



**LBTH Energy Services Response to the Energy Statement for 2012
Olympic, Paralympic and Legacy Transformation Applications
Submitted by the Olympic Delivery Authority**

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Friday, 23rd February, 2007.

1) Response to the Executive Summary:

The report has been professionally prepared covering all aspects as much as possible but we have our expectations which we request to be taken into consideration.

The carbon mitigation for the buildings in the Olympic Park is set out according to the requirements of UK National and London Regional policy.

For an event like the London Olympics the carbon mitigation standard has to be a lot higher than stated in order to achieve a carbon neutral and zero carbon Olympics for the world to see and emulate.

The energy hierarchy for the Olympic Park as defined is good:

Mean: Energy Efficiency

Lean: Efficient Conversion (Fossil Natural Gas fired CHP and Biomass Boiler)

Green: Renewable Energy (various options to be phased in)

Our preferred Cooling, Heating and Electricity provision is by locally sourced sustainable wood chip-fired (Biomass) gasification/Pyrolysis CCHP System working in coordination with additional Biomass Boilers to meet the energy needs of the games park and legacy agenda. The integration of heat and coolth networks is very energy efficient.

Energy Efficiency in Buildings:

The targeted aspiration of 15% improvement on current Building Regulations needs to be higher. The Building Research Establishment (BRE) would have to take an Olympic Standard view of this.

SupaMag Technology (An Energy Services Renewable Energy Option):

Such new technology as the SupaMag which should be a matured and mass application heat and power provider well before the London Olympics should be given a slot to help London Olympics achieve a zero carbon Olympics.

SupaMag:

“Using two of nature's most powerful natural forces, the north and south magnetic fields within a proprietary and exclusive design, the motor will generate electricity and heat to power a home/building thus removing the home from reliance on the electrical grid systems and gas/heating oil currently used”.

The 'SuperMag' is the first of its kind in the world and merits an Olympic slot.

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The 'SuperMag' engine is designed to be scalable so that it can power any sized structure, or any number of structures.

It is also environmentally ideal with zero emissions.

Carbon Mitigation Strategy:

Fuel Cells Providers with their state of the arts systems of 2012 can be invited to have the privilege of supplying zero carbon energy on-site and they would pay for this privilege and of course because of the Olympic exposure. The selected few could be given slots to supply zero carbon power to the Olympic Smart networks controlled from the Energy Centre and this fact can be announced to the arenas as to who is supplying the zero carbon power and by what means.

With all this infusion of future proof technology, the carbon dioxide emissions reduction would be of Olympic standard consequently contributing to a carbon neutral and zero carbon Olympics.

Carbon Dioxide Emissions Reduction through Renewable Sources:

The proposed target of 20% from these sources is poor and can be improved by a factor of two. Since the Olympics would be during the summer months, the role of Photovoltaic technology should be raised as a deliverable on-site power option and of course manufacturers would do anything to have their systems in the Olympic infrastructure.

The key policy drivers for the carbon mitigation strategy are as follows are:

- Government policy on energy and the Kyoto Protocol.
- Government planning policy at national level.
- Regional (Mayoral) policy on Energy (London Plan and Mayor's Energy Strategy).
- Local Borough policies.
- Olympic special policies.

These key policy drivers are adequate enough if applied together with the additional strategies stated herein to deliver a carbon neutral and pure zero carbon Olympics with legacy wins.

2) Energy Efficiency...Mean Response:

Building Regulations:

The strict application of the 2006 revision to part L of the Building Regulation in coordination with BRE would also reduce emissions from the 2012 games park.

Energy Efficiency through Heat and Coolth Recovery:

In venues where there are potentially heat gains from the spectators, opportunities are created to recover this heat by heat-pumps and the recovered thermal energy is utilised to pre-heat the hot water used in the shower rooms etc. This would add to demand reduction of energy during the games.

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Rain Water harvesting:

There doesn't seem to be any mention of this concept to reduce the amount of water drawn from the mains. With vast amounts of roof space this feature is necessary.

3) Efficient Energy Supply.....Lean Response:

The Gas fired CCHP is good but would be exposing UK PLC yet again to the uncertainties of the Fossil-Natural-Gas world markets where price stability and security of supply is not guaranteed and can never be guaranteed. However locally sourced wood chip (Biomass) fired CCHP System would be an excellent choice as the technology has moved on as I will explain later on. This would provide cooling, heating and electricity on the cheap and is also an effective carbon mitigation measure. This would represent a solid legacy sustainable power provision. It would also be reliable.

The provision of the wood chips feedstock should be sourced from within London and the suburbs. We have in mind utilizing the vast supply of wood waste in the London area for the provision of the wood chips feedstock for the CCHP. The various parks in London can power the Olympics. LBTH has done a lot of research in this area. Waste wood in London has the potential to produce at least 70,000 tonnes a year of high quality woodchip fuel.

The establishment of Tree Stations in the Olympic Boroughs especially in the London Borough of Tower Hamlets would tap into this vast resource and during the Olympics, the woodchip feedstock would be provided free to the Energy Centre's CCHP and after the Olympics it would be paid for to make a business sense for the Tree Station operators. Our Borough can join Croydon in this enterprise and therefore would translate into a legacy win.

The Energy Centre should control other energy systems that feed power to the Olympic Park Smart Net work. Renewable Energy Providers would jump at the privilege to supply on-site green power to the Olympics; they stand to gain from the Olympic exposure. Wouldn't it be nice that when the power supply is on zero carbon during the Olympics, this information would be announced to the arenas? It would show to the World that London Olympics is a zero carbon Olympics with no carbon footprint! This objective is achievable at low cost by application of creative thinking.

As was stated in the ODA Energy Statement, "Systems based on gasification/Pyrolysis, thermal rankine cycle and indirect air intake cycle are

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considered as being at prototype scale within the UK. There has been a number of high profile failures of gasification systems in the UK recently” This is in reference to the wood chip fired CCHP I proposed above.

We beg to differ because if you step over to the continent, gasification/ Pyrolysis systems are successfully being operated in Austria and other European countries and we only have to ask them of this technological excellence which is affordable.

For a typical manufacturer of a working system Visit the following Website and also find attached a brochure in PDF:

<http://www.repotec.at>

With the above system, we can locally source the low cost feedstock that would sustain and raise the wood chip industry in this country. This is a win-win formula against yet more gas importation demand, this is a much better solution, economically viable and sustainable. It is also scalable and this technology can be faithfully relied upon.

The capital costs would be higher than the Fossil Natural Gas fired CCHP system, but this system would have highly reduced emissions, security of feedstock supply and availability of feedstock plus the attraction of ROCs. Even without ROCs it can stand on its merit.

Bio-Gas CHP

According to the Energy Statement: “The technology for on-site generation of bio-gas is currently not commercially viable or technologically proven.

The technology is commercially available and technologically proven. Examples can be found in Denmark, Sweden, Austria and Germany to name but a few. In USA the produced gas which is cleaned is termed “renewable natural gas” because of the high content of methane.

The Olympic Games could serve as an expo of other types of power systems; therefore the supply of power to the Olympic site should be multidimensional by incorporating other low to zero carbon options. I am sure power providers around the world would like to participate.

Community Heat and Coolth Networks:

The implementation of this will be another addition to the Olympic legacy.

4) Energy from renewable sources.....Green Response:

The methodology used to evaluate the application of renewable technologies for the Park infrastructure is very good.

Wind Turbines:

The selection of Utility scale wind turbine is appropriate but instead of one, two should be recommended and sited in an adjacent location.

Biomass Boiler:

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The selection of wood feedstock fuelled Biomass Boiler is appropriate.

Biomass combined cooling, heating and power Systems:

The European established electrical efficiency is 25% and not 15% and this was stated earlier. Our research shows that the woodlands around London which includes the Royal Parks, Epping Forest, Hampstead Heath et al can guarantee the provision of feedstock and is sustainable. In addition there are many wood chip and wood pellet producers across the country that would like this industry to really take off instead of enslaving the country to yet more gas imports. The favourable economic impact of Olympic coolth, heat and power supplied from Biomass CCHP is far superior to whatever Gas fired CHP can offer to the games and legacy agenda. The combination of Biomass CCHP and additional Biomass Boilers would shrink the carbon footprint of these games to the point of where it could be classified as the greenest games of all time. With the right financial model, the implementation of the above would be a child's play.

Any system installed in mainland Europe can be interpreted as installed in the UK as well because we part of the EU.

5) The Grand Conclusion:

The Olympic, Paralympic and Legacy Transformation potential impact has created a golden opportunity for decentralised energy, renewable energy, carbon neutral and zero carbon strategies to be implemented in the London Energy Supply landscape. This opportunity can not be missed.

Biomass (wood chip) fired Combined Cooling, Heating and Power generation systems sited across the Olympic Boroughs would be a solid legacy that would shrink the carbon footprint of the Olympic Boroughs. The economic impact is also a big gain. The resulting low priced heat, coolth and power would go a long way to diminish fuel poverty in the Olympic Boroughs.

Whilst the ODA appear to be content with the potential reduction of circa 34% carbon emissions from the predicted baseline, the evidence is that a target of carbon neutral or pure zero carbon powered games (strictly non-nuclear) is easily achievable with a mix of commercially available and proven technologies and the right financial models. I rest my case!