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ESMIS

ENHANCE SUSTAINABLE MEASURES
IN SPORTS FACILITIES

Enhance Sustainable Measures in Sports Facilities (ESMIS)

Deliverable 4.2 - White paper, policy recommendation

*Different language versions of the White Paper can be found here:
[Dutch](#), [Greek](#), [German](#) and [Spanish](#).*

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Introduction

The ESMIS project

Traditional models of sports facilities have proven inadequate in addressing sustainability challenges, while rising energy costs and climate-induced water scarcity are further exacerbating the situation. Moreover, the majority of sports facilities in Europe were built before 1990, without taking energy-efficiency criteria into account. Considering these concerns regarding their environmental impact, the need for a transformative shift towards sustainable management practices has become paramount.

Recognising the pivotal role of sports facilities in societal wellbeing and development, the *Enhance Sustainable Measures in Sports Facilities (ESMIS)* project aims to transform them into fully sustainable infrastructures. The project seeks to empower sports facilities to adopt sustainable practices, thereby driving positive change across the sport sector. To this end, a digital platform has been developed, showcasing innovative sustainability best practices for sports facilities across Europe. The platform will serve as a source of inspiration and a space for sharing experience, helping to ensure that successful examples can be replicated in sports facilities across different European countries.

By disseminating critical knowledge and lessons learnt, ESMIS aims to strengthen informed decision-making and the implementation of best practice across Europe, fostering a more sustainable and resilient sport sector aligned with economic, social, and environmental goals.





Purpose and structure of the document

In response to the objectives set out above, this document seeks to provide stakeholders with recommendations and guidance on how to promote sustainable processes in sports facilities. It builds on the recommendations produced by the Green Sport expert group (published by the European Commission in *Sport's contribution to the European Green Deal: a sport sector playbook*) and, on that basis, incorporates the insights gained during the development of the interactive sustainability map and the shared knowledge environment featuring best practices oriented towards the sustainability of European sports facilities (ESMIS project).

The document is structured into four sections. The first two move from identifying the sustainability problem in sport to outlining the challenges it presents at European level, and then progress towards solutions in the context of sports facilities, drawing on the innovative approaches compiled by the ESMIS project.

Next, a set of supporting resources is provided to help advance further along the long path towards environmental sustainability in sport. Finally, conclusions are presented, intended to serve as a platform from which to continue making progress collaboratively.

1. Problem identification

Sport's impact on sustainability

Sport is a highly significant sector that continues to grow and, as an open system, it interacts continuously with other social subsystems—such as the economy, education and politics—thereby amplifying its overall impact. When referring to sport, this document considers a range of conceptions or models, spanning from competition-



oriented practice (the most traditional model) to approaches centred on entertainment (the organisation of major events) and more instrumental uses of sport for social, educational, or health purposes. Against this backdrop, millions of people participate in, or follow, sport every day—whether in person, on television, or online—highlighting sport’s strong connection to daily life. This high level of activity generates significant environmental impacts and contributes unequivocally to climate change, primarily due to the travel required by athletes and fans, energy consumption, the construction of sports infrastructure, catering, and associated activities.

Sport’s environmental impact is multifactorial, as the environmental cost of the various components of sporting activity must be taken into account. Some estimates suggest that the sport sector may generate around 350 million tonnes of CO₂ emissions globally each year. Major sporting events, structured leagues, and mass-participation activities represent critical hotspots for direct and indirect greenhouse-gas emissions, particularly due to travel. To varying degrees, both outdoor sport in natural environments and sport practised within indoor facilities have a relevant environmental footprint.

The contribution of sports facilities to the overall environmental impact of sporting practice is substantial and entails significant effects on the environment. Across Europe, most existing stadiums currently in operation still depend on fossil fuels, underscoring the urgent need to reduce energy consumption and ensure energy efficiency as key levers for the transition to more sustainable sport.

Two additional factors further reinforce the urgency of adopting more sustainable energy alternatives. First, energy prices have risen in recent years due to instability stemming from various armed conflicts in international politics (not only within Europe but also involving fossil-fuel producing countries). Second, worsening water scarcity and increasingly frequent and widespread drought conditions across the EU intensify the sustainability challenge. Water consumption is particularly significant in facilities with swimming pools, as well as in those with outdoor spaces requiring irrigation for the





maintenance of sports surfaces (such as grass pitches or clay courts). Indeed, during severe drought episodes where public authorities have introduced restrictive measures on water use, the inability to fill pools, irrigate sports areas, or operate changing-room showers has forced the temporary closure of some sports facilities.

A further, recent concern relates to microplastic pollution. According to ECHA (the European Chemicals Agency), artificial-turf pitches with polymer infill are the main source of intentionally added microplastics. This has led to a ban on such materials for sports pitches, taking effect in 2031 under Commission Regulation (EU) 2023/2055. This development is, once again, driving a shift towards a new paradigm of sustainable solutions in one of the most widely used sports facility types globally.

At the same time, sport also represents a major opportunity to advance environmental sustainability, as it provides an ideal platform to reach large audiences (athletes, fans, followers and consumers) through events, broadcasting, sponsorship, and online media.

Concern about sport's impact on society

Given sport's environmental impact, data from the Special Eurobarometer 525 (*Sport and Physical Activity*, 2022) show that more than half of Europeans (51%) pay little attention to the environmental impact that sport or physical activity may have. When analysed by country, results indicate that in 11 EU Member States, a slight majority report concern about this impact; conversely, in 16 Member States, the majority fall on the side of those who do not pay attention. Europeans living in a large (48%) or small/medium-sized town (47%) are slightly more likely than those living in rural areas (43%) to say they pay attention to sport's environmental impact.



Regarding socio-demographic profiles, respondents with fewer years of education (54%) are more likely to state that they do not pay attention to sport’s environmental impact than those who continued their education beyond the age of 20 (51%). A similar pattern appears by occupational status: unemployed respondents (56%) show lower concern compared with retirees (48%) or managers (49%). Finally, respondents with a lower economic level show less concern, whereas those with higher incomes—and who consider themselves upper class—report greater concern.

Using the same source, club members were asked what sustainability-supporting actions, to their knowledge, are currently being undertaken by their sport organisations, clubs, or health/fitness centres. Nearly a quarter (24%) stated that their organisation works to reduce waste or improve waste management. More than one in ten indicated that their organisation promotes the use of green energy (16%), energy-efficiency measures (14%), or sustainable transport (12%).

A diverse and complex sport system

Beyond the individual awareness and engagement of participants and fans regarding sport’s environmental impact, addressing the challenge of progressing towards greater sustainability requires taking full account of the complexity of the agents and actors who work with, or for, the sport sector.

The sport sector is notably diverse. It encompasses different models of sporting practice that can be grouped into three broad domains (recreational, organised, and industrial), and it involves a wide range of stakeholders spanning both the public and private sectors. In addition, sport is linked to multiple connected sectors and related areas of activity, which also generate environmental impacts.

In relation to these three domains as they are structured at European level, a distinction can be made between grassroots and recreational sport (non-competitive sport pursued for leisure, health, educational or social purposes); organised sport (typically associated





with sport federations, clubs and leagues, and clearly competition-oriented); and the sport industry (the production of goods and services required for sport, such as equipment, technology, infrastructure, architecture, apparel, etc.). All of these actors and activities contribute to the environmental footprint—through the manufacture of goods, the construction of facilities, the provision of services, or the organisation of sport events.

It is also necessary to consider related sectors, given that sport is interconnected with other sectors both at upstream stages (construction, maintenance, energy and transport) and at downstream stages (catering, hospitality, waste management, communications, tourism, etc.). These interrelationships, expressed through activities, generate environmental impacts; at the same time, they are areas that may be affected by regulations that can help drive the sector towards greener practice.

In any case, as already anticipated by the European Sports Charter, sports facilities are one of the determinants that can extend sport’s reach and impact and, potentially, the main barrier to participation. This becomes more tangible when we recognise that a “sports facility”, as currently understood, is no longer limited to a physical space dedicated solely to sport. Any space can be adapted to enable sport participation, and an increasingly holistic view of these practices is being adopted, incorporating a wider range of activities more closely associated with active living.

Main challenges at European level

The sport sector faces significant challenges in adopting environmental sustainability measures that can reduce its impact, and these must be addressed with the involvement of all relevant agents and actors. The Green Deal sport expert group suggests that the sector’s principal challenges include the lack of widespread understanding of its environmental impacts, limited data availability, and the frequent absence of strategies





or policy responses. Accordingly, at European level, technical, structural and methodological challenges must be set out to support progress in addressing this issue.

From a technical perspective, the diversity of activities and the variety of settings in which sport is practised add complexity when it comes to defining impacts and identifying solutions that can be shared. In many cases, different approaches will be required; however, it can be anticipated that, in most instances, sports organisations lack sustainability strategies and do not have dedicated governance structures that enable measurement and accountability. Distinct challenges must be considered for one-off activities (events) versus ongoing activities (facilities), as well as for areas where change is especially material—such as athlete and spectator mobility, snow sports, and sports conducted in aquatic environments.

From a structural perspective, governance structures within organisations should be reviewed in order to drive change; external pressure for environmental sustainability from participants and spectators should be increased; and the operational capacity, expertise and training of staff within sports organisations should be strengthened. Sustainability should also be embedded in public funding and investment models, and a more holistic, integrated approach is needed across the sectors that converge in sport.

Finally, from a methodological perspective, the lack of common approaches to measuring and reporting the impacts of sporting activities makes it difficult to set targets, compare results and track progress. While there is a wide range of tools (guides, guidelines, etc.), most are not scalable or readily transferable across different contexts. As such, efforts should be consolidated to support a more cross-cutting approach that advances sport towards more environmentally responsible practice.



2. Moving towards solutions

Recommendations for sport policymakers

Drawing on the Practical Guide published by the Green Deal sport-sector expert group, a set of recommendations is outlined for the principal decision-makers at European and national level. These are high-level recommendations intended to address governance, policy, funding, support, and communication from the highest levels of responsibility.

In parallel, a further set of recommendations—more practical in orientation—is proposed for a lower level of responsibility, encompassing all stakeholders within the sport ecosystem, including key enablers such as sport federations, clubs, and sport service providers. These recommendations are structured around four core activities within the sport system, viewed through a sustainability lens: cross-sector synergies, infrastructures, events, and capacity-building.

On this basis, the following section interprets these recommendations with a specific focus on sports facility managers, analysing them through the four key areas defined within the ESMIS project. The first pillar concerns measures that reduce energy consumption or carbon emissions—an essential element of sustainable facility management given the significant energy demand required for lighting and climate control (both air and water) in sports infrastructures. There is an urgent need to activate systematic strategies to improve energy efficiency and reduce greenhouse-gas emissions in order to align with climate action goals.

The second pillar addresses measures that reduce water consumption or improve wastewater quality. Water scarcity and drought conditions are becoming increasingly frequent and widespread, and certain sports facilities have substantial supply requirements, such as swimming pools or natural-grass pitches. Sports infrastructures





must invest in improved water management to ensure long-term viability, resilience, and environmental responsibility.

The third pillar relates to governance and includes measures that enable a more sustainable way of working—such as commitment to local communities, smart data management, and action through documented processes. Sustainability must be embedded in all decisions taken in the management of sports facilities, both strategically and operationally.

Finally, the fourth pillar covers measures that encourage circular use of materials or reduce waste generation. By adopting circular economy principles, sports facilities can help reduce the depletion of natural resources and the volume of waste sent to landfill. This entails extending the lifespan of materials and products required for the operation of sports infrastructures, reducing waste and promoting reuse. Strategies such as repairing, reusing, and recycling are central to the circular economy and make a decisive contribution to environmental sustainability.

Opportunities and recommendations for sport facility managers

Building on the facility-management recommendations included in the Practical Guide produced by the Green Deal sport-sector expert group, the guidance below is organised across four main areas: developing cross-sector synergies in sport; sustainable sports facilities; sustainability in sport events; and, finally, capacity-building, training, and the promotion of sustainable sport practices.

Developing cross-sector synergies in sport

To promote sustainability—and thereby mitigate the negative environmental impact inherent to sport sector activity—the development and implementation of innovative methodological approaches, disruptive creative processes, and technological advances are essential. This requires fostering strategic partnerships and forward-looking





collaborations among a diverse set of key actors, with the aim of identifying new environmental sustainability opportunities that leverage the capabilities and specialist expertise of each participating sector.

Sport has generated innovative solutions with strong potential for replication in other economic and social sectors, which can catalyse effective cross-sector cooperation. Sports facilities, in particular, can act as catalysts for initiatives that influence their immediate surroundings and have direct impact across other sectors. Examples include initiatives that valorise by-products to improve energy efficiency or reduce water consumption; solutions that convert heat generated by sports surfaces into usable energy; and full facility refurbishments that apply circular economy principles by using waste from other industries.

The areas where collaboration opportunities have been identified are diverse, including mobility and transport, technology, tourism, food systems, construction, the sporting goods industry, and—critically—the energy sector.

Energy efficiency

- **Tourism (snow sport):** Artificial snow production requires significant energy and water; it should therefore be designed efficiently and with respect for the environment. Mountain resort models should be re-imagined to offer alternative activities and long-term sustainable solutions.
- **Construction:** In the construction and maintenance of sports facilities, collaboration can focus on sustainable materials, energy-efficiency systems, and the installation of renewable energy sources. At the design stage, passive strategies such as natural lighting and ventilation can reduce energy demand.



- **Energy sector:** Renewables (e.g., solar PV, wind, geothermal) can reduce facility carbon footprints and generate long-term cost savings. Smart technologies that monitor and control energy consumption can also reduce demand materially.

Water management

- **Tourism (snow sport):** Reducing the water required for artificial snow—often involving additives—is a clear improvement opportunity. Snow production and technical management should be environmentally responsible, taking into account the absorption of additives by the ground during thawing.
- **Construction:** Water consumption can be reduced through measures that manage stormwater runoff and through water-saving technologies; rainwater harvesting can support irrigation; and sensors plus efficiency measures can be implemented in toilets and showers.

Governance

- **Technology:** Digital tools open new cooperation opportunities for both participants and managers. Mobile applications have transformed participation and data capture; for policymakers and facility managers, technology can support data collection, analysis, and even the development of shared frameworks and standards for decision-making.
- **Food systems:** Collaboration can promote healthy and sustainable diets in events and facility catering. Choosing local, seasonal food, reducing meat consumption, and prioritising organic agriculture can lower sport's environmental impact while reinforcing health messaging for both athletes and the wide public.



- **Energy:** Cooperation between sport and energy sectors can support the development and uptake of sustainable energy practices and technologies, as well as guidance for energy management in facilities and events and awareness-raising among participants regarding energy use.

Circularity

- **Agri-food sector:** Composting agri-food and agri-forestry waste can reduce carbon footprints and create alternative materials for sports equipment; collaboration can also help reduce waste generation, noting that many by-products originate within the agri-food sector.
- **Industry partnerships:** Partnerships between facility managers and industry can advance circular economy principles and ensure product durability and transferability. Linear “buy–sell” models are no longer viable; leasing, renting, repairing, refurbishing, and recycling programmes should be prioritised. Procurement should favour sustainable materials and promote repair and reuse to extend product lifespans.

Sustainable sports facilities

The role of sports facilities and their environmental impact is the second area to be considered, according to the Green Deal's group of experts in the sports sector. Below, we will review some sustainability considerations surrounding the decisions that accompany the entire process of sports facilities, from their initial conception phase (with recommendations on planning and implementation aspects) to their management, including the design and construction phases.

As outlined in the previous section, some of the most relevant considerations will be reviewed below, structured according to the pillars defined above. This section will also



include some examples of good practices that have been identified in the development of the ESMIS project's interactive map, in order to share the sustainability innovations currently being implemented in European sports facilities.

Starting with planning, consideration should be given to assessing the need for new sports infrastructure, always prioritising the possibility of implementing improvements in the management and operation of existing facilities that could increase their service offering and user numbers. In any case, when faced with the need to build a new sports facility, it is essential that considerations of sporting and economic viability are accompanied by environmental and social viability, with an impact assessment that guarantees benefits for the community.

Energy efficiency:

Facilities with high energy consumption must be strategically located so that any excess heat can be used by adjacent facilities.

Not only is their location within the territory important, but also their orientation in relation to the sun, in order to contribute to better natural lighting and air conditioning (implemented in the Løgstør Sports Hall - Denmark).

Water management:

The location of sports facilities must respect the climate, geography and local contexts, avoiding the construction of facilities that require a significant water supply in arid regions, or the development of winter sports activities in places where snow has to be produced artificially.

Governance:

Planning for sustainable use and legacy should be optimised, ensuring that use can extend beyond specific sporting uses to establish long-term benefits for the community.

Facilities should be optimised for the long term, and their sustainability requires the involvement of stakeholders from the initial stages to ensure that the needs of the community are met.

Avoid negatively affecting common goods such as existing biodiversity, resources, health, culture and capital, considering the impacts of light, air, soil and water pollution. The impacts of congestion resulting from high user numbers (public at major sporting events) must also be anticipated.

Assess the suitability of the location, taking into account its proximity to other infrastructure that guarantees the viability of energy supply, sustainable accessibility for users and waste management.

A relevant example is the Ciutat Esportiva Joan Gamper in Catalonia as an example of good practice in which the participation of fans, citizens, the local council and other stakeholders has been encouraged in planning and decision-making.

Circularity:

Prioritise the reuse, renovation and refurbishment of existing infrastructure over the construction of new sports facilities.

Ensure sustainable waste treatment and reuse, either on site or through existing local infrastructure.



Sustainability aspects should be incorporated into the cost-benefit calculation, considering life-cycle costs in the approach used.

Dismantling, separation and recycling after the use phase should also be considered in the planning phase.

Regarding the design, construction and management of sports facilities, certain environmental recommendations based on four basic pillars must also be taken into account in order to minimise their climate and environmental impact.

Energy efficiency:

Ensure that an energy hierarchy is followed, which involves first reducing demand, then energy efficiency, a commitment to renewable energies and finally the reduction of carbon emissions.

To reduce demand, passive design strategies such as natural ventilation and lighting through skylights (developed at Løgstør Sports Hall in Denmark) can be used.

Good energy efficiency practices include LED lighting systems with presence sensors and automatic regulation according to use (implemented at the Autonomous University of Barcelona - SAF Catalonia, at the Philips Stadion - Netherlands, and at the Telenor Arena - Norway); the installation of photovoltaic solar panels on the roofs of stadiums and sports halls (present at CEM Corxera and Joan Miró, both in Catalonia); or the replacement of gas with aerothermal heat pumps combined with stratified heat/cold storage (present at Tottenham Hotspur Stadium in the United Kingdom and Continassa in Italy).



Water management:

Achieving low water demand during construction and management by implementing efficient technologies in taps and irrigation systems, also incorporating rainwater harvesting and grey water treatment.

A good practice is the collection and storage of rainwater from roofs for irrigation or cleaning of playing fields (implemented at CEM Claror and Ciutat Esportiva Joan Gamper, both in Catalonia).

Another option is to recycle grey water from showers and sinks for toilet flushing and playing field irrigation (developed at Hydraloop - Netherlands).

Another good practice is the installation of smart low-flow taps equipped with sensors (CEM Can Felipa- Catalonia) or advanced swimming pool filters that reduce water consumption by decreasing the need for backwashing (Universitat Autònoma de Barcelona- SAF- Catalonia).

Governance:

During the construction phase, the use of sustainable materials should be prioritised.

Biodiversity should be protected by incorporating vegetation and protecting existing fauna.

Good practices include facilities that define clear sustainability policies, setting specific CO₂ reduction targets, energy saving goals or a zero-waste commitment (Tennis Club Strasbourg in France).



It is recommended that annual sustainability reports be published for the sports facility, showing progress in energy, water and waste management (active at Tottenham Hotspur Stadium, United Kingdom).

Circularity:

Both during the construction and management phases, it is necessary to assess the carbon footprint in order to monitor the environmental impact at all times.

Firstly, it is necessary to start planning sports facilities according to the principles of eco-design. Have a plan for the efficient use of materials and resources and how these can be transformed into other uses during the facility's useful life and dismantling.

Design waste management and segregation with the priority of reducing waste production, reusing as much as possible, and moving towards zero waste. A good example of this can be seen at the Aviva Stadium (Ireland), where waste separation and recycling systems have been installed in stadiums and training centres.

During the construction phase, waste, noise and dust should be minimised to protect the health of both those involved in the work and residents.

Incorporate aspects of environmental sustainability into the tendering and selection process for construction and management companies. This is the case at Løgstør Sports Hall (Denmark), where there has been collaboration with regional suppliers of uniforms, catering and materials that follow environmentally friendly practices.

Good practices for improving indoor air quality and optimising energy consumption include CO₂ monitoring using sensors connected to smart ventilation systems (implemented at the CEM Joan Miró - Catalonia).



Encouraging the use of recycled and recyclable materials such as steel, reclaimed wood or composites in the construction and renovation of stadiums (as seen in the Paris 2024 Olympic Aquatic Centre in France), as well as any other materials obtained from the recovery of by-products from the sports industry or any other industry or sector.

Sustainable sporting events

Sporting events, whether held in sports facilities or in unconventional venues (in natural or urban settings), have an impact on nature and the environment. They also offer an opportunity to raise awareness and engage the public in environmental issues. In many cases, the sporting events that are organised or promoted account for most of the environmental impact produced by the sports sector, while also providing the best opportunity to interact with the various stakeholders.

Sustainability aspects in sporting events apply generally at all levels and in all phases, from initial planning to post-event follow-up. It is therefore advisable to review the overall strategy for organising events to ensure that sporting and economic objectives are balanced with environmental considerations. Replicating the same structure as in the previous sections, the sustainability considerations in the organisation of sporting events are reviewed below.

Energy efficiency:

As with the management of sports facilities, an energy hierarchy should be used for specific events to reduce consumption, from demand prevention to the use of low-carbon energies.

Incorporate sustainable energy solutions such as solar energy.



Replace fossil fuel-powered equipment with electric or solar alternatives and reduce energy consumption by implementing efficiency measures such as LED lighting.

Water management:

If a temporary facility is built for the event, incorporate water-saving devices, from taps to irrigation systems, and incorporate rainwater harvesting and grey water recycling.

Governance:

Sustainability should be a cross-cutting principle in organisations, assigning a responsible team and developing an environmental sustainability plan for the event.

Similarly, local communities and stakeholders should be involved to ensure that the sports facility (even if temporary) meets their needs and promotes environmental sustainability.

The event should be located in a place that is easily accessible and well connected to public transport, making short journeys and eco-friendly transport the default option for attendance.

Existing permanent facilities should be prioritised over new temporary infrastructure. The entire life cycle of any temporary facility should be considered.

The first step in limiting the impact of sporting events is to measure the impact of the different activities.



Circularity:

The carbon footprint of the event must be measured and reduced, in line with the European Green Deal objectives. In addition, it is important to collect data during the event in order to update the model and decision-making for future editions.

Use low-carbon equipment options, and if this is not possible, offset their impact with investments or support for renewable energy projects. The costs of this offsetting should be included in the event budget.

If a temporary facility is built for the event, minimise the environmental impact during the construction and dismantling phases as well.

Prioritise the use of sustainable materials, such as recycled and natural materials that can be easily dismantled and reused.

Consider all aspects to reduce and optimise waste management and other sources of pollution. In this regard, it is recommended to opt for rental and leasing options, monitor air quality during all phases of the sporting event, and provide local and seasonal food if catering for attendees is being considered.

Capacity building, education, training and promotion of sustainable sports practices

Sustainable sports practices and facilities influence the sports sector, as well as the large audiences that sport reaches in society. To take advantage of this opportunity to raise awareness of sustainability among the general population and at the same time support sports organisations in achieving their specific environmental objectives, three levels of knowledge development and dissemination have been identified: capacity building, education and training, and finally promotion.



The first level involves the acquisition and development of skills and practices within sports organisations, through the allocation of structures and resources to promote a culture of environmental sustainability. The second level involves the development of knowledge about sustainability among various sports stakeholders (coaches, trainers, managers, etc.) so that they can become agents of change in their respective groups. Finally, the third level refers to raising awareness and communicating environmental sustainability issues to society in general (athletes, spectators, children, parents, etc.) through dissemination platforms and the media. This third level also covers relationships with other agents such as sponsors, suppliers and public administration.

In this section, all recommendations are associated with the governance pillar, considering that sustainability must be integrated into all decisions made in sports management, both at the strategic and operational levels.

Governance:

Facilitate the implementation of strategies and governance structures committed to environmental sustainability and provide them with a budget for implementation. At a minimum, have one person in each organisation who is responsible for sustainability.

Increase the knowledge of all staff on sustainability and climate action by offering training programmes. Collaborate with universities to incorporate environmental sustainability into the curricula for training different actors in the sports sector.

Encourage cross-sector cooperation in sport by creating networks of interest and sharing experiences and good practices in sustainability.

Take advantage of competitions to reward sustainable behaviour and encourage the adoption of more environmentally friendly measures.



Encourage famous athletes to act as ambassadors for the cause of sustainability and climate action.

Communicate environmental sustainability issues and actions to spectators (mobility tips, purchasing goods and services, etc.) and associate this with the brand message, both of the organisation and of potential sponsors.

3. Supporting data

Key international frameworks for environmental sustainability in sport

EU sports policy has evolved significantly since the first comprehensive initiative in 2007 with the publication of the [White Paper on Sport](#). However, we find no references to sustainability until the [2022 European Sports Forum](#), which emphasised the ecological transition of the sport sector, and more specifically the promotion of sustainable sports facilities.

In terms of European policies on environmental sustainability, it is necessary to link to the [Green Deal](#) (2019) as a general reference framework, responsible for driving a sustainable revolution in the EU's economy and society, and which constitutes a cross-cutting priority in all European policies and programmes. The Green Deal lists the issues and measures needed to achieve the 2050 carbon neutrality targets, impacting all sectors, including sport. Within the framework of the EU Work Plan for Sport 2021-2024, the Green Sport Expert Group published the [Handbook for the Sports Sector](#), which is not only a compendium of guidelines, but also a call to action for all stakeholders in the European sports ecosystem.

At the international level, the main reference point is the UN Sustainable Development Goals (SDGs), implemented through the [2030 Agenda](#). The SDGs seek to contribute to a more just world by focusing on environmental, social and economic development



issues. Sport can make a decisive contribution to the SDGs by reducing its impact on environmental sustainability. More specifically, the United Nations Framework Convention on Climate Change (UNFCCC) has created a '[Climate Action Framework for Sport](#)' that provides sports organisations with guidance on how to take action, evaluate their environmental efforts and report progress to stakeholders.

The International Olympic Committee (IOC) also has a [sustainability strategy](#), based on the [Olympic Agenda 2020](#) as one of its three main pillars. The IOC has adopted 18 objectives based on its responsibilities as the organisation responsible for the Olympic Games and as the leader of the Olympic Movement. This strategy for greener sport is aligned with the SDGs and includes a commitment to publish regular reports to monitor progress on environmental sustainability.

[Sports for Nature](#) is a joint initiative of the International Union for Conservation of Nature (IUCN), the International Olympic Committee (IOC), the United Nations Environment Programme (UNEP), the Secretariat of the Convention on Biological Diversity (CBD) and Sails of Change. This initiative aims to implement transformative and positive actions for nature, facilitating its protection and restoration through sport.

[The ISO 20121](#) standard for sustainable events is a practical tool that provides a management framework for organising sporting events with the aim of minimising their negative social, economic and environmental impacts. It provides instructions for measurement and monitoring, from the planning phase to the operation and evaluation of the event.

European Green Sport Projects

EU support for sport is channelled through funding and support programmes, mainly directly through [Erasmus+](#) and [Pilot Projects and Preparatory Actions \(PPPA\)](#), but also indirectly through [Horizon Europe](#), the [LIFE](#) programme and [Cohesion Policy Funds](#), among others. It is important to note that all funding programmes have cross-cutting





priorities at EU level, which directly link sport to the objective of “building a climate-neutral, green, fair and social Europe”.

Examples of projects that support sports organisations through the Erasmus+ programme include the “[Green Sports Hub](#)” and “[ASAP](#)” projects. The former empowers sports federations, associations and clubs to address environmental sustainability through a European centre that provides tools and guidance. The ASAP (As Sustainable As Possible) project aims to promote a strategic approach to sustainability in National Olympic Committees with a clear alignment with the IOC's ecological objectives mentioned above.

As an example of research focused specifically on particular sports, the [LIFE Tackle](#) Programme seeks to improve the environmental management of football matches in particular, and awareness in the football sector more generally. On the other hand, and moving more into grassroots sport, the European Commission's [SHARE](#) Initiative seeks to raise public awareness of the value of physical activity and sport for local and regional development.

Innovative solutions: ESMIS platform

The Enhance Sustainable Measures in Sports Facilities (ESMIS) project aims to promote sustainability practices in the sports sector through knowledge sharing. It is a project funded by Erasmus+ Sport - 2023, led by the Sports & Technology Cluster, with the participation of various organisations from Greece, Ireland, Spain, Belgium and the Netherlands. The project aims to improve the implementation of good practices in the sustainable management of sports facilities by creating a solid support platform for professionals and stakeholders.

The [ESMIS](#) mapping platform, developed as part of this project, provides a digital map of innovative sustainability solutions implemented in different sports facilities across Europe. The aim is to share best practices and solutions to inspire sports facility





managers and create a community committed to environmental sustainability. The platform is aimed both at sports facility managers who want to find innovative solutions that have already been developed and validated in other facilities, and at managers who have implemented green innovations and want to share them.

The platform's usability allows information to be filtered by country, type of sports facility or the sustainability pillars addressed by the innovation. In terms of facility type, both indoor facilities (sports halls, indoor swimming pools, sports centres) and outdoor facilities (outdoor sports courts or fields and outdoor swimming pools) are covered. With regard to the pillars, a distinction is made between energy efficiency, water consumption, circularity and waste management, and governance.

4. Conclusions

As explained in the identification of the problem, the activity generated by the sports sector has a significant impact on environmental sustainability and contributes unequivocally to climate change. The impact is multifactorial, resulting from the mobility of players and spectators, as well as from construction and high energy and water consumption in the management of sports infrastructure.

On the other hand, sport also provides a great opportunity to promote environmental sustainability, as it represents an ideal platform for reaching the general public (athletes, fans, followers and consumers) through events, broadcasts, sponsors or online media. In this regard, there is still a long way to go, as according to Eurobarometer data, half of Europeans currently pay little attention to the impact that sport or physical activity can have on the environment, and almost half of those who belong to a sports club say that, to their knowledge, their organisation does not take any action on sustainability.

Therefore, in order to address the environmental impact generated by the sports system, sustainability measures must be adopted to reduce it, and the best way to tackle this



major challenge is to take into account the complexity of all the agents and actors working with or for the sports sector and related areas. In Sport's contribution to the European Green Deal: a sport sector playbook, produced by the European Commission's expert group on sport, it is suggested that the biggest challenges for the sector are a general lack of understanding of its environmental impacts, a scarcity of data and the frequent absence of strategies or policy responses.

In light of these challenges, and after carefully reviewing the recommendations made by this expert group and supplementing them with the lessons learned in the process of creating the ESMIS project's interactive sustainability map, some conclusions and good practices are proposed below that aim to advance their resolution.

In order to make progress in the challenge of increasing knowledge and understanding of the environmental impacts generated by sport, it is necessary to train agents of change and engage the general public. Awareness of sustainability must be raised among the general population, and, at the same time, sports organisations must be supported in achieving the specific ecological objectives they have set themselves. On the one hand, sustainability knowledge must be developed among the various actors in the sector so that they can be agents of change in their respective groups. On the other hand, environmental sustainability issues must be communicated to large audiences through dissemination platforms and the media. Using athletes, partners, events and communication channels to involve the sporting public in ecological initiatives can be a good complement to these actions.

In order to address the lack of data on the environmental impact generated by the sports sector, it is essential to encourage the measurement of this impact by the promoting agents, while creating the necessary networks for sharing information. The first step should be to measure the baseline carbon footprint of the facility or event and then design an environmental sustainability plan with strategic guidelines. The measurement should focus on three of the pillars on which the project's review of good practices has



been based: efficiency through the use of an energy hierarchy to reduce consumption; improved water management to reduce demand while evaluating grey water collection and treatment systems; and the measurement and reduction of the carbon footprint

based on circularity and waste reduction. In order to share measurement and good practices associated with sustainability, it is necessary to create networks that facilitate the exchange of knowledge, and the ESMIS mapping platform is a good support tool for promoting the implementation of innovative solutions.

Finally, in order to address the challenge of the frequent absence of strategies or political responses, it has been very useful for us to review the contributions made in the area of governance. As a first level of capacity building aligned with strategic sustainability in sports organisations, the allocation of structures and resources to promote a culture of environmental sustainability should be considered. Measures such as engagement with local communities, smart / data-driven management and action through documented processes ensure that sports organisations are also environmentally friendly in their operations. Two key ideas to consider stand out from the policy initiatives. On the one hand, the premise of renovating or refurbishing existing facilities before considering new construction and, on the other hand, the promotion of tenders or contracts with suppliers that value sustainability, or so-called green procurement. Another possible policy initiative from the public administration would be to recognise the ecological commitment of sports organisations through official certification (such as the recent Green Sport Flag, which is a certification from the Spanish Federation of Municipalities and Provinces that accredits the environmental commitment of sports facilities).

It can therefore be concluded that the sports sector represents a great opportunity to align itself with ecological principles because, although it has a significant environmental impact, it also has far-reaching strategies to reduce it. In this regard, the



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ESMIS platform delves into the promotion of the necessary cross-sector cooperation in sport, creating networks of interest and sharing experiences and innovative sustainability practices in sports facilities.

