MAPPING THE SPORT AND CLIMATE SPACE

What you need to know to join the debate about sport and the climate crisis

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PlaytheGame

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Introduction: Mapping the sport and climate space

Over the last two decades, the relationship of sport to the global climate crisis has become increasingly clear and increasingly urgent.

The risks and dangers posed by global heating and extreme weather to athletes, fans, and facilities have become tangible, as hurricanes sweep aside cricket stadiums, heatwaves hospitalise spectators, and record floods consume football fields and golf courses alike.

Sport has begun to respond. Since the creation of the UN Sport for Climate Action framework in 2018, a growing network of national and international sporting federations, professional leagues and clubs, athletes, fans, as well as NGOs and businesses have been developing climate policies and advocating and campaigning on the issue.

This has been paralleled by a growing body of academic research on the subject as well as much more serious journalistic reporting.

Now, Play the Game seeks to map this new space in global sports politics by:

- organising the main bodies of research data on climate threats to sport and sports carbon emissions
- surveying the new climate policies and systems of governance in global sport
- mapping the key campaigning organisations as well as media and information sources on the topic
- providing a guide to best practices in the field from carbon-zero stadium construction to active transport policies
- introducing readers to the main areas of debate and contention
- supporting it all by extensive reference to the best academic and journalistic work, with suggestions for essential reading.

It is designed first and foremost as a guide for those new to the debate, but the hope is that even the most seasoned sport and climate activist will find something useful here.

It begins by putting the sport and climate debate in a longer historical context; breaking down the sport and climate debate into its key components; and directing you to the best sources of news, information, and media on the topic.

Sport and the environment: A very short history

The politics of sport and climate are best understood in the context of sports' longer, if rather minimal engagement with environmental issues in general.

For much of the twentieth century, the Winter Olympics (and winter sport in general) proved the most environmentally controversial, for the games have invariably served as an opportunity to develop a mass winter sports tourist industry in fragile mountain ecosystems.

As early as 1932, the proposed bobsleigh run for the Lake Placid Games, which required the cutting down of numerous trees, was successfully opposed by local residents. The 1968 Grenoble Games were notorious for sports facilities that were unsuited to or degraded their surroundings.

This fact was noted by a coalition of Colorado environmentalists and low-tax Republicans who forced and won a referendum opposing Denver hosting the 1976 Winter Games.

Beyond winter sports, the 1980s saw the emergence of an anti-golf movement, particularly in the fragile rural ecosystems in China and South East Asia where local farmers were dispossessed by developments. These conflicts have persisted and have been paralleled by European organisations like Tripping Up Trump who has been protesting Donald Trump's golfing investments in Scotland.

Then IOC president, Juan Antonio Samaranch, first spoke on environmental issues at Davos in 1991, and a few years later the organisers of the Lillehammer Winter Games of 1994, after pressure from their local environmental movement, set new standards for environmental engagement at mega-events in terms of venue design, energy and water use and recycling.

However, the main energies pushing the IOC and the world of sport towards a comprehensive engagement with environmental issues came from outside, in particular from the United Nations Environment Programme (UNEP). At its conference in Rio in 1992, UNEP set a new baseline environmental agenda for every international and national organisation, in every sector of economy and society, committing the international community to major change in the realms of climate, waste management, and ocean and air pollution.

After Lillehammer, the IOC and UNEP convened a sport and environment commission, and in 1999 the principles of environmental sustainability were written into the Olympic charter. The following year the IOC developed its first set of environmental protocols for bidding and staging Olympic events, requiring prospective and actual hosts to monitor their environmental impact, though with very mixed results.

Climate change and carbon emissions were not central concerns at this point, but as the climate crisis has gathered pace, the issue has become the single most important aspect of

global sports' sustainability plans and has given environmental issues an urgency that they have not had before.

Even so, progress has been glacial. It was only in the mid-2000s that the IOC and FIFA first began to measure the carbon emissions of their mega events and develop policy responses. It took another decade for them to be joined by a small number of sports federations like UEFA, but the vast majority of international and national sports federations and leagues have barely begun to develop governance structures or policies to address any environmental problems.

The recent history of environmental issues in sport suggests that, at the leading edge, the sports world is capable of making a serious response to environmental questions. However, it is also clear that the tail of non-engagement is very long, and mechanisms for bringing it in line with best practices are thin on the ground.

Key readings

For anyone who wants to get the big picture and the sheer breadth of disciplinary approaches and topics covered in recent work on sport and the environment, there are a number of collections worth browsing.

- B. McCullough and T. Kellison (eds.) (2017) Routledge Handbook of Sport and the Environment**.**

This handbook covers the environmental dimensions of marketing event management and construction, as well as more political themes like greenwashing, and the role of the European union in sport and environmental policy.

- B. Wilson and B. Millington (eds.) 2020 *Sport and the environment: Politics and preferred futures*.

This book covers similar territory as the 'Routledge Handbook of Sport and the Environment' but with more input from sociological and political thinking and pays closer attention to economic interests in this space. Highlights include native American responses to the environment; witness tours of landscapes that are being lost to climate change; climate and surfing; and the role of the UN's sustainable development goals (SDGs) in a more rounded sport and environmental policy.

- B. McCullough, B. Kellison, and N. Melton(eds.) (2022) *The Routledge Handbook of Sport and Sustainable Development.* Routledge.

This handbook explores the role of the UN's sustainable development goals in sport and environmental policy.

- United Nations Environment Programme (2022) *Sports for Nature: Setting a baseline – Handbook*. Nairobi, Kenya.

The climate crisis is just one element of a much broader and complex series of intersecting ecological crises - from marine pollution to the precious decline of insect species. This report from the UNDP takes a holistic view of sports' environmental impact. It highlights the light, noise and plastic pollution that sport generates, as well as its impact on biodiversity through land development programmes, the use of herbicides, and the disruption of habitats.

Sport and climate change: An overview

This guide breaks down the sport and climate space into five components:

Section 1 on the impact of the climate crisis reviews the research and reporting on how the climate crisis is directly affecting the world of sport, and it looks at projections, based on mainstream climate models, of where we might be by 2050.

Section 2 on sports' carbon emissions looks at sport's contribution to the climate problem. It reviews the carbon audits that have been conducted by major sporting organisations, as well as more academic research on the topic. It also makes some plausible estimates of the sports carbon footprints and considers areas - like the sports goods industry - that have not yet been included in the count.

Section 3 on sports' responses to the climate crisis looks at how the world of sport at different levels has taken steps to deal with the climate crisis and the wider environmental problems it is entwined with, including:

- the mechanisms of governance and regulation at a global level, like the UN Sport for Climate Action Framework, and the UN Race to Zero programme
- the responses of international sports federations; and the policies of leading national sports organisations, commercial leagues, and clubs, with a special focus on football
- the emergence of a range of NGOs, from athlete activists to fan-based campaigns, working on climate and sport.

Section 4 on sustainable innovations in sport looks in more detail into some of the best environmental practices from new stadium designs over redesigning sports competitions to new business models and products in the sports goods industry.

Section 5 on current debates looks at areas of controversy and debate in the field. In particular:

- the place of the global south in the sport and climate space
- the call for sport to disengage from fossil fuel money
- the very real limits and problems of carbon offsetting programmes
- the idea that sport's unproblematic relationship with commercial and geographical growth needs to be radically rethought.

Key readings

These five reports are amongst the best overviews of the state of research on climate and sport. All of them review the current and future impact of climate change on sport in their field, look at sport's contribution to the problem, and think about the ways in which both can be tackled.

- The Climate Coalition (2018)
- BASIS (2019) Hit For Six: The Impact of Climate Change on Cricket, BASIS,
- D. Goldblatt (2020) Playing Against the Clock: Global Sport and the Climate Crisis, Rapid Transition Alliance
- M. Rice et al., (2021) Game, set, match: Calling time on climate inaction. Australian Climate Council
- WWF France (2021) Dereglement Climatique: Le Monde Du Sport a +2°C et +4°C, WWF France

Key media sources

- The sustainability report is the single best source of news on sustainability in global sport. The site regularly posts news, interviews, and opinion pieces on every aspect of sport and the environment and has a very good back catalogue of podcasts, featuring academics, sustainability managers, athlete activists, and other leaders in sport speaking on everything from racial and environmental justice to new recycling technologies for sport goods.
- Sustainability. Sport is a very useful website, run by the IOC and other sports bodies, that gathers together a wide range of material on sustainability published by international sports organisations. It is particularly strong on the sustainability statement and policies of international sports federations.
- The Sports Ecology Group is a global network of academics working across the full range of issues in sport and sustainability. Its website has an excellent curated selection of academic work and research.
- Two notable media interventions in the field in the run-up to COP 26, held in Glasgow in Scotland, were the BBC's Sport 2050 project and the podcast Emergency on Planet Sport.
- The BBC commissioned a group of academics and journalists to imagine what kind of news the BBC sports department would be reporting in 2050 if carbon emissions were not reduced. The BBC has subsequently created a sustainability section within its sports news website.
- Emergency on Planet Sport is an eight-part podcast featuring interviews with many leading athletes who have become climate activists, looking at how the climate crisis will affect them and their sport personally as well as the bigger issues, not to mention some specially commissioned poetry.

SECTION 1:
THE IMPACT OF THE CLIMATE CRISIS

Unseasonal warm weather in January 2023 melts snow from Alpine slopes. Photo: David Kopatsch / Getty Images

The stadium's on fire! The impact of the climate crisis on venues and athletes

This section reviews the many ways in which climate change is already taking its toll on global sport, and the scale of the risks and difficulties ahead.

The section looks at six current dangers and future threats:

- Winter sports face climatological and economic demise as the geography, volumes, and frequencies of snow fall shrinks.
- Players and the public alike are threatened by more heatwaves and the range of heat illnesses; more and more events are being rescheduled or cancelled as a consequence.
- Drought is a practical threat and a huge economic cost for turf sports like cricket and football.
- Air pollution, already bad in many cities, is made considerably worse by global heating and has negative effects on both the quality of sporting performance and the health of athletes and spectators.
- Extreme weather events like hurricanes, typhoons, storms, and floods are becoming more frequent and more powerful causing considerable disruption to sporting schedules and sometimes massive damage to sporting facilities.
- Sea level rises and flooding together pose considerable threats to many urban coastal stadiums, grassroots playing fields, beach sports and surfing, and coastal golf links.

Winter sports

The impacts of climate change will, of course, not be uniform, but one almost universal consequence of the changes is that average temperatures will rise everywhere. In mountainous regions that are home to most winter sports, it will mean less snow, falling less often, and melting more quickly. Changes in precipitation, without which there is no snow, are also diminishing snowfall in many places. Obviously, winter sports are directly affected by these problems.

Winter Olympics

In January before Vancouver 2010, local temperatures were the warmest on record at 4.6 degrees Celsius above normal, and temperatures during February when the games were staged were 3.4 degrees Celsius above normal.

Snow cover was OK at the high mountain venues at Whistler, but at the lower altitude of the Cyprus Mountains venues, the organisers coyly wrote that "the warmest weather on record ... challenged our ability to prepare fields of play for athletes." In fact, a huge 24/7 operation to create and move artificial snow was required.

Many competitors at Sochi 2014 complained about the lack of snow, and that the artificial slow, wet, and heavy snow was difficult to manoeuvre on.
These poor course conditions meant that most medal winners came from amongst the first ten athletes to start in each competition, as they had the huge advantage of racing on drier snow that was quickly degraded for those that followed them.

Compared to the 2010 Games, there was a five per cent drop in athletes actually finishing their event in alpine skiing, freestyle skiing and snowboarding. There was also a nine per cent increase in competitor injuries.

The Sochi Paralympics saw a sixfold increase in injury rates compared to Vancouver.
Pyeongchang 2018 had no problem with snow, but it is worth noting that, like all the other recent Winter Games, these Olympics required the destruction of significant mountain forest, and the reassignment of protected land and national parks to permit development.

Beijing 2022 suffered, above all, from the prolonged drought that the host mountains had endured. A massive operation was required to make enough artificial snow, and then only enough to place a ribbon across parched brown slopes.

Future Winter Olympics

According to predictions made by researchers at the University of Waterloo, Beijing is just one of many former hosts that are unlikely, for climatological reasons, to be able to do so again. Of 19 prior locations, only ten were thought to still be reliable winter sports hosts in 2050, and just six in 2080.

In more recent research, based on more up-to-date climate models, the Waterloo researchers estimate that under a high emissions scenario, only Sapporo will still be a reliable Winter Olympics host by 2080.

The winter sports industry

The global winter sports tourist industry is equally imperilled. Due to the lack of snow and the poor quality of what snow there is, the season is starting later and finishing earlier. The number of good skiing days is diminishing. See for example studies of Norway, Sweden, Austria, the US and Canada.

Already, more than 90 per cent of all ski resorts worldwide are using artificial snow, but this requires not only significant capital investment but also large amounts of water and energy. Water, in particular, can be difficult or very expensive to access in mountainous regions suffering from droughts.

Even where snowmaking is technically feasible, these costs are likely to put many lower-altitude resorts out of business.

Key readings

- K. Pierre-Louis and K. Popovich, N. "Of 21 Winter Olympic Cities, Many May Soon Be Too Warm to Host the Games" *New York Times* Jan 11 2018 (subscription)
- Sport Ecology Group (2022) Slippery Slopes: How Climate Change is Affecting the Winter Olympics
- D. Scott et. al (2022) Climate change and the future of the Olympic Winter Games: athlete and coach perspectives

Heat illnesses

The physiology of overheating is complex, but once you start hitting 33 to 35 degrees Celsius it's all bad news, for spectators, officials and above all athletes.

- Increasing temperatures negatively affect memory, eye-hand coordination, and concentration, all of which means poorer sporting performance.
- Sunburn is already a considerable problem in some sports and is likely to get worse and the risk of skin cancer correspondingly increases.
- Physiologically, high temperatures raise levels of sweating and heart rates and raise the risk of dehydration, muscle cramps, and cardio-vascular problems.
- These symptoms can combine to produce heat exhaustion and, most seriously of all, the multi-organ failure of heat stroke.

All of this is made worse in high humidity. Sports organisations now calculate safe temperature thresholds by reference to both heat and humidity, which when combined produces what is referred to as a wet bulb temperature.

There are already a variety of mitigation strategies in sport to cope with this threat. They include:

- more cooling and hydration breaks
- events scheduled at cooler times of the day or year
- heat acclimatisation strategies for athletes
- alterations in game/race strategy
- new sports clothing.

At the same time, more events are just being cancelled, and in other case more athletes put at risk.

Key reading

- BASIS (2020) Rings of Fire: How Heat Could Impact the 2020 Tokyo Olympics

Drought

One inevitable consequence of more hot weather is less rain, and in many parts of the world that means more droughts. This is a problem for any lawn-based sport that requires lots of water to prepare playing fields.

- The 2018 prolonged drought in Cape Town in South Africa saw water use at both professional and amateur sports grounds severely restricted. The visiting Indian cricket team was told to shower for no more than 90 seconds while club and school cricket was cancelled halfway through the season across the whole Western Cape. Reports of pitches cracking were widespread.
- In 2016, the Mumbai high court forbade the Maharashtra Cricket Association in India from receiving water for its matches in Pune from depleted reservoirs, forcing the games to be relocated.

Droughts also affect rates of flow in rivers. Lower water flow will have an impact on multiple riverine sports (canoeing for example) both in terms of sporting performance and the cleanliness of the water.

Air pollution

Air pollution comes in many forms and has many sources. Particulates, heavy metals, ozone, and acids make up a poisonous cocktail, and athletes are breathing in more of this than most.

During a peak air pollution episode in Delhi in 2017, cricketers playing in the India v Sri Lanka game were vomiting on the pitch, and it was necessary to have repeated breaks in play and to install oxygen cylinders in their dressing rooms.

Climate change is making air pollution, already awful in most of the world's metropolitan areas, much worse.

Many habitats overwhelmed by longer periods of drought, hotter and longer summers, and large-scale and inappropriate human developments, are increasingly at risk of massive wildfires. The scale of the fires in Australia in 2020, for example, saw tennis and cricket events overwhelmed by smoke.

Increasing temperatures also lead to higher levels of ozone at ground level which has a serious impact on pulmonary functioning. Air pollution researchers have found that high exposures diminish the athletic ability of football players, and the quality of baseball officials' judgements.

Key reading

- M. Tainio et al. (2021): Air pollution, physical activity and health: A mapping review of the evidence, Environment International, vol. 147

Extreme weather

The last thirty years have seen a steady increase in the number of hurricanes, typhoons, and storms, and an increase in their average severity. Many parts of the world are experiencing greater levels of precipitation, and new geographical and seasonal patterns of rainfall. These are already having significant impacts on sport.

- Caribbean hurricanes have smashed cricket facilities in Anguilla and Dominica. Powerful Pacific typhoons arriving on Japan's eastern coastline led to games being cancelled at the 2019 Rugby World Cup, and schedules for surfing and sailing to be rearranged at the 2020 Tokyo Olympics.
- A more incremental but equally problematic change can be seen in English cricket where, for example, 27 per cent of home One Day Internationals since 2000 have been played with reduced overs because of rain disruptions, and the number of rain-affected matches has doubled since 2011. Five per cent of matches have been abandoned altogether over the last decade with considerable economic consequences.
- Amateur and recreational sports are also affected by the new weather. In England in 2014, the average grassroots pitch lost five weeks per season to bad weather, and a third of these pitches lost between two and three months in a season.

Sea level rises and flooding

Beach and coastal sports

Beaches are amongst our most important natural sports fields. Sea level rises and the inevitable land erosion that goes with them threaten professional and recreational sports alike.

- The islands and archipelagos of the south Pacific are amongst the landscapes most threatened by sea level rises, and their rich rugby cultures, nurtured on their beaches, are equally imperilled.
- California's beaches and their surfing culture are also looking insecure. One recent study predicted that 18 per cent of the state's most popular beaches will be lost by 2050, that another 16 per cent will be in decline, and that two-thirds of all beaches in the southern half of California will be gone by the of the century.
- The R&A reports that one in six of the coastal British Open championship courses, including St Andrews, Troon and Carnoustie, are unlikely to last out the century.
- Scotland's Montrose golf course, one of the five oldest in the world, has been forced to sacrifice its third tee, to provide sufficient rock defences for the even more threatened first and second holes. It expects to lose more. The Royal North Devon golf

club, entirely flooded by Storm Deirdre in 2018, saw the eighth hole disappear into the shingle beach.

Stadiums at risk

In 2020, the report 'Playing Against the Clock' used mapping technology and mainstream climate change and sea level models to look at the risks of flooding facing major stadiums in North America and Western Europe. It reported that:

- Bordeaux's Matmut Atlantiq stadium will, by 2050, be completely flooded on an annual basis, while Werder Bremen's Weserstadion can expect annual partial floods.
- In the United States the NFL's Jacksonville Jaguars and their TIAA Bank Field, as well as the NBA's Miami Heat and their American Airlines Arena, can expect annual partial floods.
- The New York Giants and Jet's MetLife Stadium and the New York Mets' Citi Arena will, by 2050, be completely flooded every year.
- In Canada, the Edmonton Oilers' Rogers Place and Toronto FC's BMO Field will be partly flooded on an annual basis.
- Of the then 92 league teams in England, 23, almost one in four, can expect partial or total annual flooding of their stadiums by 2050. Those under threat in the current Premier League are Southampton's St Marys, Chelsea's Stamford Bridge and West Ham's Olympic Stadium.
- In the Netherlands, in 2050, the stadiums of Alkmaar Den Haag, Groningen, Heerenveen and Utrecht can look forward to total annual flooding with partial floods for Ajax and Feyenoord.

Examples by year of climate impacts on global sport

2014

- The Australian Tennis Open was played in the middle of a harsh heat wave that saw four consecutive days of temperatures above 41°C. Frank Dancevic actually began hallucinating on court before vomiting and departing, one of a record nine players that retired during the first round of play. During the whole tournament over 1,000 fans were treated for heat exhaustion.

2015

- In the northwest of England, the huge rainfall that came with Storm Desmond saw Carlisle United's Brunton Park flooded, and the club was forced out of the stadium for seven weeks at considerable financial cost.

2017

- Anguilla's main cricket stadium, James Ronald Webster Park was seriously damaged by Hurricane Irma requiring a total rebuild.
- Windsor Park cricket stadium in Dominica was devastated by the category 5 Hurricane Maria.

2018

- At the 2018 US Tennis Open temperatures on court peaked at 49 degreesCelsius. Officials mandated the first use of the tournament's extreme heat policy, allowing more and longer breaks during matches. Nonetheless, five players retired from matches for heat-related reasons.
- In Indian cricket, thirteen Indian Premier League games were moved from Maharashtra due to the worst drought for 100 years.

2019

- The mid-summer heat wave in the Eastern USA saw the cancellation of New York City Triathlon.
- The Tokyo 2020 Olympic organisers finally bowed to climate realities and rescheduled the marathon and long distance walking events 1000 km north to Sapporo to escape Tokyo's now humid and dangerously hot summers.
- Typhoon Hagabis came ashore in Japan with such torrential rain and winds that three games at the Rugby World Cup were cancelled.

2020

- Critical drought conditions threatened the cancellation of the South Africa vs India test match in Cape Town.
- A combination of record temperatures and raging wildfires across Australia saw dangerously polluted conditions at the Australian Tennis Open in Melbourne and Big Bash cricket matches in Sydney.
- Storm Ciara was sufficiently powerful to force the cancellation, in England, of one Premier League game, and six Women's Super League matches and widespread postponements in Dutch football and the top two levels of Belgian football.

2021

- A typhoon that made land fall during the Tokyo Olympics forced a major rescheduling of rowing and surfing events. The heatwave in Tokyo city saw a rescheduling of tennis matches.
- Storm Eunice swept across Northern Europe precipitating huge flooding across the Low Countries and Western Germany. High winds tore part of the roof of ABO Den Haag's Stadium. Belgium's F1 circuit Spa-Francorchamps was flooded. The Koningsee, the world's first artificial sliding run, was smashed into pieces. The German Olympic Committee reported 100 million Euros worth of damage to sports facilities.

2022

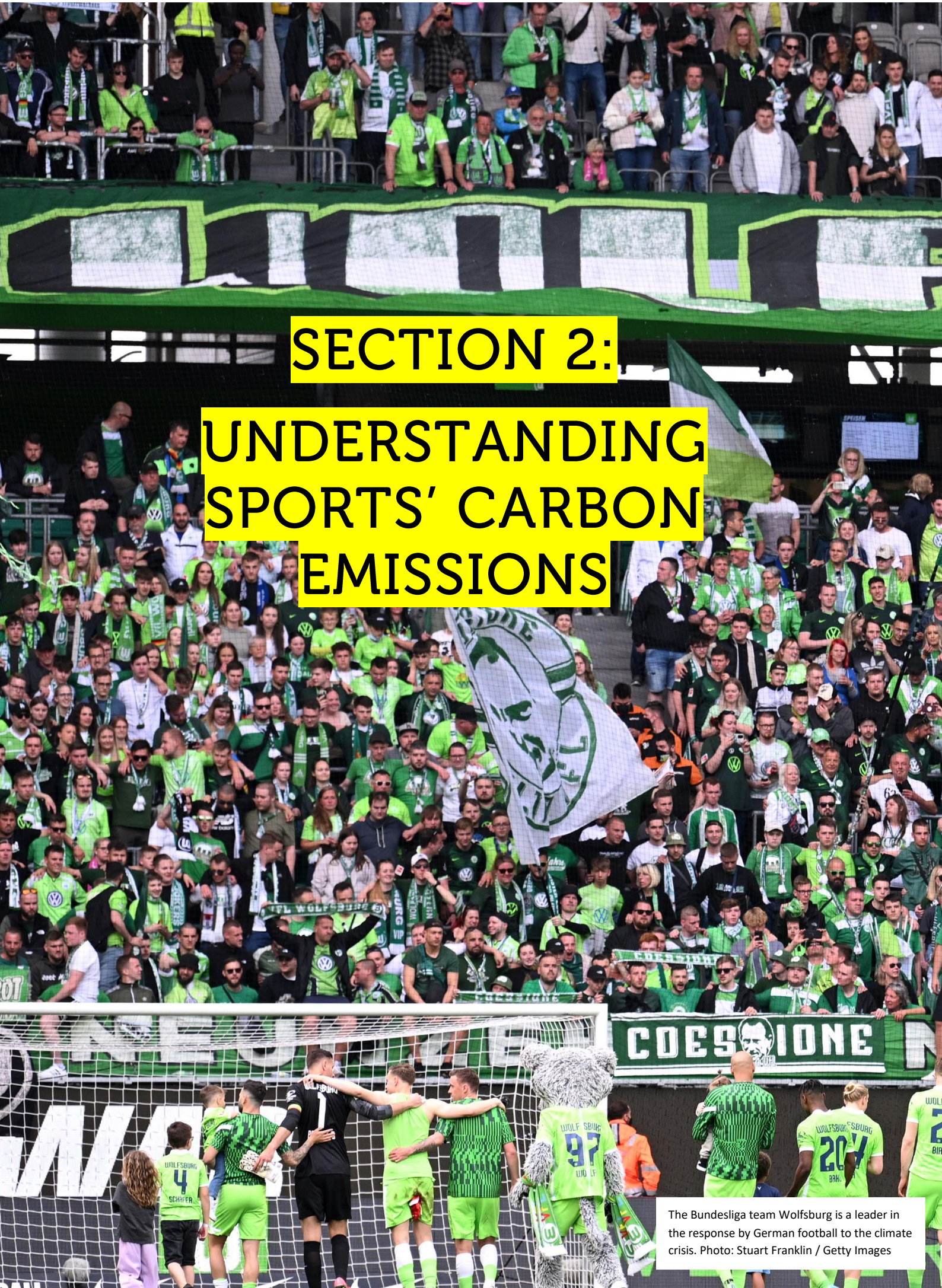
- Record floods in KwaZulu Natal, on South Africa's Indian Ocean coast, destroyed many of the region's golf courses.
- Fierce summer heatwaves saw the New York triathlon shortened and the Boston triathlon cancelled.

Winter 2022/23

- One of the warmest European winters on record saw the postponement or cancellation of many events on the world skiing circuit, as well as economic disaster for the tourism and leisure industries in France, Italy, and Switzerland.

SECTION 2:

UNDERSTANDING SPORTS' CARBON EMISSIONS



The Bundesliga team Wolfsburg is a leader in the response by German football to the climate crisis. Photo: Stuart Franklin / Getty Images

Understanding sports' carbon emissions

Counting carbon emissions accurately is a complex and technical business, but this guide will take a look at two important accounting conventions and draw on a number of case studies to show where the biggest contributions to sports' carbon footprints lie.

Global heating is produced not only by the emission of carbon dioxide in the atmosphere but by a number of other gases too, most notably methane, which is a product of, amongst other things, meat and dairy farming. In fact, methane, molecule for molecule, has a much greater heating effect than carbon dioxide.

To allow all of these different gases' impacts to be considered together, the basic unit of measurement used is tonnes of CO2 equivalent or tCO2e for short. As methane has around four times the impact of carbon dioxide, emitting 1 tonne of methane would be recorded as 4 tCO2e.

In the most widely used international accounting tool, the Greenhouse Gas Protocol, emissions are categorised into three groups or 'scopes' depending on how they have been produced.

- Scope 1 refers to direct emissions from processes owned or controlled by an organisation. This would include on-site fossil fuel use for power and heating.
- Scope 2 covers the emissions generated by electricity, steam, heating, and cooling purchased by an organisation.
- Scope 3 covers all the emissions associated with processes and consumption in an organisation's value chain.

In the case of sports organisations this could include:

- purchased goods and services – including sports and office equipment, employee catering
- athlete and employee travel
- spectator travel
- waste disposal, especially from event catering
- merchandising.

The case studies below, which are amongst the best-documented carbon audits in global sport, take a look at:

1. The carbon emissions of a single football club (Wolfsburg FC)
2. A single premier league football match (Spurs vs Chelsea)
3. Two American sports leagues (MLB, NHL)
4. The FIFA men's World Cup
5. The Olympic Games

Case study 1: Wolfsburg FC

Wolfsburg, the Bundesliga team, is a leader in the response by German football to the climate crisis.

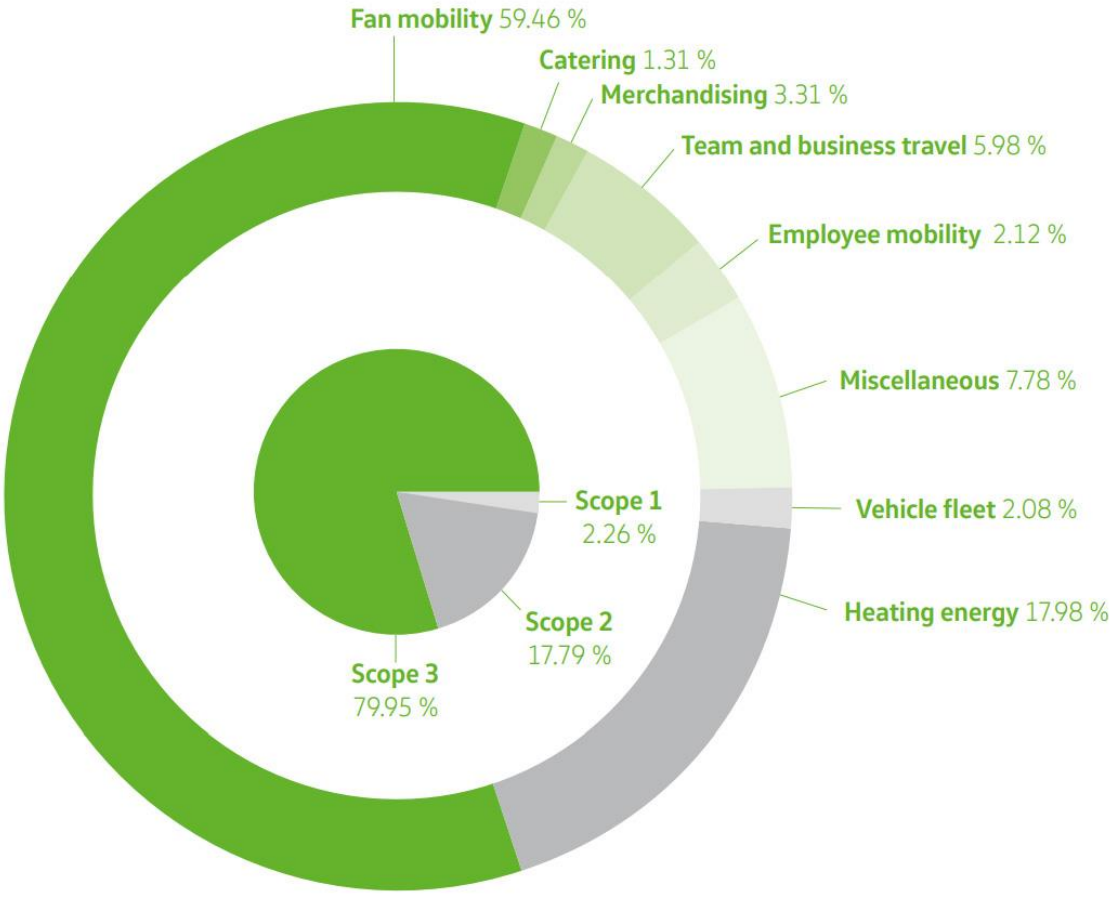
Its 2020 carbon calculation showed scope 1 and 2 emissions made up just 20 per cent of the total, and this was mainly for heating.

Scope 3 emissions made up 80 per cent of the club's total emissions.

60 per cent of the club's total emissions came from fan travel, eight per cent from team and employee travel, and five per cent from catering and merchandising.

While the precise ratios vary from sport to sport and club to club, the figures from Wolfsburg are a pretty good guide for most of the professional sports world.

Figure 1: CO2 footprint



Source: Moving Together: Sustainability Report of VFL Wolfsburg 2020

Case study 2: Spurs-Chelsea's net zero game

In November 2021, Tottenham Hotspurs hosted Chelsea in what it called the first net zero game in the Premier League.

Total emissions from the game were 862 tonnes of carbon equivalent.

Fan travel and accommodation accounted for over 90 per cent of emissions from the game, and the majority of that came from car use.

This may not sound like very much, but there are 380 games in a Premier League season. On this basis alone, the English Premier League (EPL) is probably emitting 0.4 million tCO2e every year.

However, this game had considerably lower emissions than most because:

- First, a whole range of low carbon initiatives were already in place at Spurs' new stadium – including the use of 100 per cent renewable energy at White Hart Lane – or were launched to lower the overall emissions of this game, like using biofuels to power both team's coaches.
- Second, many games in a Premier League season would have entailed longer travel distances of fans, and thus higher emissions, than a London derby with excellent public transport links.
- Third, Spurs decided to exclude the emissions generated by fans who flew to the game – calculated at 229 tCO2e, which is almost a quarter of the reported total – on the curious grounds that fans might have made the flight anyway. However, with hundreds of thousands of overseas visitors coming to see EPL games every year, this seems an unreasonable assumption.

Therefore, a more reasonable estimate of the EPL's annual footprint is closer to 0.7 million tonnes a year.

Given that just as many people are going to see lower league football as the EPL, and that the emissions associated with cup competitions, women and youth teams, and training facilities should also be added, English professional football's annual emissions are easily in the order of 1 million tCO2e.

Table 1: Spurs vs Chelsea carbon emissions

	tCO2e	Proportion
Energy	1.4	<1%
Water, wastewater, and waste	4.7	<1%
Employee commuting, both squads travel and Chelsea hotel stays	1.5	<1%
Fan travel and hotel stays	805.7	93%
Materials/consumables	44.4	5%
Misc	4.1	<1%
Total	861.9	

Source: www.skygroup.sky/game.zero

Table 2: Spurs vs Chelsea fan travel emissions

Emissions source from fan travel	GHG emissions (tCO2e)	Proportion
Car	560.8	70%
• Petrol	262.0	
• Diesel	257.8	
• Hybrid	25.5	
• Electric	9.9	
• Taxi	5.6	
Motorbike	1.3	<1%
Rail	143.8	18%
Bus/Coach	16.7	2%
Hotel	83.0	10%
Walk/Cycle	0	0%
Total	**805.6**	

Source: www.skygroup.sky/game.zero

Case study 3: MLB and NHL

Data on American sports' carbon emissions remains fragmentary, but some useful work has been done, and on that basis, some plausible estimates can be made about what the scale of the problem might be.

Major League Baseball (MLB)

In 2018, a carbon audit of the MLB club, the Tampa Bay Rays, suggested annual emissions including fan travel of 35,000 tCO2e.

As one of just 32 franchises, this would give a figure for MLB as whole of around 1.1 million tCO2e.

Tampa, though, is far from the most well-attended team; in fact, it was 30th out of 32 in 2020. Adjusting for this, a figure between 1.5 and 2 million tCO2e for MLB's annual emissions is easily plausible.

National Hockey League (NHL)

The NHL's 2018 sustainability report estimated that the league's total carbon emissions in 2014 were 0.189 million tCO2e and that this declined to 0.182 million tCO2e in 2016.

However, the NHL decided only to include team travel in their scope 3 calculations. If emissions from fan travel were added so that scope 3 emissions – in line with other sports – were around 70 per cent of the total, then the league's annual emission would be closer to 0.6-0.7 million tCO2e.

Case study 4: FIFA World Cups

FIFA has conducted carbon audits of the last four men's World Cups – South Africa 2010, Brazil 2014, Russia 2018 and Qatar 2022.

As with other sports events, fan travel is the most important contributor to emissions. Given the global reach of the tournaments and the ubiquity of aviation, this makes up a bigger share of total emissions than in national leagues – as high as 83 per cent in Brazil in 2014.

Qatar 2022 was also very heavy on flying, but there has been considerably more construction work than at the other World Cups, accounting for 20 per cent of emissions alone. Adding accommodation-related emissions to fan travel brings the figure closer to the norm of around 70 per cent.

Recent work by Carbon Market Watch suggests that the organisers of Qatar 2022 have radically underestimated the carbon emissions associated with stadium and facility construction by as much as 2 million tCO2e.

Table 3: FIFA men's World Cup carbon emissions (million tCO2e), and fan/athlete travel as percentage of emissions

	Carbon emissions (million tCO2e)	Fan/athlete travel percentage of emissions
South Africa 2010	2.75	67
Brazil 2014	2.27	83
Russia 2018	2.16	74
Qatar 2022	3.63	51

Case study 5: Olympic Games

The IOC and local organisers have been publishing environmental and carbon audits for almost two decades.

For the Summer Games see Athens 2004, Beijing 2008, London 2012, Rio 2016, and Tokyo 2020.

For the Winter Games see Vancouver 2010, Sochi 2014, Pyeongchang 2018, and Beijing 2022.

How emissions have been calculated has become steadily stricter and more encompassing. In 2018, the IOC published its most recent and stringent carbon footprint methodology to which all Olympic Games must now conform.

It is likely then that the figures below for Beijing 2008 and Vancouver 2010 are considerable underestimates.

The recent drop in emissions at Tokyo 2020 (held over till 2021) and Beijing 2022 are overwhelmingly because COVID restrictions meant almost no foreign spectators attended these Games and only very few locals.

Table 4: Summer Olympics carbon emissions (million tCO2e)

	Carbon emissions (million tCO2e)
Beijing 2008	1.18
London 2012	3.3
Rio 2016	3.6
Tokyo 2020	1.96-2.42

Table 5: Winter Olympics carbon emissions (million tCO2e)

	Carbon emissions (million tCO2e)
Vancouver 2010	0.27
Sochi 2014	0.52
Pyeongchang 2018	1.64
Beijing 2022	0.49

A thought experiment: Estimating global sports' total carbon emissions

Given all the complexities and inconsistencies of emission reporting, not to mention the huge numbers of organisations that have yet to deliver a carbon audit, it is only possible to estimate the sports industry's carbon footprint but this section makes an attempt in the form of a thought experiment.

Using case studies from the section on sport's carbon emissions as a guide, this section also discusses what might be the total global emissions of the sports industry. It takes the international championship circuits and the big professional leagues as its starting point and then extrapolates the figures to include other leagues and sports. The estimate is then put into the context of overall CO2 emissions to ask what the real contribution of limiting sports' carbon footprint would be.

The international championship circuits

Over a four-year cycle, the Olympics and the men's football World Cup alone are emitting 1.5-2.5 tCO2e a year.

These events are the pinnacle of a global network of international competitions. The global federations of every one of the Olympic sports (more than thirty across the Winter and Summer Games) hold World Championships and often continental championships too on a regular basis.

What level of emissions are these events responsible for? One way of coming at this is to look at the research in Sportcal's 2017 Global Sporting Impact report which, over the four-year cycle from 2013-2106, compiled a list of the leading 317 global sporting events.

They found that there were 54 million spectators at these events, of which the World Cup and the Winter and Summer Olympics accounted for 10 million spectators. So that's just under a fifth of the total spectator numbers for the international sports circuit.

However, the World Cup and Olympics are probably more carbon intensive per spectator than other events as there is more international travel and more consecution associated with them. To allow for that, let's assume that their emissions (around 2 million tCO2e) constitute a fifth to a quarter of the circuits' output. This translates into total emissions from international sports competitions of around 10 million tCO2e annually.

The big professional leagues and tours

Let's start with the US major leagues. Based on the estimates above of 2 million tCO2e for MLB and 0.7 for NHL, the total for MLB, NHL, National Football Legaue (NFL), National Basketball Association (NBA), and Major League Soccer (MLS) can be rounded out as 5 million tonnes.

Then add all the US minor leagues in those five sports, women's leagues, and college sports, all of which have considerable levels of attendance. Triple-A baseball in the US, for example, has as many spectators as the EPL. Call it another million tCO2e.

Then add:

- the major global football leagues by attendance (England, Spain, Italy, Germany, France, Mexico, Japan, Brazil) totalling around 100 million spectators
- the major baseball leagues (China, Japan, Korea, Mexico, Venezuela), with an annual attendance of around 40 million
- the major attractions in cricket (the IPL in India, Australia's Big Bash) and the international test circuit attract around 5 million spectators a year
- golf (the US, European and Asian Tours) and tennis (the ATP circuits), at around another 10 million spectators
- motor sport spectators (F1, NSCAR, Moto GP) around 7 or 8 million spectators
- cycling (above all the great European road races like the Tour de France and the Giro D'Italia which attract more than 12 million spectators each) for a total European season of more than 30 million spectators.

Adding up the American and other leagues and given all the sports and nations that are not included here, we arrive at a figure of more than 200 million spectators a year. Taking the EPL as a yardstick, approximately 10 million spectators produce 0.5 million tCO2e. Some sports may be less carbon-intensive per spectator, some more, but going with this assumption, a figure of 20 million tonnes a year from professional sport's more than 200 million spectators does not seem outlandish. Add on the international circuits emissions and the total stands at around 30 million tCO2e.

Large as these figures may seem, they are almost certainly a considerable underestimate. Consider this.

The size of the global sports industry has been calculated at around 500 billion US dollars a year. Global GDP is 85 trillion US dollars which means that sport makes up about 0.6 per cent of the global economy which is responsible for 50 to 60 billion tonnes of tCO2e.

Sport may be less carbon intensive than some economic sectors – like concrete production – but it is also very heavy on travel especially aviation, so its 0.6 per cent of global GDP is probably something close to generating 0.6 per cent of global emissions. Looked at this way sport would be responsible for 300–350 million tCO2e.

The role of sport is to be a catalyst and exemplar

Where, then, do sports' plans for carbon zero fit into the world's wider programme of climate action?

Even taking the low estimate of sport's emissions, it is equivalent to that of small nations. The higher estimate at around 300 million tCO2e makes it equivalent to a medium-sized and higher emissions state like Poland.

No one is suggesting that national emissions of this size are not an important component of the world's emissions.

That said, even if sport was to go comprehensively carbon zero, it will only be making a small contribution to dealing with the problem.

This, however, should not be seen as an argument for either not making these efforts, or indeed to see them as marginal. Sport's role in this process is to be a catalyst and exemplar, to show that radical decarbonisation in all walks of life is possible, essential, and urgent. Sport is well placed to make a major cultural and political contribution.

- Sport has a global and demographic reach that no other popular cultural phenomenon can claim.
- Sports, especially professional clubs and star athletes, retain a high degree of trust and influence with the global public that few other advocates of climate action can match.
- Sport, above all team sports, remains a rare place in which the public believes in the power of collective action – both amongst athletes and in the dynamic interrelationship of crowd and athletes.
- Sport is a rare cultural space in which people experience the possibility of radical turnarounds and last-minute victories – precisely the emotional and psychic space that the climate movement requires if it is to break down the walls of cynicism that block collective climate action.

If sport is to realise the political potential of these cultural resources, it is vital that it puts its own environmental house in order by moving rapidly to a carbon-zero economy.

Table 6: Comparing global sport to nations by estimated carbon emissions

Emissions tCO2e	Sport	Nation
1	English professional football	Burundi
3.6	Qatar 2022 World Cup	Namibia
10	International Circuit estimate	Cote d'Ivoire
20	Professional league estimate	Bolivia
30	Total sport, low estimate	Cuba
300	Total sport, high estimate	Poland

Missing emissions

Three other elements of the global sports industry which have, so far, not been included in sport's carbon accounting are also worth thinking about.

Grassroots sport
Quite simply there are no estimates of how much grassroots, amateur, and recreational sport is contributing to global sport's carbon emissions. Data on how many people are participating in sport is notoriously inaccurate, and how they are travelling and consuming is equally opaque.

FIFA's survey came up with a figure of 275 million people playing football on a regular basis, which is about the same as the total spectator attendance at global sport. Certainly, the number of regular participants worldwide in all sports will be in the hundreds of millions, and the travel, facilities, and equipment this entails will have a very considerable carbon footprint.

This is one of the areas of the climate and sport debate where new research is most needed, and where decarbonisation plans need to be most urgently thought about.

Broadcasting
Broadcasting is integral to global sport, and it has its own carbon footprint related to moving staff and equipment around the world and using energy to run computers and cameras. This is not usually included in carbon auditing in the sector, which it should be.

In the UK, the main sports broadcasters have developed their own carbon-zero broadcasting protocols – Albert – which is a useful model for the rest of the global industry. However, no one in the broadcasting industry has as yet fully incorporated all of the carbon emissions associated with streaming and internet use, which are considerable.

The sportswear industry
The sportswear industry is tightly integrated with the global sports industry, and its sponsorship of tournaments, clubs and athletes is central to building brands and driving sales. By the same token, sports federations, clubs, and athletes draw very considerable income from their work with these global corporations.

It is obvious that an industry that turns over more than 200 billion US dollars a year, has huge global supply chains requiring vast amounts of transport, and which relies on many fossil fuel-based raw materials, is going to have a colossal carbon footprint.

Puma, the third largest corporation in the sector has reported annual carbon emissions of almost 40 million tCO2e, bigger than the lowest estimate for the whole sports industry above.

Some consultancies report that the shoe industry alone is responsible for one per cent of all global emissions and sports shoes are mainly made of petroleum-derived fabrics (polyester, thermoplastic polyurethane (TPU), polyethylene terephthalate (PET) and ethylene-vinyl acetate (EVA)) which are the heaviest carbon emitting materials used in the fashion industry.

However, the leading manufactures – Nike and Adidas – have yet to actually publish comprehensive carbon audits that include all parts of their supply chains, and the emissions associated with post-consumption waste. While both of these companies have detailed sustainability policies and publish some data on carbon, they are simply not transparent or comprehensive.

This is the single most important absence in the debate. It would be untenable for global sport to make a huge effort to go carbon zero, without a parallel effort from the sportswear industry.

Key reading

- J. Amann and M. Doidge: Climate change, catastrophe and hope in football fandom: Football as an island of hope in a warming sea of despair. In Sport and Physical Activity in Catastrophic Environments (pp. 161-174). Routledge.

SECTION 3:

SPORTS' RESPONSE TO THE CLIMATE CRISIS

World Sailing is one of the few Olympic sports federations that currently commits to a carbon reduction target with a plan to cut emissions at events by 50 per cent by 2024. Photo: Phil Walter / Getty Images

Sports' response to the climate crisis

The last decade, and especially the last five years, have seen a serious shift in sports' engagement with the climate crisis. This section maps and begins to evaluate the sector's response.

Section 1 looks at the newly developed global frameworks for climate action in sport: ISO20121, a global standard for managing environmentally sustainable sports events, the UN's sport for climate action framework (UNSCAF), and its more challenging Race for Zero programme.

While UNSCAF with over three hundred signatories including the majority of international sports federations marks a major advance, it is important to note what a small fraction of the sports world it actually covers, and how few of the signatories have begun to seriously implement the commitments they have signed up to. Nonetheless, amongst the best of the signatories, there are real signs of what could be possible.

Section 2 turns to practical examples of how the most advanced international sports federations – UEFA, World Athletics and World Sailing – have attempted to deliver on the commitments they have signed up to under UNSCAF or Race for Zero.

Section 3 looks at two examples of best practices from national sports federations (the English tennis association LTA) and commercial leagues (the Bundesliga).

Section 4 explores a flowering of sports climate action from below, driven by new campaigning NGOs, athlete activism, and fan engagement.

Section 5 maps the environmental response of the world's football clubs. As the world's most popular sport, football, is the biggest prize for climate action in sport, while the depth of the relationship between clubs and fans offers a very promising arena for climate advocacy

Global frameworks for addressing climate change

There are, at present, three global frameworks which are guiding sports' carbon-zero ambitions:

ISO 20121 is a management system created as part of the London 2012 Olympics and Paralympics that is designed to help organisations staging events to be socially responsible and environmentally sustainable.

UNSCAF (UN Sport for Climate Action Framework) was created in 2016 by UNFCCC and some of the leading world sports organisations, including the IOC, FIFA, and UEFA.

Race to Zero is a global UN-backed campaign to achieve net zero carbon emissions 'by 2050 at the latest'. Its signatories include businesses, cities, and regions.

Note, there are other ISO standards that some sports organisations draw upon, like UEFA's use of ISO 14001 which specifies the requirements for an environmental management system that an organisation can use to enhance its environmental performance; and the EU Eco-Management and Audit Scheme (EMAS) which is a premium management instrument developed by the European Commission to help companies and other organisations to evaluate, report, and improve their environmental performance.

See also the recent EU Council initiative 'Green and sustainable new deal for sport'.

Increasingly, national climate plans and directives from national ministries of sport are impacting sports organisations' climate action. In France for example, more than 100 sports organisations signed up to a national charter pledging major changes in sports consumption of transport, food, and energy.

The three frameworks can be distinguished by:

- the main environmental goals and objectives of the frameworks
- the criteria for joining the programme and commitments required
- the support offered to organisations joining a programme, and forms of audit on their progress
- their policy on spectator travel
- their policy on sponsorship and climate
- their policy on carbon offsetting.

Table 7: Overview of global frameworks for addressing climate change in sports

	ISO20121	UNSCAF	Race to Zero
Goals	The standard requires that an organisation has in place a transparent process through which it systematically evaluates the issues relevant to its operations and sets its own objectives and targets for improvement.	Signatories are now requested to commit to a range of climate actions: • educating athletes and spectators • engaging all their stakeholders in climate issues • measuring their own emissions • halving emissions by 2030 and aiming to achieve net zero by 2040	A review group examines all organisations' applications. Signatories must commit to : • net zero carbon emissions by 2050 at the latest • an interim target of 50 per cent reduction by 2030 • align their climate policy with the UN's SDG's (Sustainable Development Goals)

Commitments on joining	None	The organisation's CEO must: • publicly commit to net zero emissions by 2050 • draw up a plan within a year to achieve this • publish annual progress reports	The organisation's CEO must: • publicly commit to net zero emissions by 2050 • draw up a plan within a year to achieve this • publish annual progress reports • submit their plans to an expert peer review group
Support and audit	*Support*: Provides checklists, training, subjects guides, and a variety of toolkits *Audit:* The process of certification requires an organisation to present evidence to demonstrate that the event sustainability management system is an integral part of the event management process	*Audit:* Signatories are asked to report regularly on progress, but there is no external certification or audit process.	*Audit:* The Expert Peer Review Group annually reviews participating organisations with clear benchmarks
Spectator travel	• Offers tools for improving the use of public transport at sports events • Does not set targets on travel and carbon emissions	• Includes scope 3 or indirect emissions from upstream and downstream activities, such as travel, purchased goods and services, in carbon footprints. • No clear commitments on the inclusion of spectator travel in members' carbon footprints.	• Includes scope 3 or indirect emissions from upstream and downstream activities, such as travel, purchased goods and services, in carbon footprints. • No clear commitments on the inclusion of spectator travel in members' carbon footprints.

Sponsorship	• Suggests that organisations should be working with partners who share their views on environmental sustainability • Hopes that the adoption of ISO 20121 will become a minimum requirement for anyone wishing to operate in the events industry. • Suggests that environmental issues should be used as an incentive to partner and the two can work together to raise awareness and invest in projects.	Calls for signatories to engage and work with stakeholders on climate action, but there is no prescriptive policy	**No policy**
Offsets	As yet no position on offsetting, but a review is promised	No position on offsetting	Permits offsets provided it entails 'purchase of valid offset credits', certified to the highest global standard.

Events that have used ISO 20121 include the London 2012 Olympics and Paralympics, COP 21 in Paris in 2016, horse racing at Goodwood in the South of England, Formula E, and the 2016 Rio Olympics.

It has not, however, established itself as the environmental/sustainability certification system for events. Some sports organisations consider it too cumbersome and too process-driven and given its lack of target setting, too timid for the rapid decarbonisation efforts required.

UNSCAF has now over three hundred signatories, including most of the world sports federations like FIFA, the UCI, and World Athletics. Cricket, however, is conspicuous by its absence. After that things get more eclectic. There is a scattering of stardust from the NHL and the NBA, the New York Yankees and the New York Mets, four teams for the English Premier League, and a dozen other football clubs. Some of the global commercial tours are also present – like Formula 1, Formula E and Golf Saudi – alongside the German Ski Instructors Association, Bowls Australia, and Sky Sports.

The Global South, while not totally absent (Kenya Athletics for example), is massively underrepresented. Impressive as the numbers may seem, it is a very, very long way short of where the sports industry needs to be.

Just under one hundred of the signatories have also signed up to the more stringent Sports for Climate Action.

Key reading

E. Hawkins (2022) Sport and climate change – what is the guidance?

Case studies: International federations

UEFA

UEFA released its new environmental policy in 2022, as part of a wider programme of social responsibility commitments. The policy is still in development but breaks new ground in its commitment to a circular economy model. Some of the most innovative policies are being developed alongside the DFB in Germany for the staging of the Euro 2024.

Goals:

- To reduce European football's carbon footprint and be a credible reference partner for organisations working on climate protection, with a target of cutting greenhouse gas emissions by 50 per cent by 2030, and achieving net zero carbon by 2040 within UEFA, across UEFA events, and collaboratively across European football.
- Embed the circular economy – the '4R approach' – built around reducing, reusing, recycling, and recovering – into European football which means the "optimisation of the consumption and life cycle of products, most notably food, packaging, and branded items throughout UEFA operations and events."
- Set a new benchmark for zero-impact sporting events by developing and rolling out UEFA's own sustainable event management system.
- Raise the bar for European football infrastructure by setting criteria and sharing best practices for a new generation of sustainable football venues.

Support for federation members

- Not much support. UEFA's focus is overwhelmingly on its own organisational units' events rather than its members' national-level activities.

Offsets:

- UEFA experimented at the 2016 European Football Championships with a campaign and an app that would allow fans to offset their own carbon emissions when attending the tournament, but the take-up was lamentably low.
- For the Euro 2022, UEFA decided to absorb the entire costs of offsetting the aviation emissions.
- For the Euro 2024, the report by the Oko Institut recommends investing in greenhouse gas reductions within German football as the most efficient and reliable way of achieving 'climate responsibility' rather than 'climate neutrality'.

Spectator transport:

- Plans for Euro 2024 include signed, safe routes known as 'fan miles' that will allow fans to reach the stadiums easily on foot or by eco-friendly public transport.
- Bike-sharing stations will be set up for staff at the stadiums.
- The tournament's Combi-Ticket Plus is designed to make low-carbon public transport cheaper and more appealing to fans, not only for travel to Germany but also to cover the long distances between venues.

Sponsors:

- Plans to actively involve sponsors in developing sustainability solutions.

World Athletics

In 2019 World Athletics unveiled its environmental strategy. It is one of the first really serious attempts to go carbon neutral amongst sports federations.

Goals:

- Carbon neutrality by 2030 across World Athletics operations and events based on an annual 10 per cent reduction in emissions from a 2019 baseline.
- All events sanctioned by WA are required to commit to carbon neutrality targets.

Policy on member federations:

- World Athletics plans to encourage and support member federations to join the UN's Sport for Climate Action Framework.
- Provides sustainability workshops to member federations.

Offsets:

- The policy is to "identify credible means to offset unavoidable emissions".

Spectator transport:

- WA does not, as yet, commit to dealing with the emissions generated by spectators, but is planning to add emissions from athlete travel to the WA carbon footprint.

Sponsors:

- Planning for all corporate partners to be engaged and active around an aspect of sustainability by 2030.

World Sailing

World Sailing with its Sustainability Report 2030, is one of the few Olympic sports federations that currently commits to a carbon reduction target with a plan to cut emissions at events by 50 per cent by 2024.

Goals:

- World Sailing aims to be the first international federation to achieve and maintain a third-party-certified ISO 20121 management system.
- Cut emissions by 50 per cent by 2024.
- Close alignment of policy to the full range of the United Nations' SDGs, with a special emphasis on oceanic pollution, plastics, and biodiversity.

Support for national federations:

- Created a sustainability charter that all members have to sign as a condition of membership.
- World Sailing plans to encourage national sailing events to achieve the highest level of sustainability standards set by 2030.
- Sustainability training to be included in its Emerging Nations Programme.
- Include modules on sustainability in all World Sailing training/coaching programmes by 2020.

Technical standards:

- World Sailing plans to develop technical standards by 2030 to reduce the environmental impact of the sailing industry focusing on the end-of-life of composites and engine and energy technology**.**
- The strategy introduces higher environmental standards for boats, for example, so to participate in the 2028 Olympic Games, 90 per cent of a boat must be recyclable, and waste from the production process must be halved compared to 2018.
- It also requires a 50 per cent reduction in boat building waste (by weight) across all World Sailing classes by 2030.
- All race yachts under World Sailing classes and ratings will not be solely reliant on fossil fuels to produce power on board, or for auxiliary drive by 2030.
- Single-use plastics are to be abolished at international and national sailing events by 2030.

Offsets:

- No policy.

Spectator Travel:

- No policy.

Sponsors:

- No policy.

Case studies: National federations and leagues

English LTA (Lawn Tennis Association)

LTA is signed up to Race to Zero as an organisation, as an event/competition owner and operator, and as a national governing body.

Goals:

- to achieve net zero carbon emissions from LTA operations and major events by 2030
- to support the wider tennis community in reducing carbon emissions
- for tennis in Britain to have a net positive impact on biodiversity
- for policy to be aligned with the full range of UN Sustainable Development Goals.

Policy for federation members:

- to embed sustainability into the local governance framework of English tennis
- to ensure that all national, county, and island associations have a sustainability plan by 2026
- to offer sustainability training to all LTA-accredited coaches by 2026
- ensure that all LTA facility investment has a sustainability element by 2026.

Offsets:

- No policy as yet.

Spectator transport:

- Promote travel by public transport for major tournaments
- Engage with international tennis tours on reducing international travel impacts
- Sponsors
- Seek out sustainability-focused commercial partners by 2026.

Timetable:

- Ensure that all electricity for LTA facilities is sourced from renewable supplies by the end of 2023
- Reduce organisational carbon emissions by 25 per cent by 2026 and 75 per cent by 2030
- Reduce operational carbon emissions from events by 75 per cent by 2030.

The Bundesliga

In 2020, proposals were put forward by a network of German fan groups arguing that the Bundesliga's annual financial audit of clubs should be accompanied by an audit of their environmental performance, with the ultimate sanction of refusing a playing license to those clubs making insufficient progress. The Bundesliga has taken up this idea and the audits will begin in 2023.

Goals:

- Clubs must demonstrate a sustainability strategy and an environmental strategy for licensing for the 2023/24 season and appoint a sustainability officer.
- The environmental strategy must analyse the environmental impact and emissions of the club locations and set targets and interim goals.
- The clubs must collect a range of other data, for example on their energy and water consumption as well as their wastewater production.
- Clubs are required to look at ways to reduce waste.

Support for league members:

- A data platform for the clubs is planned to help them to collect and evaluate information.
- Guidelines and templates for analyses will also be supplied, as will further training opportunities for club employees.

Offsets:

- No policy.

Spectator travel:

- Clubs will also have to conduct a mobility and traffic analysis and develop an environmentally friendly mobility concept on this basis.

Sponsorship:

- No policy.

Climate action from below: NGOs and campaigns

Over the last five years a whole range of organisations which campaign internationally and nationally on climate and environmental issues in sport have emerged. Some focus on sport in general, while others focus on a specific sport.

All of these organisations are engaged in lobbying the official sports federations, professional clubs, and franchises. Some have been set up to work specifically with athletes, developing and nurturing them as climate activists, others have sought to engage fans and supporters in a climate dialogue. A few also focus on grassroots and amateur sports, but generally, there is a significant gap in this field.

As with the formal response to the climate crisis, these organisations are overwhelmingly in the global north, and especially North America, Australasia, and Northern Europe. Where they have emerged in the global south, it is in the form of youth-related environment and development projects.

This list is not comprehensive, as new initiatives are emerging all the time, but it gives a good sense of the scope, geography, and forms of sport and environment NGOs.

Sport and environment international NGOs

At a global level, the Sport Positive Summit organises an annual conference amongst the more than 300 signatories of the UN Sports for Climate Action Framework. Sport Positive also organises the research and publication of Sustainability Leagues for the national football leagues Premier League, Ligue I, and the Bundesliga.

Sport and Environmental Education is an EU-funded programme that looks to use outdoor activities, including sport, as a tool for wider environmental education.

Sport and Sustainability International works across all sports on environmental issues as an advocate and think tank. Two of its main programmes are a football-specific campaign on climate, football4climate, and its research programme at the Sustainable Sports Lab.

Multi sports campaigns

BASIS, the British Association for Sustainability in Sport, is now ten years old and has played a vital role in igniting the environmental conversation in UK sport. Alongside advocacy, network, and research it provides consultancy services to the industry.

At a national level multi-sports campaigns have recently emerged in continental Europe, the largest so far being Sports For Future in Germany which has been joined by Sports for future Switzerland.

Two organisations founded by athletes complete the current picture. We Play Green, backed by Norwegian football player Morten Thorsby and Formula 1 driver Sebastian Vettel, mixes advocacy and grant-giving, while the Big Plastic Pledge, established by the British Olympic rower Heather Mills, has been campaigning and working to remove plastic from all levels of sport.

Sport-specific NGOs

Surfers Against Sewage was founded in 1990 by Cornish surfers to campaign against sewage discharges into the sea, and they are pioneers in this space. Over the last thirty years, they have expanded their work to campaign on climate, plastics, sewage, and water quality across the UK.

Founded in 2007 by professional snowboarder Jeremy Jones, Protect Our Winters gathers together winter sports athletes to protect cold environments and campaign for climate action. It has commissioned research on the future of winter sports and lobbied the US government and has received considerable support from winter sports goods manufacturers. Initially based in North America, there are now branches in Japan, Australasia, and across Europe.

Founded in 2020, Football for Future works on a variety of fronts to make English football environmentally sustainable. Projects include climate education at football clubs, working with professional footballers as climate ambassadors, and providing environmental

consultancy to football clubs.

They have been joined in English football by the Football Supporters Association - England who have voted to campaign on climate issues and partnered with Pledgeball to engage fans on the topic. In France, Football Ecologie France works with football clubs at every level of the game, providing environmental audits and consultancy, as well as projects to engage fans on climate action.

English journalist Tanya Aldred, who has written extensively on cricket and the climate crisis, has created the website The Next Test which has gathered together a great range of information on the subject and campaigns on social media for change in the game.

They have been joined in this space by Cricket for Climate, launched on the back of an open letter to Australian cricket authorities calling for radical action on climate. It is fronted by Australia's cricket captain Pat Cummings but joined by many cosignatories from the men's and women's games.

So far only small initiatives have emerged in cycling and running. In Norway, Green Cycling is campaigning on climate issues, engaging cyclists, and looking at ways of making cycling more sustainable.

Runners Against Rubbish, an English organisation, is as the name suggests, campaigning for runners not to litter either as individuals or during organised races.

Athlete activism

Recent years have seen a major step up in the level of athlete activism. Empowered by social media and acquiring a degree of financial and personal autonomy that earlier generations of athletes did not possess, they have been finding their voices: from Colin Kaepernick's decision to take the knee, to the impact of Black Lives Matter on English football, to Marcus Rashford's work on food poverty in Britain. The growth of climate activism amongst athletes is part of this wider trend.

A range of organisations have emerged to support, train, and amplify athletes who want to speak up on climate issues: In North America, Ecoathletes has been the leading NGO, in the UK the same work is done by Champions for Earth, and in New Zealand, Lite Foot occupies this space.

In Australia, there are currently two organisations that cover all sports, Players for the Planet and Frontrunners, while Australian rules football players have created AFL Players for Climate Action.

Finally, Common Goal, which has worked with football players and coaches, has recently added issues of climate to their agenda. Common Goal's approach is to ask players and coaches to donate one per cent of their income to football and development projects and to support them as advocates for social change.

Fossil fuel sponsorship

The Rapid Transition Alliance, a UK think tank and activist network, has launched a campaign to get fossil fuel companies out of sport and published a report on the subject in 2021, 'Why sports should drop advertising and sponsorship from high-carbon polluters'. In 2022, they have been calling out the world of sport with their 'Bad Sport and Greenwash Awards' campaign.

A more focused NGO that grew out of a campaign amongst Liverpool fans around the fossil fuel investments of the club's sponsor Standard Chartered, has now gone national as Fossil Free Football.

Fan and youth engagement

Football has proved to be the main sport, so far, in which fan engagement on environmental issues has taken off.

In England, two rapidly growing fan engagement NGOs have emerged in football. Pledgeball, which works at all levels of the game to encourage fans and players to make environmental pledges that score points in online competitions with other clubs.

Planet League takes a very similar approach, again focusing on football, while in Australia the Sustainable Sports Programme has tried to use this model across all sports.

Football has also been used as a tool in educating youth and supporting environmental regeneration programmes, especially in the global south. Examples include Global United FC, Green Kenya, Seacology and Spirit of Football.

Key readings

- J.Amman (2021) 1:0 for the environment: Engaging football fans on tackling climate change
- M. Campelli (2021): Could mobilising football fans be a key climate action strategy? Sustainability Report
- J.M. Casper, M.E. Pfahl and B.P. McCullough (2017): Is going green worth it? Assessing fan engagement and perceptions of athletic department environmental efforts *Journal of Applied Sport Management*, *9*
- C. Poole (2021): How to reach & engage sports fans on sustainability and climate change in a credible and meaningful way, Sports Positive Summit

Climate action in football clubs and leagues

Argentina

Latin American football has, so far, not taken up the sustainability challenge, except for the pioneering Argentina club, Estudiantes de La Plata, which has taken the construction of a new stadium as the opportunity to embed sustainability at the heart of the club's operations.

England

The Premier League is a recent signatory to UNSCAF, but has yet to develop a comprehensive policy or insist on minimum environmental standards from its members.

There are currently four clubs in the Premier league who are signatories to the UNSCAF: Liverpool, Southampton, Tottenham Hotspurs and Arsenal.

The overall environmental performance of the Premier League clubs can be seen in the Sports Positive sustainability league.

The EFL (English Football League) is responsible for the three lower divisions in England, and has launched its own sustainability model – EFL Green clubs. Though membership remains voluntary the vast majority of its 72 clubs have signed up.

Clubs:

- Forest Green Rovers, now in league one of the third level of English professional football, has been the pioneer of sustainability in English football. Owned by Dale Vince, chair of the green energy company Ecotricity, they have combined success on the field (rising up from non-league football through successive promotions) with significant investments in renewable energy, organic turf culture, and vegan food. They currently have planning permission to build a zero carbon new stadium, the first to be made of wood since the 19th century.

- Arsenal has, so far, focused its efforts on renewable energy. They have installed solar panels on the roof of the Emirates Stadium and have also installed large lithium batteries to store electrical charge which provides power for the stadium for much of the week. For the rest of their energy needs, they have signed up with an exclusively renewable energy supplier.

- Liverpool has branded its sustainability policy as The Red Way, and interestingly has applied its principles to the planned expansion of the Anfield Road stand.

- Southampton has branded its sustainability policy as The Halo Effect. Their 2021 sustainability report features new kits partly made from recycled ocean plastic, and the phase-out of single-use plastic cups.

- Tottenham Hotspurs made issues of sustainability central to the design and construction of its new stadium and is perhaps the leading club in the EPL on these issues. It was the first club in the Premier League to stage what it referred to as a zero-carbon game. They have also created an organic vegetable garden at the training ground which supplies their canteen and have mobilised many of their players, like Eric Dier, as environmental ambassadors.

Germany

Given the strength of the environmental movement, it is no surprise that Germany is a leader in football and sustainability. It has been a pioneer in offering free or discounted public transport to match ticket holders for example.

The overall environmental performance and ranking of Bundesliga clubs can be seen in the Sports Positive League.

While many clubs have good policies and programmes, a few stand out.

- Wolfsburg, although owned by Volkswagen, has a particularly strong and well-documented sustainability policy.

- TSG Hoffenheim: Details of Hoffenheim's strategy are discussed in this podcast from the Sustainability Report with emphasis on the sustainable sportswear brand that the club has created in Africa. The club has also invested in tree planting programmes in Uganda and stages a kick-for-climate football tournament in Namibia.

- Werder Bremen has recently signed up for the UN's Race to Zero programme. The club has tried to reduce car use by getting a ban on parking around the stadium on match days and investing in a boat taxi service to the ground. It also encourages its staff to support the climate strikes.

Ireland

Bohemians FC, a fan owned team from Dublin, is the leading Irish club on sustainability issues. They are the first to appoint a climate justice officer and in 2021 they hosted an Environmental Justice Film Festival.

Italy

Italian football has been slower to take up the sustainability agenda, and its football federation has, so far, been silent on the issue. However, two of its clubs are making progress:

- Juventus has been on this journey for almost a decade as its detailed annual reports make clear.

- Newcomer Udinese has been innovating, particularly with new recyclable kits and green messaging on their shirts.

Scotland

Hibernian FC, based in Edinburgh, was the first Scottish team to sign up for the UN Sports for Climate Action Framework. One interesting example of its work has been its use of bamboo shinguards cutting down on plastic consumption. The club has recently been joined in this work by Aberdeen FC.

Spain

Real Betis from Sevilla is the pioneer in Spanish football. Its extensive work on energy, water, and transport has been used to create an open platform for other clubs to follow called Forever Green under the slogan No Planet, No Football. It has recently partnered with La Liga which is encouraging all of its member clubs to join the programme.

United States

MLS, like other major American sports leagues, has signed up to the UN Sport for Climate Action Framework and has developed its own sustainability guidelines.

- First out of the blocks on the topic, preceding MLS by some years were LA Galaxy who in 2016 launched their Protect the Pitch.

- Portland Timbers and Thorns have put sustainability alongside equity, diversity and community at the heart of their operations and values. Recent work includes a switch to one hundred per cent renewable energy supplies.

- One interesting newcomer to US soccer and sustainability is Vermont Green. The club was founded in 2021 and played its first season in the fourth level of US soccer in 2022 with an explicit and radical environmental agenda that emphasises racial and climate justice. The founders can be heard discussing their vision and plans for the club in this podcast from the Sustainability Report.

SECTION 4:

SUSTAINABLE INNOVATIONS IN SPORT

Seattle's Climate Pledge Arena is the first major new stadium to put sustainability right at the heart of its conception and construction. Photo: Icon Sportswire / Getty Images

Sustainable innovations in sport

Many of the climate actions that sports organisations are taking, like switching to renewable energy and investing in building insulation, are the same actions that any organisation needs to take. However, in a number of areas sports organisations are responding to the unique challenges and opportunities arising in sports.

The examples range from rethinking sports stadiums over redesigning sports competitions to developing new business models, materials and products in the sports goods industry.

Making stadiums sustainable: Seattle's Climate Pledge Arena

At the heart of most professional and commercial sports is the sports stadium. At their largest and most expensive, these are now billion-dollar pieces of infrastructure of considerable architectural and social complexity. Making them and the events they stage sustainable is, perhaps, the single most important task facing the industry, but it is an enormously complex one.

Seattle's Climate Pledge Arena is the first major new stadium to put all of these issues right at the heart of its conception and construction and is an operational innovator in the industry.

The Climate Pledge Arena is the latest incarnation of what began as the Washington State Pavilion at the 1962 Seattle World's Fair and served as the city's main indoor sports arena for half a century. In 2016, the city of Seattle initiated a further redevelopment and was joined by NHL franchise the Seattle Kraken, developers Oak View Group and Amazon, who bought the naming rights and called the stadium the Climate Pledge Arena with the ambition to "set a new sustainability bar for the sports and events industry."

Construction

Rather than demolishing and rebuilding the area from scratch the developers chose to retain the iconic, swooping roof of the original stadium and saved a considerable amount of materials and carbon emissions in the process.

More carbon emissions were prevented by reusing 30,000 square feet of glass from the original stadium and reinstalling it in the new arena's facade.

This plan required the roof to be raised up on a massive steel scaffold while the old stadium beneath it was demolished, and a deep bowl was dug out beneath it to house the new enlarged arena and its facilities.

Some of the earth was reused locally and all of the carbon emissions associated with it counted towards the stadium's overall footprint. The old gas heating systems were removed, and the new arena was designed with a 100 per cent electric energy supply.

Certification

The arena's carbon footprint and eventual aspiration to be carbon zero is being monitored and certified by the Seattle-based International Living Futures Institute, whose Zero Carbon Certification programme demands higher sustainability stands than LEED (Leadership in Energy and Environmental Design), which is the current leading certification programme for green buildings.

The ice rink

The arena's ice is made from rainwater harvested from the arena's roof. It is then frozen using natural rather than high-carbon refrigerants, and polished and maintained by a fleet of electric ice resurfacing machines.

Energy

A small amount of the arena's energy is generated on-site from solar panels on the roof, but the vast majority is purchased offsite. The strict certification rules that the arena has chosen mean that it cannot just buy in renewable energy that is already being generated but must contribute to creating new and expanded sources of clean energy.

Initially, the arena is purchasing and then retiring renewable energy credits from a local wind farm to compensate for power that it is taking from the existing grid, and then it plans to buy all of its power from new local solar farms.

Transport

All tickets for events at the arena come with free public transport use. The arena is well served by bus services, light rail, and monorail. Cycle valet parking is also available.

Food and drink

The arena has committed to providing food and beverages where 75 per cent have been sourced locally.

It has introduced reusable, recyclable, and compostable packaging and cutlery and is aiming to have removed all single-use plastics by 2024.

Climate education

The main lobby of the building houses a 200-foot living plant wall and within it an LED wall that informs visitors about the arena's carbon-zero ambitions and keeps track of its current carbon emissions.

Redesigning sports competitions

Rethinking key features of sport has also been a source of innovation in designing more sustainable formats for sports competitions.

One example is SailGP – a global series of catamaran races – that has mobilised the driving force of competition to run alongside its sporting league, an impact league which records

teams' environmental impact and rewards the winners. Another example is the motor race Extreme E which has found a new way to engage with spectators by building an entirely virtual audience.

SailGP's Impact League

SailGP was launched in 2020 and is one of World Sailing's global competitions. It features nine teams on a global circuit of races, and under the slogan Race for the Future, it promises to be a carbon-positive sporting spectacle. Its ambitious decarbonisation programme includes all boats and technical equipment, support services, host and spectators villages, and broadcasting.

Host cities must now sign SailGP's Climate Action Charter and commit to two projects, one of which must involve clean energy, and the other should focus on 'blue carbon' – projects that maintain and restore "critical carbon-sequestering shoreline ecosystems" like salt marshes, mangroves, and seagrass beds which, per square metre, absorb and store considerably more carbon dioxide from the atmosphere than most forests.

It is also looking to be a significant voice for climate education, mobilising events and athletes to draw attention to oceanic plastic pollution, and the threat of sea level rises and coastal flooding.

One of its key innovations is the Impact League**.** Alongside points scored for racing, each team is scored on ten environmental and social categories: Sustainability strategy; tech and innovation; clean energy; merchandise; waste and single-use plastic; travel and accommodation; food; using your voice; diversity, equality and inclusion; and NGO collaboration. At the end of the season, the winner of the Impact League takes the podium alongside the winner of the regular league and receives a cash prize for their nominated NGO partner. In its inaugural season, the Impact League was won by the New Zealand SailGP team, and their USD 100,000 prize went to NGO Live Ocean which will fund research into kelp forests to explore their potential to sequester carbon emissions.

Having significantly reduced its scope 1 and 2 missions, SailGP is now tackling scope 3 emissions and has recently signed a new deal with its logistics supplier that is carbon neutral.

Extreme E: The spectacle without spectators

Extreme E, launched in 2021, has nine teams racing off-road in electric SUVs in locations that are threatened by climate change including deserts, rainforests, and artic landscapes, drawing attention to the threats we face.

Given the remoteness and fragility of these kinds of locations, there are no spectators, in person at Extreme E events. This makes its carbon emissions considerably smaller than any other motorsport, indeed any other comparable sporting event.

As an alternative, fans can use the app GridPlay which allows them to follow the race, interact with teams and drivers, and vote for their favourites who are rewarded with pole positions.

Extreme E has also established a legacy programme, working with NGOs on environmental projects in the location it has staged races.

Making the sports goods industry sustainable

One of the biggest contributions that sports could make to climate action is making the global sportswear and equipment industries sustainable.

Sports organisations and athletes have significant potential leverage with sportswear corporations who eagerly sponsor them, building their brands and sales in the process.

In return, global sport should increasingly demand and expect their sponsors and suppliers, at the minimum, to use only recycled plastic or plant-based materials to create entirely recyclable goods and to use their reach and influence to support climate action.

There have been a number of recent initiatives in this field that include new business models and the development of new materials and products.

New corporate dynamics: Corporations for climate action

Most companies, whatever their environmental policies, are primarily driven by the pursuit of shareholder value and profit. This means that they are under relentless structural pressure to produce and sell more. Outdoor clothing company Patagonia's recent transformation into a climate-oriented social business offers an alternative.

In 2022, Patagonia's founder, Yvon Chouinard, announced that he would transfer his shares in the company, worth around three billion euros, to a charitable foundation. Patagonia itself would be transformed into a non-profit organisation. Profits generated by the company that are not reinvested are to be transferred to a charitable foundation that will support climate action.

New business models: Renting over buying

In the global north people are buying on average around 60 items of clothing a year, and more than 40 per cent of them will sit unused in drawers and wardrobes. Sportswear is no different and a great deal of sports equipment sits either unused or infrequently used in sheds and garages.

Renting clothing and equipment is one simple way of massively reducing the sector's carbon emissions. Already widespread in parts of the cycling and winter sports industry many companies are expanding the range and availability of these kinds of services.

German company Globetrotter, for example, rents tents, backpacks and bags, water sports equipment, bikes, and outdoor equipment for children. In France, Decathlon has explored renting outdoor equipment and clothing via its own brand. German ski brand Schöffel started renting skiwear in Austria and Switzerland where deliveries are made directly to customers' accommodations.

In grassroots sport, kit and equipment libraries have also begun to emerge. As the single most effective way of reducing consumption and emissions, as well as making sport more accessible, supporting these kinds of initiatives should be a priority for the sports industry.

New materials and products

While many sportswear companies are trying to use more recycled plastic in their clothing, and have also tried to make those products themselves recyclable, they have hit a series of technical problems.

Adidas' Terrex jacket is a good example of some of the kinds of innovation that the industry needs to pursue. Many garments are hard to recycle because the different kinds of artificial fibre and plastic used in their production must all be separated.

Consequently, this jacket is made of just one material – polyester – and thus is entirely made from recycled materials and is itself easy to recycle. However, this required a design that dispensed with zips and buttons that can't be made of polyester.

Winqs' Zerofly running shoes contain a range of small innovations that make them made almost entirely from plant-based or recycled materials. These include:

- an outsole made of hybrid rubber itself made from rubber waste
- a midsole made in part from castor seeds
- an inner lining that uses Lyocell which is made from wood pulp
- an upper covered in a thin layer of 100 per cent recycled polyester
- packaging that uses only recycled paper and plastic-free cardboard boxes
- repair service to extend the life of all shoes
- a commitment to take back all shoes and take care of responsible disposal.

Carbon zero sports equipment: Plant-based skies

While much of the focus in the industry has been on clothing, sports equipment is also a major producer of carbon emissions. Plastics and materials like carbon fibre rely on a lot of fossil fuels.

One interesting set of innovations has been used by Finnish winter sports company Loska and textile manufacturer Spinnova to create plant-based skies.

These skies are made of wood, but with a core made from fibres spun from natural cellulose obtained from recycled wood and textiles. The manufacturers claim that their performance is as good as any conventional competitor.

Adidas' latest iteration of its Terrex jacket has incorporated Spinnova materials into its design.

SECTION 5
CURRENT DEBATES

Fans arrive prior to the match between Germany and Algeria at the 2014 FIFA World Cup in Brazil. Photo: Vicinius Costa / Getty Images

Current debates in climate and sport

While some of the agenda for climate action in sport is agreed upon, if not implemented, there remain areas of significant controversy and debate.

At the level of overall strategy, as in the wider decarbonisation debate, there are considerable differences in approach. Some emphasise individual actions and micro-changes in consumer behaviour as the route to sustainability, others argue that structural changes in infrastructure and regulation are the priority.

However, with regard to the carbon emissions produced by spectator travel, which remains the sports sector's biggest source of emissions, it is obvious that the sports industry is locked into transport infrastructure and pricing systems that will need to deal with more than consumer nudges. At the very least, the world of sport needs to become a very vocal advocate for investment in active travel and urban public transport.

Similarly, nearly all of the policy frameworks that have been created in the sports industry favour voluntarism over statutory intervention, but the sluggish uptake of serious carbon-zero policies by many sports organisations in much of the world suggests that time for more rigorous and prescriptive environmental governance may be due.

There is also one serious absence in the debate: The global south.

The work that has been done on the climate risks to sport has very little to say about the global south, but there can be little doubt, given wider climate predications, that the global south and its many coastal cities will be seriously impacted by rising temperatures, extreme weather, sea level rises, and flooding with all of the same consequences for sport predicted for the global north, and with significantly fewer resources to mitigate these problems.

To make matters worse there is, so far, very little sign that the sports federations and professional leagues of the global south are taking this issue seriously, and precious few have signed up to UNSCAF.

It is vital that the next phase of the conversation includes the global south and that research on the prospects for sport in Africa, Latin America, and Asia is supported. At the same time, it is vital to think about new forms of international financial transfers within sport to support the transition to carbon zero in the global south.

There are three immediate policy questions that global sport needs to address.

First, and most immediately, there has been a gathering call for sport to end its relationship with fossil fuel wealth and fossil fuel sponsorship, both of which have had a long presence in the global sports industry.

Second, most sports organisations that are committed to carbon-zero targets remain reliant on purchasing carbon offsets to achieve this. However, like many other industries pursuing this course, it is clear that there are deep, perhaps irresolvable problems with this strategy.

Third, the global sports industry has been, over the last half a century, premised on growth in the economic scale and geographical reach of its activities and shows little sign of stopping. In recent years, for example, the FIFA World Cup has become a 48-team tournament, Formula 1 has added new grand prixs almost every year, the American National Football League (NFL) has sought to play more games outside the US, and Saudi Arabia has added yet another international golf tour to the circuit.

It could be argued that with sufficient carbon offsets, global sport will be able to meet its carbon-zero commitments. However, if the carbon offsetting policies of these events are deeply flawed, then sport will have to ask itself whether it can really be a leading force for climate action while pursuing unsustainable expansion and growth.

Indeed, given the perilous situation we face, it may need to think about doing less rather than more.

The fossil fuel industry and sport

There is no solution to the overall climate crisis that involves maintaining the fossil fuel industry. It simply has to be shrunk and then eliminated. If sport is to take serious climate action it is by being a leading example, inspiring and educating its stakeholders and the public.

In this context, it is not a plausible political strategy for the sports world to pursue carbon-zero policies and take money from the fossil fuel industry or to lend its glamour to high carbon consumption and lifestyles. Simply put, sports need to wean itself off of fossil fuel money entirely.

This will prove difficult. The fossil fuel industry and its money has been finding its way to commercial sport for more than half a century. Many of the key teams that created the American National Football League (NFL) in the 1950s were owned by oil magnates, while the Dallas Cowboys has never been owned by anyone who didn't make their billions in the fossil fuel industry. Today, a majority of NFL teams can claim at least part ownership by people who make their money in oil or fracking.

The presence of the industry in African football is particularly noteworthy: State-owned fossil fuel companies are a major presence in football in Algeria, Egypt, and Ghana. Total, the French energy company, is a major supporter of CAF and the African Cup of Nations, while oil money has been poured into pharaonic stadium-building programmes in Angola, Gabon, and Equatorial Guinea.

Latin America has also seen a long history of fossil-fuelled football, with the state oil companies of Venezuela, Ecuador, Brazil, Argentina, and Mexico all being major sponsors of the game.

More recently, European football has come to the attention of fossil fuel oligarchs – most famously Roman Abramovich who spent 1.5 billion US dollars of the money he made in aluminium and oil on Chelsea. More modestly, Maxim Denham, a Russian petrochemical trader, has spent a few hundred million on Bournemouth.

Most eye-catching and politically charged have been the purchases of major European clubs by the sovereign funds of Gulf states. The United Arab Emirates' purchase of Manchester City in 2008 was just the beginning of a now nine-team global network of clubs from Uruguay to the USA to Japan.

They were joined in 2013 by Qatar, whose Qatar Investment Authority bought PSG. Now Saudi Arabia's sovereign fund has taken a 90 per cent stake in Newcastle United.

Fuel companies are massive sponsors of sports

Where they don't own clubs, fossil fuel interests have lavished sponsorship on global sport. The Rapid Transition Alliance report 'Sweat Not Oil: Why Sports Should Drop Advertising from High Carbon Polluters', found a substantial fossil fuel presence – including hydrocarbon companies, airlines, and vehicle manufacturers – in more than a dozen sports from baseball to football, from athletics to cycling and sailing.

Most notable in recent years has been the reach of Russia's largest company, the state-owned Gazprom, which has partnered with FIFA and UEFA, sponsored a World Cup, sponsored Schalke 04 in Germany, as well as saved Red Star Belgrade from bankruptcy.

Since the Russian invasion of Ukraine, Gazprom's sponsorships have mostly been terminated, but Azerbaijan's national oil company Socar remains an active sports sponsor, and the main Gulf airlines – Emirates, Qatar Airways, Etihad – have huge sports portfolios.

Japanese, Korean, and European vehicle manufacturers are also prominent sponsors and have been joined by INEOS, the Swiss registered petrochemical corporation, which in just five years has made itself amongst the most prominent hydrocarbon sponsors.

INEOS sports sponsorships and investments

- INEOS team UK – official British America's Cup sailing team £150 million
- Team INEOS Grenadiers – British cycling team with a budget of £50 million per year
- OGC Nice – League1 football club in France, worth an estimated 100 million euros
- Lausanne's football club, Lausanne-sport, and hockey team HCL bought for an undisclosed sum
- Mercedes British Formula 1 team, in a five-year deal worth around £100 million

The only focused campaign on this issue is the newly created UK-based Fossil Free Football.

Two recent events suggest that the case against fossil fuel sponsorships is gathering pace. First was the decision of the Australian Tennis Open in 2022 to end its sponsorship deal with fossil fuel company Santos. Second was the huge pushback against British Cycling signing a huge sponsorship deal with Shell which led to the resignation of its chief executive.

Key reading

- S. Chadwick and P. Widdop, (2021) The Energy-led Geography of UEFA's Champions League Final
- R. Canniford and T. Hill (2022) Sportswashing: how mining and energy companies sponsor your favourite sports to help clean up their image, The Conversation
- E. Tricarico and A. Simms, (2021) Sweat Not Oil: Why Sports Should Drop Advertising from High Carbon Polluters, Rapid Transition Alliance.

Carbon offsets

Over the last five years, the leading organisations in sport have had to confront the fact that, while they might be making progress on renewable energy and plastic waste, there is an irreducible core of activities – especially aviation and spectator transport – that they cannot decarbonise.

Thus, sports organisations' commitments to carbon-zero are reliant on purchasing carbon offsets.

Offsets are investments in activities that notionally reduce the carbon emission of other economic activities or capture and sequester carbon from the atmosphere. Renewable energy projects would be an example of the former, and reforestation projects an example of the latter.

So, for every tonne of carbon emissions an organisation is responsible for, it would need to purchase a carbon offset that resulted in a tonne of carbon being taken out of the atmosphere.

These offsets are purchased through intermediaries who are responsible for auditing and monitoring the projects.

However, there are serious problems with this strategy.

- First, offsets often serve as a "get out of jail free card" which allows organisations to consciously or unconsciously avoid making difficult decisions about reducing

emissions.

- Second, most reforestation offset projects will deliver their carbon reduction twenty or thirty years in the future, when we need to be reducing emissions right now. Moreover, the sale of land consumed by the projects has a negative impact on food production and resilience.

- Third, many of these projects are based on faulty ecological and social assumptions, planting the wrong species in the wrong place, and have very poor maintenance programmes. There are also many examples of indigenous people's land rights and livelihoods being undermined by offsets schemes.

- Fourth, renewable energy is now so cheap that it is not clear whether offset money is adding to the overall total of renewables, rather it may just be displacing other funding mechanisms.

- Fifth, many of the actual carbon calculations on which these schemes are based are at fault, overestimating benefits and underestimating emissions. Airlines are one industry whose net zero claims have been seriously undermined by implausible offset accounting.

Sport is unlikely to avoid this or indeed any of the above problems. The IOC's promise of carbon neutrality, for example, rests on the notion of an Olympic forest. In practice, this means that the IOC is investing in reforestation projects that are part of the African Union's wider Great Green Wall of Africa project.

Launched in 2007 it envisaged a massive program of investment in reforestation across the Sahel running from Senegal in the west to Ethiopia in the east.

However, the programme is only four per cent complete after fifteen years and has run into multiple intersecting problems, including a lack of finance, monitoring, and accountability, poor and inaccurate assessments of Sahelian ecology and the impact of tree planting, and too many top-down projects that have harmed or alienated local communities.

While a variety of reforms have attempted to deal with these problems, the idea that the IOC's investment is an unproblematic, guaranteed accounting for its carbon emissions is highly questionable.

China's claims for the Beijing 2022 Winter Olympics were sharply criticised for their poor accounting and poor-quality investments, while FIFA's offset plans for the 2014 World Cup in Brazil, and the 2018 World Cup in Russia did not stand up to serious examination.

As the climate debate in sport has become more pressing, the Qatar 2022 World Cup has been scrutinised much more closely than any of these events, and it has also been found wanting.

The report by Carbon Market Watch 'Poor tackling: Yellow card for 2022 FIFA World Cup's carbon neutrality claim' argued that Qatar has significantly underestimated its emissions, especially from the construction process, and that many of its offset purchases are in poor quality offset projects.

A number of smaller offset schemes in sport have explored a different approach.

In 2019, for example, The New York Yankees, New York Mets, NASCAR, the U.S. Tennis Association (USTA), and Major League Soccer (MLS) announced their investment in clean cooking stove projects across Africa. These stoves make charcoal consumption (the main cooking fuel) twice as efficient as current stoves, hopefully halving the volume of trees that need to be cut down to supply them.

Key readings

- FOE (2021) A Dangerous Distraction: The Offsetting Con
- Carbon Market Watch (2022) Poor tackling: Yellow card for 2022 FIFA World Cup's carbon neutrality claim

Sport, growth and degrowth: How much is enough?

If carbon offsetting is, at present, not a feasible way of reducing sports carbon emissions to net zero, then some argue that global sport will need to shrink. This, of course, cuts against the grain of all the forces – economic, technological, and political – that have been driving the commercial globalisation of sport for the last forty years.

Is it possible that maintaining a habitable planet will require less global sport to be played and fewer athletes and coaches to travel to fewer places? Will sports tourism, a growing industry in the global north, have to be discouraged or curtailed?

Is it possible to imagine that the balance of activity and money in sport can shift from the high-carbon professional international circuits to the lower-carbon, more local grassroots areas of sport? Will a sustainable sports culture have to make shifts in values, priorities, and power?

One area where more immediate change has been proposed is in changing the pattern of play in leagues over a season in order to significantly reduce the amount of flying required.

Tim Walters, in writings on football, has proposed that the expansion of the World Cup and other international tournaments should be reversed, and ticketing arrangements altered to privilege home attendance over foreign travel.

Key listens

- Tim Walters explores all of the territory about growth and degrowth - questing the expansion of tournaments, proposing smaller, less frequent global events, longer slower seasons and discouraging fan tourism and travel in sport in podcasts from The Climb and The Blizzard.

Key reading

- T. Walters (2020) The Green Future: If carbon emissions are to be met, football's relentless expansion must stop, *The Blizzard* 37.
- S. Wynes (2021) COVID-19 Disruption Demonstrates Win-Win Climate Solutions for Major League Sports, Environ. Sci. Technol. 2021, 55, 23, 15609–15615
- S. Wynes (2022) The Pandemic Blueprint For Sport to Cut Back On Carbon Emissions


Play the Game