissions.

24. This measurement is necessary to evaluate the overall climate impacts of your organisation or project, and to understand which activities contribute most to these impacts.

25. Understanding the most significant impacts is essential for guiding decision-makers to take actions that will reduce your GHG emissions. The top priority should be to focus on activities that have the highest contribution to your climate footprint. This will help you to select the most cost-effective actions with the highest reduction potential.

2.2 Take action

26. Actions to mitigate your climate impacts would normally follow a hierarchical approach:

- (a) Avoid – actions designed to eliminate GHG emissions occurring in the first place.
- (b) Reduce – actions designed to lower the climate impact of your current activities. This may entail using resources in a more

efficient way and thereby reducing the overall need, and associated costs, for such resources

- (c) Substitute/replace – actions designed to improve efficiency. This may be achieved by switching to more efficient and “cleaner” equipment, fuels, materials or processes.
- (d) Compensate – actions designed to compensate for some or all of your remaining, unavoidable impacts, typically by investing in emission reductions in other projects through UNFCCC recognised mechanisms.
- (e) Report – provide a credible account of your climate footprint and the climate actions you have undertaken in order to share knowledge and lessons learned.

Principle 3: Educate for climate action

27. The objective of this principle is to bring together, diffuse and spotlight existing guidelines, resources, tools and expertise and collectively address potential knowledge gaps. It aims to enable knowledge sharing capacities to optimize the impact of collective effort on climate action. This principle can provide a forum for sport organisations to understand climate change issues in a global and regionally relevant context and incorporate lessons into their strategy.

Principle 4: Promote sustainable and responsible consumption

28. The objective of this principle encourages sports organizations and sports events organizers to adopt sustainable procurement policies to motivate providers to develop cleaner options. Communication campaigns toward fans and other stakeholders could be built, to promote the use of greener, sustainable options. This also applies to giving preference to sustainable means of transport, being one of the major sources of GHG emissions in sports, thereby supporting global transition to low-carbon transport.



Principle 5: Advocate for climate action through communication

29. The objective of this principle refers to consistently promote awareness about climate change by mobilising resources to support action on climate change, such as:

- (a) Broadcasting channels
- (b) Social media
- (c) Athletes as role models and climate ambassadors
- (d) Showcasing sustainable actions at events, at club grounds and at iconic venues
- (e) Association/federation networks
- (f) Sport clubs memberships and team fans

3. MODALITIES OF WORK

30. The UN Climate Change is committed to facilitate and coordinate, within its resources and mandates, and as part of its work on Global Climate Action, the work undertaken by signatories to Sports for Climate Action.

31. The Sports for Climate Action Initiative does not constitute a new formal initiative or registered organization, but work is carried out by the signatories with facilitation from the UN Climate Change secretariat.

32. Signatories to the Sports for Climate Action are committed to support the implementation of the principles contained in its Framework, both by pursuing the principles within their own organizations, by leading the work for a specific principle, and by working collectively with other signatories.

3.1 Delivery of sports for climate action

33. Delivery of the Sports for Climate Action Initiative is through working groups, each having a focus on one of the principles in the Sports for Climate Action Framework.

34. Working groups will convene to develop activities, processes and, if necessary, come up with joint resources to carry out work under each principle. This among others, means mapping existing tools and resources, developing approaches for how good practices can be scaled up and applied consistently, including by agreeing on methodologies or minimum criteria for reporting and recognition of climate action by sports organizations.

35. Sport Organisations who sign up to the principles defined in this Sports for Climate Action Framework will be invited to lead and/or contribute to the working group of their choice and support the development of associated activities falling under that specific working group, in collaboration with the UN Climate Change secretariat. Sport Organizations signing up to the Sports for Climate Action Initiative may contribute to the work of one or several working groups of their choice⁷.

36. Substantive direction of the work for each principle is to be decided by consensus among the organizations that are part of that working group, and reflected in a time-bound working plan.

⁷ Signatories are required to apply the principles defined in this framework. Participation in the working groups is optional, but very much encouraged.



37. Working group activities requiring resources for their implementation shall be budgeted for by the participating organizations, either through own sources of funding or through joint fund raising.
38. Any products or outputs resulting from the work of participating organizations will be free of copyright and publicly accessible.
39. No participating signatory may represent, or make statements on behalf of the other signatories of the Sports for Climate Action Initiative, unless this has been agreed by all Signatories.
40. The participation of signatories in the working groups will be recognized by the UN Climate Change secretariat in relevant communications and events. Such participation may also be reflected in the signatories' own communications, by stating that they are a signatory to the Sports for Climate Action as part of the sports sector response to UN Climate Change global climate action.
41. Signatories of the Sports for Climate Action are not entitled to use the name or logo of the UN Climate Change without the express permission by the UN Climate Change secretariat in writing.
42. The UN Climate Change secretariat and the signatories of the Sports for Climate Action Initiative may not use the name, brand or logo of any of the other signatories without express permission.
43. The UN Climate change will deploy its existing Global Climate Action platforms such as NAZCA, Climate Neutral Now, and the Momentum for Change initiative to inspire action, track progress and/or highlight success and provide recognition.
44. The UN Climate Change secretariat will facilitate the work by:
- (a) Supporting the delivery of the working groups goals as per UN Climate Change's existing resources and mandates;
 - (b) Maintaining a list of signatories and their participation in working groups;
 - (c) Facilitating regular online calls and meetings as may be necessary among signatories;
 - (d) Organizing an annual face-to-face meeting with all signatories to take stock of progress; share lessons learned, and discuss and agree on work to be done in the next year. Leads of the working groups will be invited to host the meeting on a rotational basis and attendees will bear their own costs of attendance;
 - (e) Coordinating external communication activities by the signatories;
 - (f) Presenting and explaining the work of the signatories to other entities and organizations, as needed, to facilitate delivery of work by the signatories.
45. The International Olympic Committee will facilitate the work by:
- (a) Creating and publishing joint guidelines together with the UN Climate Change to support and facilitate the signatories in understanding and implementing the guiding principles;
46. In order to ensure the quality and credibility of the work of the signatories of the Sports for Climate Action Initiative, the UN Climate Change secretariat, based on consultations with signatories, may exclude an organization from the list of signatories if its sincerity in participation or ability to participate is a cause for concern.



47. The Signatories of the Sports for Climate Action Initiative shall take into due account all regulations applicable to them that relate to antitrust or anticompetitive behaviours and shall refrain from any such behaviours during or in relation to their participation in the Sports for Climate Action meetings, events and related activities.

4. SPORTS FOR CLIMATE ACTION DECLARATION

Recognizing that:

- the Paris Agreement represents a global response to the scientific consensus that human activity is causing global average temperatures to rise at unprecedented rates;
 - the goals agreed in the Paris Agreement translate to reaching climate neutrality in the second half of the twenty-first century. Sports organizations need to take an active part in contributing to the realization of these goals;
 - delivering on the climate agenda also contributes to the broader Agenda 2030 for Sustainable Development;
 - all sports organisations, regardless of size or geography, have opportunities to take actions that will result in a measurable reduction in greenhouse gas emissions;
- actions that reduce greenhouse gas emissions are consistent have multiple synergies and co-benefits with, among other things, expanding economic opportunity and securing livelihoods, using resources more efficiently, driving economic competitiveness and innovation, strengthening environmental, social and economic resilience in the face of increasing climate impacts;
 - sports have a unique power to inspire a wider societal change that embraces a low-carbon future and keeps the planet safe for future generations.

We, the signatories to the Sports for Climate Action Initiative support the goals of the Paris Agreement in limiting global temperature rise to 1.5 degrees Celsius above pre-industrial levels and affirm our commitment on behalf of our organizations to:

1. Undertake systematic efforts to promote greater environmental responsibility;
2. Reduce overall climate impact;
3. Educate for climate action;
4. Promote sustainable and responsible consumption;
5. Advocate for climate action through communication.



5. LETTER OF COMMITMENT

To the Executive Secretary of the United Nations Framework Convention on Climate Change (UNFCCC) secretariat Bonn, Germany

Recognizing the critical need for cities, regions, companies and investors from around the globe to help implement the Paris Agreement and accelerate the transformative change needed to reach greenhouse gas (GHG) emission neutrality (i.e. climate neutrality) in the second half of the twenty-first century, I am pleased to confirm that [Organization] supports the vision outlined in the Sports for Climate Action Declaration.

With this communication, we express our intent to implement the principles enshrined in the Sports for Climate Action Framework and commit to working collaboratively with our peers and relevant stakeholders to develop, implement and enhance the climate action agenda in sports.

[Organisation] will communicate this commitment to our stakeholders and the general public and will report publicly on progress.

Yours Sincerely

Signature

Place

Date

Please send your signed letter of commitment to the UNFCCC secretariat at:
climatedialogues@unfccc.int

APPENDIX 2: PRACTICAL MEASURES FOR CLIMATE ACTION

Although it is one of five focus areas of the IOC Sustainability Strategy, Climate is a crosscutting theme that relates to each of the other four focus areas. In this chapter we look at a series of practical ways in which climate actions can be applied to the different focus areas. These embrace both carbon reduction measures and adaptive measure to build resilience to the impacts of climate change.

INFRASTRUCTURE AND NATURAL SITES

There are many climate actions that can be applied to the siting, design, construction and operational management of sport venues and their related infrastructure. These can vary considerably in scale and cost and it is important to consider relevant options as early as possible in the planning process for new venues, or when reviewing the management and/or upgrading of existing facilities.

There is a wealth of information and guidance on sustainable design and construction, including several well-recognised “green building standards”. Although these standards are mostly generic, rather than sport-specific, they do provide an essential basis that can be applied to the development of sports venues. Please see Appendix 4 for a selection of recommended further reading.

Here we highlight a selection of key aspects to consider in relation to mitigating potential greenhouse gas (GHG) emissions and building resilience to the impacts of climate change. These points are not exhaustive and are intended to give you a feel for the scale and nature of the measures you might need to introduce. In all cases, it would be advisable to seek local expert advice.

Managing flood risk

Increased incidence and severity of flooding is one of the most obvious impacts of climate change. Many sports facilities are located in areas increasingly prone to flooding and this has severe economic and practical consequences.

Where fast-drainage of playing surfaces is critical for maximising playability, this can exacerbate flooding problems downstream. Conversely sports grounds may be victims of inappropriate flood management practices upstream.

Solutions to minimising these impacts and risks will normally require multi-agency initiatives across a larger catchment area than just the immediately affected sites. It is important, therefore, for venue managers and sports bodies to have an active place in such discussions.

In terms of practical measures that venue/site managers can consider to lower the impacts, or at least not contribute further to flood risk, it is worth considering the following:

- setting aside specific parts of the site as water retention areas;
- maximising vegetation cover and areas of porous surface; and
- creating natural drainage swales – these can reduce water run-off rates and thereby lessen the risk of flash flooding downstream.

In urban areas flooding is often associated with increasing amounts of hard, impermeable surfacing (buildings, roads, car parks, pavements, town squares etc.) and it is important to seek opportunities to allow natural absorption of rainwater rather than letting it run-off into drainage systems. Sports grounds, especially for turf-based sports, play an important role here.



With regard to the development of new sports facilities, the simplest maxim is not to build in flood plains.

Managing for drought and extreme heat

At the opposite end of the scale to flooding, many parts of the world are increasingly experiencing extended periods of drought and extreme heatwaves, which are having strong impacts on sports venues and sports activities. Among the most severe impacts are restrictions on irrigation – including sometimes total bans on irrigation – to the extent that turf-based sports can no longer be practised. Short-term effects may be costly and inconvenient but survivable; if such extreme weather effects are felt over extended periods, they can be ruinous. A number of such examples have already been highlighted in this guide.

Indoor sports facilities may be less directly affected although certain water use restrictions may still apply and the cost of water might increase. More likely impacts would be in the form of increased energy costs for cooling and air-conditioning.

We recommend considering the following specific adaptation measures to minimise the physical and financial impacts of drought and extreme heat:

- Capture and store rainwater for irrigation purposes.
- Create irrigation reservoirs that can be filled during wet seasons.

- Avoid, or at least minimise use of potable water for irrigation.
- Utilise more drought-tolerant turf cultivars and those that can tolerate poorer water quality, i.e. from non-potable sources.
- Minimise areas requiring irrigation especially landscape areas and gardens.
- Plant drought-tolerant species in landscape areas.
- Avoid extensive areas of hard, impermeable surfaces.
- Ensure plenty of shade is provided, either by temporary or permanent shelters and natural shade from trees.
- Buildings should incorporate energy efficiency measures, including passive solar design⁸, natural ventilation and using materials with high thermal mass⁹.
- Ensure infrastructure is in place to provide accessible drinking water sources wherever sports events are likely to take place regularly in hot conditions.

Water conservation is also important indoors in washrooms, showers and kitchens, and for cleaning. Here the emphasis is on water-efficient appliances, both for new building and for retrofitting in existing facilities.

⁸ In **passive solar building design**, windows, walls, and floors are made to collect, store, reflect, and distribute solar energy in the form of heat in the winter and reject solar heat in the summer.

⁹ **Thermal mass** is a property of the mass of a building, which enables it to store heat, providing “inertia” against temperature fluctuations. The thermal mass is warmed passively by the sun during the day and the thermal energy stored in the mass is released back into the interior during the night. This works in temperate and hot arid areas but is less effective in hot humid places, where night-time temperatures remain high.



Managing coastal erosion

In some parts of the world rising sea levels are already impacting on sports facilities, notably a number of coastal golf courses. This is not an easy situation to manage, since the impacts will be felt along whole stretches of coastline, not individual sites. Thus measures to reinforce sea fronts in one particular place may cause impacts further along the shore, or simply be ineffective.

Sports facilities that are potentially affected by coastal erosion need to be actively engaged in coastal management strategies for their area/region. Independent, ad hoc measures are not recommended.

In the case of proposed new sports developments on coastal sites, planners and developers should take extreme care to avoid impacting on natural coastal environments, such as estuaries and dune systems. Not only is this important ecologically but also to avoid disrupting natural coastal defences that these ecosystems provide.

Minimising GHG emissions through landscaping and biodiversity conservation

Areas of vegetation within the land holding of sports venues can be precious refuges for wildlife, as well as serving to cool the air, reduce glare, improve air quality and soundscape – they can also have an important aesthetic function.

Established natural vegetation is better adapted to local conditions and less water-demanding than newly planted landscaping. Likewise natural vegetation supports more native wildlife than non-native plants.

The following measures offer a dual benefit in conserving biodiversity and supporting efforts to mitigate and/or adapt to climate impacts:

- Where there are areas of natural wildlife habitat on your venue ensure they are effectively safeguarded and ecologically managed.

- Give preference to native species in landscaping.
- If using non-native species or varieties, ensure they are appropriate for your local climatic conditions.
- Use vegetation to provide green facades on walls, on roofs, for areas of shelter and shade and to break up large expanses of hard landscaping.
- Wherever possible allow, open natural drainage systems and establish water retention areas on the site.

A number of studies have shown that turfgrass has the potential to be a carbon sink, at least over short time spans. This depends in part on the management regime (i.e. how much fertiliser, pesticide and irrigation water is used) and on the capacity of the soil to absorb carbon. More natural grasslands (i.e. those that are less intensively managed than sports surfaces) have even greater potential to be carbon sinks and there is some evidence they may be more resilient to wildfires than forests.

Many sports venues have the potential for different grassland structures, from regularly low-cut field-of-play to tall, uncut vegetation in unused areas. This variety is good for biodiversity as well as being potentially beneficial in terms of carbon sequestration.

Minimising GHG emissions through venue siting and design

This section applies specifically to the development of new sports facilities and refurbishing and upgrading of existing venues.

In many cases site location is predetermined by ownership and availability of land, but where there is a choice, new venues should be sited away from areas at risk of flooding or coastal erosion, they should avoid impacting on protected natural environments, and they should



be close to the target population catchment and be accessible by public transport.

There are several new stadiums and multi-purpose arenas that have been built in recent years that are held up as exemplars of sustainable design. These include:

Amsterdam ArenA – the home of the football club Ajax, is powered by more than 4,200 solar panels and one wind turbine. The main building comprises an impressive energy-generating escalator and the stadium has also installed an energy storage system powered by second-life batteries from used electric vehicles.

Mercedes-Benz Stadium, Atlanta – the official home of Atlanta Falcons for the US National Football League (NFL) & United FC and Atlanta United FC of Major League Soccer (MLS). In November 2017, it became the first professional sports stadium to receive a platinum Leadership in Energy & Environmental Design (LEED) certificate, a global standard for measuring the sustainability of buildings.

Levi's Stadium, San Francisco – the home of the San Francisco 49ers holds two LEED certifications. In 2014, it achieved the first Gold LEED certification to be awarded in a stadium which hosts a professional team, and in 2016 it received a second Gold certification for operations and maintenance.

Golden 1 Center, Sacramento – the home of Sacramento Kings was awarded the world's greenest and most technologically advanced sports and entertainment facility for 2017. According to Green Project Management, the Golden 1 Center is in the top 3 per cent of high-performance buildings in the world.

Through an urban smart grid, the venue meets 100 per cent of its power needs through solar energy. Water conservation practices are particularly important to California, due to the water shortages the region has been facing in recent years. The stadium has, therefore, managed to use 45 per cent less water than allowed under the California code.

AAMI Park (Melbourne Rectangular Stadium) – since being completed in 2010, it has been largely used for hosting rugby and soccer games. Sustainability-focused measures included the use of 50 per cent less steel for the roof than a typical stadium. The stadium has a rainwater collection system that can save up to 2 million litres of water every year and it can also provide four other venues in the precinct with water.

Source: [Climate Action](#) 2018; [Humans for a Sustainable Future](#) 2015

These and many others like them are high-profile venues backed by considerable resources. Nevertheless, the principles and applications of clean technology applied in these cases should provide inspiration for similar approaches on smaller-scale projects.

Importantly, several of these high-profile cases demonstrate how sports can not only address some of their direct climate impacts, but also provide wider benefits in the context of urban regeneration schemes and supporting local communities to address sustainability challenges. In addition, there is considerable value in the leadership shown through these projects, which can be used to spread public awareness and understanding of climate change issues and what can be done to mitigate them.

Green building standards

Many new sports venues have been, or are being built to internationally recognised “Green Building Standards”. These provide a framework and technical criteria for achieving specific sustainability targets, especially related to energy supply, use of low-carbon construction materials, energy efficiency, water resource management and waste production. The two most widely known and used are:

- LEED – Leadership in Energy and Environmental Design, operated by the US Green Building Council
- BREEAM – Building Research Establishment Environmental Assessment Methodology, operated by BRE, UK

There are many other similar standards, often national-level systems (such as CASBEE in Japan, HQE in France and AQUA in Brazil). While the application of such standards usually adds a premium to design and construction costs over “business as usual”, their use is becoming more and more widely required by planning authorities and other critical stakeholders, especially for high-profile projects, such as for major sports venues. These extra costs may be offset by smoother planning processes, better stakeholder relations and lower operational costs over the venue’s lifetime.

Minimising carbon emissions through use of renewable energy

The most direct way to contribute to a low-carbon economy is through the installation of on-site renewable energy, typically solar or wind power and in some instances geothermal energy. These installations require capital investment, but in many countries there are grants and subsidies to encourage uptake of renewable energy. Furthermore, the pay-back period is continually getting shorter as the market for renewable energy has become much more competitive, capital costs have reduced and generation efficiency levels have improved – in fact in many places the cost of installing and operating solar panels have dropped so sharply that the economic benefits significantly outweigh the costs.

This is indicated by the fact that prior to 2010 only a handful of sports venues round the world had installed solar power, whereas in the last decade the number of “solar sports venues” has increased significantly. The majority of such facilities are in North America and Europe, but there are examples in all regions of the world.

Rank	Name	Size (kWp)	Team	Sport	Location	Year	No of panels
1	Indianapolis Motor Speedway	9,000	-	Car/motor racing	Indiana, USA	2014	39,312
2	TT circuit Assen	5,600	-	Car/motor racing	Assen, Netherlands	2016	21,000
3	Lincoln Financial field	3,000	Philadelphia Eagles	American Football	Philadelphia, USA	2010	11,000
4	Pocono Raceway	3,000	-	Car/motor racing	Pennsylvania, USA	2010	39,960
5	Estádio Nacional Mané Garrincha	2,500	Brasília and Legião Futebol Clube	Football	Brasília, Brazil	2013	9,600

Table 2: The world top five solar sports venues (source: [Solarplaza](#) 2018)



Solar is the most widespread form of on-site renewable energy used on sports venues, which is probably a reflection of their predominantly urban locations, where wind power is not always practical. However, the third venue listed in Table 2 (see previous page), Lincoln Financial Field, also has 14 wind turbines, which along with the solar panels supply more than four times the power used during a season of home games. In addition the venue introduced a variety of conservation programmes, such as an improved building management system and a properly evaluated commissioning of the building, leading to a reduction of the venue's energy bills by 33 per cent. They also saved up to five years in electric costs thanks in part to new occupancy-based lighting controls (Source: Office of Energy Efficiency and Renewable Energy [2017]).

Geothermal energy derives from naturally occurring heat within the earth. It typically involves drilling down to the hot rocks in places where the heat does not naturally get to the surface, passing water through the substrate, which is then pumped back to the surface as hot water. Many systems take this hot water and pass it through a heat exchanger that warms up a second liquid. This second liquid is more efficiently converted into steam to drive a turbine to generate electricity.

Potentially this is a widely available resource and there are many places around the world where the hot rocks are at a reachable depth to make this a viable source of energy. It is also a near zero emission and renewable energy source that can be generated for both small-scale (e.g. individual buildings) to industrial levels (e.g. to power a neighbourhood or small town).

There is a growing number of sports facilities that use geothermal energy, spanning a range of size and type of venue, such as the following three examples:

- The Palma Sport and Tennis Club in Mallorca
- Beijing Olympic Stadium (The Bird's Nest)

Minimising carbon emissions through energy efficiency

Energy efficiency is relevant for all sports venues and offers potentially significant cost savings as well as important reductions in GHG emissions. These are not isolated measures and many of the options listed below link closely with the preceding sections.

- Design buildings to optimise use of natural light and ventilation and to minimise requirement for supplementary heating or cooling (e.g. through insulation of walls and roofs).
- For large buildings/venues where there are different activities (e.g. administrative functions, data servers or broadcasting studios, hospitality and sports facilities) introduce energy plans to optimise airflow across and between different zones.
- Ensure energy is not being wasted heating/cooling/lighting unused areas.
- Ensure different functions are on separate circuits (e.g. if you need security lighting it does not mean other non-critical systems are always on).
- Use smart meters and other tools to monitor energy use.
- Install, or switch to more efficient lighting, HVAC and other systems and appliances.
- Switch off lighting and appliances when not in use and/or install automatic occupancy-based lighting systems.



- Ensure any refrigerants used have a low Greenhouse Warming Potential – this is especially important for ice venues and aquatic centres, where large amounts of coolants may be needed.

Many of these measures can be captured via a Building Management System (BMS). This is particularly relevant for large facilities with extensive mechanical, HVAC, and electrical systems. For smaller venues and offices, where the cost of automated systems would be prohibitive, it is still important to have a basic energy plan and being diligent in its operation.

SOURCING AND RESOURCE MANAGEMENT

How you procure the goods and services you need is one of the most fundamental ways in which an organisation can achieve its sustainability goals and limit its environmental and social impacts. Understanding the climate impact of the products you buy, how you use them and what you do with them at the end of their useful life, will have a massive bearing on your carbon footprint.

Full details on how to go about sustainable sourcing are provided in a separate guide in the “Sustainability Essentials” series, which focuses on what to consider in order to minimise the climate impact of your sourcing decisions, including what you do with goods and materials after you have finished with them.

We can consider the climate impacts of products in three ways:

- carbon emissions arising from manufacturing and transportation of goods and materials (known as “embodied carbon”);
- carbon emissions arising from their operational use – e.g. fuel burnt and energy consumed by

vehicles, equipment, lighting or air-conditioning systems; and

- carbon emissions arising from disposal of goods and materials – e.g. from landfill waste.

Choosing products with low embodied carbon

If you are buying something new, you are ultimately causing it to be made in the first place. Thus the more new products you purchase, the greater the amount of embodied carbon there will be in your carbon footprint. There are several ways you can avoid or minimise this:

- **Buy less** – be strict about quantities and assessing the real necessity for a purchase.
- **Buy second-hand** – in this way you are giving extra life to something originally procured by another party.
- **Hire rather than buy** – if you rent goods and equipment just for the period you need them and then return to the rental company, your carbon footprint only has to account for the fraction of the lifespan the item(s) are in your possession.
- **Specify items that contain recycled content (“secondary materials”)** – by including secondary materials you are not causing something to be made entirely from virgin materials.
- **Buy from local sources** – in this way you can minimise the transportation element of the embodied carbon.
- **Share equipment and other goods** – can you club together with other organisations to spread the cost of ownership of certain items and use them as a shared resource?



- **Combine procurement to achieve economies of scale** – like the previous example you join forces with other organisations so that your collective purchasing power can make low-carbon choices more feasible.

Individually these various approaches can make sense, but sometimes one thing might counteract another, making it difficult to know which to choose. For example, second-hand or rental equipment might be very inefficient to operate, so carbon you save through sourcing might be outweighed by additional carbon emissions during your ownership of the items. Or an item bought locally has a low impact from transportation but it might have been made using a carbon-intensive process, such that a longer distance import might have been better.

As always with sustainability decisions, it is important to look at different angles and not assume one attribute necessarily outweighs another. Each sourcing decision needs to be based on a well-informed choice.

Choosing products with low operational emissions

Here we are concerned about vehicles, energy-using equipment and systems that use refrigerants and gases that have a high “greenhouse warming potential” (GWP), because their operational use will generate carbon emissions.

To minimise carbon emissions consider the following measures:

- Choose appliances with high ratings for energy efficiency.
- Choose vehicles with zero or low tailpipe emissions ratings (manufacturers’ own ratings have been heavily criticised in recent years, so try to find corroborative sources of information if possible).

- Understand how to optimise the running efficiency of your equipment and/or vehicles.
- Switch off or power down when equipment is not in use.
- Make sure equipment and vehicles are the right size for your needs, not over or underpowered.
- Maintain equipment and vehicles properly.

These measures are generally common-sense care for equipment and vehicles and can add up to substantial cost savings, as well as carbon benefits. However, in any organisation wastefulness is a continual risk and this is especially so in high-pressured environments such as sports events. It is therefore important to have clear policies on efficient operation and maintenance of equipment and vehicles, and for these to be implemented correctly.

Optimising end-of-life disposal

Once goods and materials are surplus to requirement you have the job of disposal. Unless this has been planned in advance – ideally at the time of purchase – often this can mean simply sending to waste disposal: i.e. landfill or incineration.

These items may no longer be of any use for your organisation, but they may well still be of value to others. Whether it’s through donation, onward selling or some form of repurposing for reuse, the best solutions are those that extend the lifetime use of a product in a high-value state. This saves carbon because you are not causing new products to be made and you are avoiding GHG emissions from burning or landfill.



Recycling is the next best solution if no form of reuse is available. However, depending on the processes used in recycling, there may be some GHG emissions released as a result. Nevertheless, this is still normally preferable to having products made entirely of virgin materials.

The most significant cause of GHG emissions from waste is organic materials, notably food waste. Here, the decomposition process releases methane, which is a much more potent GHG than carbon dioxide. Fortunately, there are various forms of composting processes can capture the methane as a biogas for use as a fuel and thereby avoid the direct release of high levels of GHG emissions.

Key steps to take to minimise carbon emissions through end of life disposal of goods and materials include the following:

- Ensure your sourcing processes always consider eventual disposal options, as these should influence the initial choice.
- Favour items that can be reused in one form or another.
- If reuse is not an option, ensure the items can be recycled.
- Ensure organic waste is composted or used for biogas production.

Most problems with waste materials arise because they were not anticipated at the sourcing stage. Such errors can be costly, financially and in terms of carbon emissions.

Recent research indicates that scenarios achieving zero-waste compliance are not necessarily the most effective means of reducing GHG emissions or energy use. The two most effective approaches are eliminating edible food

waste and recycling. For further information see <http://www.mdpi.com/2071-1050/9/7/1236/htm>.

MOBILITY

Transport-related carbon emissions probably make up the greatest share of the sport sector's global carbon footprint and the same is likely to be true for any sport organisation or major event with an international remit. Travel is obviously a fundamental part of the world of sport, so many of these impacts may be regarded as inevitable. Nevertheless, there are several options to consider that can help reduce these carbon emissions. Indeed, many of these solutions can be applied to any sport organisation or event, large or small.

Although much attention is given to the carbon emissions related to flying, in total the day-to-day travelling to and from local facilities and across country for domestic matches, training and meetings, as well as workforce commuting, are likely to add up to a significant proportion of the sport sector's carbon emissions.

All sports bodies and event organisers should develop a travel plan to assess how much travel is required, how this can be optimised, what alternative modes are available and how to measure the impacts in order to gauge a realistic level of carbon compensation that would be necessary to meet carbon neutrality goals. Elements to consider in developing such travel plans are given in the following two sections on ground-based travel and air travel.

Low-carbon options for ground-based travel

This covers day-to-day commuting and local travel to and from sports facilities, as well as longer-distance road and rail travel for training, attending domestic matches and meetings. General principles to apply include:



- seeking opportunities to reduce the amount of travel required;
- promoting soft-mode travel – i.e. cycling and walking;
- favouring rail over road transport;
- using shared rather than individual transport;
- using “cleaner”, low-emission vehicles;
- choosing venues for meetings and events that allow access by public transport; and
- providing opportunities for virtual working (i.e. staff being able to work from home, or from local/regional office facilities rather than travelling to a central location).

Obviously your specific geographical situation will determine the practicality and affordability of which of the above measures could work for you. What is important is that sports organisations take a careful look at travel policies and actively seek more efficient solutions. By doing this you should be able to reduce your organisation’s carbon footprint, while some of the measures will have other benefits too. Less road use and use of cleaner vehicles help to lower air pollution, and cycling and walking are healthy options.

It is worth considering incentives to encourage uptake of more sustainable travel options. Can you provide secure cycle parking and shower and changing facilities at your offices, or at a nearby sports facility? Is it possible to offer subsidies or loans to staff for public transport season tickets? Or create a points system to reward staff who make the most effort to reduce their travel carbon footprint?

Options for limiting impacts of air travel

Aviation is one of the fastest-growing sources of GHG emissions and accounts for more than 2 per cent of global emissions. If global aviation was a country, it would rank in the top 10 emitters. Someone flying from London to New York and back generates roughly the same level of emissions that the average person in the European Union does by heating their home for a whole year¹⁰.

Clearly, therefore, aviation has a massive impact in terms of GHG emissions; while equally there is no question that flying is a vital part of the global sport industry. International competition is the lifeblood of modern sport and bringing people together from different countries and cultures has huge positive social and economic benefits. In large countries, or those with limited road and rail infrastructure, flying is often the only practical travel mode available.

Nevertheless, too many people in the sport sector fly too often and there is definitely scope to economise and optimise travel plans. This means examining necessity for travel, number of travellers, the timing of travel to limit need for multiple return trips, choosing optimal routes and airlines that operate “cleaner” fleets.

- **Assessing need:** is there a real business case for the intended travel? Can purpose be achieved through virtual meetings instead of physical meetings? Can fewer people do the job, thereby reducing number of flights required? Where available, can high-speed rail be used as a viable alternative to flying?
- **Optimising timing:** instead of several repeat journeys, can timings of meetings and other activities be adjusted to facilitate fewer journeys that achieve multiple objectives?

¹⁰ Source: https://ec.europa.eu/clima/policies/transport/aviation_en



As an example, IOC Commission meetings are nowadays clustered so that members who sit on more than one Commission can attend their meetings on a single trip.

- **Optimising travel routes:** Flying direct, even on less efficient aircraft, is environmentally preferable than taking multiple connecting flights on efficient aircraft. Sometimes the lower-carbon option may be prohibitively expensive, but as a rule you or your travel agent should first seek direct options.
- **Preferring airlines:** it is worth checking which aircraft are being used. On fuel-intensive long haul routes, aircraft models like the Boeing 787-9 or the Airbus A350-900 outperform other aircraft types; while for short-haul routes the A319 equipped with sharklets (a wingtip device to reduce fuel consumption) is the most efficient aircraft currently in operation¹¹.

Sustainable logistics

It is not just people that travel for sport. There is also a huge volume of materials and equipment that are freighted around the world to and from competitions, meetings and conferences. In addition there is freighting of goods through your supply chain to consider.

The method and timing of freighting materials and equipment will have a strong bearing on the associated GHG emissions. Some points to consider include:

- Use shipping in preference to airfreight.
- For some major projects rail or river freight may be a viable option.
- Use trucking companies and couriers that operate low-emission vehicle fleets.

- Assess logistics suppliers on their local as well as long-haul performance. Thus consider:

- sustainability credentials of their warehousing facilities;
- types and sizes of vehicles in their fleet;
- fuel types and fuel management policies;
- policies on load optimisation; and
- policies on reducing packaging and packaging waste

In the case of major international sports events, you will probably be procuring services of a number of large event suppliers especially those involved in venue overlay construction and providing heavy equipment. In these cases it is good to specify requirements for sustainable logistics during the tendering process, so that you can evaluate which suppliers have the best policies for limiting GHG emissions as well as for other sustainability aspects.

Promoting green tourism

The climate impacts of travel are not limited to the transport mode of getting to and from your destination. Accommodation, food and beverage and local transport are also factors to be considered. When selecting venues for events and meetings, and associated accommodation options, there are several factors to consider that can help limit GHG emissions and contribute to the wider theme of “green tourism”.

Recommended actions include:

- Select hotels and venues with visible sustainability policies and credentials (these are usually stated on their individual or group websites).
- Select hotels and venues easily accessible via public transport.

¹¹ Source: https://www.atmosfair.de/en/air_travel_and_climate/atmosfair_airline_index/



- Use rail and/or metro systems for airport transfers and local travel wherever practical.
- If using taxis, give preference to companies using low/zero-emission vehicles.
- Select catering services that promote use of local and seasonal ingredients.

These points are equally valid for those hosting events and meetings, whereby you should seek the most sustainable local venues and hotels and inform participants and visitors of the sustainable transport options they can take. These may also include information on safe walking routes and use of local cycle-hire schemes. There may also be opportunities in partnership with local transport and tourism authorities to integrate event ticketing/ accreditation with use of public transport and access to local attractions.

PEOPLE

In the context of climate action, it is important to consider all groups of people involved in sporting activities and events, not just workforce¹². This means the entire workforce of employed staff, contractors and volunteers, as well as athletes, sports officials, media, sponsor staff, guests and the public.

Sports organisations and event organisers should always make the utmost effort to ensure the safety and wellbeing of all people under their care: i.e. everyone on site for an event, at

a training facility, at your offices, or any other properties under your control, including construction sites.

Heat stress planning

The most significant and increasing effect of climate change on people's wellbeing is exposure to extreme heat. In very dry conditions, people can work outside in temperatures of up to 40°C. But the safety cut-off drops below 30°C when you have very high humidity. To calculate the limits in which it is safe for people to work in extreme heat, scientists rely on a measure of temperature that takes into account both the heat and the humidity, as well as other factors. This is known as the wet-bulb globe temperature¹³.

At wet-bulb temperatures higher than 35°C, human skin can no longer cool itself down through evaporation. While such conditions have not yet been recorded naturally, some regions of the world (e.g. South Asia) are increasingly experiencing conditions close to this limit.

Clearly the combination of high heat and humidity limits athlete performance and also significantly the ability of workforce to carry out their tasks safely and comfortably. For example, the US military suspends training and physical exercise when this temperature exceeds 32°C. Importantly, people working for sports organisations are not high-performance athletes themselves and your workforce and volunteers may include many vulnerable people who would suffer in extreme heat and high humidity conditions.

¹² Workforce is one of the focus areas of the IOC Sustainability Strategy.

¹³ The WetBulb Globe Temperature (WBGT) is a measure of the heat stress in direct sunlight, which takes into account: temperature, humidity, wind speed, sun angle and cloud cover (solar radiation). This differs from the heat index, which takes into consideration temperature and humidity and is calculated for shady areas. If you work or exercise in direct sunlight, this is a good element to monitor. Military agencies and many nations use the WBGT as a guide to managing workload in direct sunlight (source <https://www.weather.gov/tsa/wbgt>).



All responsible sports organisations should therefore have in place policies to deal with extreme weather situations, notably heatwaves, both for normal office or venue operations, and for during sports events.

Specific practical measures to consider may include:

- provision of freely available drinking water;
- provision of shade and shelter from direct sun;
- revision of working hours and shift patterns;
- relaxation of dress codes; and
- regular monitoring of conditions to assess if adjustments to policies are necessary.

Where possible, options for staff to work from home could be beneficial where that enables them to avoid difficult daily journeys to/from work during periods of extreme weather.

In relation to sports events, if there is a significant risk of heat exhaustion, among competitors, workforce and spectators the following measures should be considered:

- revision of competition times and schedule for cooler times of day;
- managing queuing times so spectators are not standing in exposed areas for long periods;
- providing additional areas of shade and drinking water facilities;
- provision of additional medical/first aid facilities;
- Installation of additional fire-fighting equipment (for outdoor venues in fire-risk areas).

Inevitably such measures would have knock-on impacts on event operations, notably transport so that people can get to/from venue(s) out of normal hours, and logistics for restocking and moving materials and equipment at different times.

All of the above points are common sense measures that have been used many times in the past. What is different now is that they are likely to become frequent, rather than occasional emergency interventions. Therefore, sports bodies and event organisers need to anticipate such eventualities in their forward plans and workforce training programmes, so that when issues arise they are not a total surprise.

Other impacts affecting wellbeing of athletes and workforce

Effects of severe weather can endure beyond the period in question. For example where extended periods of drought have caused playing surfaces to harden and crack, it could be some while before they are safe to play on, and this requires careful monitoring.

Another effect of increased temperatures is a change in water quality. Commonly this can be seen in the form of algal blooms but there can also be a number of water-borne pathogens that multiply in such conditions and render conditions dangerous for sports involving direct contact with water – both for athletes and technical officials in some cases.

Shifts in weather patterns are affecting the distribution and abundance of various pest species to the extent that areas that previously had not been within the known range are now being impacted. When this includes biting/stinging insects it becomes a relevant concern for people's wellbeing.



APPENDIX 3: LEADING ORGANISATIONS WORKING IN THE FIELD OF CLIMATE SCIENCE

A full list of organisations working in the climate change arena would make for a very long directory. Below we have selected a small number of the leading entities in this field that have key roles in global policies, setting standards and promoting climate action.

Organisation name	Acronym	About
C40 Cities	C40	<p>Initiated in 2005 as a collaboration between the Mayor of London and the Clinton Climate Initiative, the name C40 was adopted in 2006 to reflect the number of initial partners in a network of the world's megacities committed to addressing climate change. Today the initiative connects more than 90 of the world's largest cities, representing over 650 million people and one quarter of the global economy.</p> <p>C40 is focused on tackling climate change and driving urban action that reduces GHG emissions and climate risks, while increasing the health, wellbeing and economic opportunities of urban citizens.</p> <p>http://www.c40.org</p>
Carbon Disclosure Project	CDP	<p>CDP is an international non-governmental organisation (NGO) founded in 2002 and headquartered in the UK. It currently has regional offices and local partners spanning 50 countries.</p> <p>Its primary mission is enabling companies and cities to report publicly on their environmental impacts, following standardised disclosure protocols. CDP obtains data from participating organisations and transforms the data into detailed analyses on critical environmental risks, opportunities and impacts.</p> <p>https://www.cdp.net/en</p>
Climate Action		<p>Established in 2007 and headquartered in London, UK, Climate Action works in a contractual partnership with the United Nations Environment Programme.</p> <p>Climate Action's role is to establish and build partnerships between business, government and public bodies to accelerate international sustainable development and advance the "green economy". This is done via a global media and events platform across which stakeholders can share knowledge, technologies and expertise, and identify innovative solutions to the challenges faced by climate change and a growing population.</p> <p>Climate Action's website has a section dedicated to sport, where it highlights sustainability initiatives within the sport sector. Climate Action also organises the annual conference Sustainability Innovation in Sport (SIIS)</p> <p>http://www.climateactionprogramme.org</p>



Organisation name	Acronym	About
Climate Institute		<p>Founded in 1986, the Climate Institute was the world's first organisation focused solely on climate change. Since its founding, the Institute has been instrumental in moving climate change onto the international agenda, fostering collaboration between developing countries and richer nations, and in launching and implementing pioneering studies and initiatives on subjects such as environmental refugees, transforming the energy infrastructure of small island states, and catalysing policymaker focus on the necessity of limiting emissions of black carbon and other short-lived climate forcers.</p> <p>http://climate.org</p>
Greenhouse Gas Protocol	GHGP	<p>Founded in the late 1990s as a joint initiative between the World Resources Institute and the World Business Council for Sustainable Development, GHGP provides an NGO-business partnership to address standardised methods for GHG accounting.</p> <p>The first edition of the Corporate Standard, published in 2001, has been updated regularly with additional guidance that clarifies how organisations can measure emissions from electricity and other energy purchases, and account for emissions from throughout their value chains. The GHG Protocol has also developed a suite of calculation tools to assist companies in measuring their GHG emissions and evaluating the benefits of climate change mitigation projects.</p> <p>http://www.ghgprotocol.org</p>
Intergovernmental Panel on Climate Change	IPCC	<p>The IPCC, based in Geneva, is the international body that provides policy-makers with regular assessments of the scientific basis of climate change, its impacts and future risks and options for adaptation and mitigation.</p> <p>The IPCC was first established in 1988 by two United Nations organisations, the World Meteorological Organisation and United Nations Environment Programme, and later endorsed by the UN General Assembly through Resolution 43/53.</p> <p>IPCC assessments form the basis for negotiations at the UN Climate Conference (UNFCCC).</p> <p>http://www.ipcc.ch</p>
The Climate Group		<p>The Climate Group is an international non-profit, founded in 2004, with offices in London, New Delhi and New York. Its mission is to accelerate climate action towards a goal of a world of under 2°C of global warming and greater prosperity for all.</p> <p>The Climate Group brings together networks of business and governments, acting as a catalyst to take innovation and solutions to scale.</p> <p>https://www.theclimategroup.org</p>



Organisation name	Acronym	About
United Nations Framework Convention on Climate Change (The secretariat of the UNFCCC, which is based in Bonn, Germany, is known as UN Climate Change)	UNFCCC	<p>UNFCCC is an international environmental treaty adopted on 9 May 1992 and opened for signature at the Earth Summit in Rio de Janeiro that year. It entered into force in March 1994 following ratification by a sufficient number of countries.</p> <p>The UNFCCC objective is: “to stabilise greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system”. The framework sets non-binding limits on GHG emissions for individual countries and contains no enforcement mechanisms. Instead, the framework outlines how specific international treaties (called “protocols” or “agreements”) may be negotiated to specify further action towards the objective of the UNFCCC.</p> <p>The parties to the convention have met annually from 1995 in Conferences of the Parties (COP) to assess progress in dealing with climate change.</p> <p>http://unfccc.int</p>
World Business Council for Sustainable Development	WBCSD	<p>WBCSD is a global, CEO-led organisation of over 200 leading businesses working together to accelerate the transition to a sustainable world.</p> <p>The WBCSD’s Climate and Energy Programme facilitates interaction on critical topics between organisation members, their peers and stakeholders to address critical industry issues and share best practices and solutions.</p> <p>https://www.wbcsd.org/</p>
World Resources Institute	WRI	<p>WRI is a global research organisation that spans more than 50 countries, with offices in the United States, China, India, Brazil, Indonesia and more. With more than 700 experts and staff, WRI works closely with leaders to turn big ideas into action to sustain natural resources – the foundation of economic opportunity and human wellbeing. WRI focuses on six critical issues at the intersection of environment and development: climate, energy, food, forests, water, and cities and transport.</p> <p>https://www.wri.org</p>



APPENDIX 4: RECOMMENDED FURTHER READING

The following references provide detailed information on specific aspects of climate action in relation to sport, or that can be applied to sport. They can all be freely accessed online.

[“Game Changer: how climate change is impacting sports in the UK”](#) (2018). Report by the [Climate Coalition](#) in association with the [Priestley Centre for Climate Change](#), University of Leeds, UK.

[“Green Building Standards and Certification Systems”](#) (2016). Paper by Stephanie Vierra, published by [Whole Building Design Guide](#), Washington DC.

[“Achieving Sustainability beyond Zero Waste: A Case Study from a College Football Stadium”](#) (2017). Paper by Christine Costello, Ronald G McGarvey and Esma Birisci, University of Missouri, Columbia MO, USA, published in [Sustainability](#), MDPI, Basel, Switzerland.

“Dow Climate Solutions Framework” (current) <https://www.dow.com/en-us/sports/sustainability>.

[“Carbon Footprint Methodology for the Olympic Games”](#) (2018)



APPENDIX 5: LEADING INTERNATIONAL CARBON OFFSET INITIATIVES AND INCENTIVE PROGRAMMES

We summarise below some of the main mechanisms available to the sports community for participating in international climate mitigation programmes, notably through credible offsetting schemes. We have also included related initiatives that incentivise further action and promotion of what you have achieved.

UNITED NATIONS PROGRAMMES

The following initiatives are provided via UN Climate Change (UNFCCC).

Clean Development Mechanism offsets

The purpose of the Clean Development Mechanism (CDM) is to identify the most cost-effective ways to reduce emissions globally, while contributing to sustainable development of developing countries. It is the only mechanism that has been approved at an international level by the Climate Change Convention.

The CDM has stringent, multi-stage processes in place, with third-party oversight to ensure that emission reductions generated by projects are real, measurable, verifiable and additional to what would have otherwise occurred. Participating projects must clear three levels of approval: national level, independent accredited entities, and the CDM Executive Board, the intergovernmental body that oversees the mechanism.

- By paying for avoided GHG emissions you support worthy projects that bring sustainable development to developing countries while reducing GHGs.
- By purchasing offsets you can compensate for the emissions that you generate and cannot avoid in your daily life, in your travel or in your organisation.

- You indicate the purpose and you receive a customised UN offset certificate.
- 100 per cent of your contribution goes to the project owners. The UNFCCC takes no commission and adds no fees.

For further information (see p53) visit the UN carbon offset platform:

<https://offset.climateneutralnow.org>

Momentum for Change Initiative

Are you already taking climate action? Are your climate activities practical, scalable and replicable examples to tackle climate change? You can apply for the UNFCCC Momentum for Change Award.

Momentum for Change awards organisations which go climate-neutral by measuring, reporting and reducing carbon emissions. The initiative provides a public platform to highlight broad-ranging climate change actions that are already achieving real results on the ground. By shining light on the most inspiring and transformational mitigation and adaptation activities, called “Lighthouse Activities”, Momentum for Change aims to strengthen motivation, spur innovation and catalyse further change towards a low-emission, high-resilient future. The Lighthouse Activities are showcased at the annual United Nations climate change conferences.

Winners benefit from great public and marketing exposure and are invited to speak at a high-level ceremony at the biggest conference on climate change, the Conference of the Parties.

For further information please see:

<https://unfccc.int/climate-action/momentum-change>



Non-State Actor Zone for Climate Action (NAZCA)

NAZCA is a global platform that brings together the commitments to action by companies, cities, subnational regions, investors and civil society organisations to address climate change.

Any entity wishing to have their data featured on the NAZCA portal can do so by selecting the “Register your commitment” button on the homepage.

For further information please see:

<http://climateaction.unfccc.int/views/about.html>

VOLUNTARY SECTOR INITIATIVES

Gold Standard

Gold Standard represents the best that can be achieved in climate and development projects. It was established in 2003 by WWF and other international NGOs as a best practice standard to ensure projects that reduced carbon emissions under the UN’s Clean Development Mechanism (CDM) also delivered on the dual mandate to foster sustainable development.

Gold Standard has more than 80 NGO supporters and 1,400+ projects in over 80 countries, creating billions of dollars of shared value from climate and development action worldwide. With the 2017 launch of Gold Standard for the Global Goals, it is now possible to have certified a range of independently verified UN SDG impacts, in addition to flagship carbon credits.

For further information please see:

<https://www.goldstandard.org>

Verified Carbon Standard

The VCS Programme is the world’s most widely used voluntary GHG programme. More than 1,300 certified VCS projects have collectively reduced or removed more than 200 million tonnes of carbon and other GHG emissions from the atmosphere.

Many organisations throughout the world find it is too expensive or impractical to meet their targets or eliminate their carbon footprint entirely with internal reductions. Therefore, they need a mechanism to achieve these aspirational goals. By using the carbon markets, entities can neutralise, or offset, their emissions by retiring carbon credits generated by projects that are reducing GHG emissions elsewhere.

Of course, it is critical to ensure, or verify, that the emission reductions generated by these projects are actually occurring. This is the work of the VCS Programme – to ensure the credibility of emission reduction projects.

Once projects have been certified against the VCS Programme’s rigorous set of rules and requirements, project developers can be issued tradable GHG credits called “Verified Carbon Units” (VCUs). Those VCUs can then be sold on the open market and retired by individuals and companies as a means to offset their own emissions. Over time, this flexibility channels financing to clean, innovative businesses and technologies.



The VCS programme is managed by Verra, a not-for-profit organisation founded in 2005 by environmental and business leaders who saw the need for greater quality assurance in voluntary carbon markets. Verra now serves as a secretariat for the various standards it develops and programmes it manages, as well as an incubator of new ideas that can generate meaningful environmental and social value at scale.

For further information please see:

<https://verra.org/project/vcs-program/>

Climate, Community & Biodiversity Standards

The Climate, Community & Biodiversity (CCB) Standards identify projects that simultaneously address climate change, support local communities and smallholders, and conserve biodiversity.

The CCB Standard focuses on land management. When carefully designed, land management projects can improve livelihoods, create employment, protect traditional cultures and endangered species, help secure tenure to lands and resources, increase the resiliency of ecosystems and help to combat climate change. The CCB Standards can be applied to any land management project, including projects also certified under the VCS Program.

Over 100 projects have been validated to the CCB Standards, over 40 of which have achieved full verification. CCB projects span over 40 countries on every continent except Antarctica. Projects validated and verified to the CCB Standards encompass more than 10 million hectares, an area the size of Iceland.

For further information please see:

<https://verra.org/project/ccb-program/>