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Green Games: Sustainable innovation at the Olympics



The Olympic Games serve as a global platform that transcends the boundaries of sport, promoting not only athletic excellence, but also fostering international unity and cultural exchange. Beyond the excitement of competition, the Olympics generate substantial economic benefits and provide a stage for the host nation to shine a spotlight on key issues. The Paris Organising Committee for the 2024 Olympic and Paralympic Games set out to establish a new model, pledging to deliver an ambitious, spectacular, universal event that is more responsible, sustainable, and inclusive than past Games. This Olympic Games

will be the first to attempt to align with the Paris Agreement to reduce greenhouse gas emissions, setting new standards for environmental responsibility and ensuring a lasting positive impact on both the economy and environment.¹ This commitment provides corporate sponsors and associated companies the platform to showcase their dedication to sustainability and innovation, increasing brand visibility and consumer loyalty. The Games also drive significant economic activity, urban development, and social improvements in host cities, leaving a lasting legacy of infrastructure and community benefits.²

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Sustainable innovation in sports

The Olympic Games have long been a stage for showcasing human ingenuity and progress. The upcoming Paris Games are no different, setting new benchmarks for environmental responsibility and stewardship. One of the most notable areas of innovation is in the use of recycled materials and end-of-life circularity considerations. Traditional sports equipment often relies on non-renewable resources and generates significant waste. The Paris Games, however, are leading the charge in changing this paradigm.

Field hockey will be played on the world's first carbon-neutral artificial turf, made from 80% sugarcane and

manufactured using green electricity, maintaining the high-performance standards required by athletes, while reducing the long-term environmental impact through less water use and end-of-life recycling.³ Track and field events are seeing a revolution in the materials used for track surfaces, repurposing plastic waste into high quality athletic surfaces that would otherwise end up as landfill waste.⁴ Uniforms and athletic wear are increasingly manufactured from recycled plastics like recycled polyester derived from discarded water bottles. Leading sportswear brands and team sponsors are embracing sustainable practices and putting these front and center of the Olympic Games:



Uniqlo, sponsor of Team Sweden, has significantly increased its use of recycled materials in the production of uniforms and gear, from 33% in the Tokyo Games to 50% in the Paris Games. By raising the proportion of recycled materials, Uniqlo is setting a new standard for sustainability in sportswear. Their innovations include fabrics derived from yarn discarded during manufacturing, utilizing recycled polyester, and incorporating molecular-level recycling, marking a pioneering effort to create new fabrics from used clothing provided by its customers.⁵



Asics, sponsor of Team Australia and Team Japan, has committed to listing the CO₂ emissions emitted during production of its athletic gear with a stamp on each product, providing transparency on the carbon footprint for each item. Through the use of recycled materials and renewable energy in their factories, Asics has reduced emissions by approximately 34% compared to previous Games.⁶



Cariuma, sponsor of the Dutch, Portuguese, and Slovakian Olympic skateboarding federations, uses recycled polyester made from old water bottles. This process requires 90% less water and up to 50% less energy than creating new petroleum-based polyester. Cariuma also made the decision to manufacture their products in Europe versus their home country of Brazil to further reduce emissions associated with shipping and travel. Their approach exemplifies how companies can integrate sustainability into each step of their production process, from sourcing materials to delivering the final product.⁷



Berluti designed the outfits for Team France to wear during the Opening Ceremonies, showcasing the potential for luxury brands to integrate eco-friendly practices into their production processes. Berluti used existing materials and collaborated with deadstock fabric company Nona Source to reuse high-end textiles leftover from the end of fashion seasons and unused inventory from LVMH fashion Houses.⁸

Companies can take a page out of the playbook from brands showcasing their innovative and sustainable designs in the upcoming Olympic Games. By integrating these sustainability practices, corporations can reduce their environmental impact, enhance their reputation, meet regulatory requirements, and appeal

to eco-conscious consumers. These efforts contribute to long-term economic sustainability by fostering innovation, reducing costs associated with waste and energy consumption, and building resilient business models that can adapt to changing environmental and social landscapes.

Event-level considerations to manage environmental impact

With several Olympic firsts, the Paris Games are pioneering novel sustainability strategies to proactively mitigate impacts of the Games and leave a legacy of environmental responsibility.⁹ From adopting a comprehensive carbon budget to using sustainable building materials, the Games are a model of eco-focused design and event management. These efforts provide a blueprint for how major events can be conducted sustainably and set new standards for corporate responsibility:

- **Carbon Measurement and Budget.** As an Olympic first, the Organising Committee will implement a comprehensive carbon measurement and budget strategy, using advanced tools to estimate, track, and manage the carbon footprint at every stage of the event. The aim is to achieve a 50% reduction in carbon emissions compared to the average of the 2012 London and 2016 Rio Games, including scope 3 emissions. This bold effort requires innovative approaches to managing the emissions footprint of the Games, focusing on transparency and accountability to achieve these ambitious sustainability goals.¹⁰
- **Material Footprint Calculation.** The Games are employing a detailed process to map all the resources required for the Games and analyze their lifecycle impacts. By understanding the event's complete material footprint, from spectator seating to sports equipment, the organizers can identify opportunities to reduce resource use, promote recycling, and manage materials more effectively. This meticulous planning effort ensures that every aspect of the Games is optimized for minimal environmental impact.¹¹
- **Use of Temporary Structures.** To reduce the permanent environmental footprint of the Games,

Paris is making extensive use of temporary structures which feature modular designs constructed from sustainable materials. These temporary structures are designed for disassembly, allowing for materials to be reused or repurposed after the Games.¹²

- **Renewable Energy Use.** The Games will be powered entirely by solar and wind energy and all venues will be connected to the grid. Historically, venues have utilized on-site generators to avoid any risk of power cuts. While the Paris Olympics will have backup generators in place, they will be powered – to the extent possible – by hydrogen and biofuel.^{13, 14}
- **Reducing Single-Use Plastic.** Food and beverage services will implement reusable catering equipment, which will be collected, cleaned, and repurposed for future events, cutting the need for single-use plastics in half. Worldwide Olympic Partner Coca-Cola will install 700 beverage fountains at competition venues where spectators will receive their drinks in reusable cups. After the Games, the fountains will be redistributed throughout France.^{15, 16}

The sustainability initiatives deployed for the Paris Games have applications for companies looking to advance their sustainability objectives. Ensuring accountability, fostering trust amongst stakeholders, implementing sustainable building practices and energy-efficient designs, and embracing circular economy principles all promote real economy impacts and resource conservation. These strategies collectively contribute to a robust and forward-thinking sustainability framework that companies can utilize for their own sustainability goals, inspiring future corporate practices worldwide.

Catalyzing sustainable development in communities

The International Olympic Committee (IOC) understands the sweeping impact of the Olympics and has established a strategic priority to ensure the Games are at the forefront of sustainability, helping host cities leverage them as catalysts for their own sustainable development. The Olympics often entail urban mega-projects that can help cities improve sustainable mobility, reduce greenhouse gas emissions,

restore natural environments, and expand access in low-income neighborhoods.¹⁷

While the actual Olympic events are short-lived in any given community, the impacts on infrastructure, recreational sites, housing, and nature are felt for decades. Therefore, the IOC has developed a series of strategic intents for sustainable development to guide future implementations of Games.

Paris 2024 is the first Olympic Games that has aligned itself with the Olympic Agenda 2020, the roadmap for the IOC and the Olympic Movement built on the three pillars of credibility, sustainability, and youth.¹⁸ At the outset of its candidature, Paris committed to reducing the Games' carbon footprint by half compared to previous events, and set a carbon budget that spanned across construction, energy, transportation, catering, and procurement.¹⁹

In line with the IOC's Olympic Agenda 2020, which requires hosts to prioritize existing and temporary venues, and consider building new ones only if they significantly contribute to the needs of the local population, 95% of the Paris 2024 venues are preexisting or temporary.²⁰ One notable new building is the Aquatics Center, which sits at the heart of the Paris 2024 vision to place any new constructions where they are really needed.²¹

The Aquatics Center was designed with a long-term goal in mind – to serve the local Seine-Saint-Denis community long after the Games. The Center will have the largest hanging roof in the world made entirely from wood, reducing emissions from construction and housing 4,680 square meters of solar panels. This urban solar farm will be one of France's largest, powering the entirety of the building. Spectator seats will be made from recycled plastics collected from

Sample IOC strategic intents for sustainable development²²

- Use of existing infrastructure is maximized and temporary venues are used where no permanent venue need exists or can be justified
- If built, infrastructure is viable and has a minimal environmental footprint
- Sites have net positive impact on local communities
- Sites respect protected natural areas, and urban green spaces are promoted
- Sites respect protected cultural areas
- Sites conserve water resources and protect water quality
- Mobility solutions are environmentally and socially responsible

local schools and the furniture will be made of wood waste from the construction site and other nearby demolition sites. The Aquatics Center will provide a multi-sports hub for the local community where currently half of 11-year-olds do not know how to swim. It will include swimming, climbing and fitness facilities, and areas for individual and team sports.²³

Aquatics Center rendering²⁴



The Games are also serving as an accelerator to clean the River Seine, with significant investment allocated for pollution remediation to enable Parisians to enjoy the river from 2025 onwards. The initiative is part of the city's future climate resiliency planning and has represented a major investment in restoring Paris's iconic river to make it fit for swimming again. While such complex infrastructure projects inevitably come

with their challenges, a future swimmable Seine will give Parisians an escape from sweltering summer temperatures, revive fish stocks, and restore river foliage.²⁵ While there is still work to be done, scientific readings showed the Seine was swimmable an average of seven out of ten days since cleanup efforts began.²⁶

Finally, the Paris 2024 organizers have structured the Games to leverage an extensive existing public transport network, to be reinforced by more than 400km of new bike lanes. Over 80% of the Olympic venues are situated within 10km of the Olympic Village, minimizing travel time for athletes. All venues are accessible by public transport and the vehicle fleet catering to athletes is set to include electric, hybrid, and hydrogen-powered vehicles provided by Toyota, the Worldwide Olympic Mobility Partner. The fleet will have a visual identity highlighting a multi-channel approach towards carbon neutrality: fuel cell hydrogen vehicles will be blue, battery electric vehicles green, and hybrid and plug-in hybrid vehicles purple.^{27,28}

The next summer Olympics, Los Angeles 2028 (LA28), is also incorporating sustainability into their plan to maximize positive long-term impacts to the community. The LA28 Games announced a collaboration with local community leaders to gather advice and guidance around community business and procurement, local hiring and workforce development, and sustainability. Galvanized by the opportunity to showcase the city, Los Angeles has developed a plan to reduce transportation-related greenhouse gas emissions by 25% by the 2028 Games. The plan is being carried out by the Los Angeles Cleantech Incubator (LACI), which is the city's official cleantech business, and is part of the Clean Energy Partnership. LACI is looking to accelerate the move to 100% clean energy while ensuring it meets the needs of transportation electrification, building decarbonization, and grid resiliency in the Greater Los Angeles region by the time of the Games.^{29,30}

A notable project to watch is the construction of the \$12 billion Brightline West project, a train line connecting Los Angeles to Las Vegas with a fully electric, zero-emission system that officials say will be one of the greenest forms of transportation in the United States. The Department of Transportation (DOT) has approved a total \$3.5 billion in funding to date, and also awarded a \$3 billion grant from President Biden's infrastructure law to the Nevada Department of Transportation for this project.³¹ The project is spurring significant private investment, with the expectation that Brightline West will be completed in time for LA28 and provide long-term clean transportation on one of the busiest highway arteries in the U.S.

Sustainability is not easy though, and host cities have had mixed experiences. "Academic opinion is divided regarding the sustainability of mega-events such as the Olympic Games. While some scholars doubt whether mega-events can ever be sustainable, others extol their virtues."³² As sustainability claims have come under pressure, city and Games officials are being careful about overstating the impact of their achievements. For example, LA28 officials are no longer touting their initial goal of being "energy positive," or generating more energy through renewable sources and energy efficiency than the energy needed to power the Games.^{33,34} Language matters.

Nonetheless, the Olympics can energize community development programs that have been lagging, shore up infrastructure for decades to come, and educate residents on implementable sustainable practices.

Financing sustainable Olympic Games

With the prestige and visibility that comes with hosting the Olympics comes the cost of financing the Games. The IOC requires host cities to have sufficient housing, transportation, and infrastructure to accommodate the influx of athletes and tourists. These infrastructure costs can be quite significant, depending on the needs of the host cities, ranging from \$5 billion to \$50 billion.³⁵ While the majority of financing comes from the private sector—namely the IOC, partner companies, ticket revenue, and licensing fees—a portion of the budget is provided by public funding. This public funding often involves financial

contributions from national, regional, and local governments to cover a range of expenses, including infrastructure improvements, venue construction, and security.³⁶ However, as the cost of the Games has risen, there is greater focus to ensure that the infrastructure built for the Olympics continues to serve the local community effectively and does not become a long-term financial burden. The following examples illustrate the balance host cities try to strike in preparing for the Games and being good stewards of public funds:

Paris 2024

Grand Paris Express	<ul style="list-style-type: none"> Major transportation project that will add four new lines to the Paris Metro and extend two current lines Will serve an estimated 2 million passengers daily, replacing the need for personal vehicles Expected cost of €36.1 billion, expected to be completed in 2030 Société du Grand Paris, the public service and government heading the project, has established the Green Euro Term Note Programme to fund the railway
Aquatics Center	<ul style="list-style-type: none"> Only permanent sporting facility that will be built for 2024 Games Venue after the Games will have 2,500 seats, learner pools, fitness center, climbing walls, gyms, soccer fields, paddle tennis, basketball, and yoga facilities for community use Structure is made out of timber and hosts a 4,680 square meter solar installation; one of France's largest urban solar farms and will supply 100% of energy needed to the center Estimated cost of €188 million
Athletes Village	<ul style="list-style-type: none"> Will house nearly 15,000 athletes in the Olympic and Paralympic Games Runs on 100% renewable energy Being transformed into 2,800 houses after the Games for 6,000 residents Estimated cost of €2 billion

Los Angeles 2028

Los Angeles Convention Center	<ul style="list-style-type: none"> \$54.4 million will be used for preconstruction efforts to remodel downtown convention center that will be used for table tennis and other events Using Olympics as an opportunity to renovate buildings that have been needing attention for years "Very fast-paced" schedule to complete projects before the 2028 Games
Inglewood People Mover	<ul style="list-style-type: none"> Will connect the Metro K Line to Kia Forum, SoFi Stadium, and Intuit Dome Federal Transit Authority is contributing half of the \$2 billion project through a capital investment grant, rest of funding is through local, state, and federal sources Will carry 11,000 riders an hour for events and reduce vehicle traffic around venues
Brightline West	<ul style="list-style-type: none"> Nation's first true high speed rail system connecting Las Vegas to Southern California spanning 218 miles Zero emission, fully electric trains that will travel up to 200 mph Will create the foundation of new industries and supply chains Awarded \$3 billion from the Bipartisan Infrastructure Law and is expected to cost about \$12 billion in total Government is supporting the issuance of bonds on behalf of the project

Brisbane 2032

Cross River Rail	<ul style="list-style-type: none"> Targeted 2025 completion and estimated cost of A\$7 billion, including government contribution of A\$3.4 billion Additional 10km of track being added as well as 6 new stations Fully-electric and will have zero emissions Will connect fans to sporting venues across the whole city
Athlete's Village	<ul style="list-style-type: none"> Northshore Hamilton area is being transformed into athlete village Will provide permanent housing for the growing population in Southeast Queensland after the Games are completed Will house over 10,000 athletes and team officials for the Games
Queensland Sport and Athletics Center	<ul style="list-style-type: none"> Reusing stadium rather than building new ones from ground up Capacity for 48,500 spectators Needs refurbishment, expected to cost around A\$1.4 billion-A\$1.6 billion

Public funds are often used in conjunction with private investments to share the financial burden and risks. This collaborative approach ensures resources are

used efficiently, projects are economically viable, and these investments contribute to the long-term well-being of the host communities.

A lasting legacy

As the first Olympic Games to seek alignment with the Paris Agreement, the 2024 Games mark a significant advancement in integrating environmental responsibility into major global events. The Paris 2024, Los Angeles 2028, and Brisbane 2032 Games are setting new standards in environmental and social stewardship, from utilizing recycled materials in sportswear, to implementing comprehensive carbon budgets. These initiatives not only minimize the environmental footprint of the Games, but also deliver lasting benefits to host communities. Focus on the long-term, from improved public transportation to renewable energy infrastructure, provides a legacy that extends well beyond the closing ceremonies.

For sponsoring and participating corporations, these Games provide a global platform to showcase their brand, highlight innovations developed to reduce emissions throughout the value chain, and demonstrate the economic viability of green products and services.

As cities around the world prepare for future Olympic Games and other large-scale events, the insights gained from these sustainability efforts will serve as critical blueprints for balancing the grandeur of global sporting events with environmental stewardship, while simultaneously driving corporate growth, sustainably.

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