

Perspectives on the sustainable organisation and management of the Olympic Games: from Turin 2006 to Brisbane 2032

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Abstract

Increasing concerns about sustainable development and climate change have pushed public and private actors and organisations to intensify their efforts to embed these issues in their plans, projects, programmes, and strategies. Within this context, the article examines sustainability as it relates to the Olympic Games, providing an overview of the measures taken by the International Olympic Committee (IOC) and the attention that these events' organisers have paid to integrating it over time. A comparative analysis of two cases – the 2006 Winter Olympic Games in Turin, Italy, and the 2032 Summer Olympic Games in Brisbane, Australia – has been developed to identify specificities and opportunities in staging such a global event, examining diverse and interconnected aspects of sustainability that could help evaluate it in future games. The article highlights that interpretations of the meaning of sustainability change over time and vary across stakeholders and that the long-term impact assessment of the legacy of such events requires further research.

Keywords

Olympic games,
mega events,
sustainable
development,
events governance,
Olympic legacy

Introduction

The Olympic Games are among the most expensive, complex, and significant types of global mega events. They generate significant pressures on the environment, consume vast amounts of both economic and planetary resources, and cause lasting impacts on cities and societies in often unpredictable ways (e.g., Delaplace & Schut, 2019; Essex & Chalkley, 1998, 2004; Gold &

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Gold, 2008; Lauermann, 2019; Lenskyj & Wagg, 2012). On the other hand, their preparation and implementation could also help in lowering greenhouse gas emissions, as well as afford sustainable mobility, promote social justice, control urban sprawl and reduce the loss of biodiversity, among other possible advantages (Müller et al., 2021). So, while some question whether mega events can ever be sustainably held (e.g., Geeraert & Gauthier, 2018; Hall, 2012), others laud them (e.g., Liang et al., 2016; Meza Talavera et al., 2019). Couched in this debate, increasing concerns about sustainable development and climate change issues have also reshaped the priorities and duties of the International Olympic Committee (IOC) in its strategic roadmap (IOC, 2021b). While the Olympic Games themselves lack formal enforcement power, their global visibility and symbolic prestige often compel decision-makers at local, regional, national and even international levels to radically align policies and investments with Olympic ambitions (Geeraert & Gauthier, 2018; Lauermann, 2019; Müller et al., 2021).

The IOC's process to formally embed sustainability in the Olympic Games started around three decades ago, initially from a strictly environmental point of view. Milestones in this process are represented by the Olympic Agenda 2020 (IOC, 2014a) and the Olympic Agenda 2020+5 (IOC, 2021c). In particular, the sustainability strategy of the IOC requires them to be in line with the United Nations declaration on the role of sport in the achievement of sustainable development (UN, 2018) and the intent of the UN Sustainable Development Goals (SDGs) (UN, 2015). However, from a practical point of view, how to implement and evaluate sustainable events (particularly mega events such as the Olympic Games) is a key issue nowadays, and it requires a full understanding of all the effects at play. A few previous studies have explored this topic: Müller et al. (2021) evaluated the sustainability of 16 editions of the Summer and Winter Olympic Games between 1992 and 2020. Boggia et al. (2018) proposed an assessment procedure for measuring the environmental sustainability of such events, using a set of indicators, combined through a multi-criteria approach. Tu et al. (2023) used time-series satellite images to map the transformation of urban greenspaces. Cury et al. (2023) assessed formal commitments to environmental sustainability within Australian Olympic sport by taking stock of existing environmental sustainability policies and analysing how environmental considerations have been formally embedded in sports policies. Many others investigated a single event (e.g., Collins & Flynn, 2008; Hou et al., 2014; Trendafilova et al., 2023; Vanwynsberghe, 2014). The present work, therefore, follows and contributes to this area of research by exploring the Olympics, their legacy, and their planning processes.

Within this context, our study is based on content analysis and critical assessment of secondary sources. A similar methodological approach has been applied by Tham (2023) to the same topic. Additionally, our work is situated at the cross-section of different disciplines – planning, design, management, and geography – with our expertise being in environmental

impact assessment and urban sustainability. Our aim is to reach a broader spatial planning and development audience.

Specifically, the article presents an overview of procedures and actions implemented by different cities during the Olympic Games from 1992 onwards. It is in that year that the IOC started to consider environmental aspects in the selection of Olympic Games host cities: “The beginning of the IOC’s sustainability journey came from the 1992 United Nations (UN) Earth Summit in Rio de Janeiro, Brazil, at which the IOC was represented” (IOC, 2016). That year was also marked by the impact of the Brundtland Commission Report’s definition of sustainability (1989), with the three pillars of environment, society, and economics. Moreover, various authors use that year as the starting point for examining the varying idea of sustainability in the Olympics (e.g., Karamichas, 2012; Konstantaki, 2018; Müller et al., 2021).

This article, thus, presents changes in perspectives on sustainability in the Olympics by referring to plans prepared for the Turin Winter Olympic Games 2006 and the forthcoming Brisbane Summer Olympic Games 2032. To explore the two cases, we first provide an overview grounded in documents provided by the IOC (e.g., IOC, 2012, 2014a, 2017, 2020), individual Olympic legacy reports (e.g., PyeongChang 2018 Olympic and Paralympic Winter Games, 2017; Salt Lake City Organizing Committee, 2002; The Atlanta Committee for the Olympic Games, 1997), and research books and papers (e.g., Bottero, 2007; Bottero et al., 2005; Minnaert, 2012; Müller, 2015; Müller et al., 2021). Case analysis is then applied based on reports and feasibility studies of the two Games, and supplemented with direct knowledge held by the authors on the host cities and their Olympic plans.¹ The knowledge of these events and contexts by the authors, in spite of one being a past event (2006) and one currently being planned (2032), as well as one being a Winter Olympics and the other a Summer event, has allowed for a deeper understanding of both cases claiming to be innovative regarding their approach to sustainability. It is possible, then, to consider features and characteristics that are strictly connected to the idea of delivering a sustainable event, while showing how IOC requirements have changed in time.

The article is guided by the following research questions: *How does the growing attention to sustainability concretely influence actions and plans of the Olympic Games? Are there any shifts in attention from economic-environmental aspects to socio-environmental ones?*

To do so, Section 2 examines the idea of sustainability in Olympic Games by analysing the sustainability strategy of the IOC and the related main initiatives of the Olympic Games. Section 3 describes the main features of the two cases, Turin 2006 and Brisbane 2032. Section 4

¹ The authors live and work in the two cities, participated to the Olympic plans design and/or evaluation, and contributed to relevant related publications (Bottero et al., 2016; Bottero, 2007; Bottero & Caprioli, 2024; Dansero et al., 2011; Foth et al., 2022; Bottero et al., 2005).

identifies a set of dimensions to be used for examining the sustainability of Turin's and Brisbane's mega events, and Section 5 provides final discussion and conclusions.

Sustainability and the Olympic Games

Before launching into details of the Turin and Brisbane cases, we offer a brief review of how the sustainability strategy of the International Olympic Committee has evolved over time, while looking at how these high-level strategic priorities have informed different sustainability pathways for the Olympic Games.

The Sustainability Strategies of the IOC

The process increasingly including sustainability concerns in the Olympics started around 1992 (Figure 1; IOC, 2016), as stated in various contributions on Olympic sustainability (e.g., Karamichas, 2012; Konstantaki, 2018; Langenbach & Krieger, 2017; Müller et al., 2021). This has been a consequence of the discussions and pressures felt after the Brundtland Commission Report (1989). IOC's representatives participated to the UN Earth Summit 1992 in Rio de Janeiro and consequently included environmental criteria and requirements in the selection of Olympic Games host candidates. In 1994, the *environment* was adopted by the IOC as the 'third pillar' of Olympism, joining *sport* and *culture* (Chappelet, 2008). After the Rio summit, the IOC created its Sport and Environment Commission and organised the first World Conference on Sport and Environment, in 1995. In these first years, the topic of sustainability mainly referred to the environmental perspectives embedded in the concept of sustainability.² "The Olympic Charter" (1996) called for heightened responsibility for environmental issues by encouraging the Olympic Movement to adopt measures that reflect such concern in its activities and educate all those connected with the Olympic Movement about the importance of sustainable development.

A more comprehensive view of sustainability was adopted in 1999, when the IOC published the Olympic Movement's Agenda 21, "Sport for Sustainable Development". In this report, the IOC urged to improve socio-economic conditions integrated with the conservation and management of resources for sustainable development, as well as strengthening the role of specific groups (i.e., women, youth, and Indigenous people). However, it provided only a theoretical framework rather than practical tools for including sustainable development into the Olympic Games.

To fill this gap, in 2005, the IOC published the "Sport, Environment and Sustainable Development Guide," which foresaw the adoption of the Agenda 21 into the Olympic Movement.

² "The IOC's official definition of sustainability is that, when making decisions, we ensure feasibility, and we seek to maximise positive impact and minimise negative impact in the social, economic and environmental spheres." (IOC, 2018c, p. 8).

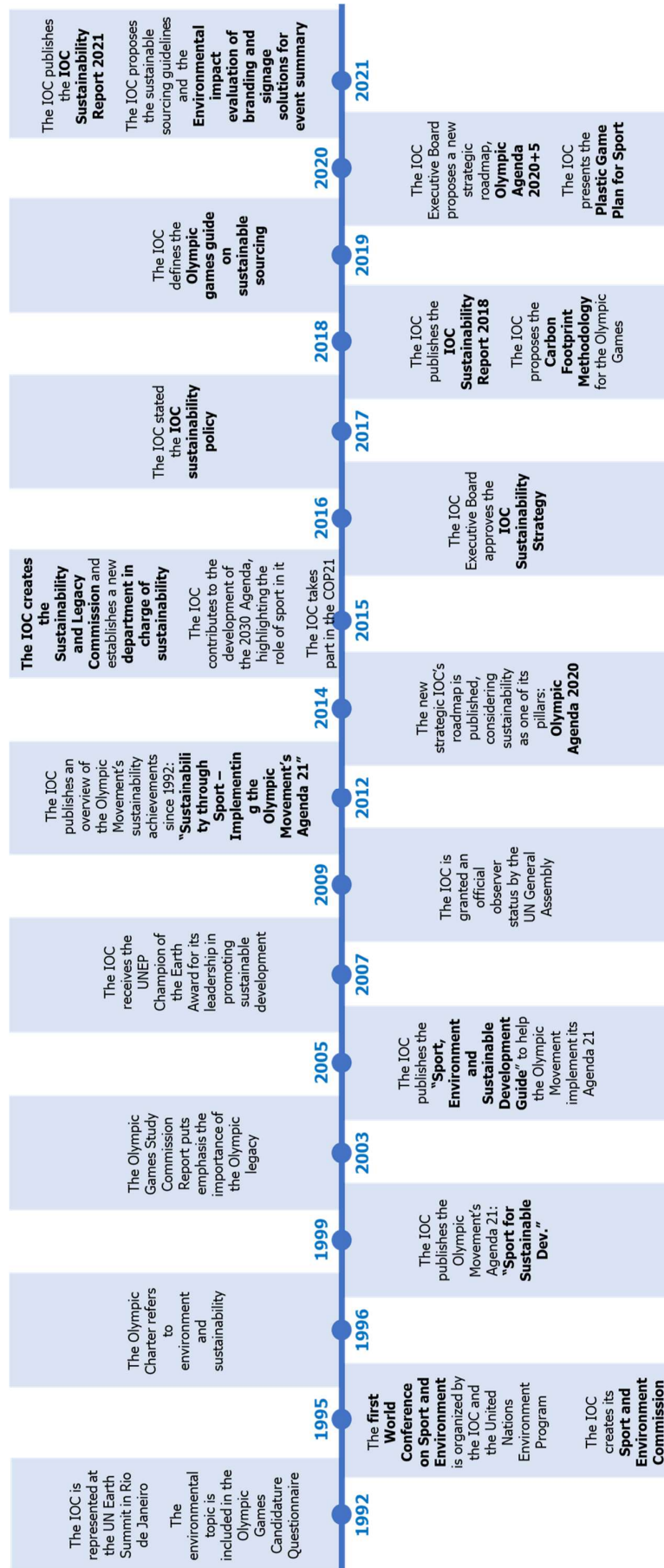


Figure 1 – Inclusion of the sustainability concept in the IOC procedures over time (elaborated and updated from: IOC Sustainability Strategy, 2016)

The Guide offers methodological and practical tools to the sport community, based on the major principles of sustainable development as stated in UN documents (IOC, 2007).

In 2014, the IOC published a new strategic roadmap in the “Olympic Agenda 2020” where *Sustainability* was included as one of its three pillars together with *Credibility* and *Youth* (IOC, 2016). To achieve goals related to these three pillars, the document detailed a total of 40 recommendations and, in particular, two recommendations specifically related to sustainability: to include sustainability in *all aspects of the Olympic Games* (recommendation 4) and *within the IOC organisation and its daily operations* (recommendation 5).³ In 2015, the IOC established its Sustainability and Legacy Commission (replacing the Sport and Environment Commission) as well as a new department in charge of sustainability. Furthermore, as a result of the “Olympic Agenda 2020,” the IOC developed the IOC Sustainability Strategy (IOC, 2016), where three spheres of responsibility were identified (i.e., responsibility as an organisation, as owner of the Olympic Games and as leader of the Olympic Movement), as well as five main focus areas for the sustainable development of the Olympic Games (Figure 2). In particular, to achieve recommendations 4 and 5 of the Olympic Agenda, 17 strategic intents for 2030 were defined, each relative to the five focus areas and common across the three spheres of responsibility,⁴ while 18 objectives were specific for each sphere.⁵

Topics and aims launched as part of the IOC Sustainability Strategy (2016) were embedded in the progress report entitled IOC Sustainability Report (IOC, 2018b), which provided detailed information on how sustainability had been integrated into the IOC governance and internal management systems, as well as how they worked on the 18 sustainability objectives for 2020, in view of their strategic intent for 2030. In the same year, the IOC also proposed the Carbon

³ Recommendation 4 required the IOC to have a more proactive position and leadership role concerning sustainability, ensuring that it is embedded in all aspects of the planning and staging of the Olympic Games, with “sustainability measures that encompass economic, social and environmental spheres in all stages of their project” (p. 2), and “post-Games monitoring of the Games legacy” (p. 2). With recommendation 5, the IOC, as an organisation, strongly embraced sustainability principles in a more practical way in its direct activities (e.g., by reducing the IOC’s travel impact through offsets of its carbon emissions, and collaborating with the United Nations Environmental Programme).

⁴ Among the intents: Use of existing infrastructure is maximised and temporary and demountable venues are used where no long term venue legacy need exists or can be justified; Products and materials are treated as valuable resources and their lifecycle is optimised; Mobility solutions are environmentally and socially responsible; Working conditions of employees and volunteers are safe and healthy, and active lifestyles are promoted; Effective carbon reduction strategies are in place for operations and events, and are aligned with the objectives of the Paris Agreement on climate change.

⁵ Among the objectives: O2: Increase energy efficiency of our buildings; O4: Achieve a measurable reduction in waste quantities O5: Reduce the IOC’s travel impact (business travel for IOC staff, Members and guests; vehicle fleet; staff commuting; freight); O6: Further increase staff diversity, in particular with regard to gender and geographical diversity; O7: As part of IOC@work2020, further develop a wellness programme to promote healthy and active lifestyles at the IOC; O8: Achieve carbon neutrality by reducing direct and indirect GHG emissions, and by compensating emissions as a last resort; O11: Reinforce sustainability commitments in the Host City Contract so that bidding for and hosting an Olympic Games edition can act as a catalyst for sustainable development within the host city and region; O17: Set up an ambassador programme including athletes, in order to raise awareness on sustainability in sport.

Footprint Methodology for the Olympic Games (IOC, 2018a) in order to apply carbon foot printing and accounting, normally used to evaluate organisations, products or services.



Figure 2 – The 5 components of sustainability according to the IOC (source: IOC Sustainability Strategy, 2016)

In 2020, the IOC Executive Board released the Olympic Agenda 2020+5 (IOC, 2021c) as a new strategic roadmap, which included 15 recommendations for 2025 based on key trends that were identified as likely to be decisive in the post-coronavirus world, as well as 17 new sustainability objectives. Three of the 15 new recommendations specifically relate to the theme of sustainability: *Foster sustainable Olympic Games* (recommendation 2); *Strengthen the role of sport as an important enabler for the UN Sustainable Development Goals* (recommendation 10); *Continue to lead by example in corporate citizenship (i.e., a company responsibility toward society)* (recommendation 13).⁶

In 2021 (IOC, 2021b), the IOC published an updated version of the Sustainability Report, where new achievements were highlighted according to the 18 sustainability objectives of the Olympic Agenda 2020, as well as the new 17 objectives based on the Olympic Agenda 2020+5.

Sustainability Pathways for the Olympic Games

Building on the IOC's institutional frameworks discussed above, the practical application of Olympic sustainability has evolved through successive Games and expanded from environmental protection to broader social and economic considerations. Since the 1992 Earth Summit, the inclusion of sustainability and the adoption of sustainable strategies and actions in the Olympic Games have had different results over the last 30 years. These results are not necessarily more positive as time goes on, as shown in Table 1, which synthesises the main

⁶ For the 2024 Paris Olympics Games we can see the main goals related to sustainability both in setting a pre-Games target on carbon footprint (<https://www.paris2024.org/en/delivering-carbon-neutral-games/>) and in the strategy to align the Games with the goals of the Paris Agreement (<https://www.ouvrages-olympiques.fr/en/commitments/sustainable-city>). In Los Angeles, preparation for the 2028 Games is based on the Clean Energy 2028 Roadmap (<https://lincubator.org/wp-content/uploads/laci-cep-roadmap-2028.pdf>).

sustainable initiatives developed for the Olympics over time, using the information contained in different documents provided by the IOC (e.g., IOC, 2012, 2014a, 2017, 2020), individual Olympic legacy reports (e.g., PyeongChang 2018 Olympic and Paralympic Winter Games, 2017; Salt Lake City Organizing Committee, 2002; The Atlanta Committee for the Olympic Games, 1997), (e.g., IOC, 2012, 2014, 2017, 2020), and scholarly literature (e.g., Bottero, 2007; Bottero et al., 2005; Minnaert, 2012; Müller, 2015; Müller et al., 2021). It is important to recognise that the use of IOC and OCOG (the event-specific Organising Committee of the Olympic Games) documents allows us to have an overview of all the Olympic Games from 1994 to the present day. Inevitably, however, this may introduce some biases due to the different narratives of IOC and OCOGs. To mitigate this risk, other documents have also been consulted to verify and strengthen the credibility of the data reported.

The Olympic Winter Games 1994 in Lillehammer, Norway, represent the first example in which environmental issues were considered in planning and implementation (IOC, 2012). From then on, all the other host cities have included sustainable strategies and actions in a more or less explicit way. Initially, hosts focused their attention on the environmental component of the so-called triple-bottom line approach borrowed from the notion of corporate social responsibility, considering ecological integrity, waste recycling, eco-friendly materials, and low-emission vehicles and public transport improvement. While Atlanta 1996 primarily emphasised economic development goals, it also included some social sustainability aims in its candidature, particularly in relation to housing and community development (Minnaert, 2012; The Atlanta Committee for the Olympic Games, 1997).

Since then, the prominence of social and environmental dimensions of sustainability has increased in the rhetoric and planning of subsequent Olympic Games. This can be seen in the 2000 Sydney Olympics, when substantial efforts were made to turn the idea of social sustainability into practical programs and initiatives (Minnaert, 2012), alongside a more obvious environmentally oriented perspective (Chalkley & Essex, 1999). Additionally, public awareness policies were developed for Salt Lake City 2002 (Salt Lake City Organizing Committee, 2002), Athens 2004, Beijing 2008, and Vancouver 2010 (IOC, 2012). Gender equality initiatives and promotion of healthy living were promoted in London 2012 (IOC, 2012), while the participation and direct involvement of stakeholders, local community and local cooperatives has been part of the Games preparation in Turin 2006 (IOC, 2012), Rio de Janeiro 2016 (IOC, 2017), and again London 2012 (IOC, 2012). The Olympics have also provided opportunities for urban renewal and the regeneration of areas in the host cities and their surroundings (see, among others: Chalkley & Essex, 1999; Delaplace & Schut, 2019; Gold & Gold, 2008).

Water recycling and improvement, its optimisation, protection and improved sewage system have had a strong importance in many games, such as Sydney 2000, Turin 2006 and

Beijing 2008 (IOC, 2012). At the same time, the protection, safeguarding and regeneration of banks, rivers, their drainage and hydrogeological integrity held great importance in Turin 2006, Beijing 2008, Sochi 2014, and Rio 2016 (IOC, 2012, 2014b, 2017). Some hosting cities also assessed the sustainable quality of their projects and actions through international certification – Turin being the precursor with the ISO 14001 environmental management certification and European Union Eco-Management and Audit Scheme, EMAS, registration for its Olympic developments (IOC, 2012). However, constraints and limitations of such assessment schemes have been recognised (Loh et al., 2020). Connected with such certifications is, in fact, the use of carbon offsets, renewable energy technologies, and the development of efficient and eco-friendly buildings (e.g. solar-powered village in Sydney 2000 or renewable energy used in Tokyo 2020 and Beijing 2022; IOC, 2020). However, a focus on energy efficiency is limited in its ability to make mega-events truly sustainable (Foth et al., 2022; Ringenson et al., 2017), because efficiency gains do not result in net reductions. Notwithstanding the fact that economists have long known this (Herring, 1999), past and future Olympic Games continue to proclaim their sustainability credentials based on resource efficiencies.⁷

Recent and upcoming Olympic Games editions have committed to being carbon neutral (“net zero”) or even carbon-positive or climate-positive (Birkeland, 2022; Foth et al., 2022). Tokyo 2020 prioritised the use of renewable energy sources and offsetting unavoidable emissions, considering the entire range of emissions associated with the Games (IOC, 2020). This covered the building (both permanent and temporary venues) as well as the running of the Games, which involved moving participants, officials, and spectators. Toyota, the global partner of the 2020 Olympics, supplied the official zero-emission vehicle fleet, including hydrogen cars. Beijing 2022 committed to using 100% renewable energy for all Olympic venues (IOC, 2020). In addition to ground transport, a much more significant source of carbon emissions for any Olympic Games is air travel required to bring international athlete teams, partners, journalists and spectators to the host city. It is often left unaccounted for and outside the host’s carbon accounting. While some airports have started to claim carbon neutrality, this is often a fallacy and mere greenwashing (de Freitas Netto et al., 2020), because they only account for a small part of their total emissions. According to the 2022 Greenhouse Gas Protocol,⁸ these emissions comprise Scope 1 (emissions from airport-controlled sources, e.g. buildings) and Scope 2 (emissions from

⁷ In economic theory, the *Khazzoom–Brookes postulate* (Saunders, 1992), *Jevons Paradox* (Alcott, 2005; Giampietro & Mayumi, 2018; Polimeni et al., 2015), and *Rebound Effect* (Binswanger, 2001; Gossart, 2015) are concepts related to energy efficiency and/or resource consumption. While they slightly differ in their take on the outcomes of efficiency improvements, they suggest that improvements in energy efficiency can stimulate more energy consumption. As energy becomes more efficiently utilised, the cost of using energy decreases, which often leads to an increase in overall energy use. This rebound can be either direct (more frequent usage of the same resource) or indirect (using cost savings to consume additional goods and services).

⁸ https://climate-pact.europa.eu/eu-climate-action-academy/resources/ghg-protocol_en

energy purchased by the airport) but exclude ‘indirect’ Scope 3 emissions from flights and ground transport used by passengers and airport workers travelling to/from an airport. Yet, they can account for as much as 99% of an airport’s total emissions (Budd et al., 2023).

Before the IOC published its proposal on carbon footprints (IOC, 2018a), host cities tried to reduce carbon emissions with different initiatives, from public transport to building efficiency (Table 1). Additionally, some cities undertook additional steps by proposing ways of compensating for the inevitable emissions produced (Table 1), e.g. in Turin 2006, offsets were directed in reforestation projects and in the protection of environmental and hydrogeological integrity; in Vancouver 2010, a portfolio of compensation projects from all over the world was developed (IOC, 2012).

Table 1 – The inclusion of the sustainability concept and the adoption of sustainable strategies and actions in the Olympic Games from 1994 to 2022

Olympic host cities	Fields of actions and policies for sustainability
Lillehammer 1994, winter games	<ul style="list-style-type: none"> • ecological integrity • deforestation • air pollution • use of local materials • recyclable dishware and cutlery
Atlanta 1996, summer games	<ul style="list-style-type: none"> • sidewalk improvements, planting street trees, signs for pedestrians • job training programme for residents of the relevant neighbourhoods • children’s Olympic Ticket Fund • Atlanta Organising Committee (ACOG) + Committee for Olympic Development in Atlanta (CODA) + Olympic Environmental Support Group • Analysis of concerns about asbestos and underground storage tanks • involvement of the Environmental Protection Agency
Nagano 1998, winter games	<ul style="list-style-type: none"> • low-emission vehicles • recyclable printer cartridges • wrapping materials and the introduction of recycling boxes
Sydney 2000, summer games	<ul style="list-style-type: none"> • green regeneration • no or limited use of persistent organic pollutant • recycled and efficient building materials • water recycling • solar-powered village • integration of indigenous peoples, engagement of different cultural communities, and employment and training programmes for the construction industry
Salt Lake City 2002, winter games	<ul style="list-style-type: none"> • environmental awareness to encourage innovative techniques of environmental protection • more than 100,000 trees planted in Utah and more than two million others throughout the world • use of recycled energy • no ozone harming materials
Athens 2004, summer games	<ul style="list-style-type: none"> • spread environmental awareness • improvements in the city’s public transport infrastructure (reducing heavy traffic and improving air quality) • sponsors to promote green technologies (low-emission vehicles, wind and solar-powered lighting units and recycling activities) • historic centre into a pedestrian area
Turin 2006, winter games	<ul style="list-style-type: none"> • ISO 14001 environmental management certification and European Union Eco-Management and Audit Scheme (EMAS) registration

	<ul style="list-style-type: none"> • HECTOR project to analyse every aspect of the Games including transport infrastructure, hospitality facilities, and waste and sustainable event management • estimation of the volume of direct and indirect greenhouse gas emissions • compensation projects to offset emissions (reforestation and protection of environmental and hydrogeological integrity) • investment in energy efficiency and renewable energy projects • sustainability criteria for all the key categories of the supply chain • sponsors sustainability guidelines • optimised use of water and improvements in the local water system • strategic alliance among stakeholders
Beijing 2008, summer games	<ul style="list-style-type: none"> • environmental sustainability into a comprehensive city development plan • eco-friendly and energy-saving technologies and materials • involvement of environment-related industries • raise public awareness • measures to protect water and the sewage system • 200 measures to address pollution (vehicles, heating systems, monitoring systems) • Increased green areas • sorting and recycling of solid waste
Vancouver 2010, winter games	<ul style="list-style-type: none"> • all buildings for the Games certified by LEED • increasing habitat quality • attention to biological diversity • zero-solid waste management strategy for all the stakeholders and provision of recycling depots • food donations • minimise energy and travel requirements • expanded public transport with low-emission buses • emissions compensation with the development of a portfolio of projects from all over the world • raise public awareness
London 2012, summer games	<ul style="list-style-type: none"> • eco-friendly and energy-saving building technologies • low-emission vehicles • cooling systems free from hydrofluorocarbons • reuse and recycling of material from demolitions • new urban park and new wildlife habitats • gender equity goals • stakeholders and local community participation • promotion of healthy living
Sochi 2014, winter games	<ul style="list-style-type: none"> • national standard for environmental construction • BREEAM standard for the venue's construction • restoration of the unique ecosystem of the Olympic construction area, including the Mzymta river basin
Rio de Janeiro 2016, summer games	<ul style="list-style-type: none"> • ISO 20121 certification • Implementation of energy-efficient and low-carbon technologies • timber (chain of custody), fish and sea food certifications • new areas with native and natural vegetation • regeneration of banks and drainage works • sanitation infrastructure (sewage processing plants) • new waste treatment centre • waste recycling, with inclusion of local cooperatives
PyeongChang 2018, winter games	<ul style="list-style-type: none"> • green transport infrastructure • self-sufficient renewable energy system • green building certification system • green product purchase education campaign • monitoring green product purchase
Tokyo 2020 (held in 2021), summer games	<ul style="list-style-type: none"> • use of renewable energy • compensation of unavoidable emissions • emissions reduction • use of zero-emission vehicles
Beijing 2022, winter games	<ul style="list-style-type: none"> • 100 per cent renewable energy for all Olympic venues

While the IOC presents a largely self-congratulatory narrative of sustainability progress, an increasing number of authors raise due criticisms, particularly related to the IOC's claims to offer sustainable solutions while actually taking very little action to make significant long-term changes to the environment and ecological sphere (Boggia et al., 2018). Sochi 2014, for example, hosted part of the games inside a UNESCO World Heritage Park, harming rare vegetation (Müller et al., 2021). The 2014 Sochi Games fell short of the sustainability targets outlined in the first bid and instead caused irreparable environmental damage as a result of poor governance (Karamichas, 2019). The 2016 Olympics in Rio de Janeiro had a similar outcome and, despite bidding documents promising to remediate, more than 80% of the sewage poured into the notoriously dirty Guanabara Bay, which hosted the Olympic sailing and windsurfing contests (Boykoff, 2021). For the 2018 Pyeongchang Winter Olympics, an old forest was felled in preparation for a ski slope (ibid.). Additionally, international criticism was also directed at the preparation for the games, for instance, regarding illegal construction waste disposal, toxic waste discharge that contaminated local water supplies, work that significantly increased the risks of spring floods by changing the local hydrological cycle, and disruption of migratory bird patterns (Foth et al., 2022; Müller, 2015; O'Hara M, 2015).

Governance and accountability have emerged as critical components of the Olympic sustainability discourse. For instance, Rowe (2012) critically evaluated the Sydney 2000 and Beijing 2008 Games from the standpoint of human rights. Karamichas (2019)) problematised the human rights violation in Sochi 2014. Byrne & Lee Ludvigsen (2024) examined the IOC's evolving commitment to human rights and argue that despite new policy frameworks, implementation remains inconsistent and accountability mechanisms weak. These concerns are not merely institutional: governance failures and weak human rights protection often manifest spatially through displacement, exclusion, and uneven access to the urban legacies of the Games. Thus, human-rights considerations are inseparable from questions of urban renewal and sustainable development. While the London 2012 Olympics sought open reporting on sustainability and had plans to revitalise urban areas, an analysis of wellbeing data by Dolan et al. (2019) did not find any clear evidence of inherited effects on the host city, while the whole idea of hosting such an event to help regenerate an area has been widely debated (e.g., Karamichas, 2019; Vijay, 2015; Watt, 2013). These patterns suggest that the credibility of Olympic sustainability depends less on rhetorical expansion than on how governance, accountability, and human-rights commitments translate into urban realities and people's lived experience. How some of these dynamics and tensions in sustainability and governance discourses become spatially and socially embedded is being explored further in the comparative examination of Turin 2006 and Brisbane 2032 in the following sections.

The cases of Turin 2006 and Brisbane 2032

In this section, we focus on two cases in order to highlight the evolution of the idea and the practical implementation of sustainability in the Olympics. To do that, the cases of the Turin Winter Olympic Games (2006) and planning for the Brisbane Summer Olympic Games (2032) are investigated. These cases have been chosen for different reasons. Firstly, the authors bring first-hand knowledge about these two Olympics and their related regional impacts (Bondonio & Guala, 2011; Botta & Comoglio, 2007; Bottero et al., 2016; Bottero, 2007; Bottero & Caprioli, 2024; Dansero et al., 2011; Foth et al., 2022; Bottero et al., 2005). Secondly, the Turin games ended around 20 years ago, in a period in which the IOC embraced sustainability as an important, but still collateral, principle, while Brisbane will host the event in less than 10 years, with sustainability – and specifically the first contractual obligation (at least in the original host agreement) to be “climate-positive” – as core requirements for the games.

Turin 2006, Winter Olympic Games

Turin is an Alpine Italian municipality of 836,661 inhabitants (ISTAT, 2023), the capital of the Piedmont region and the core of the namesake metropolitan city (with 2.2. million inhabitants, 312 municipalities and a total size of 6828 km²). Both the city and the metropolitan city have actually lost population from 2006 to nowadays (-6% and -2% respectively) but Turin is still the fourth largest Italian municipality by population and one of the major urban centres in the country.

The Olympic Games were organised considering the geographical features of the area, which has a metropolitan core and broad rural and Alpine regions, thus proposing a polycentric system of venues in a total of 78 municipalities (Figure 3). Turin was, as a matter of fact, the first Winter Olympics organised in a medium-large urban area, hence the decision to not concentrate the majority of the games and ceremonies in a single Olympic district, but to spread them across different areas and buildings in the whole Olympic region, while promoting regeneration processes and building reuse in the city as well as in the wider metropolitan city (Bottero, 2007).

Principles of sustainable development were explicitly embedded in the preparation of the games, and the Strategic Environmental Assessment (SEA) procedure (Directive 2001/42/EEC of the European Parliament and of the Council) for Olympics related infrastructure and building works was adopted for the first time in Italy. Additionally, the 2006 Winter Olympics provided the opportunity to implement the management, planning and governance of a mega event with a high potential impact on the territory, as well as a chance to evaluate and monitor such a complex program before-during-and after the event (Bottero, 2007). The Turin Olympics Organising

Committee (TOROC) established an environmental management system that, for the first time in the history of the Olympic Games, received environmental management certification, under ISO 14001, and registration, under the European Union's Eco-Management and Audit Scheme (EMAS) (Botta & Comoglio, 2007).



Figure 3. Venue masterplan of Turin 2006 (TOBO – Torino Olympic Broadcasting Organisation, 2014)

Brisbane 2023, Summer Olympic Games

Brisbane is a subtropical city located in Queensland, Australia. It is the third-largest city in the country, with a population of around 1.25 million in the Brisbane City Council Local Government Area (LGA) and 2.5 million in the Greater Capital City Statistical Area for Brisbane (ABS, 2021). Over 190 suburbs and municipalities make up Brisbane City, which has a total size of almost 16,000 km², making Brisbane City Council Australia's biggest local government area.

According to the Feasibility Assessment and the Report of the future host commission for the games (IOC, 2021a), Brisbane has based its project on a polycentric concept both for the Olympic and Paralympic Games (Figure 4). Furthermore, the Venue Masterplan is aligned with the Olympic Agenda 2020, with 84% of competition venues supposed to be using existing or temporary buildings/infrastructure.

The host city proposal conveys the impression that Brisbane 2032 aspires to create a legacy for the people of Queensland and Australia and a vision fully aligned with Queensland's ambitious economic, climate, and public health objectives and local development plans, designed to respond to an anticipated 46% demographic growth over the next two decades (IOC, 2021a).



Figure 4. Venue masterplan of Brisbane 2032 (IOC, 2021b)

As previously mentioned (see Figure 2), the sustainability programme of the new Olympic Games must be developed according to the five foci of the IOC Sustainability Strategy. According to these, Brisbane identified specific strategies and control actions (IOC, 2021a). And, in particular, for the fifth focus of the IOC sustainability objective (climate), Brisbane 2032 had originally promised to develop a carbon management strategy able to produce a comprehensive analysis of their initial carbon footprint, which would have underpinned the plans for delivering on their original, contractual obligations with the IOC to host climate-positive games. However, Foth (2025) reported that the Olympic Host Contract was amended in October 2022 with an addendum that removes and replaces all mentions of “climate-positive” obligations with a watered-down target to “minimise the Games’ carbon footprint”.

Synthesis: Changing patterns of planned sustainability

This section unpacks these patterns further: first, by examining cross-cutting thematic shifts across successive Games; and second, by discussing Olympic legacies and long-term perspectives with a specific focus on the sustainability agenda, governance framework, and community implications of Brisbane 2032.

Comparative patterns across Games

To understand how the idea and practical implementation of sustainability has changed from 2006 to the future 2032 games, we may look at differences and similarities in the approach to sustainable development of the two Olympic Games (Table 2). For this purpose, we collected and organised data and information, clustering them according to the different aspects affecting the sustainable development of the Olympics. Specifically, these aspects cover the five focus areas of the IOC Sustainability Strategy, reflecting multiple sustainable strategies and actions that emerged from the investigation of past Olympic Games (see Table 1). These clusters allow us to examine the various and interrelated dimensions of sustainability, that go from environmental aspects (e.g., ecological integrity, biodiversity and landscape), social impact and urban-territorial development (e.g., people awareness and participation, management and governance, local development), economic perspectives, infrastructural and technological implementation (e.g., mobility and transport, digital systems), energy and efficient buildings (i.e., renewable energy, eco-friendly materials) and cultural promotion. To these five clusters we have added a sixth one, related to the impact of the Games on local communities,⁹ since this topic has specifically gained greater importance in the Games' organisation in the past decades. It is important to acknowledge that the IOC Strategic Framework on Human Rights (IOC, 2022) is an important development stemming from the Olympic Agenda 2020+5. This framework defines responsibilities towards local communities. While this framework extends the IOC's sustainability agenda to include human rights and community wellbeing, recent studies suggest that its practical impact remains uncertain, with implementation gaps and limited accountability persisting across Olympic contexts (Byrne & Lee Ludvigsen, 2024; Karamichas, 2019; Rowe, 2012).

We have seen both cities adopting a polycentric approach in the distribution system of the event, thus stressing the importance of paying attention to infrastructures and impact on natural sites. In both cases, there is a clear effort in reusing existing buildings / venues or temporary ones (40% in Turin and 84% in Brisbane, an increase which shows the impact of IOC policies). As well,

⁹ There is no explicit reference to local communities in the IOC's 40 recommendations (IOC, 2014). Nevertheless, it should be noted that the 15 recommendations of the 2020+5 Agenda (specifically, recommendation 3) aim to Strengthen the global and local communities of Olympians using social and digital technologies IOC. (2021d).

Table 2 - Comparative assessment matrix of the two Olympic Games, Turin 2006 and Brisbane 2032, following the 5 IOC Sustainability Foci (**infrastructure** and natural sites (I); sourcing and **resource** management (R); **mobility** (M); **workforce** (W); and **climate** (C)). Additionally, the topic impact on **local communities** (L) was added, clustering those actions that do not exactly fall into the previous categories but are considered in the analysed Games.

	Turin 2006	Brisbane 2032
Infrastructure	<ul style="list-style-type: none"> • 40% existing and temporary buildings / venues; • Buildings thermal insulation. 	<ul style="list-style-type: none"> • 84% existing and temporary buildings / venues; • Advanced national internet infrastructure; • New venues targeting the 6 star (world leadership) Green Star for Buildings ratings.
Resources	<ul style="list-style-type: none"> • Optimised use of water and improvements in the local water system; • Investing in solar photovoltaic; • ISO 14001 environmental management certification and European Union Eco-Management and Audit Scheme (EMAS) registration; • Environmental criteria for all the key categories of the supply chain; • Sponsors sustainability guidelines; • HECTOR project to monitor sustainable event management. 	<ul style="list-style-type: none"> • Queensland ambition to go for a 50% transition to renewable energy (2030) by 2050; • Maximising efficiency in the manufacturing and supply processes; • Investing in energy network asset renewal; • Expanding carbon farming; • Targeting emerging competitive advantage areas (e.g., precision healthcare, food security, sustainable agriculture, data-driven and urban management).
Mobility	<ul style="list-style-type: none"> • HECTOR project to monitor transport infrastructure and hospitality facilities; • Improvement in transport infrastructures not entirely connected with the Games organisation (e.g., the new metro line). 	<ul style="list-style-type: none"> • All Games vehicles from 100% renewable energy • Ensuring that 90% of spectator journeys to Games venues use public or active transport.
Workforce	<ul style="list-style-type: none"> • Investing in the construction sector, tourism, project management. 	<ul style="list-style-type: none"> • Career development opportunities; • Safe and healthy workplaces; • Around 122,900 full-time equivalent (FTE) job years over a 20 years evaluation period (2022-2042).
Climate	<ul style="list-style-type: none"> • Estimation of the volume of direct and indirect greenhouse gas emissions 	<ul style="list-style-type: none"> • Low risk environment regulation for the Games.
Local Communities	<ul style="list-style-type: none"> • Culture of hospitality; • City image and branding; • Area regeneration, also in areas that were not Olympic sites or venues. 	<ul style="list-style-type: none"> • Generating benefits for the local communities in the following areas: sport for all and elite sport; social development through sport and human skills and cultural development; environmental protection; and economic development; • Opportunities for local and Indigenous businesses, as well as to recognise, respect and celebrate them; • Strengthening inclusive communities; • Developing community centres; • Promoting affordable housing; • Growing Queensland's film industry (up 50% from '16-'17); • Tourism uplift (overnight visitor expenditure) of USD 15.3 billion; • Legacy for the people of Queensland and Australia and a vision fully aligned with Queensland's existing ambitious economic, climate, and public health objectives and local development plans; • Tools and standards developed with OCOGs for measuring legacy and impacts; • Promoting diversity, inclusion and gender equity; • Promoting healthy lifestyles; • Increasing sport and recreation programme funding.

in both cases, the building efficiency and the contribution provided by renewable energies are considered. Nevertheless, the percentage of re-used or temporary buildings in Brisbane is lower than that declared for the Paris Olympics 2024 (95%) and foreseen for the LA Olympics 2028 (100%), while the construction of new venues in a target 6-star Green Star Buildings ratings is only considered “when relevant” (Foth et al., 2022, referring to AOC, 2021, p. 62). What is also quite controversial is the impact on natural sites, since sports facilities will affect certain spaces for a shorter or longer period. Attention to the environment is either shifted to resource management and sourcing or to evaluation procedures but seldom practically considered, if not for offsetting measures (e.g. Sydney 2000 or London 2012). From an environmental point of view, the Olympic Games in Turin were seen as an occasion for improving ecological integrity through ecosystem restoration and conservation, promoting biodiversity and protecting the landscape with many initiatives and actions. Brisbane mentions a few initiatives, regarding the increase of awareness concerning the conservation of the Great Barrier Reef and attention to circularity in using resources and recycling but, overall, the commitments remain vague and superficial.

Mobility and transport constitute crucial topics to achieve various sustainability objectives, spanning from the reduction in the use of private cars, reducing air pollution and congestion, and increasing public transport services. In this sense, Brisbane aims to guarantee that all Games vehicles are fuelled from 100% renewable energy and to ensure that 90% of spectator journeys to Games venues use public or active transport. However, the proposal for alternative means of transport includes “Advanced Air Mobility” or AAM services such as air taxis and drones, which risk detrimental environmental and noise pollution outcomes and social inequity. Furthermore, apart from the single event of the Olympics, these initiatives should be promoted more explicitly with a long-term view, which seems to be lacking in relevant documents so far. In Turin, for example, funds related to the Olympics helped to boost the process of construction of the city’s first underground line. Similar works are being accelerated in Brisbane such as the Cross River Rail project, which is a new 10.2 km rail line that includes 5.9 km of twin tunnels running under the Brisbane River and CBD with four new underground stations at Boggo Road, Woolloongabba, Albert Street and Roma Street.¹⁰

Olympic legacies and long-term perspectives

Olympic cities are increasingly scrutinised for how they pay attention to managing their legacy, thus linking the event organisation to broader development strategies. However, processes of degradation and abandonment characterise many Olympic sites and purportedly built infrastructure, betraying initial expectations for a durable, versatile and sustainable use.

¹⁰ <https://crossriversrail.qld.gov.au>

Sports that are important during the Games may not succeed in surviving the Olympic hype (as in the case of the abandoned bobsleigh track in Cesana, one of Turin's Olympic sites), leaving behind costly facilities that, in the best cases, may end up in a change of use (e.g., from sport facilities to music or exhibition venues).

In Turin and Brisbane, great importance is given to governance aspects and participatory approaches, developing strategic alliances among the stakeholders, with clear definition of their roles and responsibilities. On the one hand, Turin implemented an initiative to monitor the overall sustainable event management, the HECTOR (Heritage Climate Torino) project. Additionally, the city introduced, for the first time in the Olympics, an environmental management certification and an audit scheme registration, as well as a monitoring system of environmental indicators to assess all the key categories of the supply chain and detailed sponsors' sustainability guidelines. On the other hand, Brisbane benefits from being the first-time preferred candidate bid. This could be advantageous in terms of more inclusive legacy outcomes to the IOC (Tham, 2023). Additionally, the Australian city – while promoting a strong legacy for the people of Queensland and Australia – is developing tools and standards for measuring impacts and legacy, and it established *ad hoc* regulations to eventually be used to facilitate the organisation of the Games. However, at the time of writing the governance mechanisms are lacking the promised participatory qualities and the original rhetoric of the proposal has been reduced to “engagement theatre” (Kamols et al., 2021). While the Lord Mayor Adrian Schrinner started to distance himself from the project, the Queensland Premier Annastacia Palaszczuk had to step down on 15th of December 2023 as a result of community backlash against her proposed costly demolition and rebuilding of The Gabba stadium at a cost of AUD 2.7 billion (Messenger, 2023), which comes at a time of an intense cost-of-living crisis. More recently, a new State Government was elected in Queensland at the end of 2024 and has made an executive decision to abandon the Gabba redevelopment plans. Instead, it has proposed building a new stadium in Victoria Park, Brisbane's largest remaining inner-city parkland (Messenger & Smee, 2025). This decision has significant implications for public participation, the protection of urban green space, and the social sustainability of Brisbane's Olympic planning, as recent commentary calls out ongoing tensions between public interest, political expediency, and the spectacle created not just by the Olympic Games themselves but by the hype surrounding their planning and design in their lead-up (Foth, 2025c). Recent demonstrations have been organised in response to the proposed construction of the stadium in Victoria Park, which is heritage-listed due to the significant Indigenous history. Furthermore, concerns have also been raised regarding transport and mobility, including traffic congestion, impact on the road system, and access to public

transport.¹¹ Last but not least, the government's shift in stance, from a commitment not to construct new stadiums, has drawn criticism, particularly for the valuable public asset and habitat represented by Victoria Park (Messenger & Smee, 2025).

With regards to cultural promotion, the two cities include it as an integral part of their games-related policies, to have had a different role than in past Olympics. Turin emphasised the redevelopment and valorisation programs of the historic centre (with interventions on pedestrian areas, public greenery, lighting, facades and porticoes). Interventions proposed by Brisbane 2032 aim to emphasise more intangible assets: diversity, showcasing culture and talent, monitoring liveability and lifestyle, and promoting the film industry. Yet, being explicitly intangible, they are harder to implement as well as to evaluate in the medium to long term. Further, aspirations towards cultural celebration and inclusivity sit uneasily alongside recent legislative developments. The *Planning (Social Impact and Community Benefit) and Other Legislation Amendment Bill 2025* (POLA Bill) came into force with the conservative government's majority in the Queensland parliament. It grants sweeping powers to a new Games bureaucracy – Games Independent Infrastructure and Coordination Authority (GIICA) – and overrides 15 cornerstone Queensland laws, including those protecting cultural heritage, the environment, and public consultation in urban planning. By exempting Olympic projects from normal planning scrutiny and judicial review, the Bill dismantles long-standing safeguards designed to protect both people and place. In practice, this undermines the very social and cultural sustainability goals that Brisbane 2032 purports to advance and puts democratic accountability, environmental integrity, and community rights at risk (Foth, 2025a).

Conclusions

The present article explored the topic of sustainability within the Olympic Games, overall showing the steps followed by the IOC and the attention given by the organiser of these events to embed the three pillars over time (environment, society, economy). Following our research questions, the article brings a cross-national comparative analysis of Olympic sustainability governance from Turin 2006 to Brisbane 2032 – and the broader lessons that can be drawn. These include insights into the persistent gaps between sustainability rhetoric and implementation, the limited enforceability of IOC guidelines, and the risks posed by ambiguous governance frameworks. The value of our work is in the interdisciplinary perspective for broadening the discourse on Olympic sustainability beyond the niche field of “Olympic studies” to include spatial planning and urban studies.

¹¹ <https://www.savevictoriapark.com/why-a-stadium-in-victoria-park-doesnt-make-sense>

In particular, the article first examined the IOC official documents to understand its vision and application of the concept of sustainability in the Olympic Movement. Secondly, we discussed the main sustainable initiatives and failures promoted by hosting cities during Olympic Games, starting from the winter games in Lillehammer 1994. Thirdly, we referred to the plans of two case studies, a past and a future Olympic Games (i.e., 2006 Turin Winter Olympic Games and 2032 Brisbane Summer Olympic Games).

Our analysis of official documents showed how much the IOC's rhetoric for sustainable development has grown over time: many initiatives and documents have been realised in an attempt to set sustainable goals and recommendations. In particular, the Agenda 2020 and 2020+5, and their application in the Sustainability Strategy, were considered the most helpful and relevant references for this purpose. However, the result of this work is more focused on the IOC organisation, which mostly provide guidelines and general indications that could be interpreted in very different ways. This certainly does not help but has encouraged the adoption and application of strong sustainability-oriented actions and strategies during and after the Games, beyond the use of slogans and popular statements during the bidding phase.

This is particularly clear also from the analysis that has highlighted how the Olympics' commitment to sustainability has changed, including different dimensions and perspectives, but it has not necessarily improved in terms of its impact on the games and the city. In Table 1, it is possible to see that the number of sustainability initiatives does not considerably increase over time, and it is not related to a substantial perceived or measured improvement of the solutions. At the same time, our analysis highlights the controversial aspects related to the inclusion of sustainability in the Olympics, as emerging from the literature. This is in line with other commentaries, such as Karamichas (2019), who suggest that there is no clear correlation between the environmental capabilities of the host nation improving over time and the country hosting the Olympics.

The comparison between Turin and Brisbane also corroborate this controversial aspect: Table 2 underlines the relatively unbalanced improvement of Brisbane 2032 compared to Turin 2006 on some aspects of sustainability (i.e., social inclusion, local development and energy and building efficiency). Even though Brisbane's rhetoric seems to give great importance to governance and local development, relatively smaller improvements concern environmental and ecological topics. This shows that greater attention to intangible aspects does not necessarily correspond to innovative or renewed trends in ecological and environmental dimensions. This tendency is also corroborated by Müller et al. (2021), whose analysis showed how some past Olympic Games, such as the ones in Salt Lake City 2002, were more ecologically sustainable than recent ones, such as Sochi 2014 or Rio de Janeiro 2016 (Boykoff, 2021). Therefore, when examining the sustainability goals of the Olympic Games, there is a continuous

gap between rhetoric and reality (Boykoff, 2021; Müller et al., 2021), as well a complicated and unbalanced relationship between the three pillars of sustainability.

Moreover, while the IOC has provided even more criteria and guidelines for improving sustainability in the Games, their application in the plans continues to be very different. In some cases, host cities have wrongly claimed to pursue sustainability-related actions during and after their Games, while they produced irreparable damage to the environment (e.g., Sochi 2014, Rio de Janeiro 2016, and Pyeongchang 2018) and negative societal impact (e.g., Sydney 2000, and Beijing 2008). However, many IOC guidelines remain broad and open to interpretation by host cities, each operating within distinct political and governance contexts. In practice, breaches of these guidelines – or even of Host Contract provisions – are rarely enforced, and non-compliance seldom carries meaningful consequences (Geeraert & Gauthier, 2018).

For this reason, the focus on Turin and Brisbane has allowed us to consider multiple dimensions for examining the sustainability of mega events, covering various and interrelated dimensions of sustainability, such as venues and transport, ecological and environmental aspects, community and governance. Starting from the sustainable focus areas identified in the Sustainability Strategy (2016), the analysis showed that the IOC perspective appears limited (i.e., Boggia et al., 2018; Müller et al., 2021) and that a better understanding of the context is needed. We thus argue for the 5+1 dimensions proposed in this article, as they can help in designing coherent, place-specific and long-term strategies. We further argue for stronger commitments to genuine sustainability, environmental governance and multispecies justice that do not shy away from the entangled nature of more complex areas of environmental and ecological impact than mere carbon offsets (Sheikh et al., 2023b). While the original contractual obligation to host “climate-positive” games has been removed (Foth, 2025b), we argue that the imperative to do more than just “minimise the Games’ carbon footprint” (IOC, 2022) remains regardless. This requires far more radical transformations of the broader economic framework so as to end the complacency of the business-as-usual approach. A shift towards urban governance frameworks that acknowledge more-than-human entanglements could provide valuable insights for guiding such transformations. Scholarship on post-anthropocentric approaches in design and planning (Fieuw et al., 2022; Graham et al., 2024; Sheikh et al., 2023a; Yigitcanlar et al., 2019) offers relevant perspectives for those interested in exploring alternative pathways beyond business-as-usual sustainability models.

In conclusion, we can state that some steps were taken by the IOC and hosting cities to embed sustainability, in its broader meaning, in the Olympic Games. Agenda 2020 and 2020+5 are in many ways a response to some critiques of Olympic games, in terms of human rights, environmental concerns and the diminishing appeal of Olympic Games hosting (Karamichas, 2019). However, more genuine efforts and improvements can still be made, particularly in the

governance and in the long-term view of benefits and impacts after the events. Within this context, Lopes dos Santos and Gonçalves (2022) highlight the growing presence of strategic planning practices in city bid planning processes and a matter of far greater relevance, in the aftermath of the pioneering editions of Barcelona 1992 and Lillehammer 1994. In particular, the Olympic planning strategy generally aims to combine and balance the unique event strategy with long-term benefits (Lopes dos Santos & Gonçalves, 2022). In this vein, the IOC has proposed the *New Norm in the Olympic Agenda* as a model for planning, organising, and managing the Olympic Games, designed to make them more sustainable, flexible, and less expensive (IOC, 2018c). The Milan-Cortina 2026 Winter Games will be the first European Olympics to directly adopt the New Norm framework for all areas of preparation, from venue and infrastructure delivery to the bidding process (Raco & Di Vita, 2024). However, the analysis of Milano-Cortina by Raco & Di Vita (2024) suggests how the proposal of an increased standardised process grounded in the logic of rapid development, occurring through the application of abstract methods, is difficult to imagine as being more beneficial than a slower and more deliberative, site-based planning process. More generally, the idealistic function of mega events in strategic planning is jeopardised by the degree of contradiction between the long-term expectations of hosting cities and the aspirations of event owners (Lopes dos Santos & Gonçalves, 2022).

It could be useful, however, to establish a set of credible sustainability standards and indicators, which would be selected site-specifically and utilised for monitoring during the *ex-ante*, *in itinere* and *ex-post* phases of the Olympic Games (as at least partially attempted by Boggia et al., 2018; Bottero, 2007; Collins & Flynn, 2008; Dolan et al., 2019; Bottero et al., 2005; Müller et al., 2021). The Olympics should be viewed less as an end point than a catalyst for transformation within the host city's socio-ecological system. Whether the legacy proves beneficial or detrimental depends on how effectively planning and management integrate event-related infrastructure into existing urban and environmental frameworks. Encouragingly, recent host cities have begun to recognise the value of intangible legacies – skills, reputation, regeneration, and spatial reuse – supported by coherent policies and adaptive planning. Yet, without binding standards and transparent accountability, these aspirations risk remaining rhetoric rather than reform.

Acknowledgements

We thank the anonymous peer reviewers for their constructive feedback and suggestions, which helped us to improve this article.

Conflict of interest

The authors report that there are no competing interests to declare.

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