

Olympic Delivery Authority
Sustainable design and construction update
October 2008



update

Games for the future

Sustainability was at the heart of London's bid for the 2012 Olympic and Paralympic Games. It is now at the heart of the Olympic Delivery Authority's (ODA's) work to design and build the venues for the Games.

The **London 2012 Sustainability Plan** is structured around five key themes: climate change, waste, biodiversity, inclusion and healthy living.

To help measure its progress on sustainability, the ODA has split these five themes into 12 objective areas. This update provides a 'snap shot' of the ODA's progress against these sustainable development objectives.



Objectives

1. Carbon

To minimise the carbon emissions associated with the Olympic Park and venues.

2. Water

To maximise the opportunities for efficient water use, reuse and recycling.

3. Waste

To reduce waste through design and to maximise the reuse and recycling of demolition, remediation and construction materials.

4. Materials

To identify, source and use environmentally and socially responsible materials.

5. Biodiversity and ecology

To protect and enhance the biodiversity and ecology of the Lower Lea Valley, and of other venue locations.

6. Environmental impacts

To maximise positive and minimise adverse impacts on land, water, noise and air quality.

7. Supporting communities

To create new, safe, mixed-use public space, housing and facilities appropriate to the demographics and character of the Lower Lea Valley that are adaptable for the future.

8. Transport and mobility

To prioritise walking, cycling and public transport as ways to get to the Olympic Park and other venues.

9. Access

To create a highly-accessible Olympic Park and venues through inclusive design.

10. Employment and business

To create new employment and business opportunities locally, regionally and nationally.

11. Health and well-being

To promote healthy lifestyle opportunities during the construction of the Olympic Park and venues.

12. Inclusion

To involve, communicate and consult effectively with stakeholders and the diverse communities surrounding the Olympic Park and other venues.

Weymouth and Portland

Enhancement works at the Weymouth and Portland National Sailing Academy involve reclaiming 18,000 square metres of land in front of the academy using 80,000 tonnes of local Portland stone. Construction of a new permanent 250m slipway, together with a new pier offering two yacht lifting cranes. In front of the pier, a new pontoon will be constructed with 70 berths for race boats and the enhanced facilities will be protected by a 200m breakwater.



The ODA were presented with a CEEQUAL Excellent Award in May 2008, the highest possible rating. **CEEQUAL** is an independent company that undertakes environmental assessments of engineering projects. An additional assessment will be undertaken once construction has finished.

1. Carbon

We aim to reduce carbon emissions in three ways:

Mean: minimising demand for energy

Lean: supplying energy efficiently

Green: using renewable sources of energy

Highlights

- Achieve a 50 per cent reduction in carbon emissions from buildings within the Olympic Park (against 2006 Building Regulations) by 2013.
- Ensure 20 per cent of the energy used on the Park after the Games will be from renewable sources on site.
- A two-megawatt wind turbine will be built at the north of the site that will supply enough power for 1,000 homes.
- Achieve Code for Sustainable Homes Level four for the Olympic Village, resulting in a 44 per cent reduction in carbon emissions.

Key progress to date

- Construction on the Energy Centre has started.
- Innovative designs for the Olympic Park venues (Aquatic Centre, Olympic Stadium, Handball Arena, VeloPark and International Broadcast Centre/Main Press Centre) are currently achieving above the 15 per cent reduction in energy demand against Building Regulations 2006 Part L levels.
- Procurement is under way to appoint a contractor to build and operate a two-megawatt wind turbine.
- We are taking measures to ensure that our construction process is as sustainable as possible. For example, we used small scale solar panels and wind turbines to power toilets and signs during site preparation.

50%

reduction in carbon emissions from buildings within the Olympic Park by 2013.

The Energy Centre

The Energy Centre is central to our plans to reduce carbon emissions. It will include biomass boilers and a combined cooling, heating and power plant (CCHP), which is up to 30 per cent more efficient than traditional generation.

A development of the scale of the Olympic Park makes it possible to put in place the 16 kilometres of pipe and other underground infrastructure that a CCHP requires to distribute heat and cooling locally. The central location of the Energy Centre minimises electrical losses. The pipes for the CCHP will be sized to requirements that would be needed after the Games.

The Energy Centre will:

- provide heating and electricity for all developments and venues within the Olympic Park;
- provide cooling for the International Broadcast Centre/Main Press Centre and Handball Arena;
- connect to the Stratford City Energy Centre that will supply energy for the Olympic Village and Stratford City development;
- supply electricity to the local grid; and
- house an education centre in legacy.



The Energy Centre will initially be powered by wood biomass and gas, but will be capable of being upgraded to burn other renewable fuels. Local waste timber will provide the biomass fuel, while sustainable transport methods, such as rail or water, are being considered to move the wood fuel to the site. In total, the CCHP will reduce carbon emissions generated in the Olympic Park by a minimum of 20 per cent.

A 40-year agreement has been signed with a private sector partner to build and operate the Energy Centre that will provide electricity to up to 10,000 local homes at a competitive rate. Employment opportunities will be created during its construction and operation, and also in its education centre, which will be created after the Games.

2. Water

We will reduce our water usage by managing the demand for drinkable water, encouraging changes in behaviour, reducing demand through water-saving technologies, and by using alternative water sources, like rainwater or recycled 'grey' water.

Highlights

- Reduce demand for drinkable water by 40 per cent for venues and, in line with the Code for Sustainable Homes Level four, by over 30 per cent for residential buildings compared to current practice.
- Achieve a 30 per cent reduction in the use of drinkable water by installing water efficient fixtures and fittings in venues such as low flow taps and waterless urinals.
- A further 10 per cent reduction will be achieved by installing major non-potable water networks across the Park for irrigation.

Key progress to date

- A detailed analysis has been completed and instructions issued to all permanent venues to install water efficient fixtures and fittings so we can achieve a 30 per cent reduction in potable water.
- The VeloPark and Handball Arena will use rainwater harvesting to reduce potable water demand.
- The Aquatics Centre will recycle water that has been used to clean swimming pool filters for toilet flushing.
- Site offices have been fitted with waterless urinals and low-flow taps and showers.
- During construction we are recycling water used for soil washing and dust suppression.
- A major non-potable network is currently under design and a long term supply contract will be procured.

40%

reduction in the use of drinkable water.

Velodrome water efficiency



The Velodrome has been designed to reduce water consumption by 44 per cent through low-use water fittings. It will also capture and use about half of the rainwater falling on the roof for non-drinkable applications, including toilet flushing and landscape irrigation. Overall, the Velodrome will use about 55 per cent less drinkable water than a comparable facility.

The rainwater is collected in a perimeter gutter and is routed to two specially designed hopper systems, one at either end of the building. Due to the size of the roof, peak run-off exceeds 800 litres per second, with the water moving very fast by the time

it gets to the end of the building. A key hydraulic challenge is how to deal with this high speed flow, turning it through a series of bends and dissipating the energy before the water enters the plant room.

Once it gets into the plant room, it undergoes treatment by passing through a vortex separator to remove silt and other solid debris. The water is then stored in a 25,000 litre tank so that supplies can be maintained during periods without rain. Before distribution for use, the water is treated by a UV disinfection process to ensure that any bacteria are destroyed.

3. Waste

London 2012 aims to reduce waste through design, avoid producing waste during construction, and also during and after the Games.

Highlights

- Reclaim 90 per cent of demolition waste by weight for reuse or recycling.
- Reuse or recycle 90 per cent of construction waste by working with the Site Waste Management Contractor.

Key progress to date

- Currently exceeding our target of reclaiming 90 per cent of demolition material for reuse or recycling.
- Over 220 buildings have been demolished and materials such as bricks, granite kerbs, cobbles and tiles have been stockpiled to be used later in the design and construction of the Park and venues.
- Four buildings have been reclaimed for re-assembly and reuse off site.
- Five soil washing machines and a bioremediation plant on site that will clean 1.3 million tonnes of soil.
- To date, around 80 per cent of contaminated soil has been able to be cleaned and reused.
- A single contractor has been appointed to streamline waste collection and management across the site. A consolidation centre will be set up on site so waste can be reused and recycled.
- The ODA recently won a Brownfield Briefing Remediation Award, which recognised its use of a number of methods to wash soil and effectively 'recycle land'.

1.3 million

tonnes of soil are being washed by five soil washing machines and a bioremediation plant on site.

Cleaning soil naturally



Billions of naturally occurring micro-organisms are helping to clean nearly 50,000 tonnes of contaminated soil on the Olympic Park site. This means soil can be reused rather than transported to landfill.

Warm air, nutrients and water vapour is pumped through soil in specially constructed bioremediation beds to increase the numbers of harmless micro-organisms, from a wide variety of bacteria.

The micro-organisms in the soil consume organic petroleum hydrocarbons, such as petrol and diesel, which are one of the major sources of contamination on the Olympic Park.

After a few weeks, the soil is cleaned and can be reused to build the platforms for the construction of the venues and parklands without waste materials being taken to landfill.

4. Materials

We are choosing the materials to build the Olympic Park and venues carefully to minimise the environmental and health impact of our work and to maximise opportunities for materials to be reused after the Games.

Highlights

- 100 per cent of timber will be procured from sustainably certified and legal sources in accordance with the Central Point of Expertise on Timber (CPET).
- 20 per cent of materials (by value) and 25 per cent of aggregate (by weight) will be from recycled or secondary sources.
- A bespoke Olympic Park Green Guide will be used to identify the 'embodied carbon' impact of materials – the carbon produced during the extraction, manufacture, production and assembly of materials.
- An aspirational target has been set for 50 per cent of materials (by weight) to be transported by rail or water.

Key progress to date

- All timber supplied to the project during enabling works was in accordance with CPET. We are procuring a panel of timber suppliers, which must commit to supplying legal timber that is fully certified as coming from **sustainable sources**.
- A site-wide contractor has been appointed to supply concrete and aggregates to all contractors, boosting the use of recycled content and materials.
- The construction of Prescott Lock is well advanced. The project managed by British Waterways, will enable barges to carry construction materials and waste to and from the Olympic Park site and is expected to open in late 2008.
- A rail head has been built on the south of the site, and we are working with contractors to identify which materials can be brought to site by rail or water cost-effectively.

100%

of timber to be procured from sustainably certified and legal sources.

Making a concrete difference



A site-wide concrete supplier is working with us to deliver sustainable concrete and aggregates.

Standard concrete aggregate consists of sand and various sizes of gravel or stone. However, some of these raw materials can be substituted for alternative secondary materials, which are largely recycled, such as; Pulverised Fuel Ash (a by-product of producing electricity in coal-fired power stations; waste glass) and Stent (a waste rock produced in the removal of China Clay).

All concrete delivered to contractors will state the recycled content and its embodied energy (amount of energy used to make and deliver the concrete) allowing us to monitor the exact embodied energy of the concrete produced. Concrete on the Olympic Park site is expected to contain at least 26 per cent recycled content on average.

The contractor has committed to exceeding the target of 50 per cent of materials to be delivered to the site by rail or water.

5. Biodiversity and ecology

We are committed to protecting and enhancing the biodiversity and natural habitats within the Olympic Park wherever possible, creating the biggest new park in Europe for 150 years.

Highlights

- The Olympic Park will feature 45 hectares of species-rich habitat.
- Designs for the Park are being worked on to ensure a useable and biodiverse space is created.

Key progress to date

- Produced and implementing an Ecological Management Plan.
- A Biodiversity Action Plan has been submitted for planning approval outlining the type, amount and location of habitat that will be created in the Olympic Park.
- Undertaken a long-term programme of removing invasive species like Japanese Knotweed (on site treatment of Japanese Knotweed saved 48,000 m³ of soil going to landfill), Himalayan Balsam and Giant Hogweed.
- Protected existing habitat refuges where possible or created new refuges, such as new ponds and artificial sandmartin and kingfisher nests at the Waterworks Nature Reserve, as well as a wildlife corridor at East Marsh at the north end of the Park.
- Translocated over 2,000 newts and more than 100 common toads from waterways and ponds within the Park.
- Required contractors to take account of biodiversity issues as part of their Environmental Management Plans.

45 hectares

of the Olympic Park will be species-rich habitat.

East Marsh habitat planting



More than 40 children from an east London school have been helping to create a nature reserve for the Olympic Park, along the banks of the River Lea at East Marsh.

The joint project with Hackney Borough includes the creation of a wildlife corridor around the north perimeter of the Olympic Park, covering more than 10,000 square metres. The area will become home to a variety of wildlife including birds, frogs, spiders and beetles, and even

the endangered ground bug and the rare 'toadflax brocade' moth.

Natural materials, many of which were taken from the Olympic Park site clearance programme, have been used to create different habitat areas. This includes log walls, compost piles and earth mounds.

The school children who helped to plant the grasslands and wildflower areas will be invited back before 2012 to see their work grow and develop.

6. Environmental impacts

We are committed to minimising the negative impacts and maximising the positive impacts of our construction programme on land, water, air quality and noise.

Highlights

- Contractors will abide by the **Considerate Constructors Scheme** and achieve a minimum score of four out of five for each section, meaning that the site will operate beyond industry standards.
- Permanent buildings will achieve a BRE Environmental Assessment Method (BREEAM) 'Excellent' rating, an internationally recognised standard for environmental quality in buildings, after the Games.
- The ODA is following the GLA London Best Practice Guidance in relation to dust, air emissions and construction activities.
- Buildings and infrastructure are being designed to cope with a one-in-100-year flood and a six millimetre yearly sea level rise.

Key progress to date

- A **Code of Construction Practice**, which includes measures to reduce and control noise, dust and local traffic, has been issued to contractors for implementation.
- A **community commitments document** sets out ten commitments to the local community and shows how we are addressing and managing construction impacts.
- An air quality and noise monitoring scheme has been implemented.
- Water collected by road sweepers is being treated and recycled, at around 80,000 litres per day. Once the water has been cleaned by a mobile silt trap and centrifuge system, it is used for soil washing, road sweeping and dust suppression.
- Site weekly inspections have been established and audits for all projects are undertaken. These processes are backed by the ISO14001 certified Environment and Sustainability Management System (ESMS).

100%

of permanent venues are on target to achieve BREEAM excellent rating.

Working together to set new standards



We are working with the Environment Agency (EA) to identify suitable techniques to maximise the amount of soil to be reused on the Olympic Park site.

A new approach has been used on the Olympic Park and is focused around the production of a site-wide Global Remediation Strategy (GRS). The soil was highly contaminated and required a massive clean-up operation – more than one-million cubic metres of soil needed to be cleaned before it could be re-used.

A GRS sets out the procedures for cleaning up land contamination over

the whole site and for taking forward site specific remediation strategies for the improvement of land quality. This approach has worked well and is recommended as a model for other development sites where land is affected by contamination.

A team of three EA officers are based at the Olympic Park site and conduct inspections on a regular basis.

The success of the GRS has meant that the EA now recommends it as a model for other developments where land is affected by contamination.

7. Supporting communities

The London 2012 Olympic and Paralympic Games will be the catalyst for the regeneration of the Lower Lea Valley in east London. The area in and around the Olympic Park has a young and diverse community, but also has areas that would benefit from redevelopment.

After the Games, the Olympic Park will become the centrepiece of the biggest regeneration project in Europe. Five major sports venues, as well as the Olympic Village, the wider Olympic Park, and the International Broadcast Centre/Main Press Centre, will be converted for other use.

Over time, the Park will be fringed by new mixed-use neighbourhoods offering homes, jobs, office space, shops, and cultural and leisure facilities to local people. Legacy will be planned so that new neighbourhoods are integrated with and reflect the character of the diverse places that surround them.

The London Development Agency (LDA) has taken lead responsibility for planning the legacy. The Legacy Masterplan Framework is being prepared with extensive public involvement during 2008 and will form the basis of planning applications in 2009.

Together with the London Development Agency (LDA), we have talked with local residents about how to make sure that the venues and infrastructure are used by them and support them long after 2012.

For further information visit www.legacynow.co.uk

75 pence

in every pound is committed to
regeneration.



8. Transport and mobility

London 2012 will be a 'public transport' Games. We aim to get 100 per cent of spectators there by public transport, walking or cycling.

There are strong transport links to the Olympic Park. Stratford Regional Station is the main gateway to the Games and we are making a range of infrastructure improvements to boost accessibility and capacity at the station.

The **Transport Plan** was published in October 2007. The Transport team has a Sustainable Transport Manager and a Principal Access and Inclusion Officer, and holds a regular Transport Sustainability Forum with other transport stakeholders. The **Accessible Transport Strategy** was published in May 2008. The strategy outlines the access improvements it is making alongside its partners to encourage disabled people of all impairments to use public transport for at least part of their journey to the Games.

An 'Active Spectator Programme' to encourage spectators to walk or cycle to the Games is currently being developed.

An aspirational target has been set to transport 50 per cent of materials by rail or water during construction.

For more information see [the Transport area of the London 2012 website](#).

25,000

maximum number of people per hour that the Javelin® will carry from central London to the Olympic Park.



9. Access

London 2012 will be everyone's Games. For the first time, both Olympic Games and Paralympic Games are being planned together from the start, while preserving the distinctive feel that is unique to each event.

London 2012 will be the most accessible Games to date. Inclusive and accessible designs are at the heart of the planning for all Games venues and infrastructure.

The Olympic Park and venues will offer athletes and spectators an experience that can be enjoyed equally, confidently and independently, regardless of age, disability, gender or faith.

Inclusive Design Standards have been developed and an Inclusive Design Strategy published. To ensure that these standards are met, we have established a Built Environment Access Panel to review designs, working with a full-time Principal Access Officer. An Access and Inclusion Forum has also been set up to engage with disabled people of all impairment representative groups.

For more information **view the Inclusive Design Strategy.**

1.5 million

spectators are expected to watch the Paralympic Games during 11 days of competition.



10. Employment and business

The London 2012 Games offer new employment and business opportunities in one of the most economically deprived areas of London. We are working with our partners to make sure that local people and businesses are well-placed to benefit from these opportunities.

An **Employment and Skills Strategy** was published in February 2008. It sets out how training and job opportunities from building the Olympic Park venues and those outside of London would be made available to local people.

The Olympic Park construction workforce will peak at around 9,000 jobs and we have set challenging targets for employing local people, previously unemployed and providing apprenticeship opportunities. We are benefitting from 247 graduates from the Plant Training Trust, with over half of these working on the Olympic Park.

A dedicated **London 2012 Business Network** enables businesses to find out about current and upcoming opportunities to supply to London 2012 or its main contractors. Businesses can also access services and offer their services through the CompeteFor website. Contractors are required to monitor the diversity of their supply chain.

We are encouraging our contractors to pay the 'London Living Wage', which is higher than national minimum wage.

Monitoring systems are in place to assess performance in these areas, while skills forecasting systems help to develop training programmes.

Read the **Employment and Skills Update** for more information.

24%

of the Olympic Park workforce are local residents and 9 per cent were previously unemployed.



11. Health and well-being

We are committed to 'designing out' health and safety risks associated with the construction, maintenance and use of the Olympic Park and other venues, and to promoting healthy living among our workforce.

The **Health, Safety and Environment Standard** was updated in July 2008 and gives clear guidance to contractors and their staff on the standards and procedures.

We are addressing a range of health matters, such as diet and the provision of healthy food in site canteens, exercise and activity. An occupational health team, 'Park Health', has been appointed to enhance the general well being of all everyone within the project and to carry out health checks to identify and address any health conditions for all workers on site.

Health and safety is monitored on site and a target for zero fatalities during the construction of the Olympic Park and other venues has been set. The rolling 12-month accident rate has been falling over the past year and the fifth one million hours without a reportable incident was achieved in September 2008.

1 million

working hours without a reportable incident achieved on five occasions.



12. Inclusion

The Olympic Park is located amid some of the most diverse communities in London. We are committed to involving and engaging with these communities, and to ensuring that it meets and exceeds its equal opportunity duties across all of these communities.

We work with the LDA and other partners to prepare an integrated programme of community engagement. This gives local people a chance to contribute both to the plans for the Olympic Park and venues during the Games, and to the Legacy Masterplan Framework. To keep local people informed during construction work, the ODA publishes a quarterly newsletter called 'Your Park', has established a 24-hour construction hotline and runs regular meetings with local community organisations.

An **Equality and Diversity Strategy** has been produced, which provides a framework for our approach to equality and diversity. Alongside this strategy, three equality schemes describe how the ODA will fulfil its statutory requirements to promote disability, gender and race equality. The strategy integrates equality, diversity and inclusion, which we have factored into recruitment, procurement, and training.

Workforce equality monitoring has been implemented for the entire programme and is helping contractors to develop their own equality action plans through an equalities network.

11.5%

proportion of the total programme workforce who are women, against the ODA target of 11 per cent.



Olympic Delivery Authority

23rd Floor, One Churchill Place
Canary Wharf, London E14 5LN
Reception +44 (0) 203 2012 000
Fax +44 (0) 203 2012 001
www.london2012.com

This publication is available on request in other languages and formats. To obtain these please email enquiries@london2012.com or phone +44 (0) 203 2012 000 quoting reference number ODA 2008/081.

This document can be found in the publications section of www.london2012.com

Please phone for a free translation

Ju lutemi telefononi për përkthime falas

رجاءً اتصل بنا للحصول على ترجمة مجانية

বিনামূল্যে অনুবাদের জন্য অনুগ্রহ পূর্বক টেলিফোন করুন

請致電要求免費翻譯

请打电话要求免费翻译

Téléphonez pour obtenir une traduction gratuite

মহত আর্থাৎর মাটে মডেংরানী ক্রীমে হ্রো ক্রী.

Prosimy zadzwonić w celu uzyskania bezpłatnego tłumaczenia.

Por favor telefone para obter uma tradução gratuita

ਮੁਫਤ ਅਨੁਵਾਦ ਵਾਸਤੇ ਕਿਰਪਾ ਕਰਕੇ ਫੋਨ ਕਰੋ

Fadlan soo wac tarjumaad lacag la'aan ah

Llámenos para conseguir una traducción gratuita

Lütfen ücretsiz çeviri için arayın

براه مهربانی مفت ترجمے کے لیے فون کریں

xin gọi điện để được dịch miễn phí

The construction of the venues and infrastructure for the London 2012 Games is funded by the National Lottery through the Olympic Lottery Distributor, the Department for Culture, Media and Sport, the Mayor of London and the London Development Agency.

© 2008 Olympic Delivery Authority.

The official Emblems of the London 2012 Games are © London Organising Committee of the Olympic Games and Paralympic Games Ltd (LOCOG) 2007. All rights reserved.

Published October 2008.



LOTTERY
FUNDED



department for
**culture, media
and sport**



MAYOR OF LONDON